

FOREST BOTANY MANUAL
MODULE 2
WOOLNORTH REGION



2005

**FOREST BOTANY MANUAL:
MODULE 2 – WOOLNORTH REGION**

2005

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Published by the Forest Practices Authority, 30 Patrick Street, Hobart – Tasmania – 7000

Phone: (03) 6233 7966; Fax: (03) 6233 7954

Email: info@fpa.tas.gov.au; Website: www.fpa.tas.gov.au

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INTRODUCTION

Tasmania is divided into eight bioregions on the basis of the State's biogeography. Separate Forest Botany Modules have been developed for these regions.

This module deals with the Woolnorth Region. It covers subjects relevant to conservation of flora, as required by the Tasmanian *Forest Practices Code* (2000), the *Forest Practices Act* and other legislation and processes.

The module is designed to assist Forest Practices Officers (FPOs), and others involved with forest management, to prepare Forest Practices Plans (FPPs) for sites within the region. The information can also be used for other purposes (e.g. management planning for reserves, preparation of property plans).

The module is divided into six sections, which follow the format of the FPP *Flora Evaluation Sheet*:

Section 1 gives a brief overview of Woolnorth Region.

Section 2 provides keys to forest and non-forest vegetation, and more detailed keys to forest communities. Tables indicate conservation priorities for forest communities.

Section 3 lists plant species that have a priority for conservation in the region - most of these are species listed on the Tasmanian *Threatened Species Protection Act 1995*.

Section 4 indicates sites of potential significance for flora conservation. These are environments that are often associated with species or communities that have a priority for conservation.

Section 5 discusses some other issues (e.g. weed and disease management) that may need to be considered by FPOs, to ensure that the operation complies with botanical requirements of the *Forest Practices Code* and other policies.

Section 6 summarises the evaluation process and indicates the steps that need to be taken after a FPO has assessed the FPP area. It also indicates whether specialist advice is required.

The processes used to determine if communities, species and sites of potential significance are present in an area, will also capture those National Estate flora values (as identified in the Tasmanian Regional Forest Agreement) that have the potential to be affected by operations requiring FPPs.

Module 1 of the *Forest Botany Manual* gives background information relevant to users of the regional modules. The Manual is supported by information on the Forest Practices Authority (FPA) website, including a gallery containing images of many threatened species, and species used to identify vegetation types and forest communities. An ongoing series of Flora Technical Notes also covers aspects of vegetation management in Tasmanian forests. The Manual provides links to several external websites – the FPA website will maintain updates to these sites, and should be consulted if there are problems accessing the links given in the Manual.

Queries and comments about the format or content of the *Forest Botany Manual* should be referred to the FPA's Senior Botanist. Queries and notifications about vegetation in operational areas should generally be referred to the Senior Ecologist.

Contact details for the Forest Practices Authority's Botany and Ecology programs:

**Forest Practices Authority,
30 Patrick Street,
Hobart, Tasmania 7000**

Phone: (03) 62337804 (Botany); (03) 62164454 or 62337870 (Ecology)

Fax: (03) 62337954

Email: info@fpa.tas.gov.au ; Website: www.fpa.tas.gov.au

Section 1 OVERVIEW OF WOOLNORTH REGION

Woolnorth Region comprises the coastal and inland areas of Tasmania's central north, northwest and the western Bass Strait islands (see map). The slopes of the Western Tiers and associated uplands (e.g. Surrey Hills) form a backdrop to the plains and undulating country of the coast and hinterland of the “mainland” part of the region. Some higher and more dissected country is also contained within the region, often supporting substantial areas of native forest. The diversity of native vegetation in Woolnorth Region is largely correlated with variation in rock types and landforms, and a distinct climate gradient from the humid west to the drier east. Land use and fire history have also influenced the extent, structure and composition of the vegetation.

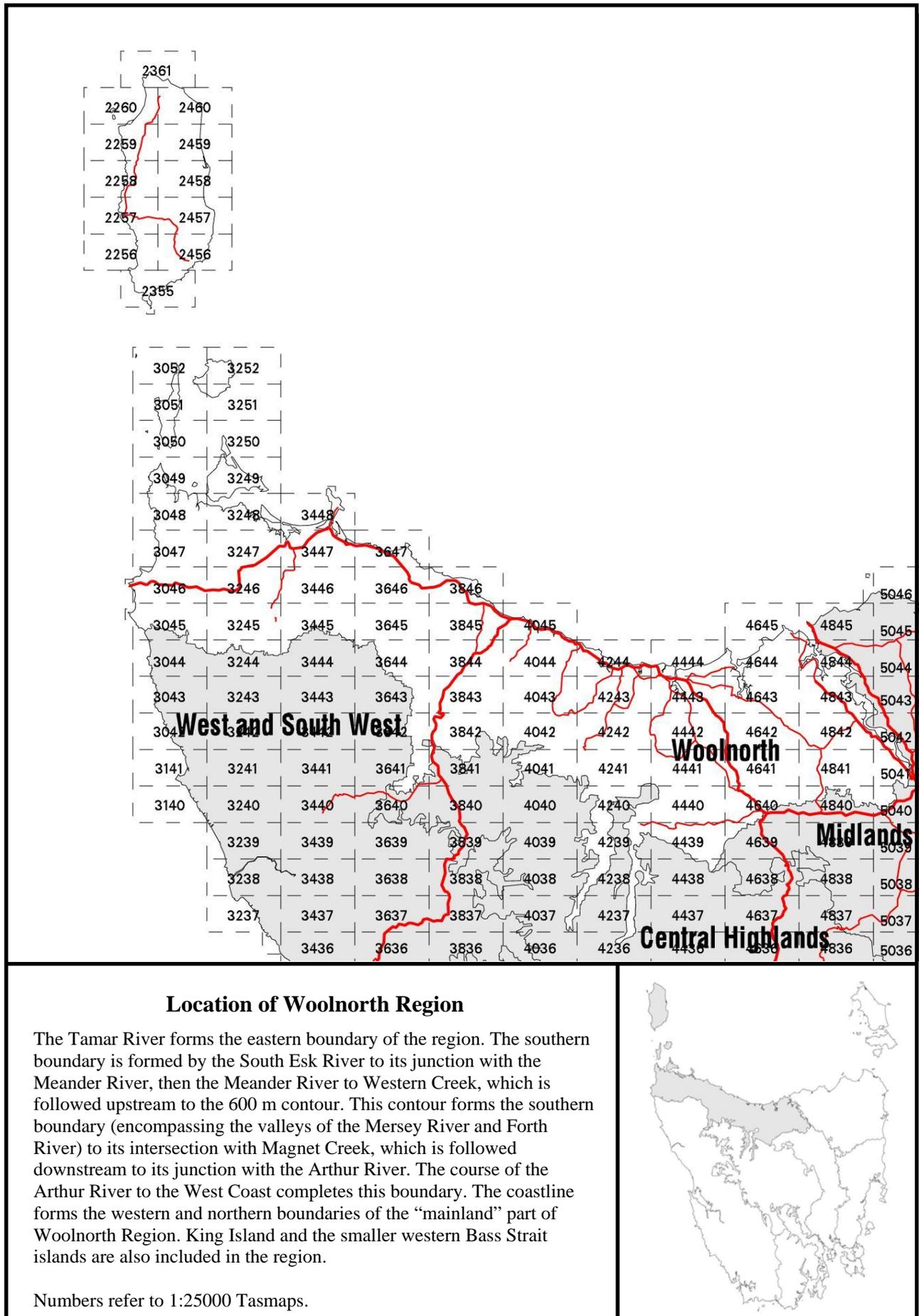
Rainforest and mixed forest (eucalypt forest with a rainforest understorey) are mainly found in moist inland environments in the west of the region. Swamp forest, riparian blackwood forest and tea-tree forest and scrub have their most extensive Tasmanian occurrence in Woolnorth Region. They mainly occupy poorly drained flats in the far northwest and King Island. Wet sclerophyll forest is widespread on moist shaded sites, and is the major native vegetation type in the region. Dry sclerophyll forest is mainly found in coastal areas and on dry, exposed or less fertile sites, particularly in the eastern part of the region. Non-forest vegetation occurring in Woolnorth region includes heath, scrub and moorland (infertile environments), native grasslands, and salt marshes and wetlands.

Woolnorth Region contains about 900 species of native vascular plants, about 10% being Tasmanian endemic species. About 120 threatened species occur in forest and non-forest vegetation in Woolnorth Region. The non-vascular flora of Woolnorth Region (i.e. mosses, liverworts and lichens) is diverse because of the variability of vegetation coupled with a humid climate. Non-vascular diversity is highest in rainforest communities.

A large part of the region has been cleared for agriculture and settlement, particularly in coastal and hinterland areas. Less than 30% of the native vegetation on King Island remains. There has been a long history of logging in accessible forests on the Tasmanian mainland, which has extended in the last few decades into more remote areas. More recently, there has been a substantial increase in establishment of both hardwood and softwood plantations on public and private land.

A substantial proportion of the native vegetation in Woolnorth Region is formally reserved. Larger reserves containing native forest include Rocky Cape National Park, Narawantapu NP, Lavinia Nature Reserve, Alum Cliffs State Reserve, Reedy Marsh Forest Reserve and Dial Range Regional Reserve. The Western Tasmania World Heritage Area extends into the region, in reserves on the northern flanks of the Western Tiers. Recent additions to the public reserve system have improved the conservation status of many species and communities in Woolnorth Region. Some forest communities and species remain threatened or poorly reserved, and require additional protection through prescription or reservation on public land (e.g. through Special Management Zoning on State forest) and private land (e.g. through agreements developed through the Private Forest Reserves Program).

An overview of the vegetation of Woolnorth Region and its relationship with the environment is given in Richley (1978) and Pinkard (1980) for mainland parts of the region; and by Richley (1984) and Barnes *et al.* (2002) for King Island and the other western Bass Strait islands. Some useful references on plant species and vegetation types are given in Module 1 and *Flora Technical Note 2*.



Location of Woolnorth Region

The Tamar River forms the eastern boundary of the region. The southern boundary is formed by the South Esk River to its junction with the Meander River, then the Meander River to Western Creek, which is followed upstream to the 600 m contour. This contour forms the southern boundary (encompassing the valleys of the Mersey River and Forth River) to its intersection with Magnet Creek, which is followed downstream to its junction with the Arthur River. The course of the Arthur River to the West Coast completes this boundary. The coastline forms the western and northern boundaries of the “mainland” part of Woolnorth Region. King Island and the smaller western Bass Strait islands are also included in the region.

Numbers refer to 1:25000 Tasmaps.



Section 2 FOREST COMMUNITIES

This section provides keys to the native vegetation types and native forest communities occurring within Woolnorth Region. Tables indicate the potential conservation priority of forest communities. The explanatory notes should be read before the keys and tables are used. The Forest Practices Plan *Flora Evaluation Sheet* indicates when FPOs need specialist botanical advice, when communities that may have a priority for conservation could be affected by forestry operations.

The keys are based on species and other vegetation characteristics that should be familiar to FPOs and field workers. Illustrations of species used in the keys are given in several publications listed in *Flora Technical Note 2*. The FPA website also carries scanned images of diagnostic species. The common and scientific names of all species used in the keys are listed in Appendix 6 of Module 1.

This section does not cover existing plantations (hardwood or softwood) or areas of exotic vegetation (e.g. pasture). Botanical advice relating to communities is not needed if the proposed operation will only affect these vegetation types. However, FPOs need to consider if other botanical values (e.g. threatened species) have the potential to occur on such sites.

Some non-forest vegetation in Woolnorth Region has a high priority for conservation, contains threatened species or is very susceptible to disturbance or disease. There are guidelines in the *Forest Practices Code* to avoid disturbance to localised environments that may contain these vegetation types. Seek botanical advice in all cases where forestry operations will affect native non-forest vegetation.

USING THE KEYS AND TABLES

The forests occurring in Woolnorth Region have been divided into several broad forest types:

- Rainforest;
- Swamp forest and related forest or scrub;
- Other forest or scrub;
- Mixed forest (eucalypt forest with rainforest species also prominent);
- Wet sclerophyll forest;
- Dry sclerophyll forest and woodland.

Different researchers have classified each forest type into several communities, on the basis of the composition and structure of the overstorey and understorey. These are called **floristic communities** in the Manual. The floristic communities can be allocated to the forest communities that were described and mapped for the RFA - these are called **RFA communities** in the Manual. There is generally good correlation between floristic communities and RFA communities, but this is not always the case.

Use the keys to determine:

- **The forest and non-forest vegetation types present in the area;**
- **The floristic communities present in each forest type.**

Use the associated tables to determine:

- **The RFA communities present (based on the floristic communities identified);**
- **The conservation priority of each of the floristic communities and RFA communities.**

Some forest communities are particularly susceptible to the root rot pathogen *Phytophthora cinnamomi* – these are also identified in the tables (see discussion on page 10).

A typical native forest coupe in Woolnorth Region is likely to contain 3 to 5 floristic communities, the number being largely related to variation in the environment (e.g. landform, rock type, disturbance history). There are usually more floristic communities than RFA communities in any given area, because the RFA communities are less finely differentiated. It is important to identify the floristic communities, as they give a much better picture of the variation in the region's forests than the RFA community classification. For example, in Woolnorth Region there are ten mixed forest or wet sclerophyll forest floristic communities dominated by *E. obliqua*. These are all included in the RFA community "tall *E. obliqua* forest". Most of the *E. obliqua* floristic communities are well reserved in the region, but two are poorly reserved.

It is important to recognise that any system of vegetation classification imposes a taxonomy on something that varies continuously in nature. In addition, our knowledge of Tasmania's vegetation is far from complete. Consequently, FPOs will inevitably come across forest vegetation that does not key out easily. There are a few reasons for this. They include:

- the community may not have been previously recorded from Woolnorth Region;
- the community may be close to a particular community given in the key, but in the area assessed may lack a species or other characteristic that allows it to be keyed out to that community (this may happen if fire or other disturbance has altered the structure or composition of the vegetation);
- the community may be intermediate between two communities given in the keys (this may happen if vegetation is sampled in transition zones).

It is essential that proposed operational areas are field assessed to determine the range of forest and non-forest vegetation that they contain. Using a combination of the RFA vegetation map, PI maps, aerial photographs, geology maps, topographic maps and local information, will give a good indication of where different communities may occur in an FPP area.

Contact the FPA Botanist or FPA Ecologist if you have problems identifying communities, providing details of the vegetation and site. References given for each forest type also contain useful information.

CONSERVATION PRIORITIES

Conservation priorities for forest communities are based on the requirements and findings of the RFA and associated processes (e.g. identification of communities as Rare, Vulnerable or Endangered) and known distribution of communities in formal reserves (see Module 1).

FPA advice regarding a priority community in an operational area will depend on many factors. They include: conservation status and distribution of the community; the condition of the vegetation; the nature of the proposed operation; presence of other values; and legislative or policy requirements. In some cases, no changes to plans will be needed, in others prescriptions or reservation will be required.

Conservation priorities for floristic communities

Priority	Explanation	General course of action
A	Community may be inadequately reserved in Tasmania, and/or may have a very high conservation priority in the region.	Seek botanical advice in all cases if an area is thought to contain a Priority A community.
B	Community may be inadequately reserved in the region, but is adequately reserved elsewhere in Tasmania.	Seek botanical advice if an area is thought to contain a Priority B community <u>and</u> the site will not be regenerated to native forest.
Non-priority (np)	Community is adequately reserved in Tasmania and in the region.	Unless priority species (Section 3) or other flora values are thought to be present, there is generally no need to seek botanical advice if an area only contains non-priority communities.

Conservation priorities for RFA communities

Priority	Explanation	General course of action
Y	The RFA has identified that additional Statewide conservation is required for the community (oldgrowth and non-oldgrowth).	Seek botanical advice in all cases if an area is thought to contain a Priority Y community.
Yog	The RFA has identified that additional Statewide conservation is required for the oldgrowth component of the community.	Seek botanical advice where the community is oldgrowth, or other flora values are thought to be present.
Non-priority (N)	The RFA has not identified that additional Statewide conservation is required for the community.	Unless priority species (Section 3) or other flora values are thought to be present, there is generally no need to seek botanical advice if an area only contains non-priority communities.

RFA processes have identified communities that are Rare (R), Vulnerable (V) or Endangered (E) at a Statewide level. These are identified (*) in the tables that indicate the conservation priorities and attributes of the different forest types (see column dealing with conservation status of the RFA community). RVE communities in Tasmania are listed in Module 1 (Appendix 3).

The RFA lists several forest communities that require further protection on public land in Tasmania. Most of these communities also have a high priority for conservation on private land.

The table below lists all RVE communities, and other communities that require protection on public land, that have been recorded from Woolnorth Region.

- R E *Melaleuca ericifolia* coastal swamp forest
- R E *Notelaea ligustrina* and/or *Pomaderris apetala* closed forest
- R E *Banksia serrata* woodland
- E King Island *E. globulus* - *E. brookeriana* - *E. viminalis* forest
- E *E. viminalis* wet forest
- E Shrubby *E. ovata* - *E. viminalis* forest
- R V *E. viminalis* and/or *E. globulus* coastal shrubby forest
- V *E. brookeriana* wet forest
- V *E. amygdalina* forest on sandstone
- V Inland *E. amygdalina* - *E. viminalis* - *E. pauciflora* forest / woodland on Cainozoic deposits
 - E. rodwayi* forest
 - E. viminalis* grassy forest / woodland
 - Allocasuarina verticillata* forest
 - E. amygdalina* forest on mudstone (oldgrowth only)
 - E. pauciflora* forest on dolerite (oldgrowth only)
 - E. viminalis* - *E. ovata* - *E. amygdalina* - *E. obliqua* damp sclerophyll forest (oldgrowth only).

The tables in this section of the Woolnorth Module indicate that all occurrences of these communities need to be referred to FPA. The other RFA communities that require referral to FPA have been identified through other analyses as having some priority for conservation within the region.

There are constraints on conversion of RVE forest communities (and RVE non-forest communities). There will be restrictions on further conversion of other forest communities if their clearance approaches the limits set by Tasmania's Permanent Forest Estate Policy (monitored by FPA).

EXPLANATORY NOTES

Some additional notes that will help FPOs to assess areas and use the keys and tables are given below.

Sources of information

There are many sources of information to indicate which vegetation types and forest communities occur in a FPP area. Assessments and surveys conducted prior to preparing FPPs will generally provide enough information to identify the communities. Published and unpublished reports and botanical data from various databases may also be useful. Distribution notes given in the tables may help confirm community identifications.

Broad scale vegetation maps such as the RFA Forest Communities Map and TASVEG maps are available through DPIWE GTSpot database and Forestry Tasmania's NewCONSERVE database. Details for accessing these databases are given in Module 1. These maps may give a useful indication of the vegetation in a FPP area, but the scale of mapping means that they are often inaccurate at the coupe level. They rarely pick up localised occurrences of communities (which may have high conservation significance), and they will not allow floristic communities to be identified.

Further information about the different forest types is provided in the major references cited in the text. *Flora Technical Note 2* provides other references on forest and non-forest vegetation.

How big is a forest community?

In preparing FPPs, the **minimum** area of forest that should be identified as a distinct community is **1 ha** (this includes contiguous areas of the community that extend beyond the FPP boundary). However, botanical advice should be sought for smaller areas of non-forest vegetation (e.g. *Sphagnum* peatlands).

Small areas of communities can be easily missed during surveys of FPP areas, though the chances of this are reduced by good sampling across the range of environments in the area. It is important to survey localised habitats within the FPP area. Communities with a high priority for conservation often occupy distinctive habitats (e.g. rocky knolls, poorly drained flats) or have fairly distinctive features (e.g. the white trunks of *E. viminalis* in *E. viminalis* wet forests contrast with the fibrous trunks of *E. obliqua* and *E. delegatensis*, the more widespread wet eucalypt forest dominants).

FPOs should try to identify a community occupying a small area (<1 ha) if:

- the forest in the small area is significantly different to the adjacent forest; or
- the forest community in the small area may be a priority community.

FPOs can subsume a community occupying a small area into the adjacent community if:

- the forest in the small area has obvious affinities to the forest community in the adjacent area (e.g. the same canopy dominants); and
- the forest community in the small area is not a priority community.

For RFA communities that only require additional conservation of oldgrowth occurrences, FPA should be notified for all oldgrowth patches exceeding 3 ha (including areas that extend beyond the FPP area).

There are particular problems in dealing with transitional vegetation and the RFA damp sclerophyll forest community (see discussion below). FPOs should take care not to confuse vegetation in transition zones with distinct communities.

When small areas of priority forest communities are referred to FPA, the advice given will be determined on a case-by-case basis. Factors that may be relevant include: requirements under the RFA and other policies; location within a coupe (e.g. whether adjacent to streamside reserve or in the middle of a proposed plantation); proposed silvicultural practices; presence of other values; and the local context of the community.

Qualifications in the tables

There are many grey areas in classifying vegetation and determining conservation priorities. The tables give qualifications for some communities. For example, some floristic communities can be allocated to more than one RFA community, depending on site characteristics (e.g. rock type). Rainforest communities in Woolnorth Region can have two conservation priorities – they are generally low priority communities in wetter parts of the region and high priority communities in drier parts, where they occur as relicts outside the typical range of rainforest.

More on community names and relationships

The systems of classifying floristic communities differ between forest types. This is because the classifications were undertaken by different researchers at different times. Most communities have an abbreviated name (used in the keys) and a more detailed name (used in the tables) that indicates some typical species or characteristics of the community. However, some stands of a particular community may not contain all the “typical” species given in the more detailed name of the community.

Most floristic communities can be readily allocated to RFA communities, but this is not always the case. Most RFA communities contain two or more floristic communities. In some cases, the RFA community names may seem inappropriate to describe some forest communities. For example, areas of wet sclerophyll forest dominated by *E. dalrympleana* are included in the RFA community “*E. delegatensis* tall forest”.

Dominance in forest communities

Accurate determination of the dominant canopy (overstorey) species and understorey characteristics is needed to classify communities. Most areas of forest contain one or more shrub layers below the canopy, and a ground layer of grasses, sedges, ferns or some combination of these. The dominant component of a vegetation layer is the species (or group of species) that supply most of the cover.

Overstorey dominance

Identifying the dominant overstorey species is one of the first steps in keying out most forest communities. This can be difficult in forests containing more than one species of eucalypt. However, in most situations, one species is clearly dominant while the others are subdominant or minor. An example: *E. ovata* provides about 60% cover on a poorly drained flat with an understorey dominated by sedges; the flat also carries *E. amygdalina* and *E. viminalis*. The floristic community is sedgy *E. ovata* dry sclerophyll forest and the correlated RFA community is shrubby *E. ovata* - *E. viminalis* forest.

Two species occasionally occur as codominants, having about equal cover in the community. The community should be keyed out using both dominants as options. Botanical advice may be needed if one of those options is a priority community. An example: if *E. obliqua* and *E. viminalis* are codominant in a wet sclerophyll forest, the community can be identified as an *E. obliqua* wet sclerophyll forest community or an *E. viminalis* wet sclerophyll forest community. The latter community has a high priority for protection in all regions of Tasmania, and the operation needs to be referred to FPA. If neither community is a priority community (e.g. *E. obliqua* and *E. delegatensis* codominant in wet sclerophyll forest), the operation does not need to be referred to FPA unless other flora values are present. FPOs should exercise their own judgement (e.g. by taking account of associated vegetation and site characteristics) when allocating such forest to floristic and RFA communities.

Understorey dominance

Within a broad forest type, some communities key out simply on the basis of their overstorey dominants. However, most floristic communities are keyed out by the presence or absence of understorey species (e.g. most wet sclerophyll forest communities) or by characteristics of the dominant understorey layer (e.g. most dry sclerophyll forest communities). For example, shrubs exceeding 2 m in height will be the most conspicuous understorey layer in a shrubby dry sclerophyll forest community. Grasses or sags are the most conspicuous understorey components in a grassy dry sclerophyll forest.

FPOs may need to make allowance if land uses or events have temporarily changed the nature of the understorey. For example, a recent fire may remove the shrub layer from a heathy forest, but if the vegetation in nearby areas or other evidence suggests that short shrubs are typically present, the community should be allocated to a heathy dry sclerophyll forest community. Section 2.6 gives more information on identifying the dominant understorey characteristics in dry sclerophyll communities.

Distinguishing eucalypt species

Correct identification of eucalypt species is essential as they are the main tree species used to identify most dry sclerophyll, wet sclerophyll and mixed forest communities. Identification can sometimes be difficult because eucalypts hybridise readily. Seek botanical advice if you find unusual or outlying occurrences of eucalypts, as these may be genetically important.

The FPA website contains scanned images of Tasmanian eucalypts; a key to species and notes on distinguishing between some closely-related species (*E. viminalis* and *E. dalrympleana*; and *E. brookeriana* and *E. ovata*) associated with communities with a high priority for conservation. Useful references for identifying eucalypts are also listed in *Flora Technical Note 2*.

FPOs may need to collect material or take notes to determine the identity of a species. Bark characteristics, fruit, buds and adult and juvenile leaves can all be important for diagnosis. Juvenile leaves may be needed to identify some species (e.g. *E. viminalis* and *E. dalrympleana*).

Oldgrowth

Oldgrowth forests have over-mature to senescent trees contributing over 30% of the crown cover to the overstorey, and have not been significantly affected by man-made disturbance. Fire does not preclude classification as oldgrowth, providing other oldgrowth characteristics are present. Oldgrowth forests generally contain a greater range of habitats than regrowth forests and consequently support a different (and generally more diverse) suite of species. Oldgrowth forest is discussed in *Flora Technical Note 7*.

Generally, oldgrowth forests have a higher conservation value than non-oldgrowth forests of the same community. Areas of oldgrowth forest, or areas containing oldgrowth trees, should be preferentially located in retained areas, if this is an option under the proposed silvicultural regime. Some RFA communities require additional protection for the oldgrowth component of the community only. For

these communities, the practical minimum patch size that requires notification to FPA is 3 hectares (including areas extending beyond the coupe boundary).

Transition zones

Transition zones often occur between adjacent forest types or adjacent forest communities, with vegetation of these zones being intermediate in structure and composition. Transition zones should be avoided when communities are being identified. Some forest communities (e.g. damp sclerophyll forest communities) are inherently intermediate in character and occupy relatively large areas - see below.

Damp sclerophyll forest communities

Some eucalypt-dominated forests have an understorey with a similar proportion of wet sclerophyll species (e.g. broad-leaved shrubs and wet ferns) and dry sclerophyll species (e.g. narrow-leaved shrubs and grasses). An example of a damp sclerophyll understorey could include dogwood, blanket bush, prickly mo, prickly beauty, guitar plant and sagg. Such vegetation is sometimes described as damp sclerophyll forest. In this section, it should be keyed to its floristic community using the dry sclerophyll forest key (where it will generally key out as a shrubby dry sclerophyll community).

One of the RFA communities is *E. viminalis* - *E. ovata* - *E. amygdalina* - *E. obliqua* damp sclerophyll forest (DSC). The community has a damp sclerophyll understorey and *E. amygdalina* and/or *E. obliqua* are both prominent in the overstorey. *E. viminalis* and *E. ovata* may be present as subdominant or minor species or may dominate very small patches within a mosaic of forest dominated by *E. amygdalina* or *E. obliqua*. This community is mapped inconsistently on the RFA Forest Communities Map. On most sites mapped as DSC, the vegetation can be better allocated to other RFA communities (e.g. dry *E. obliqua* forest, tall *E. obliqua* forest, *E. amygdalina* forest on dolerite, shrubby *E. ovata* - *E. viminalis* forest).

Inland *E. amygdalina* forest

In 2005, the RFA community Inland *E. amygdalina* forest (AI) was split into two distinct communities. Inland *E. amygdalina* - *E. viminalis* - *E. pauciflora* forest/woodland on Cainozoic deposits (AIC) is associated with Recent and Tertiary sediments (including ironstone lags) – it occurs mainly on private land and is listed as a Vulnerable community. It is abbreviated to Inland *E. amygdalina* forest on Cainozoic deposits in tables in Section 2.6. *E. amygdalina* forest on mudstone (AM) may occur on dry sites on Permian mudstone in Woolnorth Region – it is not identified as a threatened community, though oldgrowth stands require protection on public land.

Forest communities that are susceptible to *Phytophthora cinnamomi*

Some communities are very susceptible to the root rot pathogen *Phytophthora cinnamomi* because they:

- contain many species of susceptible plants, including threatened species;
- occur in warm, moist environments that are conducive to establishment of *Phytophthora*;
- occur in locations where spores can be transferred into uninfected sites by land use.

Forest communities that are highly susceptible to *Phytophthora* are identified (#) in the tables indicating conservation priorities of the different forest types (see column dealing with conservation status of the floristic community). Most are lowland dry sclerophyll forest communities – many are also Priority A communities. Several non-forest communities are also susceptible to *Phytophthora* – these should be referred to FPA if they are in operational areas (see below). Information on *Phytophthora* and its management in Tasmanian forests is given in Section 6 of this module and in *Flora Technical Note 8*.

Non-forest vegetation

Native non-forest vegetation (e.g. moorland, heath, wetland and native grassland) may be associated with native forests (and sometimes plantations). Some of these vegetation types have a high priority for conservation, contain threatened species or are very susceptible to disturbance or disease. There are specific guidelines in the *Forest Practices Code* to avoid disturbance to localised environments (e.g. swamps, rocky knolls, streambanks) that often contain these vegetation types. The key on the following page will allow FPOs to identify broad non-forest vegetation types. Seek botanical advice in all cases where native non-forest vegetation will be affected by forestry operations.

When to seek advice

This section of the module, and the FPP *Flora Evaluation Sheet*, indicates when botanical advice is needed because of the presence of particular communities in areas proposed for forestry operations. However, there is no shortage of grey areas in the natural world. Specialist advice should be sought if FPOs are uncertain about identification of communities or their conservation priority.

KEY TO VEGETATION TYPES AND FOREST COMMUNITIES

Use the key to forest and non-forest types to identify the vegetation types present in the coupe, then go to the indicated section (forest types only) to identify the floristic communities. The table following the key will allow the floristic communities to be related to the RFA communities.

Each key should be followed through sequentially. A true/false decision should be made for each statement bearing the same number (e.g. ❶). If true, proceed to the next numbered statement immediately below (❷). If false (or there is some degree of doubt), proceed to the next statement of the same number (❶) in the key.

The keys are based on species or understorey types that will be familiar to most field workers. Understoreys are defined by their dominant species, although species typical of other vegetation types may be present. Information on species and other characteristics used to distinguish communities is provided in Module 1, *Flora Technical Note 2* and on the FPA Website.

Transitional vegetation may not key out easily. If the forest is intermediate between two recognisable floristic communities, assess the conservation priorities for both communities. Contact the FPA Botanist or Ecologist if a vegetation type or forest community does not key out.

KEY TO FOREST TYPES

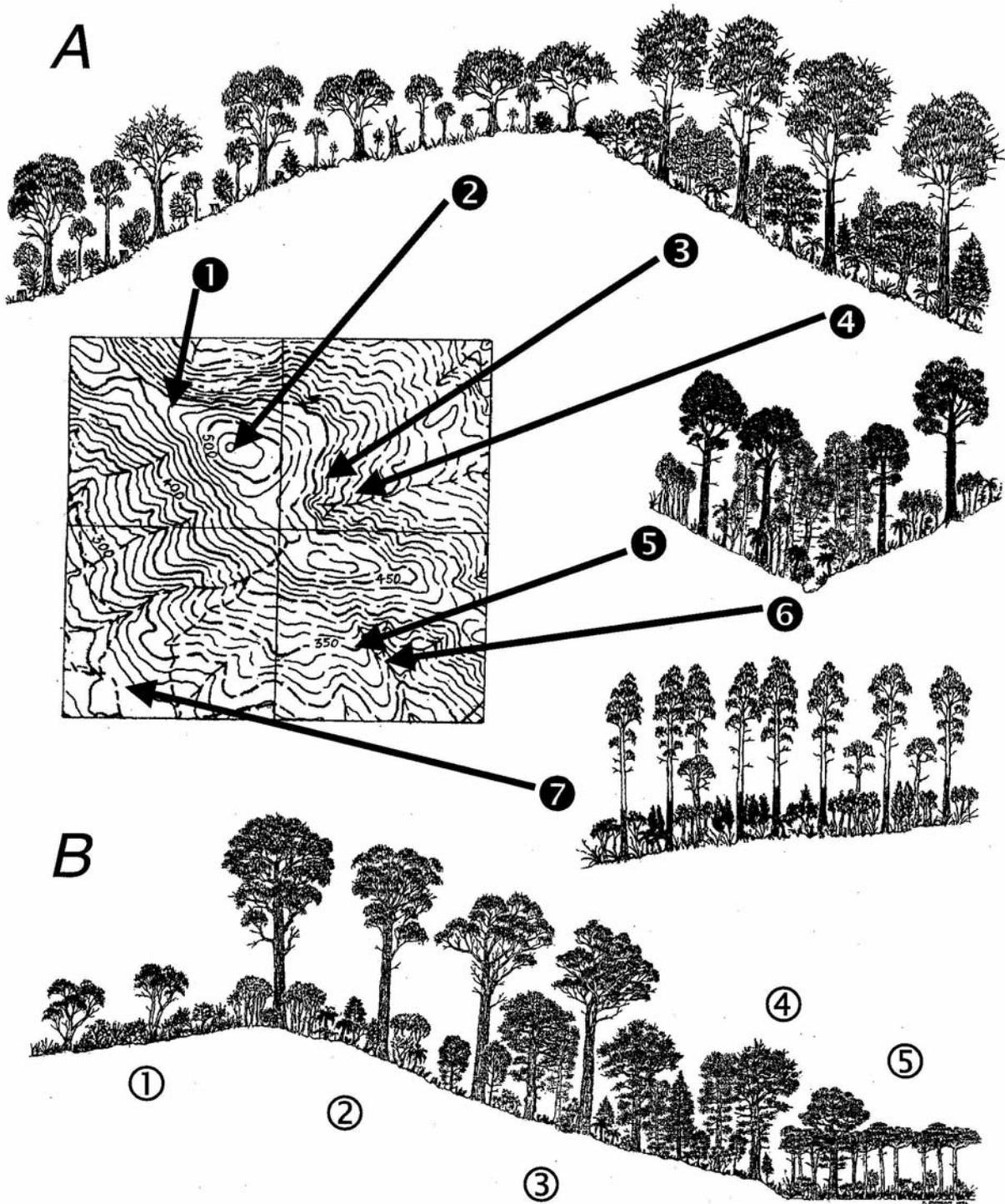
Use when vegetation is dominated by trees exceeding 5 metres, or with potential to exceed 5 metres

- ❶ **Eucalypts absent or less than 5% cover**
 - ❷ Myrtle, sassafras, leatherwood or celery-top pine dominant..... Rainforest (go to 2.1)
 - ❷ Blackwood, tea-trees or paperbarks dominantSwamp forest and related forest or scrub (go to 2.2)
 - ❷ Forest or tall scrub (5 to 8 m) with other species dominant Other forest or scrub (go to 2.3)
- ❶ **Eucalypts present with greater than 5% cover**
 - ❷ Myrtle, sassafras, leatherwood or celery-top pine prominent as secondary trees or shrubsMixed forest (go to 2.4)
 - ❷ Understorey dominated by tall tea-trees or paperbarksWet sclerophyll forest (go to 2.5)
 - ❷ Understorey dominated by broad-leaved (soft-leaved) shrubs Wet sclerophyll forest (go to 2.5)
 - ❷ Understorey dominated by an equal mixture of broad-leaved and narrow-leaved shrubs Dry sclerophyll forest/woodland (go to 2.6)
 - ❷ Understorey dominated by sedges, heaths or narrow-leaved (hard-leaved) shrubs (generally under 2 m in height) Dry sclerophyll forest/woodland (go to 2.6)

KEY TO NON-FOREST TYPES

Seek advice from FPA in all cases if operations may affect native non-forest vegetation.

- ❶ Dominated by shrubs over 2 m Scrub
- ❶ Dominated by shrubs under 2 m, usually infertile or exposed sites Heathland
- ❶ Dominated by sedges or buttongrass; low to high altitudes, often on the boundary of sedgy woodland or tea-tree scrub forest Moorland/sedgeland
- ❶ Dominated by native grasses and saggis; often herb-rich; lowland to upland sites Native grassland
- ❶ Dominated by *Sphagnum* moss; shrubs (e.g. tea-tree or richea) may be sparse or locally dense; often in high altitude soaks or drainage lines *Sphagnum* peatland
- ❶ Aquatic vegetation or vegetation submerged seasonally, generally dominated by graminoids, herbs and succulent species..... Wetland



Diagrams showing relationships between forest types and typical Tasmanian forest environments:

A: Moderate rainfall site: soils of moderate fertility (e.g. dolerite); site varying in landform and fire history

1 – shrubby *E. amygdalina* dry sclerophyll forest (exposed slope); 2 – grassy *E. amygdalina* dsf (exposed ridgeline); 3 – *E. delegatensis* wet sclerophyll forest (shaded slopes at higher altitudes); 4 – *E. delegatensis* mixed forest (humid slope, infrequently burnt); 5 – *E. obliqua* wsf and mixed forest (shaded slopes at lower altitudes); 6 – callidendrous rainforest (humid fire-shadow gully); 7 – *E. regnans* wsf (regrowth on humid site after wildfire or intensive logging).

B: High rainfall site, low altitude: site varying greatly in soil fertility and drainage

1 – heathy *E. nitida* dry sclerophyll forest (infertile substrate); 2 – *E. obliqua* wet sclerophyll forest (shaded slope); 3 – *E. obliqua* mixed forest (humid slope, infrequently burnt); 4 – callidendrous rainforest (humid, well-drained lower slope; fire-shadow site); 5 – *Leptospermum lanigerum* swamp forest (poorly-drained flat).

2.1 RAINFOREST COMMUNITIES

Major References: Jarman, Brown and Kantvilas (1984); Jarman, Kantvilas and Brown (1991); Neyland (1991); *Flora Technical Note 4*.

Tasmanian cool temperate rainforest is defined as vegetation with trees taller than 8 m, dominated in Woolnorth Region by the following species: myrtle, sassafras, leatherwood, horizontal, celery-top pine, King Billy pine or Cheshunt pine. Rainforest is relatively extensive and diverse in the humid western part of Woolnorth Region. Myrtle and sassafras dominate callidendrous rainforest occupying more fertile sites. Tasmanian endemic rainforest species (leatherwood, celery-top pine, horizontal) co-occur with myrtle and sassafras in thamnic rainforest, and may dominate implicate communities. In the east, callidendrous rainforest occurs as relict stands, restricted to humid, fire-shadow sites such as gullies and riverine corridors. Most rainforest communities in Woolnorth Region are well reserved. However, relict rainforest patches have a high priority for conservation (see below). High altitude rainforest species (notably King Billy pine) occasionally extend down slopes and creeklines into Woolnorth Region. Any such occurrences in operational areas need to be referred to FPA.

Rainforest generally grades into other moist forest types (e.g. mixed forest and swamp forest), but can also form sharp boundaries (e.g. adjacent to wet sclerophyll forest and native grassland) associated with substantial differences in environment, fire history or land use.

KEY TO RAINFOREST COMMUNITIES

- ❶ **Generally forest of tall to moderate height (>20m, except at high altitudes or exposed situations); myrtle or sassafras dominant; understorey open**
 - ❷ Myrtle dominant or common; sassafras often present
 - ❸ Ground ferns common
 - ❹ Musk common RAIN-C3.1
 - ❹ Musk sparse or absent RAIN-C1.1
 - ❸ Ground ferns sparse; woolly tea-tree or native pepper often present RAIN-C2.1
 - ❷ Sassafras dominant; myrtle usually sparse or absent
 - ❸ Musk common RAIN-C3.2
 - ❸ Musk sparse or absent RAIN-C1.2
- ❶ **Generally forest of moderate height; myrtle usually dominant or subdominant, leatherwood or celery-top pine usually prominent; understorey shrubby but distinct from tree layer**
 - ❷ Understorey dominated by horizontal RAIN-T1.1
 - ❷ Understorey dominated by native laurel RAIN-T3.1
 - ❷ Understorey dominated by trochocarpa
 - ❸ Sassafras common; flax lily and hard water-fern sparse or absent RAIN-T5.1
 - ❸ Sassafras sparse or absent; flax lily or hard water-fern common RAIN-T7.1
 - ❷ Understorey dominated by native plum RAIN-T8.1
- ❶ **Forest of low to moderate height with broken, uneven canopy; myrtle or celery-top pine usually dominant or subdominant; understorey tangled and mixed with tree layer**
 - ❷ Paperbark or cutting grass common; horizontal sparse or absent RAIN-I1.1
 - ❷ Paperbark or cutting grass sparse or absent; horizontal common RAIN-I3.1

RELICT RAINFOREST

Relict rainforest comprises isolated patches of rainforest that occur in drier parts of Woolnorth Region, outside the normal range of rainforest. About 30 patches have been identified, ranging from less than 1 ha to over 40 ha. Grid references and details of known sites are given in Neyland 1991 and *Flora Technical Note 4*. Other patches of relict rainforest may occur in drier parts of the region, most likely on sites with a PI type containing S or T. Areas of relict rainforest that could be affected by forestry operations need to be referred to FPA. Typical prescriptions for protection of relict rainforest are given in *Flora Technical Note 4*.

CONSERVATION PRIORITIES AND ATTRIBUTES OF RAINFOREST COMMUNITIES

Note: * – Community identified as Rare, Vulnerable or Endangered at a Statewide level through RFA processes

Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
RAIN-C1.1 Callidendrous	<i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> over <i>Dicksonia antarctica</i> and/or <i>Polystichum proliferum</i>	Relict patch	M+	Callidendrous & thamnic rainforest on fertile sites	A	N	Widespread on basalt and fertile sites, especially along creeks and rivers in west (e.g. Deep Gully, Hellyer Gorge). Uncommon as relict rainforest in east (e.g. Wallaby Creek).
		Other sites			np		
RAIN-C1.2 Callidendrous	<i>Atherosperma moschatum</i> over <i>Dicksonia antarctica</i> - <i>Polystichum proliferum</i> - <i>Blechnum wattsii</i>	Relict patch	M+	Callidendrous & thamnic rainforest on fertile sites	A	N	Occasional in protected gullies and along creeks in west of region. May also occur as relict rainforest in east.
		Other sites			B		
RAIN-C2.1 Callidendrous	<i>Nothofagus cunninghamii</i> - (<i>Leptospermum lanigerum</i>) over clear understorey or <i>Telopea truncata</i> or <i>Tasmania lanceolata</i>		M+	Callidendrous & thamnic rainforest on fertile sites	A	N	Occasional at higher altitudes on dolerite (e.g. at the base of Western Tiers).
RAIN-C3.1 Callidendrous	<i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> over <i>Olearia argophylla</i> with <i>Dicksonia antarctica</i> and/or <i>Polystichum proliferum</i>	Relict patch	M+	Callidendrous & thamnic rainforest on fertile sites	A	N	Occasional on low altitude sites in west, often transitional between swamp and mixed forest (e.g. Bond Tier, Trowutta). Uncommon as relict rainforest in east (e.g. Wallaby Creek, Saxons Creek, Holwell Gorge).
		Other sites			np		
RAIN-C3.2 Callidendrous	<i>Atherosperma moschatum</i> over <i>Olearia argophylla</i> with <i>Dicksonia antarctica</i> - and/or <i>Polystichum proliferum</i>	Relict patch	M+	Callidendrous & thamnic rainforest on fertile sites	A	N	Local on Cambrian sediments and greywacke (e.g. lower slopes of the Gog Range and Promised Land). The most common relict rainforest community (e.g. Branches Creek, Notley Gorge, Wallaby Creek).
		Other sites			B		
RAIN-I1.1 Implicate	<i>Phyllocladus aspleniifolius</i> - <i>Nothofagus cunninghamii</i> - Myrtaceae spp. over a diverse tangle with <i>Agastachys odorata</i>		M-	Thamnic rainforest on less fertile sites	B	N	Localised on siliceous Precambrian sediments in the far west.
RAIN-I3.1 Implicate	<i>Leptospermum lanigerum</i> - <i>Phyllocladus aspleniifolius</i> - <i>Nothofagus cunninghamii</i> over <i>Anopterus glandulosus</i> - <i>Anodopetalum biglandulosum</i> - <i>Telopea truncata</i>		M-	Thamnic rainforest on less fertile sites	B	N	Localised on siliceous Precambrian sediments in the west; also recorded from Dip Falls area.

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
RAIN-T1.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Eucryphia lucida</i> - (<i>Phyllocladus aspleniifolius</i>) over <i>Anodopetalum biglandulosum</i>	Trees >20 m over a sparse u/s	M+	Callidendrous & thamnic rainforest on fertile sites	np	N	Widespread on less fertile sites; often associated with creeks (e.g. Lovells Creek, Deep Gully, Old Park).
		Trees <20 m over dense u/s	M-	Thamnic rainforest on less fertile sites			
RAIN-T3.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Eucryphia lucida</i> - (<i>Phyllocladus aspleniifolius</i>) over <i>Anopterus glandulosus</i>	Trees >20 m over a sparse u/s	M+	Callidendrous & thamnic rainforest on fertile sites	B	N	Occasional on low to mid altitude sites in west.
		Trees <20 m over dense u/s	M-	Thamnic rainforest on less fertile sites			
RAIN-T5.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> - <i>Eucryphia lucida</i> over <i>Trochocarpa gunnii</i>		M-	Thamnic rainforest on less fertile sites	B	N	Uncommon; recorded from infertile and relatively exposed sites (e.g. Hellyer Gorge area, Old Park).
RAIN-T7.1 Thamnic	<i>Phyllocladus aspleniifolius</i> - <i>Nothofagus cunninghamii</i> - (<i>Eucryphia lucida</i>) over <i>Dianella tasmanica</i> - <i>Trochocarpa cunninghamii</i> - <i>Blechnum wattsii</i>		M-	Thamnic rainforest on less fertile sites	B	N	Uncommon; local on poorly sorted quartz-rich tillite at Pruana.
RAIN-T8.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Phyllocladus aspleniifolius</i> - <i>Eucryphia lucida</i> over <i>Cenarrhenes nitida</i>		M-	Thamnic rainforest on less fertile sites	B	N	Occasional and scattered at low to mid altitude sites in west.

2.2 SWAMP FOREST AND RELATED FOREST OR SCRUB COMMUNITIES

Major Reference: Pannell (1992)

Swamp forest is defined as closed forest dominated by blackwood, tea-trees and paperbarks, which typically occupies flat, poorly drained sites. Eucalypts are sparse or absent. Swamp forests are most extensive and diverse in the northwest of Woolnorth Region, and many of the communities identified in Tasmania are restricted to this area. They mainly occur on the seasonally-inundated flats of the Duck, Montagu, Arthur and Welcome River systems. They also occur in similar environments on King Island.

Riparian blackwood forest contains some typical wet sclerophyll species (e.g. dogwood, cheesewood, stinkwood and bracken) that are not found in swamp forests. They occur on better drained sites adjacent to rivers and creeks, and extend to slopes (particularly on disturbed sites that previously supported rainforest). Tea-tree forest is mainly found on relatively infertile sites. Its scrub phase is lower (<8 m) and denser, and associated with more exposed or frequently burnt sites, often adjacent to moorland. Montane forest dominated by woolly tea-tree (*Leptospermum lanigerum*) occurs locally in upland areas.

Swamp forests and related forest types grade into rainforest, mixed forest and wet sclerophyll forest. Swamp forests in Woolnorth Region have been extensively cleared for agriculture, but their conservation status has improved with recent additions to Tasmania's reserve system.

KEY TO SWAMP FOREST AND RELATED FOREST / SCRUB COMMUNITIES

- ❶ **Blackwood, scented paperbark or woolly tea-tree dominant; leatherwood, celery-top pine or horizontal absent; understorey open with ferns or cutting grass; mainly poorly drained sites**
 - ❷ Myrtle common in canopy or subcanopy
 - ❸ Swamp paperbark or cutting sedge present; scented paperbark usually absent.....SWAMP-C6
 - ❸ Swamp paperbark and cutting sedge absent; scented paperbark often present
 - ❹ Manfern common SWAMP-A5
 - ❹ Manfern sparse or absent..... SWAMP-A4
 - ❷ Myrtle sparse or absent in canopy or subcanopy
 - ❸ Sassafras common
 - ❹ Cutting sedge present; scented paperbark absent.....SWAMP-C5
 - ❹ Cutting sedge absent; scented paperbark often present SWAMP-A2
 - ❸ Sassafras sparse or absent
 - ❹ Woolly tea-tree or cutting grass common
 - ❺ Cutting sedge present; scented paperbark usually absentSWAMP-C4
 - ❺ Cutting sedge absent; scented paperbark often present..... SWAMP-A1
 - ❹ Woolly tea-tree and cutting grass sparse or absent..... SWAMP-A3
- ❶ **Blackwood, paperbark or woolly tea-tree dominant; leatherwood, celery-top pine or horizontal present; understorey often shrubby; mainly poorly drained sites**
 - ❷ Horizontal present
 - ❸ Manfern common; scented paperbark usually absent.....SWAMP-B2
 - ❸ Manfern sparse or absent; scented paperbark present
 - ❹ Cutting grass commonSWAMP-B1
 - ❹ Cutting grass sparse or absentSWAMP-B3
 - ❷ Horizontal absent
 - ❸ Trochocarpa present
 - ❹ Fishbone fern or cutting sedge common; celery-top pine sparse or absentSWAMP-B4
 - ❹ Fishbone fern and cutting sedge sparse or absent; celery-top pine commonSWAMP-B5
 - ❸ Trochocarpa absent
 - ❹ Manfern common; scented paperbark usually absent.....SWAMP-B1
 - ❹ Manfern sparse or absent; scented paperbark present.....SWAMP-B2

- ❶ **Swamp paperbark prominent in canopy (sometimes with blackwood or woolly tea-tree); cutting sedge (*Carex*) often prominent in understorey; mainly poorly drained lowland flats**
 - ❷ Myrtle common in canopy or subcanopy SWAMP-C6
 - ❷ Myrtle sparse or absent in canopy and subcanopy
 - ❸ Swamp paperbark dominant
 - ❹ Tussock grass (*Poa*) present (often coastal sites)..... SWAMP-C1
 - ❹ Tussock grass (*Poa*) absent (mainly subcoastal sites)
 - ❺ Cutting sedge present SWAMP-C3
 - ❺ Cutting sedge absent..... SWAMP-C2
 - ❸ Blackwood or woolly tea-tree dominant
 - ❹ Sassafras common..... SWAMP-C5
 - ❹ Sassafras sparse or absent
 - ❺ Woolly tea-tree prominent..... SWAMP-C4
 - ❺ Woolly tea-tree sparse or absent SWAMP-C3
- ❶ **Blackwood dominant or codominant; dogwood, cheesewood, musk, cathead fern or bracken prominent in understorey; mainly better drained flats, riparian sites and slopes**
 - ❷ Myrtle common
 - ❸ Dogwood present
 - ❹ Swamp paperbark or musk present; sassafras absent..... SWAMP-D1
 - ❹ Swamp paperbark and musk absent; sassafras present SWAMP-D5
 - ❸ Dogwood absent
 - ❹ Leatherwood present; celery-top pine often present SWAMP-D7
 - ❹ Leatherwood and celery-top pine absent; open understorey SWAMP-D6
 - ❷ Myrtle sparse or absent
 - ❸ Silver wattle present SWAMP-D2
 - ❸ Silver wattle absent
 - ❹ Swamp paperbark present; musk may be present SWAMP-D1
 - ❹ Swamp paperbark absent
 - ❺ Dusty daisy bush present; dogwood, lancewood and sword sedge sparse or absent SWAMP-D3
 - ❺ Dusty daisy bush absent
 - ❻ Dogwood, lancewood or sword sedge common SWAMP-D4
 - ❻ Dogwood, lancewood and sword sedge sparse or absent SWAMP-D5
- ❶ **Tea-tree (manuka) usually dominant or codominant; low shrubs often sparse; cutting grass often common, mainly lowland sites**
 - ❷ Rainforest trees (e.g. myrtle, leatherwood, celery-top pine, horizontal)SWAMP-F3
 - ❷ Rainforest trees absent
 - ❸ Swamp paperbark sparse or absent.....SWAMP-F1
 - ❸ Swamp paperbark commonSWAMP-F2
- ❶ **Woolly tea-tree dominant and montane sites (usually above 500 m)**
 - ❷ Myrtle codominant or common (silver wattle sparse or absent) SWAMP-E2
 - ❷ Myrtle sparse or absent SWAMP-E1
- ❶ **Glaucous tea-tree dominant (other tea-trees often present also)..... OTHER-02**

CONSERVATION PRIORITIES AND ATTRIBUTES OF SWAMP FOREST AND RELATED FOREST OR SCRUB COMMUNITIES

Note: * – Community identified as Rare, Vulnerable or Endangered at a Statewide level through RFA processes

Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
OTHER-02	<i>Leptospermum glaucescens</i> - <i>Leptospermum scoparium</i> closed forest/scrub		L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	B	N	On infertile sites may form local thickets on ridges and in gullies (e.g. Gog Range, Cradle Mt area, Black Creek).
SWAMP-A1	Depauperate callidendrous swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Relatively common on recently disturbed or burnt sites with little peat accumulation (e.g. Dismal Swamp, Welcome Swamp, Bond Tier, Trowutta).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-A2	Callidendrous sassafras swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	B	N	Widespread in northwest swamps on sites which have been burnt less recently than SWAMP-A1 (e.g. Welcome Swamp, Bond Tier).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-A3	Depauperate callidendrous fern swamp forest		BF	<i>Acacia melanoxylon</i> forest on flats	A	N	Occurs on flat, poorly drained gullies adjacent to eucalypt forest; isolated occurrences in Dismal Swamp, Plains Creek and Togari Swamp.
SWAMP-A4	Callidendrous myrtle swamp forest		BF	<i>Acacia melanoxylon</i> forest on flats	np	N	Common on long unburnt swamp sites where peat has developed (e.g. Dismal Swamp, Bond Tier).
SWAMP-A5	Callidendrous fern swamp forest		BF	<i>Acacia melanoxylon</i> forest on flats	np	N	Northwest swamps (e.g. Dismal Swamp) and sites of impeded drainage along creeks and rivers (e.g. Lovells Creek, Duck Creek); Similar distribution to SWAMP-A4 but on sites that are better drained.
SWAMP-B1	Thamnic leatherwood swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Less fertile swamp sites and extending to gullies (e.g. Montagu Swamp, Roger River, Duck Creek).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-B2	Thamnic fern swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Often associated with SWAMP-B1; but usually on sites with better peat development (e.g. Flowerdale State Reserve, Lovells Creek, Roger River).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			

Forest Botany Manual: Module 2 – Woolnorth Region

Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
SWAMP-B3	Thamnic horizontal swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Relatively widespread in the region on poorly drained, low fertility sites (e.g. Montagu and Plains Creek Swamps).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-B4	Thamnic <i>Trochocarpa</i> swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	B	N	Relatively poorly drained sites with patchy peat; common in Montagu, Roger River and Blackwater Swamps and creeks flowing into Arthur River.
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-B5	Thamnic celery-top pine swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	B	N	Relatively infertile sites with deep peat (e.g. Montagu, Dismal and Blackwater Swamps); less widespread than SWAMP-B3 and SWAMP-B4.
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-C1	Coastal <i>Poa</i> swamp forest		ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Estuary banks just above high tide level (e.g. Perkins Island, Lees Point).
SWAMP-C2	Depauperate coastal paperbark swamp forest		ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Coastal and sub-coastal flats which are periodically disturbed by fire or flood (e.g. Lower Welcome Swamp).
SWAMP-C3	Coastal paperbark/ <i>Carex</i> swamp forest	Swamp paperbark dominant	ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Similar distribution to SWAMP-C2 (e.g. Welcome Swamp, Montagu River, Perkins Island).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats	np	N	
SWAMP-C4	Coastal tea-tree/ <i>Carex</i> swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	A	N	Coastal and sub-coastal swamps and floodplains that are subject to recurring floods (e.g. Welcome Swamp, Arthur River flood plains); often occurs in a mosaic with riparian blackwood forest.
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-C5	Coastal sassafras swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	A	N	Coastal and subcoastal swamps (e.g. Welcome Swamp) less frequently or recently disturbed than sites supporting SWAMP-C2, SWAMP-C3 and SWAMP-C4.
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-C6	Coastal myrtle swamp forest	Swamp paperbark dominant	ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Most successional advanced coastal swamp forest, occurring in sites with well-developed peat (e.g. south of Welcome Swamp).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats	B	N	

Forest Botany Manual: Module 2 – Woolnorth Region

Floristic community code and name		Qualification		RFA community code and name		Consn. priority		Distribution in Woolnorth Region
						Floristic	RFA	
SWAMP-D1	Riparian blackwood/ paperbark forest	Swamp paperbark dominant		ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Fertile, well-drained banks of streams in the northwest swamps especially along Plains Creek; also occur on rises (e.g. Bond Tier) and in the east of region (e.g. Brushy Rivulet).
		Blackwood dominant	On flats	BF	<i>Acacia melanoxylon</i> forest on flats	np	N	
			On rises	BR	<i>Acacia melanoxylon</i> forest on rises			
SWAMP-D2	Riparian blackwood/wattle forest	On flats		BF	<i>Acacia melanoxylon</i> forest on flats	B	N	Floodplains in the northwest swamps; also occurring locally in gullies and disturbed slopes elsewhere (e.g. Dial Range).
		On rises		BR	<i>Acacia melanoxylon</i> forest on rises			
SWAMP-D3	Riparian blackwood/ <i>Olearia</i> forest			BR	<i>Acacia melanoxylon</i> forest on rises	A	N	Very local on fire-disturbed riparian sites or slopes (e.g. Roger River Road).
SWAMP-D4	Riparian blackwood/ dogwood forest	East of Forth River		BR	<i>Acacia melanoxylon</i> forest on rises	B	N	Well-drained gullies and slopes (e.g. Dip River, Flowerdale, Trowutta). Mainly in west of region, but localised in east
		West of Forth River				np	N	
SWAMP-D5	Riparian blackwood/ myrtle/dogwood forest	East of Forth River		BR	<i>Acacia melanoxylon</i> forest on rises	B	N	Recorded from moist gullies adjacent to eucalypt forest (e.g. Bond Tier). May also occur in east of region.
		West of Forth River				np	N	
SWAMP-D6	Riparian blackwood rainforest	Myrtle dominant	E of Forth R	M+	Callidendrous and thamnic rainforest on fertile sites	A	N	On banks and flood plain of rivers and creeks; (e.g. Arthur River flood plains); may extend to burnt or disturbed slopes capable of supporting pure rainforest. May also occur in east of region.
			W of Forth R			B		
		Myrtle not dominant	On flats	BF	<i>Acacia melanoxylon</i> forest on flats	B	N	
			On rises	BR	<i>Acacia melanoxylon</i> forest on rises			
SWAMP-D7	Riparian blackwood/ leatherwood rainforest	Myrtle or leatherwood dominant		M+	Callidendrous and thamnic rainforest on fertile sites	B	N	On banks and flood plain of rivers and creeks; (e.g. Arthur River flood plains); may extend to burnt or disturbed slopes capable of supporting pure rainforest. Usually on slightly less fertile sites than SWAMP-D6.
		Myrtle or leatherwood not dominant	On flats	BF	<i>Acacia melanoxylon</i> forest on flats	B	N	
			On rises	BR	<i>Acacia melanoxylon</i> forest on rises			
SWAMP-E1	Depauperate montane tea- tree forest	Silver wattle common		SI	<i>Acacia dealbata</i> forest	np	N	Local on flats, often disturbed; mainly in dolerite uplands.
		Silver wattle sparse or absent		L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Local on poorly drained sites at the base of the Western Tiers; but more common at higher altitudes (e.g. Surrey Hills).

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
SWAMP-E2	Montane myrtle tea-tree forest		M+	Callidendrous and thamnic rainforest on fertile sites	np	N	May occur locally in a matrix with rainforest and mixed forest on poorly drained, high altitude sites (e.g. Old Park).
SWAMP-F1	Depauperate tea-tree scrub forest		L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Intergrades with swamp forest on frequently burnt infertile sites (e.g. adjacent to Plains Creek Swamp, Emu River, Roger River).
SWAMP-F2	Depauperate tea-tree/paperbark scrub forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Coastal and subcoastal areas with intermediate drainage and fire frequency (e.g. Mt. Cameron West, Lovells Creek).
		Swamp paperbark dominant	ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	
SWAMP-F3	Tea-tree mesophytic scrub forest		L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Later successional stage of SWAMP-F1 (e.g. infertile sites in the Duck and Montagu Rivers' catchments and tributaries of the Arthur River).

2.3 OTHER FOREST OR SCRUB COMMUNITIES

Major Reference: Kirkpatrick, Barker, Brown, Harris and Mackie (1995)

This section covers an array of forest communities that are not dominated by rainforest species, eucalypts, blackwood, tea-trees or paperbarks. They occupy a wide environmental range, from humid sites capable of supporting rainforest, to dry rocky gorges. Most of these communities occur as localised patches in other forest types. Examples include small stands (or groves) of native olive associated with rocky sites in wet sclerophyll forest; and she-oak forests on very dry hillsides. Most of the communities have a high priority for conservation, because of their localised distribution. Some are associated with threatened species. The exception is silver wattle (*Acacia dealbata*) forest, which is found locally where inadequate regeneration of eucalypts has followed land clearing, wildfire or logging.

KEY TO OTHER FOREST OR SCRUB COMMUNITIES

Note: These communities may have a sparse (<5%) cover of eucalypts or other tree species.

- ❶ Bull-oak dominant DRY-LIT
- ❶ She-oak dominant
 - ❷ Non coastal environments DRY-VERT-inland
 - ❷ Coastal environments DRY-VERT-coastal
- ❶ Dogwood (native pear) dominant OTHER-03
- ❶ Blanket bush dominant OTHER-06
- ❶ Native olive (dorrel) dominant OTHER-07
- ❶ Saw banksia dominant OTHER-09
- ❶ Silver wattle dominant OTHER-10
- ❶ Yellow bottlebrush (*Callistemon pallidus*) dominant OTHER-11
- ❶ Black wattle dominant, often with prickly box and scattered *E. viminalis* OTHER-12

CONSERVATION PRIORITIES AND ATTRIBUTES OF OTHER FOREST OR SCRUB COMMUNITIES

Note: * – Community identified as Rare, Vulnerable or Endangered at a Statewide level through RFA processes

Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
DRY-LIT	<i>Allocasuarina littoralis</i> woodland		check	check	A	check	Local on dry, exposed sites on sediments (e.g. Gog Range) and where eucalypt canopy has been removed.
DRY-VERT coastal	Coastal <i>Allocasuarina verticillata</i> low forest		AV	<i>Allocasuarina verticillata</i> forest	A	Y	Uncommon in coastal areas; typically rocky and exposed sites (e.g. Asbestos Ranges).
DRY-VERT inland	Inland <i>Allocasuarina verticillata</i> low forest		AV	<i>Allocasuarina verticillata</i> forest	A	Y	Exposed, rocky dolerite sites (e.g. Cataract Gorge); has also displaced grassy eucalypt woodlands in some areas.
OTHER-03	<i>Pomaderris apetala</i> - <i>Beyeria viscosa</i> - <i>Asterotrichion discolor</i> closed forest/scrub	Site disturbed by heavy logging or clearing	varies	Treat as associated forest community or non-forest scrub (no referral needed)	np	N	Occasional where very poor eucalypt regeneration has occurred following logging or clearing of wet forest.
		Not as above	NP	<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> closed forest	A	Y*	Shaded creeks and gullies in drier areas, and localised patches on moist slopes (e.g. Gog Range, Cataract Gorge).
OTHER-06	<i>Bedfordia salicina</i> - <i>Olearia argophylla</i> closed forest/ scrub	Site disturbed by heavy logging or clearing	varies	Treat as associated forest community or non-forest scrub (no referral needed)	np	N	Occasional where very poor eucalypt regeneration has occurred following logging or clearing of wet forest.
		Not as above	—	None appropriate	A	—	Shaded creeks and gullies in drier areas, and localised patches on upland dolerite slopes (e.g. Western Tiers).
OTHER-07	<i>Notelaea ligustrina</i> closed forest		NP	<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> closed forest	A	Y*	Occurs locally in rocky fire-shadow gullies and on rocky sites in wet forest (e.g. Deep Gully, Old Park, Oonah area).
OTHER-09	<i>Banksia serrata</i> open forest/scrub		BS	<i>Banksia serrata</i> woodland	A	Y*	Siliceous sites in the Sisters Beach - Rocky Cape - Shakespeare Hills area.
OTHER-10	<i>Acacia dealbata</i> forest		SI	<i>Acacia dealbata</i> forest	np	N	Usually created by successive fires, poor eucalypt regeneration or failed attempts at clearing on moist sites. (e.g. Lobster Rivulet, Lorinna area).
OTHER-11	<i>Callistemon pallidus</i> closed forest		—	None appropriate	A	—	Known only from upland dolerite or basalt sites, associated with <i>E. delegatensis</i> forest (e.g. Smiths Plains).
OTHER-12	<i>Acacia mearnsii</i> forest/woodland		—	None appropriate	A	—	May occur as grassy woodland on dry dolerite hills and slopes (e.g. West Tamar).

2.4 MIXED FOREST COMMUNITIES

Major Reference: Kirkpatrick, Peacock, Cullen and Neyland (1988)

Mixed forest comprises vegetation with an understorey of rainforest species and an overstorey of eucalypts that becomes sparse as the forest approaches maturity. Often only one species of eucalypt is present, with trees frequently exceeding 50 m in mature forest. The eucalypts tend to be even-aged, and are usually of one or two age classes, which relate to period since fire or other major disturbance. Mixed forests have a minimum eucalypt canopy cover of 5% - if eucalypt cover is less than 5% the forest is considered as rainforest. Mixed forests represent a transition (in space or time) between the rainforests and the wet sclerophyll forests into which they grade. They also grade into swamp forest, riparian blackwood forest and tea-tree forests.

Mixed forests are extensive and diverse in Woolnorth Region, although in deeply dissected terrain they may form relatively narrow bands between rainforest and wet sclerophyll communities. Most communities are reserved, but those that have been extensively converted on more arable and fertile sites have a high priority for conservation (e.g. mixed forest dominated by *E. viminalis*).

KEY TO MIXED FOREST COMMUNITIES

- ❶ Dominated by *E. amygdalina*..... WET-AM0
- ❶ Dominated by *E. brookeriana*
 - ❷ Celery-top pine, trochocarpa or horizontal present; native currant and musk absent WET-BR00
 - ❷ Celery-top pine, trochocarpa and horizontal absent; native currant or musk present WET-BR01
- ❶ Dominated by *E. dalrympleana*..... WET-DAL10
- ❶ Dominated by *E. delegatensis*
 - ❷ Leatherwood, horizontal or native laurel common; silver wattle, musk, manfern and cathead fern sparse or absent
 - ❸ Goldeywood or lancewood present; cutting grass absent..... WET-DEL1011
 - ❸ Goldeywood and lancewood absent; cutting grass present WET-DEL1010
 - ❷ Leatherwood, horizontal and native laurel sparse or absent; silver wattle, musk, manfern or cathead fern common
 - ❸ Silver wattle, manfern or musk present; waratah and mountain currant usually absent
 - ❹ Celery-top pine or cutting grass common
 - ❺ Dogwood, musk or bracken common
 - ❻ Stinkwood, goldeywood or lancewood present; musk and blanket bush absent WET-DEL0111
 - ❻ Stinkwood, goldeywood and lancewood absent; musk and blanket bush often present..... WET-DEL0110
 - ❺ Dogwood, musk and bracken sparse or absent WET-DEL1001
 - ❹ Celery-top pine and cutting grass sparse or absent
 - ❺ Silver wattle or bracken common; epiphytic ferns sparse or absent
 - ❻ Stinkwood, goldeywood or lancewood present; musk and blanket bush absent WET-DEL0111
 - ❻ Stinkwood, goldeywood and lancewood absent; musk or blanket bush often present WET-DEL0110
 - ❺ Silver wattle and bracken sparse or absent; epiphytic ferns often common... WET-DEL1000
 - ❸ Silver wattle, manfern and musk absent; waratah or mountain currant present WET-DEL1100
 - ❶ Dominated by *E. nitida*
 - ❷ Horizontal, trochocarpa or native pepper present; manfern and dogwood absentWET-NIT0
 - ❷ Horizontal, trochocarpa and native pepper absent; manfern or dogwood presentWET-NIT1

❶ Dominated by *E. obliqua*

- ❷ Manfern, cathead fern or leathery shield fern common
 - ❸ Cutting grass usually present; epiphytic ferns usually sparse or absent
 - ❹ Leatherwood, celery-top pine, horizontal or native laurel common; dogwood, musk, lancewood and prickly mo sparse or absent WET-OB1100
 - ❹ Leatherwood, celery-top pine, horizontal and native laurel sparse or absent; dogwood, musk, lancewood or prickly mo common WET-OB101
 - ❸ Cutting grass usually absent; epiphytic ferns usually common
 - ❹ Leatherwood, celery-top pine, horizontal or native laurel present; musk absent; usually less fertile sites..... WET-OB1001
 - ❹ Leatherwood, celery-top pine, horizontal and native laurel absent; musk often present; usually more fertile sites WET-OB1000
- ❷ Manfern, cathead fern and leathery shield fern sparse or absent
 - ❸ Prickly mo, bauera, coral fern or cutting grass present; flax lily absent..... WET-OB1110
 - ❸ Prickly mo, bauera, coral fern and cutting grass absent; flax lily present WET-OB2

❶ Dominated by *E. regnans*

- ❷ Silver wattle or blackwood present; dogwood common; epiphytic ferns sparse or absent WET-REG101
- ❷ Silver wattle and blackwood absent; dogwood sparse or absent; epiphytic ferns common WET-REG110

❶ Dominated by *E. viminalis*..... WET-VIM111

CONSERVATION PRIORITIES AND ATTRIBUTES OF MIXED FOREST COMMUNITIES

Note: * – Community identified as Rare, Vulnerable or Endangered at a Statewide level through RFA processes

Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in Woolnorth Region
					Floristic	RFA	
WET-AM0	<i>E. amygdalina</i> - <i>Monotoca glauca</i> - <i>Pomaderris apetala</i> - <i>Dicksonia antarctica</i> wsf/mixed forest		check	check	check	check	Local on a range of sites in central and eastern part of region (e.g. Deep Gully, Emu River, Asbestos Ranges).
WET-BR00	<i>E. brookeriana</i> - <i>Phyllocladus aspleniifolius</i> - <i>Hymenophyllum cupressiforme</i> mixed forest		BA	<i>E. brookeriana</i> wet forest	A	Y*	Associated with swamp forest on infertile sites, in far west of region (e.g. Montagu Swamp area).
WET-BR01	<i>E. brookeriana</i> - <i>Nothofagus cunninghamii</i> - <i>Lepidosperma elatius</i> mixed forest		BA	<i>E. brookeriana</i> wet forest	A	Y*	Associated with swamp forest on more fertile sites, including areas on carbonate rocks (e.g. Dismal Swamp, Welcome Swamp).
WET-DAL10	<i>E. dalrympleana</i> - <i>Tasmannia lanceolata</i> - <i>Dicksonia antarctica</i> mixed forest	Make sure dominant is not <i>E. viminalis</i> – contact FPA if unsure	DT	Tall <i>E. delegatensis</i> forest	A	N	May occur locally in shaded gullies, riparian corridors and shaded, fire-shadow slopes in upland areas (e.g. Western Tiers, Loongana). Generally associated with <i>E. delegatensis</i> forest.
WET-DEL0110	<i>E. delegatensis</i> - <i>Atherosperma moschatum</i> - <i>Olearia argophylla</i> wsf/mixed forest		DT	Tall <i>E. delegatensis</i> forest	B	N	Moist, shaded slopes, gullies and drainage headwaters on fertile sites in upland areas (e.g. Croesus Cave, Hellyer Gorge).
WET-DEL0111	<i>E. delegatensis</i> - <i>Zieria arborescens</i> - <i>Hydrocotyle sibthorpioides</i> wsf/mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Extends into higher altitude parts of Woolnorth Region on less fertile substrates such as granite (e.g. Marakoopa area).
WET-DEL1000	<i>E. delegatensis</i> - <i>Nothofagus cunninghamii</i> - <i>Grammitis billardierei</i> mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Moist, shaded slopes, gullies and drainage headwaters on more humid or fire-shadow sites than DEL0110. Often on basalt (e.g. Old Park).
WET-DEL1001	<i>E. delegatensis</i> - <i>Nothofagus cunninghamii</i> - <i>Gahnia grandis</i> mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Humid sites on less fertile substrates than WET-DEL1000 (e.g. granite, Cambrian sediments) at higher altitudes (e.g. Old Park).
WET-DEL1010	<i>E. delegatensis</i> - <i>Phyllocladus aspleniifolius</i> - <i>Anodopetalum biglandulosum</i> mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Higher altitudes in far west of region on infertile sites, often poorly drained (e.g. Deep Gully area).
WET-DEL1011	<i>E. delegatensis</i> - <i>Monotoca glauca</i> - <i>Hymenophyllum rarum</i> mixed forest		DT	Tall <i>E. delegatensis</i> forest	B	N	Higher altitudes on infertile sediments; mainly in west of region.

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
WET-DEL1100	<i>E. delegatensis</i> - <i>Telopea truncata</i> - <i>Pittosporum bicolor</i> subalpine mixed forest		DT	Tall <i>E. delegatensis</i> forest	B	N	Higher altitudes, mainly on dolerite (e.g. Western Tiers).
WET-NIT0	<i>E. nitida</i> - <i>Anodopetalum biglandulosum</i> - <i>Leptospermum glaucescens</i> wsf/mixed forest		NT	Tall <i>E. nitida</i> forest	np	N	Infertile Precambrian sediments in far west of region (e.g. Montagu Swamp).
WET-NIT1	<i>E. nitida</i> - <i>Pomaderris apetalata</i> - <i>Dicksonia antarctica</i> wsf/mixed forest		NT	Tall <i>E. nitida</i> forest	np	N	Mainly on Cambrian sediments in west of region on fire-shadow, humid sites (e.g. Dip River, Pruana).
WET-OB1000	<i>E. obliqua</i> - <i>Nothofagus cunninghamii</i> - <i>Polystichum proliferum</i> - <i>Hymenophyllum flabellatum</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	np	N	Widespread on humid slopes and gullies with deep soils and good drainage, often on basalt; particularly in west of region (e.g. Dial Range, Old Park).
WET-OB1001	<i>E. obliqua</i> - <i>Nothofagus cunninghamii</i> - <i>Anopterus glandulosus</i> - <i>Hymenophyllum flabellatum</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	np	N	Humid slopes and gullies on less fertile sites than WET-OB1000 (e.g. Roger River, Flowerdale, Dip River).
WET-OB101	<i>E. obliqua</i> - <i>Nothofagus cunninghamii</i> - <i>Monotoca glauca</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	np	N	Widespread at low altitudes in west of region, often adjacent to swamp forest; occurs on drier or less fertile sites than WET-OB1000 (e.g. Emu River, Bond Tier, Trowutta).
WET-OB1100	<i>E. obliqua</i> - <i>Atherosperma moschatum</i> - <i>Cenarrhenes nitida</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	np	N	Occasional on less fertile sites in west of region, sometimes adjacent to swamp forest (e.g. margins of Montagu Swamp, Emu River).
WET-OB1110	<i>E. obliqua</i> - <i>Anopterus glandulosus</i> - <i>Acacia verticillata</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	B	N	Less fertile sites with poor drainage in west region (e.g. Trowutta area).
WET-OB2	<i>E. obliqua</i> - <i>Monotoca glauca</i> - <i>Dianella tasmanica</i> wsf/mixed forest		OT	Tall <i>E. obliqua</i> forest	B	N	Recorded from Hellyer Gorge area on relatively dry and fire prone sites on slopes and ridges (Precambrian and Cambrian sediments).

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
WET-REG101	<i>E. regnans</i> - <i>Atherosperma moschatum</i> - <i>Acacia dealbata</i> - <i>Olearia argophylla</i> wsf/mixed forest		R	<i>E. regnans</i> forest	np	N	Local in moist, fire-shadow gullies (e.g. Ferndene, Mount Careless).
WET-REG110	<i>E. regnans</i> - <i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> mixed forest		R	<i>E. regnans</i> forest	A	N	Very local in east of region, on humid, fire-shadow sites (e.g. Branches Creek area).
WET-VIM111	<i>E. viminalis</i> - <i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> - <i>Dicksonia antarctica</i> mixed forest		VW	<i>E. viminalis</i> wet forest	A	Y*	Very local in humid, fire-shadow sites associated with gullies and fertile river flats (e.g. Mount Montgomery).

2.5 WET SCLEROPHYLL FOREST COMMUNITIES

Major Reference: Kirkpatrick, Peacock, Cullen and Neyland (1988)

Wet sclerophyll forests are typically dominated by eucalypts and have an understorey dominated by broad-leaved (soft-leaved) shrubs. Trees in mature forest generally exceed 40 m. Wet sclerophyll forests typically contain only one or two eucalypt age classes - these relate to period since fire or other major disturbance (including intensive logging and regeneration burning). Often only one species of eucalypt is present. The shrub layer is generally dense, preventing continuous regeneration of shade-intolerant species such as eucalypts. Ferns are often prominent in the ground layer.

Wet sclerophyll communities are extensive in Woolnorth Region, particularly in higher rainfall areas. They are also common in shaded and fire-shadow environments in drier parts of the region. Wet sclerophyll forest grades into mixed forest (as rainforest species become more prominent in the understorey) and into dry sclerophyll forest (often through a damp sclerophyll transition zone) as sites become more exposed to drought and fire.

Most wet sclerophyll forest communities are reserved, but those that have been extensively converted on more arable and fertile sites have a high priority for conservation (e.g. wet sclerophyll forest dominated by *E. viminalis*, *E. brookeriana* and *E. ovata*). The same comment applies to all wet sclerophyll forest on King Island.

KEY TO WET SCLEROPHYLL FOREST COMMUNITIES

❶ **Dominated by *E. amygdalina***

- ❷ Manfern, dogwood or goldeywood common; rainforest species may be present; narrow-leaved shrubs and sagg sparse or absent; moister sites WET-AM0
- ❷ Manfern, dogwood and goldeywood sparse or absent; rainforest species absent; narrow-leaved shrubs or sagg usually common; drier sites..... WET-AM1

❶ **Dominated by *E. brookeriana***

- ❷ Goldeywood, lancewood or prickly mo common WET-BR10
- ❷ Goldeywood, lancewood and prickly mo sparse or absent
 - ❸ Blanket bush, musk or bracken common; swamp paperbark and tea-tree sparse or absent WET-BR11
 - ❸ Blanket bush, musk and bracken sparse or absent; swamp paperbark or tea-tree common..... WET-BR2

❶ **Dominated by *E. dalrympleana***

- ❷ Guitar plant, prickly beauty or sagg common; manfern and musk absent WET-DAL00
- ❷ Guitar plant, prickly beauty and sagg sparse or absent; manfern or musk often present.... WET-DAL01

❶ **Dominated by *E. delegatensis***

- ❷ Guitar plant or prickly beauty common
 - ❸ Lancewood, stinkwood or goldeywood common WET-DEL0111
 - ❸ Lancewood, stinkwood and goldeywood sparse or absent
 - ❹ Dogwood, manfern or cutting grass common WET-DEL0100
 - ❹ Dogwood, manfern and cutting grass sparse or absent
 - ❺ Silver wattle or native currant common; blackwood, kangaroo fern, dwarf musk or dollybush sparse or absent WET-DEL0000
 - ❺ Silver wattle and native currant sparse or absent; blackwood, kangaroo fern, dwarf musk and dollybush common WET-DEL0001

- ② Guitar plant and prickly beauty sparse or absent
 - ③ Cutting grass or sword sedge common
 - ④ Woolly tea-tree common; goldeywood and stinkwood sparse or absent..... WET-DEL3
 - ④ Woolly tea-tree sparse or absent; goldeywood or stinkwood common WET-DEL0111
 - ③ Cutting grass and sword sedge sparse or absent
 - ④ Dwarf musk, viscid daisy bush or bracken common; drier sites WET-DEL0101
 - ④ Dwarf musk, viscid daisy bush or bracken sparse or absent; moister sites (myrtle or sassafras may be present) WET-DEL0110
- ① Dominated by *E. globulus*
 - ② Prickly mo, dollybush or cutting grass common; manfern absent WET-GLOB0101
 - ② Prickly mo, dollybush or cutting grass sparse or absent; manfern often present WET-GLOB001
- ① Dominated by *E. nitida*
 - ② Paperbark or tea-tree commonWET-NIT2
 - ② Paperbark and tea-tree sparse or absent
 - ③ Dogwood, manfern or bracken commonWET-NIT1
 - ③ Dogwood, manfern and bracken sparse or absentWET-NIT0
- ① Dominated by *E. obliqua*
 - ② Bauera commonWET-OB3
 - ② Bauera sparse or absent
 - ③ Guitar plant or prickly beauty common; drier sitesWET-OB010
 - ③ Guitar plant and prickly beauty sparse or absent; moister sites
 - ④ Paperbark, tea-tree, sword sedge or cutting grass commonWET-OB0111
 - ④ Paperbark, tea-tree, sword sedge and cutting grass sparse or absent
 - ⑤ Flax lily common; silver wattle and blackwood absentWET-OB2
 - ⑤ Flax lily sparse or absent; silver wattle or blackwood often present.....WET-OB0110
- ① Dominated by *E. ovata*
 - ② Understorey dominated by paperbark or tea-tree; cutting grass or sword sedge usually common WET-OV00
 - ② Understorey dominated by broad-leaved shrubs; cutting grass and sword sedge usually sparse or absent WET-OV01
- ① Dominated by *E. radiata*WET-RAD1
- ① Dominated by *E. regnans*
 - ② Bracken, cutting grass or sword sedge common; (myrtle or sassafras generally absent)
 - ③ Dwarf musk, prickly mo, stinkwood or goldeywood common WET-REG1000
 - ③ Dwarf musk, prickly mo, stinkwood and goldeywood sparse or absent WET-REG1001
 - ② Bracken, cutting grass and sword sedge sparse or absent; (myrtle or sassafras often present) WET-REG101
- ① Dominated by *E. rodwayi*WET-ROD1
- ① Dominated by *E. viminalis*
 - ② Paperbark or tea-tree common; *E. ovata* often present; poorly drained sites..... WET-VIM2
 - ② Paperbark or tea-tree sparse or absent; *E. ovata* absent; well-drained sites
 - ③ Native cherry, guitar plant or little prickly common; drier sites WET-VIM0011
 - ③ Native cherry, guitar plant and little prickly sparse or absent; moister sites
 - ④ Prickly mo or dollybush common; blanket bush and manfern sparse or absent.. WET-VIM0100
 - ④ Prickly mo and dollybush sparse or absent; blanket bush or manfern common.. WET-VIM0101

CONSERVATION PRIORITIES AND ATTRIBUTES OF WET SCLEROPHYLL FOREST COMMUNITIES

Note: * – Community identified as Rare, Vulnerable or Endangered at a Statewide level through RFA processes

Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
WET-AM0	<i>E. amygdalina</i> - <i>Monotoca glauca</i> - <i>Pomaderris apetala</i> - <i>Dicksonia antarctica</i> wsf/mixed forest		check	check	check	check	Local on a range of sites in central and eastern part of region (e.g. Deep Gully, Emu River, Asbestos Ranges).
WET-AM1	<i>E. amygdalina</i> - <i>E. viminalis</i> - <i>Lomandra longifolia</i> wsf	On dolerite	AD	<i>E. amygdalina</i> forest on dolerite	np	N	Mainly on damp dolerite slopes (e.g. Reedy Marsh, Brushy Rivulet area).
		On other substrates	check	check	check	check	Localised, mainly in moist sites in drier areas.
WET-BR10	<i>E. brookeriana</i> - <i>Monotoca glauca</i> - <i>Cyathea australis</i> wsf	On King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A	Y*	Local in remnant forest on more fertile substrate (e.g. Kentford Forest).
		Elsewhere in region	BA	<i>E. brookeriana</i> wet forest	A	Y*	Uncommon on wet sites, usually close to the coast, or on better drained sites adjacent to swamp forests (e.g. Dip River, Duck Creek).
WET-BR11	<i>E. brookeriana</i> - <i>E. obliqua</i> - <i>Bedfordia salicina</i> wsf		BA	<i>E. brookeriana</i> wet forest	A	Y*	Uncommon in Woolnorth Region, in damp but well drained gullies and slopes (e.g. Arthur River catchment, Bond Tier).
WET-BR2	<i>E. brookeriana</i> - <i>Leptospermum</i> species - <i>Lepidosperma elatius</i> wsf	On King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A	Y*	Local in remnant forest on more fertile substrate, on sites with poorer drainage than WET-BR11 (e.g. Pegarah area).
		Elsewhere in region	BA	<i>E. brookeriana</i> wet forest	A	Y*	Poorly drained flats adjacent to major rivers (e.g. Montagu River, Crayfish Creek).
WET-DAL00	<i>E. dalrympleana</i> / <i>E. delegatensis</i> - <i>Lomatia tinctoria</i> wsf	Make sure dominant is not <i>E. viminalis</i> – contact FPA if unsure.	DT	Tall <i>E. delegatensis</i> forest	B	N	Rocky dolerite gullies in dry escarpments of the northern Midlands; may extend into Woolnorth Region
WET-DAL01	<i>E. dalrympleana</i> - <i>Pomaderris apetala</i> - <i>Bedfordia salicina</i> wsf		DT	Tall <i>E. delegatensis</i> forest	B	N	Uncommon, mainly on river flats at higher altitudes (e.g. Croesus Cave area, Forth Falls).
WET-DEL0000	<i>E. delegatensis</i> - <i>Bedfordia salicina</i> - <i>Lomatia tinctoria</i> wsf		DT	Tall <i>E. delegatensis</i> forest	np	N	Occasional at higher altitudes (>400 m) in Woolnorth Region on sedimentary rocks or scree deposits (e.g. Christmas Hills).

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
WET-DEL0001	<i>E. delegatensis</i> - <i>Acacia melanoxylo</i> - <i>Bedfordia salicina</i> wsf		DT	Tall <i>E. delegatensis</i> forest	np	N	Scree and boulder slopes on drier mountains (e.g. Sensation Gorge, Bonneys Tier, Stephens Hill).
WET-DEL0100	<i>E. delegatensis</i> – <i>E. viminalis</i> - <i>Acacia melanoxylo</i> wsf		DT	Tall <i>E. delegatensis</i> forest	np	N	Lower altitudes for <i>E. delegatensis</i> , on dryish dolerite slopes and flats (e.g. Reedy Marsh area).
WET-DEL0101	<i>E. delegatensis</i> - <i>E. obliqua</i> - <i>Acaena novae-zelandiae</i> wsf		DT	Tall <i>E. delegatensis</i> forest	np	N	Occurs at the lower altitude limit of <i>E. delegatensis</i> , commonly forming a transition zone with <i>E. obliqua</i> wet sclerophyll forest (e.g. Christmas Hills).
WET-DEL0110	<i>E. delegatensis</i> - <i>Atherosperma moschatum</i> - <i>Olearia argophylla</i> wsf/mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Occasional in the higher altitude parts of region on dolerite or basalt; often in deep valleys or gullies (e.g. Croesus Cave area).
WET-DEL0111	<i>E. delegatensis</i> - <i>Zieria arborescens</i> - <i>Hydrocotyle sibthorpioides</i> wsf/mixed forest		DT	Tall <i>E. delegatensis</i> forest	B	N	Occasional in the higher altitude parts of region on less fertile sites such as granite and sandstone (e.g. base of Western Tiers, Gog Range).
WET-DEL3	<i>E. delegatensis</i> - <i>Leptospermum lanigerum</i> - <i>Gahnia grandis</i> wsf		DT	Tall <i>E. delegatensis</i> forest	A	N	Local in drainage headwaters and poorly drained saddles (e.g. base of Western Tiers).
WET-GLOB001	<i>E. globulus</i> - <i>Dicksonia antarctica</i> - <i>Ctenopteris heterophylla</i> wsf	Only on King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A	Y	Very local in humid gullies protected from fire or disturbance (e.g. Yarra Creek).
WET-GLOB0101	<i>E. globulus</i> - <i>Acacia dealbata</i> - <i>Acacia melanoxylo</i> - <i>Cassinia aculeata</i> wsf	Only on King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A	Y*	Local in remnant forest on more fertile substrate (e.g. Mt Stanley area).
WET-NIT0	<i>E. nitida</i> - <i>Anodopetalum biglandulosum</i> - <i>Leptospermum glaucescens</i> wsf/mixed forest		NT	Tall <i>E. nitida</i> forest	np	N	Common on infertile Precambrian sediments in far west of region (e.g. adjacent to Montagu Swamp).
WET-NIT1	<i>E. nitida</i> - <i>Pomaderris apetala</i> - <i>Dicksonia antarctica</i> wsf/mixed forest		NT	Tall <i>E. nitida</i> forest	np	N	Local on Cambrian sediments in west of region (e.g. Dip River, Pruana). Occasionally on more fertile sites (e.g. Kara Road).
WET-NIT2	<i>E. nitida</i> - <i>Melaleuca squarrosa</i> - <i>Monotoca glauca</i> wsf		NT	Tall <i>E. nitida</i> forest	np	N	Often on poorly drained sites on siliceous or infertile substrates, but can extend to better drained sites (e.g. Detention Falls, Flowerdale).

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
WET-OB010	<i>E. obliqua</i> - <i>Olearia lirata</i> - <i>Pultenaea juniperina</i> wsf		OT	Tall <i>E. obliqua</i> forest	np	N	Common on fairly dry sites in centre and east of region (e.g. Kelcey Tier, Dial Range); often forms an intermediate community between wet and dry sclerophyll forests.
WET-OB0110	<i>E. obliqua</i> - <i>Acacia dealbata</i> - <i>Olearia argophylla</i> wsf		OT	Tall <i>E. obliqua</i> forest	np	N	Widespread on moist slopes and gully flanks at lower altitudes (e.g. Takone, Sensation Gorge).
WET-OB0111	<i>E. obliqua</i> - <i>Melaleuca squarrosa</i> - <i>Monotoca glauca</i> wsf		OT	Tall <i>E. obliqua</i> forest	np	N	Wet on poorly drained sites; particularly along creeks and on river flats or adjacent to swamp forests (e.g. Crayfish Creek, Detention Falls).
WET-OB2	<i>E. obliqua</i> - <i>Monotoca glauca</i> - <i>Dianella tasmanica</i> wsf/mixed forest		OT	Tall <i>E. obliqua</i> forest	B	N	Local on relatively dry, fire prone sites on ridges on Precambrian and Cambrian sediments and granite (e.g. Hellyer Gorge).
WET-OB3	<i>E. obliqua</i> - <i>Phebalium squameum</i> - <i>Bauera rubioides</i> wsf		OT	Tall <i>E. obliqua</i> forest	B	N	Local on slopes, mainly on sediments and granite (e.g. Flowerdale catchment, Black Creek).
WET-OV00	<i>E. ovata</i> - <i>Leptospermum</i> species - <i>Melaleuca</i> species wsf		OV	Shrubby <i>E. ovata</i> - <i>E. viminalis</i> forest	A	Y*	Local on poorly drained lowland flats, which have escaped fire for a long period (e.g. Brands Creek).
WET-OV01	<i>E. ovata</i> - <i>Acacia dealbata</i> - <i>Pomaderris apetala</i> wsf		OV	Shrubby <i>E. ovata</i> - <i>E. viminalis</i> forest	A	Y*	Local on shaded or fertile lowland flats, drainage less impeded than most <i>E. ovata</i> -dominated communities (e.g. Brands Creek).
WET-RAD1	<i>E. radiata</i> wsf		varies	Associated with various communities - contact FPA.	A	check	Local on lower slopes and well drained river flats in upper Forth Valley (e.g. Lemonthyme, Lake Cethana, Dolcoath Hill area), but also outliers in Mersey catchment (Croesus Cave area). Mainly associated with wet sclerophyll forest dominated by <i>E. delegatensis</i> or <i>E. obliqua</i> .
WET-REG1000	<i>E. regnans</i> - <i>E. obliqua</i> - <i>Pomaderris apetala</i> - <i>Olearia lirata</i> wsf		R	<i>E. regnans</i> forest	np	N	Local on shaded slopes and gully flanks, in transition zone between <i>E. obliqua</i> wet sclerophyll forest and wetter <i>E. regnans</i> communities. Often occurs as a regrowth community (e.g. Castra area, Dial Range, Bonneys Tier).

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
WET-REG1001	<i>E. regnans</i> - <i>Acacia dealbata</i> - <i>Pomaderris apetala</i> wsf		R	<i>E. regnans</i> forest	B	N	Sheltered slopes and gullies in drier areas (e.g. Lizard Hill, Dazzler Range) but extending to drier sites in high rainfall areas (e.g. Mawbanna, Castra). Often occurs as a regrowth community.
WET-REG101	<i>E. regnans</i> - <i>Atherosperma moschatum</i> - <i>Acacia dealbata</i> - <i>Olearia argophylla</i> wsf/mixed forest		R	<i>E. regnans</i> forest	np	N	Very humid slopes and gullies in high rainfall areas (eg Ferndene, Mt Careless, steep gullies in Branches Creek area). Grades into mixed forest.
WET-ROD1	<i>E. rodwayi</i> wsf		RO	<i>E. rodwayi</i> forest	A	Y	Very localised on fertile river flats in cooler inland areas (e.g. Meander River near Montana Falls).
WET-VIM0011	<i>E. viminalis</i> - <i>Bedfordia salicina</i> - <i>Pultenaea juniperina</i> wsf	<i>E. amygdalina</i> or <i>E. obliqua</i> codominant or subdominant	DSC	<i>E. viminalis</i> - <i>E. ovata</i> - <i>E. amygdalina</i> - <i>E. obliqua</i> damp sclerophyll forest	A	Yog	Wet sclerophyll - dry sclerophyll transition community found locally on dolerite slopes (e.g. Reedy Marsh area).
		Not DSC	VW	<i>E. viminalis</i> wet forest	A	Y*	
WET-VIM0100	<i>E. viminalis</i> - <i>Acacia dealbata</i> - <i>Pomaderris apetala</i> wsf		VW	<i>E. viminalis</i> wet forest	A	Y*	Local on moist, fertile sites often associated with creeks or rivers (e.g. Mersey River, Forth River).
WET-VIM0101	<i>E. viminalis</i> - <i>Acacia dealbata</i> - <i>Dicksonia antarctica</i> wsf		VW	<i>E. viminalis</i> wet forest	A	Y*	Local on humid slopes or gullies, mainly in centre and east of region (e.g. Dogs Head Hill, Dial Range, Warrawee, Loongana, Smiths Plains).
WET-VIM2	<i>E. viminalis</i> - <i>Leptospermum lanigerum</i> - <i>Melaleuca squarrosa</i> wsf		OV	Shrubby <i>E. ovata</i> - <i>E. viminalis</i> forest	A	Y*	Very localised on better drained sites adjacent to flats with <i>E. ovata</i> forest (e.g. Brands Creek) or swamp forest (e.g. Oldina area).

2.6 DRY SCLEROPHYLL FOREST AND WOODLAND COMMUNITIES

Major Reference: Duncan and Brown (1985)

Dry sclerophyll forests and woodlands are typically dominated by eucalypts under 40 m in height, and have a multi-layered understorey dominated by hard-leaved shrubs, including eucalypt regeneration. The eucalypts often form mixed species stands, and generally several age classes of eucalypts are present. The ground layer varies, but bracken, grasses and graminoids (sedges) are typical components. Many grassy communities are described in Kirkpatrick, Gilfedder and Fensham (1988).

Dry sclerophyll forest communities are classified by their overstorey dominants and the broad characteristics of their understorey. The understorey types are grassy (g), sedgy (sd), scrubby (sc), shrubby (sh) and heathy (h); they are described below. Inevitably, many areas will support vegetation with intermediate understoreys. FPOs need to use a precautionary approach when determining the conservation priority of such forests.

Land use practices (e.g. frequent or recent firing) can modify the structure or composition of dry sclerophyll understoreys. For example, frequent firing can lead to bracken displacing a diverse heathy understorey. FPOs should allow for land use practices when determining floristic communities.

Dry sclerophyll communities are moderately widespread and diverse in the drier eastern part of Woolnorth Region, with dominants and understorey species varying in response to substrate and drainage. In the more humid western part of the region, they are mainly found on infertile and coastal sites. Dry sclerophyll forest grades into wet sclerophyll forest (often through a damp sclerophyll transition zone) as sites become progressively more humid and less frequently burnt. As the environment becomes drier or more limiting to tree growth, dry sclerophyll forests grade into woodland, scrub, heath, grassland and sedgeland, depending on site characteristics. Some dry sclerophyll communities in Woolnorth Region have been extensively modified, and have a high priority for conservation, particularly in the eastern and central parts of the region and on King Island.

There are difficulties with allocating some dry sclerophyll floristic communities to RFA communities. These problem communities are not encountered in many FPP areas. The tables indicate when FPOs need to check with FPA for guidance on community affinities, priorities and prescriptions.

Many lowland dry sclerophyll communities in Woolnorth Region, particularly on siliceous substrates and poorly drained sites, are highly susceptible to *Phytophthora cinnamomi*. These are indicated in the tables. Specialist advice will be needed if prescriptions in *Flora Technical Note 8* cannot be applied to operations in these communities.

RECOGNISING THE DIFFERENT DRY SCLEROPHYLL UNDERSTOREYS

Each understorey type is recognised by the dominance or prominence of a distinctive suite of species. Species from other understorey types may also be present, and these communities will grade into one another in some situations, so it is important to note which species are the most dominant, rather than just which species are present. Eucalypt regrowth can be present in all understorey types.

Grassy forests

Grasses or sags are the dominant or most prominent feature of the understorey. Typical species include tussock grass, kangaroo grass, wallaby grass and sagg (*Lomandra longifolia*). Note that buttongrass and cutting grass are actually sedges, and forests with understoreys dominated by these species should be considered as sedgy communities. The ground layer generally contains a high diversity of herbs, most evident when they are flowering in spring and summer. Small trees and shrubs (e.g. black wattle, she-oak, prickly box) are widespread on drier lowland sites. The eucalypt canopy is often fairly open; common species in Woolnorth Region include *E. delegatensis*, *E. amygdalina* and *E. viminalis*. Grassy forests are often associated with fertile substrate (e.g. basalt, dolerite) and well drained sites, particularly in eastern parts of the region.

Sedgy forests

Sedges or rushes are the dominant or most prominent feature of the understorey. Typical species include cutting sedge, sword sedge, buttongrass, cutting grass and rushes. Coral ferns are often present. Shrubs such as tea-trees and paperbarks are present on many sites. The eucalypt canopy is fairly open. Common

species in Woolnorth Region include *E. amygdalina*, *E. nitida* and *E. ovata*. Sedgy forests grade into scrubby forests as shrub cover increases (in the absence of fire) and sedges reduce in cover. Sedgy forests occur on sites with impeded drainage, often on sites that have been burnt frequently or recently.

Scrubby forests

Shrubs (typically tea-trees and paperbarks) are the dominant or most prominent feature of the understorey. They form a moderately dense to dense cover, generally over a sedgy ground layer. Other common shrub species include prickly mo, banksia, hakea and a range of legumes and heath species. The ground layer contains species typical of sedgy forest, though it is generally sparser, particularly under a dense shrub layer. The eucalypt canopy is typically fairly open. Common species in Woolnorth Region include *E. amygdalina*, *E. nitida* and *E. ovata*. Scrubby forests mainly occur on flats with impeded drainage, generally on sites that have not been burnt or severely disturbed for many years. They often intergrade or form a mosaic with sedgy communities.

Heathy forests

Shrubs less than 2 m in height are the dominant or most prominent feature of the understorey, though in frequently burnt sites this shrub layer can be displaced by bracken. Occasional taller shrubs are also often present in heathy forests. Shrub species include many heaths (e.g. *Epacris* species), legumes, wattles, bull-oak, banksia, tea-tree and grass-tree (*Xanthorrhoea* species). Bracken is the most widespread ground layer species, but sags, sedges and colourful herbs (e.g. orchids, lilies) are often conspicuous. Eucalypt height and density varies in response to site conditions, but common species in Woolnorth Region include *E. amygdalina* and *E. nitida*. Heathy forests are generally found on well drained sites on infertile or siliceous substrates (e.g. sands, sandstone, quartzite, granite).

Shrubby forests

Shrubs more than 2 m in height are the dominant or most prominent feature of the understorey. Several shrub layers are often present, often containing a mixture of wet sclerophyll (broad-leaved) and dry sclerophyll (narrow-leaved) shrubs. Shrubby forests are synonymous with damp sclerophyll forests when wet sclerophyll and dry sclerophyll shrubs are present in similar proportions. Shrub species present vary greatly, depending on site conditions. Common species include native cherry, wattles, blanket bush, dollybush, banksia, hop bush, prickly beauty, guitar plant and hakea. Ground layer species include bracken and other ferns, flax lily, sagg and grasses, though their cover is often sparse. Eucalypts are typically taller and denser than in other dry sclerophyll forest communities. In Woolnorth Region they include *E. obliqua*, *E. delegatensis* on moist sites and *E. amygdalina* on drier sites. Shrubby forests tend to occupy more fertile, shaded or humid sites than other dry sclerophyll types.

KEY TO DRY SCLEROPHYLL FOREST AND WOODLAND COMMUNITIES

Note: Exclude eucalypt regeneration in assessing dominance of understorey layers.

- ❶ Understorey dominated by grasses and sags; small trees or shrubs generally sparse; mainly on drier sites on basalt, dolerite or other fertile substrates
 - ❷ *E. amygdalina* dominant DRY-gAM
 - ❷ *E. delegatensis* dominant DRY-gDEL
 - ❷ *E. dalrympleana* dominant DRY-gDAL
 - ❷ *E. ovata* dominant DRY-gOV
 - ❷ *E. pauciflora* dominant DRY-gPAUC
 - ❷ *E. rodwayi* dominant DRY-gROD
 - ❷ *E. viminalis* dominant DRY-gVIM
- ❶ Understorey dominated by sedges, cutting grass or buttongrass or tea-trees or paperbarks; mainly on sites with impeded drainage (e.g. flats and marsh edges)
 - ❷ Sedges, cutting grass or buttongrass prominent
 - ❸ *E. amygdalina* dominant DRY-sdAM
 - ❸ *E. nitida* dominant DRY-sdNIT
 - ❸ *E. ovata* dominant DRY-sdOV
 - ❸ *E. rodwayi* dominant DRY-sdROD

- ② Tea-trees or paperbarks prominent
 - ③ *E. amygdalina* dominant..... DRY-scAM
 - ③ *E. nitida* dominant DRY-scNIT
 - ③ *E. ovata* dominant..... DRY-scOV
 - ③ *E. rodwayi* dominant DRY-scROD

- ❶ Understorey dominated by bracken or low shrubs (generally less than 2 m), notably heaths, legumes, wattles, tea-trees, bull-oak and banksia; mainly on well drained sites on gravels, sands, sandstone and other sediments
 - ② *E. amygdalina* dominant DRY-hAM
 - ② *E. globulus* dominant DRY-hGLOB
 - ② *E. nitida* dominant..... DRY-hNIT
 - ② *E. ovata* dominant DRY-hOV
 - ② *E. obliqua* dominant..... DRY-hOB
 - ② *E. pauciflora* dominant..... DRY-hPAUC
 - ② *E. viminalis* dominant..... DRY-hVIM

- ❶ Understorey dominated by shrubs over 2 m (excluding tea-trees and paperbarks), often including broad-leaved species; bracken or other ferns sometimes dense; mainly on well drained sites or sheltered sites of moderate fertility (e.g. dolerite)
 - ② *E. amygdalina* dominant DRY-shAM
 - ② *E. dalrympleana* dominant DRY-shDAL
 - ② *E. delegatensis* dominant DRY-shDEL
 - ② *E. globulus* dominant DRY-shGLOB
 - ② *E. nitida* dominant..... DRY-shNIT
 - ② *E. obliqua* dominant DRY-shOB
 - ② *E. ovata* dominant DRY-shOV
 - ② *E. pauciflora* dominant..... DRY-shPAUC
 - ② *E. radiata* dominant DRY-shRAD
 - ② *E. viminalis* dominant..... DRY-shVIM

CONSERVATION PRIORITIES AND ATTRIBUTES OF DRY SCLEROPHYLL FOREST / WOODLAND COMMUNITIES

Notes: # – Community highly susceptible to *Phytophthora cinnamomi* – specialist advice needed if prescriptions in *Flora Technical Note 8* cannot be applied

* – Community identified as Rare, Vulnerable or Endangered at a Statewide level through RFA processes

Floristic community code and name		Qualification		RFA community code and name		Cons. priority		Distribution in Woolnorth Region
						Floristic	RFA	
DRY-gAM	Grassy <i>E. amygdalina</i> forest/woodland	Substrate sand, alluvium, Tertiary gravels or ironstone (non-coastal areas)		AIC	Inland <i>E. amygdalina</i> forest on Cainozoic deposits	A	Y*	Local in SE of region and West Tamar, mainly on broad flats (e.g. Westwood, Exeter, Selbourne).
		Substrate dolerite (or basalt)	Not associated with AIC	AD	<i>E. amygdalina</i> forest on dolerite	np	N	Ridges, slopes and flats in centre and E of region (e.g. Cataract Gorge, West Tamar, Roaring Magg).
			Occurs with AIC	check	check	check	check	Local on lower slopes and flats (e.g. West Tamar).
		Substrate other		check	check	check	check	May occur locally on dry sites in SE of region.
DRY-gDAL	Grassy <i>E. dalrympleana</i> forest/woodland	Make sure dominant is not <i>E. viminalis</i> - contact FPA if unsure.		D	Dry <i>E. delegatensis</i> forest	B	N	Local on well drained slopes and flats at higher altitudes; often associated with <i>E. delegatensis</i> forest.
DRY-gDEL	Grassy <i>E. delegatensis</i> forest/woodland			D	Dry <i>E. delegatensis</i> forest	B	N	Cool, dry upland dolerite slopes and tier surfaces, sometimes as a result of grazing or fire (e.g. Loongana).
DRY-gOV	Grassy <i>E. ovata</i> forest/woodland			OV	Shrubby <i>E. ovata</i> - <i>E. viminalis</i> forest	A [#]	Y*	Uncommon on dry, fertile flats with impeded drainage (e.g. Sheffield, Dans Hill, Avenue Flats).
DRY-gPAUC	Grassy <i>E. pauciflora</i> forest/woodland	Substrate dolerite (or basalt)		PJ	<i>E. pauciflora</i> forest on Jurassic dolerite	B	Yog	Local on the margins of frost hollows adjacent to broad flats (e.g. Sheffield area, Brushy Lagoon).
		Substrate other		check	check	check	check	Occasional, mainly on sediments.
DRY-gROD	Grassy <i>E. rodwayi</i> forest/woodland			RO	<i>E. rodwayi</i> forest	A	Y	Very localised in upland areas on flats and hollows subject to frosts and cold air drainage, and often firing and grazing (e.g. Old Park, Lorinna area)..
DRY-gVIM	Grassy <i>E. viminalis</i> forest/woodland	Substrate sand, alluvium, Tertiary gravels or ironstone (non-coastal areas)		AIC	Inland <i>E. amygdalina</i> forest on Cainozoic deposits [@]	A	Y*	May occur locally in southeast of region and West Tamar, mainly on broad flats (e.g. Westwood, Exeter, Selbourne).
		Substrate dolerite (or basalt)		V	<i>E. viminalis</i> grassy forest/woodland	A	Y	Dry dolerite hills and slopes particularly in West Tamar area (e.g. Legana, Cataract Gorge).
		Substrate other		check	check	check	check	Occasional, mainly on sediments in east of region.

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Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in Woolnorth Region
					Floristic	RFA	
DRY-hAM	Heathy <i>E. amygdalina</i> forest/woodland	Substrate sand or alluvium in (sub)coastal areas <u>or</u> granite <u>or</u> Precambrian beds	AC	Coastal <i>E. amygdalina</i> forest	np [#]	N	Common in east and central parts of region on drier sites (e.g. Round Hill, Dazzler Range, Asbestos Range, Warrawee).
		Substrate sandstone (mainly Triassic and Ordovician)	AS	<i>E. amygdalina</i> forest on sandstone	A [#]	Y*	Local in centre and east of region (e.g. Bradys Creek, Sensation Gorge, Gog Range).
		Substrate sand, alluvium, Tertiary gravels or ironstone (non-coastal areas)	AIC	Inland <i>E. amygdalina</i> forest on Cainozoic deposits	A	Y*	Local in southeast of region mainly on broad flats (e.g. Westwood, Selbourne).
		Substrate other	check	check	check	check	Local on dry slopes in Central North.
DRY-hGLOB	Heathy <i>E. globulus</i> forest	Only on King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A [#]	Y*	May occur locally in sandy coastal areas of King Island.
DRY-hNIT	Heathy <i>E. nitida</i> forest	Western Bass Strait islands	N	Dry <i>E. nitida</i> forest	A [#]	N	Local on larger islands (e.g. Hunter Is, Robbins Is)
		Elsewhere in region			np [#]	N	Common on siliceous sediments in west of region (e.g. Harcus Hill, Seventeen Mile Plain).
DRY-hOB	Heathy <i>E. obliqua</i> forest		O	Dry <i>E. obliqua</i> forest	np [#]	N	Local on siliceous sites in coastal (e.g. Asbestos Range) and inland areas (e.g. Gog Range).
DRY-hOV	Heathy <i>E. ovata</i> forest/woodland		OV	Shrubby <i>E. ovata</i> - <i>E. viminalis</i> forest	A [#]	Y*	Local on poorly drained flats in coastal areas (e.g. Greens Beach area).
DRY-hPAUC	Heathy <i>E. pauciflora</i> forest		check	check	check	check	Mainly remnants on flats receiving cold air drainage in SE of region (e.g. Sheffield, Weetah).
DRY-hVIM	Heathy <i>E. viminalis</i> forest	Only on King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A [#]	Y*	May occur locally in sandy coastal areas of King Island.
		Elsewhere in region on coastal sand	G	<i>E. viminalis</i> and/or <i>E. globulus</i> coastal forest	A [#]	Y*	Local on well drained sites on Recent sand in coastal areas (e.g. Perkins Island, Lees Point).
		Substrate sand, alluvium, Tertiary gravels or ironstone (non-coastal areas)	AIC	Inland <i>E. amygdalina</i> forest on Cainozoic deposits	A	Y*	May occur locally in southeast of region and West Tamar, mainly on broad flats (e.g. Westwood, Exeter, Selbourne).
		Substrate other	check	check	check	check	Occasional on other substrates (e.g. sandstone, mudstone), generally with <i>E. amygdalina</i> forest.

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Floristic community code and name		Qualification		RFA community code and name		Cons. priority		Distribution in Woolnorth Region
						Floristic	RFA	
DRY-sdAM <u>and</u> DRY-scAM	Sedgy <i>E. amygdalina</i> forest/woodland Scrubby <i>E. amygdalina</i> forest/woodland	Substrate sand or alluvium in (sub)coastal areas <u>or</u> granite <u>or</u> Precambrian beds		AC	Coastal <i>E. amygdalina</i> forest	np [#]	N	Local around drainage lines and margins of marshes on a range of substrates in the east of the region (e.g. Reedy Marsh, Bradys Creek, Port Sorell).
		Substrate sandstone (mainly Triassic and Ordovician)		AS	<i>E. amygdalina</i> forest on sandstone	A [#]	Y*	
		Substrate sand, alluvium, Tertiary gravels or ironstone (non-coastal areas)		AIC	Inland <i>E. amygdalina</i> forest on Cainozoic deposits	A	Y*	
		Substrate dolerite (or basalt)	Not associated with AIC	AD	<i>E. amygdalina</i> forest on dolerite	np	N	
			Occurs with AIC	check	check	check	check	
Substrate other		check	check	check	check			
DRY-sdNIT <u>and</u> DRY-scNIT	Sedgy <i>E. nitida</i> forest/woodland Scrubby <i>E. nitida</i> forest/woodland	Western Bass Strait islands		N	Dry <i>E. nitida</i> forest	A [#]	N	Local on larger islands (e.g. Hunter Is, Robbins Is)
		Elsewhere in region				np [#]	N	
DRY-sdOV <u>and</u> DRY-scOV	Sedgy <i>E. ovata</i> forest/woodland Scrubby <i>E. ovata</i> forest/woodland			OV	Shrubby <i>E. ovata</i> - <i>E. viminalis</i> forest	A [#]	Y*	Widespread but local on poorly drained flats, particularly in lowland areas (e.g. Brushy Rivulet, Andersons Creek, Fulton Park).
DRY-sdROD <u>and</u> DRY-scROD	Scrubby <i>E. rodwayi</i> forest/woodland Sedgy <i>E. rodwayi</i> forest/woodland			RO	<i>E. rodwayi</i> forest	A [#]	Y	Local on poorly drained flats, particularly in upland areas (e.g. Montana Falls area, Lorinna) but local at lower altitudes (e.g. Avenue Flats). <i>Sphagnum</i> often prominent.
DRY-shAM (continued next page)	Shrubby <i>E. amygdalina</i> forest (continued next page)	Understorey with similar amount of wet and dry sclerophyll shrubs <u>and</u> <i>E. obliqua</i> or <i>E. viminalis</i> codominant or subdominant		DSC	<i>E. viminalis</i> - <i>E. ovata</i> - <i>E. amygdalina</i> - <i>E. obliqua</i> damp sclerophyll forest	np	Yog	Found on sites intermediate between wet and dry forest. Common on shaded slopes in drier parts of the region, and moderately exposed slopes in wetter parts of the region (e.g. Birrale area, Bonneys Tier, Dazzler Range).
		Not DSC and substrate dolerite (or basalt)		AD	<i>E. amygdalina</i> forest on dolerite	np	N	Widespread on dolerite in the east of the region (e.g. Stephens Hill).

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
DRY-shAM (from previous page)	Shrubby <i>E. amygdalina</i> forest (from previous page)	Not DSC and substrate sand or alluvium in (sub)coastal areas <u>or</u> granite <u>or</u> Precambrian beds	AC	Coastal <i>E. amygdalina</i> forest	np [#]	N	Local on moderately shaded slopes on granite and possibly sand.
		Not DSC and substrate sandstone	AS	<i>E. amygdalina</i> forest on sandstone	A [#]	Y*	Local on moderately shaded slopes on sandstone.
		Not DSC and substrate other	check	check	check	check	Local on moderately shaded slopes, mainly on sediments or Precambrian beds.
DRY-shDAL	Shrubby <i>E. dalrympleana</i> forest	Make sure dominant is <i>E. viminalis</i> – contact FPA if unsure	D	Dry <i>E. delegatensis</i> forest	B	N	Local on well drained slopes and flats at higher altitudes; often associated with <i>E. delegatensis</i> forest.
DRY-shDEL	Shrubby <i>E. delegatensis</i> forest		D	Dry <i>E. delegatensis</i> forest	np	N	Widespread on drier slopes and ridgelines at higher altitudes (>400 m) on rocky, free draining sites (e.g. Jean Brook, Stephens Hill, Arm River).
DRY-shGLOB	Shrubby <i>E. globulus</i> forest	Only on King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A [#]	Y*	May occur locally in sandy coastal areas of King Island.
DRY-shNIT	Shrubby <i>E. nitida</i> forest		N	Dry <i>E. nitida</i> forest	np [#]	N	Less fertile sites (e.g. Precambrian sediments) in west of region (e.g. Detention Falls, Rocky Cape).
DRY-shOB	Shrubby <i>E. obliqua</i> forest	Understorey with similar amount of wet and dry sclerophyll shrubs <u>and</u> <i>E. amygdalina</i> or <i>E. viminalis</i> subdominant or codominant	DSC	<i>E. viminalis</i> - <i>E. ovata</i> - <i>E. amygdalina</i> - <i>E. obliqua</i> damp sclerophyll forest	np	Yog	Found on sites intermediate between wet and dry forest. Common on shaded slopes in drier parts of the region, and moderately exposed slopes in wetter parts of the region (e.g. Birrale area, Bonneys Tier, Dazzler Range).
		Not DSC	O	Dry <i>E. obliqua</i> forest	np	N	Widespread in moister lowland environments on a range of substrates.
DRY-shOV	Shrubby <i>E. ovata</i> forest		OV	Shrubby <i>E. ovata</i> - <i>E. viminalis</i> forest	A [#]	Y*	Local on sites intermediate between DRY-scOV and wet sclerophyll forest.
DRY-shPAUC	Shrubby <i>E. pauciflora</i> forest	Substrate dolerite (or basalt)	PJ	<i>E. pauciflora</i> forest on Jurassic dolerite	B	Yog	Local on flats subject to frost and cold air drainage (e.g. Brushy Rivulet, Reedy Marsh).
		Substrate other	check	check	check	check	May occur locally on dry flats in SE of region.

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in Woolnorth Region
					Floristic	RFA	
DRY-shRAD	Shrubby <i>E. radiata</i> forest		check	check	A	check	Local on dry slopes and ridges on granite and sediments, in upper Forth catchment.
DRY- shVIM	Shrubby <i>E. viminalis</i> forest	Only on King Island	KG	King Island <i>E. globulus</i> - <i>E. brookeriana</i> - <i>E. viminalis</i> forest	A [#]	Y*	May occur locally in sandy coastal areas of King Island.
		Understorey with similar amount of wet and dry sclerophyll shrubs <u>and</u> <i>E. amygdalina</i> or <i>E. obliqua</i> codominant or subdominant	DSC	<i>E. viminalis</i> - <i>E. ovata</i> - <i>E. amygdalina</i> - <i>E. obliqua</i> damp sclerophyll forest	A	Yog	Local in dry sclerophyll - wet sclerophyll transition zones, sometimes along creeklines in drier areas.
		Not DSC and substrate dolerite (or basalt)	V	<i>E. viminalis</i> grassy forest/woodland	A	Y	Local on humid or fire-free sites that would normally support grassy <i>E. viminalis</i> forest.
		Not DSC and substrate coastal sand	G	<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	A [#]	Y*	Local on humid or fire-free coastal sites that would normally support heathy <i>E. viminalis</i> forest.
		Not DSC and substrate granite or (sub)coastal gravels	AC	Coastal <i>E. amygdalina</i> forest	B [#]	N	Occasional, usually with <i>E. amygdalina</i> forest in east of region.
		Not DSC and substrate other	check	check	check	check	Occasional, usually with <i>E. amygdalina</i> forest.

Section 3 PRIORITY SPECIES

Species listed in this section have some priority for conservation, and are known or likely to occur in Woolnorth Region. Most are listed on Schedules of the Tasmanian *Threatened Species Protection Act* 1995, with a small proportion also being listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999. This section also includes a few species (e.g. outliers of biogeographic interest) that are not listed under either Act. Priority species are arranged on the basis of the timber quality of the forests that they typically occupy, but may also occur in other vegetation types. Some priority species have been recorded from plantations.

Much more information is available on the taxonomy, distribution and conservation status of vascular species (ferns, conifers and flowering plants) than non-vascular species (mosses, liverworts and lichens). This is partly because more texts are available on vascular plants, and partly because identification of non-vascular species often requires microscopic examination of specimens.

Our knowledge of the distribution and ecology of threatened species is improving as new information is obtained from targeted studies and from surveys in different areas of Tasmania (including surveys conducted by forest workers). Information from all sources allows the conservation status and requirements of listed species to be reviewed and better prescriptions to be developed.

In many cases, assessments can be directed towards particular environments (e.g. dry rocky knolls) because many threatened species have narrow habitat ranges, and potential occurrences can be predicted from conditions of the physical environment (e.g. geology, aspect, altitude) or biological environment (e.g. dominant tree species, plant community). Many sites containing listed species will be flagged as priority communities (Section 2) or sites of potential significance for flora (Section 4). Over 50 threatened species of plants have been recorded from King Island – all proposed operations from the island need to be referred to FPA.

Many threatened species are known or likely (based on taxonomic affinities) to be susceptible to *Phytophthora cinnamomi*. These species are indicated in the tables of priority species. Many of these species are found on lowland, siliceous sites. Some of the species play an important role in ecosystem functioning. Particular care is needed in evaluating FPP areas and planning operations in environments that contain *Phytophthora*-susceptible species (see Section 6 and *Flora Technical Note 8*).

The FPP flora evaluation requires that FPOs use databases to determine if threatened species have been recorded from within or close to proposed operational areas. The nominated databases are GTSpot (DPIWE) and NewCONSERVE (Forestry Tasmania). Details of how to access these databases are given in Module 1. Both databases provide other information that may be useful in preparing FPPs. The databases are updated regularly to incorporate new records of threatened species. Updated information on threatened species in this bioregion may also be found on the FPA Website.

The absence of records does not mean that threatened species are not present – many FPP areas will not have been surveyed previously. If new sites containing threatened species are found, details on site location, abundance of the species, and other potentially useful information (e.g. habitat, land use and fire history) should be forwarded to FPA. Material (e.g. photos or scans) can also be sent to the FPA Botany or Ecology programs for confirmation.

Many priority species will not be familiar to FPOs, but some are readily identifiable. Information to help identify many of the listed species is available on the FPA Website and in some of the references in *Flora Technical Note 2*. Further information on threatened plant species can be obtained from the Threatened Flora of Tasmania website (<http://www.gisparks.tas.gov.au/ThreatenedFloraCD/>). This site contains individual PDF files of all plant species listed on Schedules of the *Threatened Species Protection Act*. The files contain an image of the species (which could be useful in field verification) as well as information on habitat, distribution and conservation management.

Contact FPA if any priority species are identified or are likely to occur in an area that could be affected by a forestry operation. Recommendations to take account of such occurrences will be developed in conjunction with DPIWE (Threatened Species Unit). They will depend on characteristics of the species, site and proposed operation. Some sites may need to be excluded from operations, but often the values can be maintained by management prescriptions. In some cases (e.g. for opportunistic species) no changes to the proposed operation will be needed.

PRIORITY SPECIES ARRANGED BY BROAD VEGETATION TYPES

Priority species are arranged by broad vegetation type: corresponding PI typing is also indicated. More information on distribution and habitat can be obtained from the Threatened Flora of Tasmania website (www.gisparks.tas.gov.au/ThreatenedFloraCD/).

The status of the species refers to its presence on Schedules of the *Threatened Species Protection Act*:

- X Presumed extinct in Tasmania (Schedule 3)
- E Endangered in Tasmania (Schedule 3)
- V Vulnerable in Tasmania (Schedule 4)
- R Rare and at risk in Tasmania (Schedule 5)

Susceptibility of species (in their natural habitat) to *Phytophthora cinnamomi* (Pc) is indicated. This is based on Barker and Wardlaw (1995) and Schahinger *et al.* (2003):

- Hs Highly susceptible: expect >75% mortality of infected plants to be killed
- Ms Moderately susceptible: expect 25-75% mortality of infected plants
- Prb Probably highly or moderately susceptible but no records of *Phytophthora* infection
- Ss Slightly susceptible: symptomless but reduced vigour
- S Susceptible but unable to make a rating
- Rh Resistant host: *Phytophthora* persists but host shows no symptoms.

FOREST QUALITY MODERATE TO HIGH (e.g. E3+, E2, M+)

Life form	Status	Pc	Botanical name	Common name
Trees & shrubs	R		<i>Elaeocarpus reticulatus</i>	Blueberry ash
	R		<i>Eucalyptus radiata</i>	Forth River peppermint
	R		<i>Gynatrix pulchella</i>	Hemp bush
	R		<i>Hedycarya angustifolia</i>	Austral mulberry
	R	Hs	<i>Persoonia muelleri</i> subsp. <i>angustifolia</i>	Mueller's geebung
	E		<i>Pimelea axiflora</i> subsp. <i>axiflora</i>	Bushman's bootlace
	R		<i>Pimelea curviflora</i> var. <i>gracilis</i>	Curved rice flower
Ferns	R		<i>Pimelea filiformis</i>	Trailing rice flower
	V		<i>Asplenium hookerianum</i>	Spleenwort
	V		<i>Blechnum cartilagineum</i>	Gristle fern
	E		<i>Cyathea cunninghamii</i>	Slender tree fern
	V		<i>Cyathea Xmarcescens</i>	Skirted tree fern
	V		<i>Hypolepis distans</i>	Scrambling ground fern
	R		<i>Hypolepis muelleri</i>	Harsh ground fern
Herbs	E		<i>Pneumatopteris pennigera</i>	Lime fern
	R		<i>Tmesipteris parva</i>	Small fork fern
	R		<i>Australina pusilla</i> subsp. <i>muelleri</i>	Mueller's small shade-nettle
	R		<i>Austrocynoglossum latifolium</i>	Forest hound's tongue
Orchids	R		<i>Centaurium spicatum</i>	Australian centaury
	R		<i>Senecio velleioides</i>	Forest groundsel
			<i>Caladenia atrochilus</i>	Dark-heart spider orchid
	E		<i>Chiloglottis valida</i>	Large bird orchid
Grasses			<i>Prasophyllum robustum</i>	Robust leek orchid
			<i>Sarcophilus australis</i>	Gunn's tree orchid
	R		<i>Deyeuxia benthamiana</i>	Bentham's bent grass
Other monocots	R		<i>Ehrharta juncea</i>	Forest wire grass
	R		<i>Carex gunniana</i>	Mountain sedge
Non vascular	R		<i>Thismia rodwayi</i>	Fairy lanterns
	E		<i>Budophorum notatum</i>	Lichen
	E		<i>Erioderma solediatum</i>	Lichen
	V		<i>Hypotrachyna laevigata</i>	Lichen
	X		<i>Menegazzia minuta</i>	Lichen
			<i>Roccellinastrum neglectum</i>	Lichen

FOREST QUALITY LOW TO MODERATE (e.g. E4, E3-)

Note that many species listed above for moderate to high quality forests extend to lower quality forests.

Life form	Status	Pc	Botanical name	Common name	
Trees & shrubs	R	Hs	<i>Acacia mucronata</i> subsp. <i>dependens</i>	Variable sallow wattle	
	R	Hs	<i>Acacia ulicifolia</i>	Dagger wattle	
	V	Ms	<i>Epacris exserta</i>	South Esk heath	
	V	Hs	<i>Epacris virgata</i>	Pretty heath	
	R		<i>Grevillea australis</i> var. <i>linearifolia</i>	Narrow-leaf southern grevillea	
	R		<i>Pimelea flava</i> subsp. <i>flava</i>	Yellow rice flower	
	R		<i>Pomaderris intermedia</i>	Tree pomaderris	
	R		<i>Pomaderris phyllicifolia</i> ssp. <i>phyllicifolia</i>	Narrow leaf pomaderris	
	V	Hs	<i>Pultenaea mollis</i>	Guinea flower bush pea	
	V		<i>Spyridium obcordatum</i>	Northern dusty miller	
	R		<i>Spyridium vexilliferum</i>	Winged spyridium	
	E	Hs	<i>Tetratheca gunnii</i>	Shy Susan	
	R		<i>Westringia angustifolia</i>	Scabrous westringia	
Herbs	R		<i>Brachyscome sieberi</i> var. <i>gunnii</i>	Sieber's daisy	
	V		<i>Brunonia australis</i>	Blue pincushion	
	R		<i>Cynoglossum australe</i>	Australian hound's tongue	
	V		<i>Desmodium gunnii</i>	Slender tick trefoil	
	V		<i>Glycine latrobeana</i>	Dwarf, clover or purple glycine	
	V		<i>Glycine microphylla</i>	Small leaved glycine	
	V		<i>Gratiola pubescens</i>	Hairy brooklime	
	R		<i>Scutellaria humilis</i>	Dwarf scullcap	
	R		<i>Stellaria multiflora</i>	Rayless starwort	
	R		<i>Veronica plebeia</i>	Trailing speedwell	
	R		<i>Viola caleyana</i>	Swamp violet	
	Orchids	E		<i>Caladenia lindleyana</i>	Lindley's spider orchid
		E		<i>Caladenia pallida</i>	Rosy spider orchid
E			<i>Caladenia tonellii</i>	Robust fingers	
E			<i>Pterostylis atriola</i>	Snug greenhood	
E			<i>Pterostylis cynnocephala</i>	Swan greenhood	
R			<i>Pterostylis falcata</i>	Sickle greenhood	
R			<i>Pterostylis grandiflora</i>	Superb greenhood	
Grasses	R		<i>Deyeuxia brachyathera</i>	Short bentgrass	
	R		<i>Rytidosperma procerum</i>	Tall wallaby grass	
	Other monocots	R		<i>Aphelia gracilis</i>	Slender aphelia
R			<i>Arthropodium strictum</i>	Chocolate lily	
R			<i>Uncinia elegans</i>	Handsome hook sedge	
Non-vascular	R		<i>Parmotrema crinitum</i>	Lichen	

FOREST QUALITY VERY LOW OR NON-FOREST (e.g. E5, S, Vz)

Note that many species listed above for low quality forests extend to very low quality forest or non-forest vegetation. Some species listed below have also been recorded within or adjacent to FPP areas.

Life form	Status	Pc	Botanical name	Common name
Trees & shrubs	R	Ms	<i>Acacia siculiformis</i>	Dagger wattle
	X	Hs	<i>Banksia integrifolia</i>	Coast banksia
	R	Hs	<i>Banksia serrata</i>	Saw banksia
	V	Prb	<i>Boronia gunnii</i>	Gunn's boronia
	V		<i>Callitris oblonga</i> subsp. <i>oblonga</i>	South Esk pine
	E		<i>Cryptandra amara</i>	Bitter cryptandra
	E		<i>Discaria pubescens</i>	Hairy anchorplant
	R	Hs	<i>Epacris curtisiae</i>	Curtis' heath
	R		<i>Frankenia pauciflora</i> var. <i>gunnii</i>	Sea heath
	R		<i>Gyrostemon thesioides</i>	Broom wheel fruit
	R	Hs	<i>Hibbertia virgata</i>	Twiggy guinea-flower
	R		<i>Hovea montana</i>	Mountain hovea
	R		<i>Hovea tasmanica</i>	Hill hovea
	R		<i>Lasiopetalum baueri</i>	Slender velvet bush
	R		<i>Lasiopetalum discolor</i>	Coast velvet bush
	R	Hs	<i>Leucopogon lanceolatus</i>	Lance beard heath

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Life form	Status	Pc	Botanical name	Common name
Trees & shrubs	R		<i>Muehlenbeckia axillaris</i>	Matted lignum
	R		<i>Pomaderris oraria</i>	Coastal dogwood
	V	Rh	<i>Prostanthera rotundifolia</i>	Round leaved mint bush
	V	Hs	<i>Pultenaea prostrata</i>	Bush pea
	R		<i>Spyridium parvifolium</i> var. <i>parvifolium</i>	Dusty miller
	R	Ms	<i>Tetradlea ciliata</i>	Black-eyed Susan
	R		<i>Wilsonia rotundifolia</i>	Round leaved wilsonia
Ferns	R		<i>Anogramma leptophylla</i>	Annual fern
	V		<i>Doodia caudata</i>	Small rasp fern
	R		<i>Lycopodiella serpentina</i>	Bog clubmoss
	R		<i>Pellaea caliduripium</i>	Hot-rock fern
	R		<i>Phylloglossum drummondii</i>	Pygmy clubmoss
Herbs	E		<i>Alternanthera denticulata</i>	Lesser joyweed
	R		<i>Asperula minima</i>	Grassy woodruff
	R		<i>Asperula subsimplex</i>	Water woodruff
	E		<i>Barbarea australis</i>	Native wintercress
	R		<i>Callitriche sonderi</i>	Starwort
	R		<i>Calystegia sepium</i>	Great bindweed
	R		<i>Centipeda cunninghamii</i>	Sneezeweed
	R	Prb	<i>Comesperma defoliatum</i>	Leafless milkwort
	R		<i>Cotula vulgaris</i> var. <i>australasica</i>	Slender cotula
	E		<i>Craspedia preminghana</i>	Preminghana billybutton
	R		<i>Crassula moschata</i>	Musky crassula
	R		<i>Cullen microcephalum</i>	Dusky scurf pea
	R		<i>Epilobium pallidiflorum</i>	Showy willow herb
	R		<i>Euphrasia collina</i> subsp. <i>tetragona</i>	North coast eyebright
	E		<i>Euphrasia scabra</i>	Yellow eyebright
	R		<i>Goodenia geniculata</i>	Bent goodenia
	V		<i>Haloragis aspera</i>	Rough raspwort
	R		<i>Haloragis myriocarpa</i>	Prickly raspwort
	E		<i>Hyalosperma demissum</i>	Moss sunray
	X		<i>Levenhookia dubia</i>	Hairy stylewort
	R		<i>Lepidium flexicaule</i>	Springy peppergrass
	R		<i>Lepidium pseudotasmanicum</i>	Peppergrass
	E		<i>Leucochrysum albicans</i> subsp. <i>albicans</i>	Grassland paper daisy
	R		<i>Limonium australe</i>	Yellow sea lavender
	R		<i>Lotus australis</i>	Austral trefoil
	E		<i>Lycopus australis</i>	Native gypsywort
	V		<i>Lythrum salicaria</i>	Purple loosestrife
	E		<i>Mentha australis</i>	River mint
	R		<i>Millotia muelleri</i>	Common bow flower
	R		<i>Myriophyllum muelleri</i>	Water milfoil
	R		<i>Parietaria debilis</i>	Pellitory
	V		<i>Persicaria decipiens</i>	Slender knotweed
	E		<i>Persicaria subsessilis</i>	Bristly knotweed
	V		<i>Phyllangium divergens</i>	Wiry mitrewort
	X		<i>Podotheca angustifolia</i>	Sticky long heads
	R		<i>Ranunculus acaulis</i>	Dune buttercup
	R		<i>Ranunculus sessiliflorus</i>	Small flowered buttercup
	R		<i>Rhodanthe anthemoides</i>	Chamomile sunray
	R		<i>Rumex bidens</i>	Mud dock
	R		<i>Scaevola albida</i>	Small fruited fan flower
	R		<i>Senecio squarrosus</i>	Rigid grassland groundsel
	E		<i>Solanum opacum</i>	Green berry nightshade
R		<i>Stackhousia viminea</i>	Slender candlesticks	
R	Prb	<i>Stylidium despectum</i>	Small trigger plant	
R	Prb	<i>Stylidium inundatum</i>	Swamp trigger plant	
R	Prb	<i>Stylidium perpusillum</i>	Small trigger plant	
R		<i>Utricularia tenella</i>	Bladderwort	
V		<i>Velleia paradoxa</i>	Spur vellea	
R		<i>Viola cunninghamii</i>	Cunningham's violet	
R		<i>Xerochrysum bicolor</i>	White alpine everlasting	

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Life form	Status	Pc	Botanical name	Common name
Orchids	E		<i>Caladenia campbellii</i>	Thick stem caladenia
	R		<i>Caladenia caudata</i>	Tailed spider orchid
	V		<i>Caladenia dienema</i>	Wind swept spider orchid
	R		<i>Caladenia congesta</i>	Black tongue caladenia
	R		<i>Caladenia filamentosa</i>	Daddy long legs
	V		<i>Caladenia patersonii</i>	Paterson's spider orchid
	R		<i>Caladenia pusillus</i>	Tiny caladenia
	E		<i>Chiloglottis trapeziformis</i>	Broad lip bird orchid
	E		<i>Corunastylis brachystachya</i>	Short spiked midge orchid
	R		<i>Corunastylis nuda</i>	Tiny midge orchid
	R		<i>Cyrtostylis robusta</i>	Large gnat orchid
	E		<i>Diuris lanceolata</i>	Large golden moths
	E		<i>Diuris palustris</i>	Swamp diuris
	R		<i>Hydrorchis orbicularis</i>	Swamp onion orchid
	R		<i>Microtidium atratum</i>	Yellow onion orchid
	R		<i>Orthoceras strictum</i>	Horned orchid
	E		<i>Prasophyllum favonium</i>	Western leek orchid
	E		<i>Prasophyllum pulchellum</i>	Pretty leek orchid
	V		<i>Prasophyllum secutum</i>	Northern leek orchid
	R		<i>Prasophyllum tadgellianum</i>	Tadgell's leek orchid
	E		<i>Pterostylis cucullata</i>	Leafy greenhood
	E		<i>Pterostylis rubenachii</i>	Arthur River greenhood
	R		<i>Pterostylis sanguinea</i>	Banded greenhood
	E		<i>Thelymitra aggericola</i>	Bleak sun orchid
	E		<i>Thelymitra antennifera</i>	Rabbit ears
	E		<i>Thelymitra bracteata</i>	Leafy sun orchid
	R		<i>Thelymitra holmesii</i>	Holmes' sun orchid
	E		<i>Thelymitra improcera</i>	Coastal sun orchid
	E		<i>Thelymitra jonesii</i>	Azure sun orchid
	E		<i>Thelymitra malvina</i>	Mauve tufted sun orchid
	E		<i>Thelymitra malvina</i>	Mauve tufted sun orchid
	E		<i>Thelymitra polychroma</i>	Rainbow sun orchid
	E		<i>Thelymitra spadicea</i>	Browntop sun orchid
Grasses	R		<i>Agrostis diemenica</i>	Flat-leaf southern bent grass
	R		<i>Amphibromus neesii</i>	Swamp wallaby grass
	R		<i>Austrostipa bigeniculata</i>	Double-jointed speargrass
	R		<i>Deyeuxia densa</i>	Heath bent grass
	R		<i>Lachnagrostis aequata</i>	Southern bent grass
	R		<i>Lachnagrostis punicea</i> subsp. <i>punicea</i>	Bristle blown grass
	R		<i>Lachnagrostis robusta</i>	Tall blown grass
	R		<i>Poa halmaturina</i>	Kangaroo Island grass
	R		<i>Poa mollis</i>	Soft poa grass
	R		<i>Poa poiformis</i> var. <i>ramifer</i>	Island purple grass
	R		<i>Sporobolus virginicus</i>	Salt couch grass
	Other monocots	R		<i>Aphelia pumilio</i>
R			<i>Baumea gunnii</i>	Slender twig rush
R			<i>Bolboschoenus caldwellii</i>	Sea club rush
R			<i>Bolboschoenus medianus</i>	Marsh club rush
R			<i>Caesia calliantha</i>	Blue grasslily
R			<i>Carex capillacea</i>	Yellow leaf sedge
R			<i>Carex longibrachiata</i>	Drooping sedge
V			<i>Chorizandra enodis</i>	Black bristle rush
R			<i>Damasonium minus</i>	Star fruit
		Prb	<i>Dianella amoena</i>	Matted flax lily
R		Prb	<i>Dianella longifolia</i> var. <i>longifolia</i>	Pale or smooth flax lily
R			<i>Hypoxis vaginata</i>	Purple star
R			<i>Isolepis habra</i>	Habra club rush
R			<i>Isolepis stellata</i>	Star club rush
R			<i>Juncus amabilis</i>	Gentle juncus
R			<i>Juncus prismatocarpus</i>	Branching rush
R			<i>Juncus vaginatus</i>	Clustered rush
R			<i>Lepidosperma forsythii</i>	Stout rapier sedge
R			<i>Lepidosperma viscidum</i>	Sticky sword sedge

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Life form	Status	Pc	Botanical name	Common name
Other monocots	R		<i>Potamogeton pectinatus</i>	Fennel pondweed
	R		<i>Schoenoplectus validus</i>	River or lake club rush
	V		<i>Tricoryne elatior</i>	Yellow rush lily, autumn lily
	R		<i>Triglochin minutissimum</i>	Tiny arrow grass
	R		<i>Wurmbea latifolia</i>	Early nancy
	V	Hs	<i>Xanthorrhoea arenaria</i>	Sand grasstree
		Hs	<i>Xanthorrhoea australis</i>	Austral grasstree
	V	Hs	<i>Xanthorrhoea bracteata</i>	Shiny grasstree
Non-vascular	R		<i>Cetraria islandica</i> subsp. <i>antarctica</i>	Lichen
	R		<i>Parmelina whinrayi</i>	Lichen
	V		<i>Pseudocephalozia paludicola</i>	Liverwort

Section 4 SITES OF POTENTIAL SIGNIFICANCE FOR FLORA

Information in this section is oriented towards sites rather than communities or species. It concentrates on environments within the region that have the potential to be directly or indirectly affected by forestry operations. This provides another approach to conservation of flora, which could be particularly useful for gaining an overview of potential botanical issues or values in an area. It could also be useful when there are problems with identifying species or communities in an area of proposed operations. However, it should not be used as a substitute for determining communities (Section 2) and priority species (Section 3) in an FPP area.

Species and communities of high conservation significance are often associated with particular environments. Sites can be identified by features of the physical environment (e.g. geology, altitude, landform) or the vegetation (e.g. dominant eucalypts, P.I. type). Local knowledge, coupled with use of aerial photographs and topographic, geology and P.I. maps, will help identify sites of potential significance. Many of these sites are of low or marginal timber value, and are not suitable for forestry activities or agricultural development. Such sites include dry ridgelines and river gorges. Other sites may be of greater commercial interest, for example forests on basalt and patches of relict rainforest. Many of the sites of potential significance in Woolnorth Region contain species that are susceptible to *Phytophthora cinnamomi*.

Table 4A and 4B indicate forest and woodland sites that have the greatest potential to contain significant flora values.

Table 4A: Sites that are often associated with priority communities or species.

Contact FPA in all cases if proposed operations could affect these sites. The botanical significance of the site can then be evaluated from available information, or a vegetation survey may be needed. Areas of remnant forest that are proposed for conversion are included in this table, though they may not always contain priority communities or species.

Table 4B: Sites that are occasionally associated with priority communities or species.

Assess these environments carefully. Contact FPA if priority species or communities are found in areas that could be affected by proposed operations.

Notes:

1. Sites supporting native non-forest vegetation types (e.g. heath, wetland, native grassland) have not been included in the table, though they may co-occur with forests and woodlands on many of the sites listed. Such vegetation often contains rare species, particularly in areas of the region where little non-forest vegetation remains. Contact FPA if areas of native non-forest vegetation could be affected by the proposed operation.
2. Management of remnant forests and woodlands, which often have important flora values, is treated in Section 6.

Section 4 SITES OF POTENTIAL SIGNIFICANCE FOR FLORA

The sites listed in this section are associated with species or communities with a priority for conservation in Woolnorth Region. Information in the tables is not a substitute for information given in Section 2 and Section 3 of this module. Botanical advice should be sought for all sites with native non-forest vegetation.

Table 4A: Sites often associated with priority communities or species. Contact FPA in all cases if these sites could be affected by operations.

Site of potential significance	Main dominants	Main understorey	Main PI type	Reason for significance	Example locations
Native vegetation on King Island	<i>E. globulus</i> , <i>E. viminalis</i> , <i>E. brookeriana</i> , paperbark, tea-tree	Paperbark, tea-tree, wet sclerophyll, scrub or heath	E3, E4, S	Priority communities and species (e.g. <i>Hedycarya angustifolia</i> , <i>Elaeocarpus reticulatus</i>)	Kentford NR, Pegarah, Ettrick Ck
Native vegetation on other western Bass Strait islands	<i>E. nitida</i> , <i>E. viminalis</i> , <i>E. ovata</i> , paperbark	Paperbark, tea-tree, scrub or heath	E4, E5, S	Priority communities and species (e.g. <i>Pterostylis cucullata</i>)	Hunter Island
Forests and woodlands on Tertiary ironstone, gravels or Recent sand or alluvium in non-coastal areas	<i>E. amygdalina</i> , <i>E. viminalis</i> , <i>E. ovata</i> , <i>E. pauciflora</i>	Heathy, sedgy, or grassy	E4	Priority communities and species (e.g. <i>Brunonia australis</i> , <i>Uncinia elegans</i>)	Westwood, Selbourne
Serpentinite landforms	<i>E. amygdalina</i> , <i>E. ovata</i> , <i>E. viminalis</i>	Heathy or shrubby	E4, E5	Priority species (e.g. <i>Tetratheca gunnii</i> , <i>Epacris virgata</i> , <i>Spyridium obcordatum</i>)	Dans Hill, Scotts Hill, Mt Vulcan
River flats, frost hollows and marshes (not buttongrass)	<i>E. ovata</i> , <i>E. pauciflora</i> , <i>E. viminalis</i>	Variable - often scrubby, sedgy or grassy	Variable	Priority communities and species (e.g. <i>Barbarea australis</i> , <i>Pomaderris phyllicifolia</i>)	Brushy Lagoon area, Forth River flats
Vegetation with grasstrees (<i>Xanthorrhoea</i> species)	<i>E. amygdalina</i> , <i>E. viminalis</i>	Variable – often heathy	E4, E5, S	Priority species and high susceptibility to <i>Phytophthora</i>	Asbestos Range area
Rocky outcrops including plates, large boulders, cliffs and scree fields	Variable	Grassy, shrubby or bare	E4 or E5; S or Wr	Localised vascular and non-vascular species; susceptibility to disturbance	Alum Cliffs, Gog Range, Dazzler Range
Rocky gorges and creeklines particularly with N or W orientation or aspect	Variable, often <i>E. amygdalina</i> , <i>E. viminalis</i> , she-oak	Variable, often scrubby or shrubby	Variable	Priority communities and species (e.g. <i>Callitris oblonga</i> , <i>Epacris exserta</i> , <i>Prostanthera rotundifolia</i>)	Cataract Gorge

Table 4B: Sites occasionally associated with priority communities or species. Assess these environments carefully. Contact FPA if priority communities or species could be affected by operations.

Site of potential significance	Main dominants	Main understorey	Main PI type	Reason for significance	Example locations
Very humid watercourses and slopes generally with a S or E aspect, in fire shadow locations	Sassafras, myrtle, (<i>E. regnans</i> , <i>E. obliqua</i> , <i>E. delegatensis</i> , <i>E. viminalis</i>)	Rainforest, wet sclerophyll	M, S or T; >E3 often present	Relict rainforest and other priority communities. Priority species, mainly ferns (e.g. <i>Cyathea cunninghamii</i> , <i>Blechnum cartilagineum</i>)	Notley Gorge, Holwell Gorge (remnant rainforest); Leven River, Hellyer Gorge, Jessie Gorge, Dip River, Pruana, Ferndene SR
Eucalypt-dominated swamp forests (mainly west of Forth River)	<i>E. brookeriana</i> , myrtle, blackwood, tea-tree, paperbark	Rainforest, tea-tree, paper-bark	E3, T(B), S	Priority communities	Dismal Swamp, Welcome Swamp, Montagu River
Creeklines and sinkholes on limestone	<i>E. obliqua</i> , <i>E. viminalis</i> , <i>E. amygdalina</i>	Varies	E2, E3	Priority communities (sphagnum peatlands) and species (e.g. <i>Cystopteris tasmanica</i> , <i>Pneumatopteris pennigera</i>)	Copper Creek, Mole Creek
Dry sclerophyll and damp sclerophyll forest at the base of the Great Western Tiers	<i>E. obliqua</i> , <i>E. amygdalina</i> , <i>E. viminalis</i> , <i>E. ovata</i>	Shrubby or sedgy	E3	Priority communities in transition zones between lowlands and uplands	Western Creek
Reedy Marsh dolerite landforms - dolerite landforms in Birralea - Reedy Marsh - Virginstow - Parkham area	<i>E. amygdalina</i> , <i>E. obliqua</i> , <i>E. ovata</i> , <i>E. viminalis</i> , plantation species	Shrubby or scrubby	E3, E4, Ph, Ps	Priority communities and species (e.g. <i>Pimelea filiformis</i> , <i>Pimelea curviflora</i>)	Brushy Lagoon area, Stephens Hill, Reedy Marsh FR. Note that some threatened species have been recorded from plantations.
Siliceous sites in Rocky Cape - Shakespeare Hills area	<i>E. nitida</i> , <i>Banksia serrata</i>	Variable, often scrubby	E4, E5, S	Priority communities and species (e.g. <i>Banksia serrata</i>)	Rocky Cape, Sisters Beach
Grassy forests, woodlands and other ecosystems	<i>E. rodwayi</i> , <i>E. delegatensis</i>	Grassy	E4, E5, Vz	Priority communities and species (e.g. <i>Leucochrysum albicans</i>)	Surrey Hills, Lemonthyme area
Dry ridges, knolls, and upper slopes often with high rock cover (particularly dolerite and sandstone)	<i>E. amygdalina</i> , <i>E. nitida</i> , <i>E. radiata</i>	Heathy or scrubby	E4, E5, S	Priority communities and species (e.g. <i>Eucalyptus radiata</i>)	Dolcoath Hill, Dazzler Range, Shakespeare Hills

Section 5 EVALUATION OF OTHER FLORA ISSUES

Section 5 covers issues that need to be considered by FPOs to ensure that operations comply with the *Forest Practices Code* and other current legislation and policies. Issues discussed in this section will not be relevant to all FPP areas.

Some topics have already been covered to some extent in previous sections of the module (for example, Section 2 identifies forest communities that may need prescriptions related to *Phytophthora cinnamomi*). However, they are also treated in Section 5, because they are dealt with separately in the FPP *Flora Evaluation Sheet*. Reference to Flora Technical Notes may be needed.

Additional topics may be introduced to this section (and the *Flora Evaluation Sheet*) as information becomes available from research, and if there are changes to legislation, policies and codes of practice.

WEED AND DISEASE MANAGEMENT

Flora values in many forest and scrub communities can be adversely affected by the introduction of disease and exotic plants. Section D3.1 of the *Forest Practices Code* gives guidelines to reduce the risk of weeds and disease being introduced through forestry operations. Quarrying, roading and road use are generally of more concern than logging and regeneration activities.

Diseases and weeds that can seriously threaten flora (and fauna) values are discussed below. Many other weeds and disease can affect wood production and plant species and communities – some of these are detailed in information available from Forestry Tasmania.

Phytophthora cinnamomi

Phytophthora cinnamomi (often called root rot fungus) is a disease that attacks the roots of many native species. Some plants die rapidly (e.g. banksias, grassstrees), while others (e.g. several eucalypt species) only show signs of disease in periods of drought or other stress. Many threatened species are highly susceptible. Open vegetation in relatively moist, lowland environments, such as dry sclerophyll forest, scrub, heath and moorland, are most at risk from *Phytophthora*. The resultant reduction in plant diversity and resources (e.g. nectar, pollen and shelter) has flow-on effects to fauna. Information on *Phytophthora* is given in *Flora Technical Note 8*.

Phytophthora is widespread in lowland areas of Woolnorth Region, including King Island. Cool soil temperatures in wet forests and at higher altitudes tend to inhibit the disease, but opening up the canopy (e.g. by tracks) can cause local infestations.

Phytophthora has been introduced to many areas by soil carried on vehicles and machinery, but other sources include the boots of wandering people and the feet of wandering animals. Once established, it is impossible to eradicate, and can spread rapidly in surface run-off and groundwater percolation. The risk of spreading *Phytophthora* can be reduced by machinery hygiene, use of *Phytophthora*-free material in road construction, and attention to infrastructure planning (e.g. roads located on ridgelines will place a larger area of susceptible vegetation at risk than roads located on lower slopes).

Over sixty *Phytophthora* Management Areas, containing species or communities that are particularly susceptible to the pathogen, have been delineated – mainly on public land in lowland areas of the State. Several of these are located in Woolnorth Region (many in existing reserves).

Location of *Phytophthora* Management Areas and records of *Phytophthora* are given in databases that FPOs need to use to complete the FPP *Flora Evaluation Sheet* (Module 1 details how to access these databases). Forest communities that are highly susceptible to *Phytophthora* are indicated in *Flora Technical Note 8*. They are also indicated (#) in the community tables in Section 2 of this module.

FPOs need to refer to *Flora Technical Note 8* if:

- *Phytophthora* has been recorded from the proposed operational area;
- the operation will affect a highly susceptible forest community; or
- the operation is located within a *Phytophthora* Management Area.

Specialist advice should be sought if prescriptions in *Flora Technical Note 8* cannot be applied. Non-forest vegetation that could be affected by *Phytophthora* should routinely be referred to FPA.

Myrtle wilt

Myrtle wilt is a disease of myrtle (*Nothofagus cunninghamii*) caused by the fungus *Chalara australis*. It kills infected trees, and can spread to other trees by root contact. Myrtle wilt occurs naturally in undisturbed forest. Operations with the potential to adversely affect rainforest in formal reserves or Special Management Zones (Flora) should be routinely referred to FPA. Buffering and other prescriptions designed to minimise disturbance from operations, including regeneration or plantation establishment treatments, may be needed.

Threatening weed species

Weed species can colonise disturbed sites associated with forestry operations, particularly when operations are close to agricultural land. Some weed species (e.g. thistles) decrease in abundance as understoreys re-establish in the regenerating forest. Other weed species are more persistent in forest – they include species with seeds that remain viable for a long time (e.g. gorse and broom), and species that are capable of vegetative regeneration (e.g. blackberry). Open sites, such as road verges, tracks, landings, quarries and bridge approaches, provide good environments for weeds to establish and persist. Weeds can also take advantage of disturbance (including burns associated with forest management) to establish in areas of non-forest vegetation (e.g. moorlands and native grasslands). Any infestation provides a launching pad, which allows the weed species to colonise other sites in the general area – through seeds dispersed by wind, birds, water movement, livestock or other land use (including road construction and use, and forestry operations).

There are legislative requirements under the Tasmanian *Weed Management Act* for land managers to control declared weed species. The required course of action will depend on the circumstances, including characteristics of the species, and extent of infestation at the site and in the municipality. The DPIWE website (www.dpiwe.tas.gov.au) gives details of the Act and Statutory Weed Management Plans for declared weed species. Declared weed species of most concern in forest environments include gorse, English broom, Spanish heath, ragwort, blackberry and pampas grass. A greater range of declared weed species may be present on plantation sites, or areas of previously cleared land proposed for plantation establishment. Control through hygiene and active management is particularly important where threatening exotics have the potential to spread into reserves or other areas of native forest where they are rare or absent.

REMNANT FOREST AND WOODLAND

The *Forest Practices Code* supports the maintenance of remnant forest in those parts of the state where native vegetation has been extensively cleared. The RFA also requires that the values of remnant vegetation are considered at a regional level as a part of forest practices planning.

For the purpose of assessing FPP flora values, remnant forests and woodlands comprise stands that are:

- greater than 1 ha in area, and
- separated by more than 2 km from the closest area of native forest or woodland that exceeds 20 ha in area.

In some cases, remnant forests in Woolnorth Region contain communities (e.g. *E. ovata* forest) and species that have a high priority for conservation. Other remnants contain communities that are more widespread and better reserved. Remnant vegetation will differ greatly in its condition – from sites with an understorey dominated by native species, to sites with understoreys having a high proportion of exotic shrubs or pasture grasses. In parts of the region with a long history of modification from agriculture and plantation forestry, remnant vegetation may be scattered and degraded by a combination of land use, edge effects and attrition of species over the years. However, even substantially disturbed remnants, can play an important role in maintaining flora and fauna at a local to subregional scale.

In all cases, remnants in FPP areas need to be carefully evaluated. Those containing communities (Section 2), species (Section 3) or sites of potential significance (Section 4) need to be referred to FPA for specialist advice. In addition, FPA needs to be contacted for any proposed operation (typically clearance for plantation or agriculture) involving conversion of remnant vegetation. Advice concerning the operation will take account of the composition, extent, condition and context of the remnant.

MANAGEMENT OF FORESTRY OPERATIONS IN VICINITY OF RESERVES

This section deals with forestry operations (logging, roading, quarrying, plantation establishment, regeneration treatments) that are within or adjacent to formal reserves. Formal reserves are gazetted reserves on public land (e.g. National Parks, State Reserves, Forest Reserves) and reserves on private land that have been registered on property titles (e.g. reserves established through the Private Forest Reserves Program). This section also deals with operations that could affect areas categorised by Forestry Tasmania as Special Management Zones (Flora). Comments may also be relevant for other areas being managed for conservation on public and private land.

Botanical values in reserves adjacent to proposed operational areas will often be identified in the assessments of plant communities (Section 2); priority species (Section 3) and sites of potential significance (Section 4).

Some reserves incorporate buffers or have management systems that are designed to prevent, absorb or reduce disturbance associated with adjacent or nearby land use. However, good forest practices planning needs to take account of potentially adverse effects on botanical values (and other values) in all reserves. Such effects could include:

- introduction or increased incidence of weeds (including wildlings of pines or non-indigenous eucalypts sown or planted in the FPP area);
- introduction or increased incidence of disease (*Phytophthora* and myrtle wilt are of most concern – see above);
- change in microclimate in reserve [this is of most concern when vegetation along the reserve boundary contains localised wet forest vegetation (e.g. rainforest) which is susceptible to warmer and drier conditions];
- increased risk of fire entering the reserve (particularly when vegetation in the reserve is upslope of the forestry operation, and contains fire-sensitive plant communities or species).

The effect of forestry operations will depend on:

- attributes of the FPP area;
- attributes of the adjacent reserve and its vegetation (plant species and communities);
- the type of operation;
- regeneration treatment or post-operational land use.

FPOs need to consider carefully all these factors. Advice should be sought from FPA if the vegetation in the reserve has the potential to be adversely affected by an adjacent forestry operation and subsequent land use. FPA must be notified in all cases where a proposed operation is within a formal reserve or Special Management Zone (Flora).

Section 6 ASSESSING THE FLORA VALUES OF AN AREA

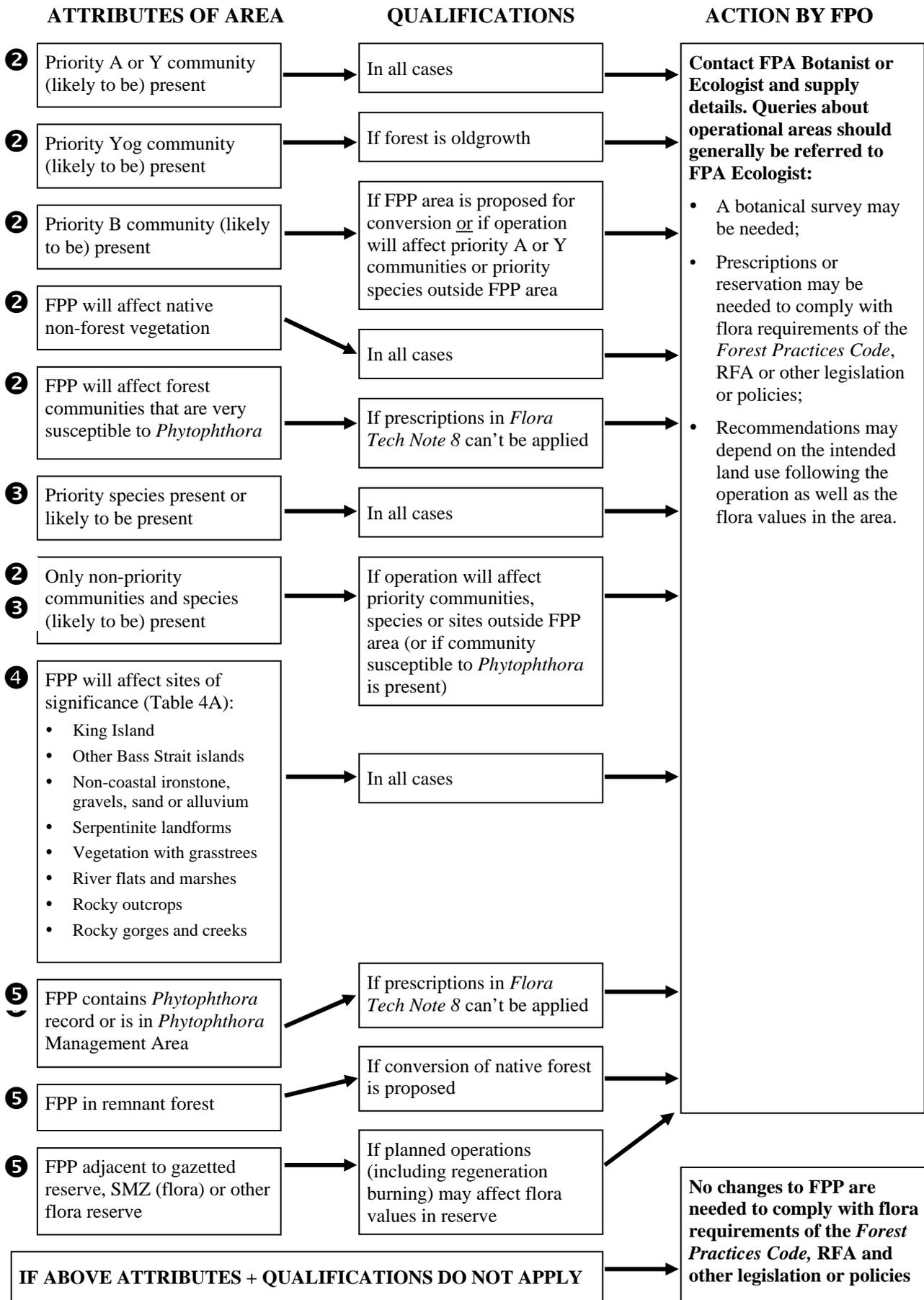
The main aim of the *Forest Botany Manual* is to allow Forest Practices Officers, and others involved with preparing Forest Practices Plans, to comply with the requirements of the *Forest Practices Code* and other policies and legislation. A similar assessment process can also be used for other areas where botanical values need to be considered.

This section uses a flow diagram to summarise the actions FPOs should take after they have assessed the vegetation of an area. It is based on information contained in sections of the module dealing with forest communities (Section 2), priority species (Section 3), sites of potential significance for flora (Section 4) and other flora issues (Section 5). Relevant sections of the manual are indicated on the left side of the flow diagram. The FPP *Flora Evaluation Sheet* has a similar format to the diagram. An example of a completed *Flora Evaluation Sheet* is given in Module 1.

Note the following points:

1. The term 'FPP area' is used to describe the area under assessment – this may extend outside the proposed harvest area (e.g. cable tailhold areas).
2. The flora evaluation needs to determine if the operation will affect flora values in adjacent areas. Conversion of native vegetation has greater potential to affect nearby vegetation than native forest operations. The FPA needs to be contacted for any FPP where conversion of native vegetation is proposed next to gazetted reserves (public or private) or Special Management Zones or other informal reserves established to protect flora values.
3. If the assessment indicates that FPA should be contacted:
 - Advice on botanical issues can be sought from the FPA Botany or Ecology programs. A discussion by phone or email may allow the botanical issues to be resolved, or clarified prior to more formal notification.
 - The normal notification process will need to be followed in most situations. Forward the FPP *Flora Evaluation Sheet* to the FPA Ecologist. Additional information that will be useful includes maps showing distribution of priority communities or priority species in the FPP area. Other information that may be needed includes past and proposed land use, site characteristics (e.g. geology) and other natural or cultural values in the area. Some of this information is required for the FPP cover sheet.
 - FPOs need to consider, and discuss with FPA if necessary, if values protected by reservation or prescription would be adversely affected by logging, regeneration practices or other activities related to the forestry operation (e.g. if regeneration burning in a coupe could affect a threatened species in an exclusion zone.)
4. **It is essential that relevant forest planners and workers are aware of agreed recommendations (e.g. exclusion of areas from coupes or roadline; procedures for control of weeds and diseases; fire management prescriptions).**

Section 6 ASSESSING THE FLORA VALUES OF AN AREA



Forest Botany Manual: Module 2 – Woolnorth Region

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