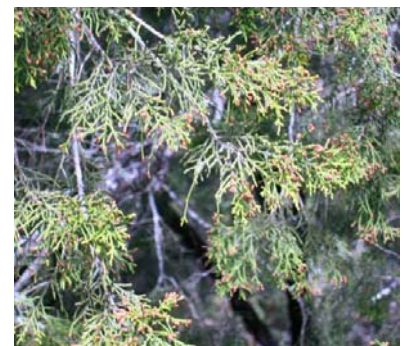
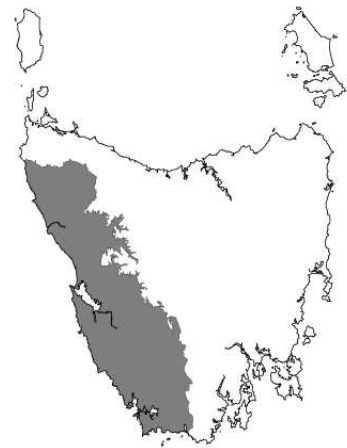




FOREST BOTANY MANUAL

MODULE 8

WEST AND SOUTHWEST REGION



2005

FPA
FOREST PRACTICES AUTHORITY

**FOREST BOTANY MANUAL:
MODULE 8 – WEST AND SOUTHWEST REGION**

2005

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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 West and Southwest 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 West and Southwest 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.

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Section 1 OVERVIEW OF WEST AND SOUTHWEST REGION

The location of the West and Southwest Region is well-defined by its name. It is the largest bioregion in Tasmania, and in some ways it is the most iconic. The region includes some of the state's most spectacular landscape features, including Federation Peak, Mt Anne, Port Davey and the valleys of the Franklin and Gordon Rivers. The conservation issues associated with West and Southwest Region, and the various values of the reserves that form about 70% of its land area, have further focussed attention on the region. The fascinating history of land use, including the activities of those who logged Huon pine, King Billy pine and other endemic conifers of the West, adds to its aura.

The diversity of native vegetation within the region is related to variation in altitude, rock types, landforms and fire history. These relationships have been thoroughly researched, and have provided a basis for conservation management and silvicultural practices in production forests.

Rainforest in the region is extensive and diverse, varying from majestic stands fringing the major river valleys, to stunted tangles in alpine and subalpine environments. It only occupies about a quarter of its potential range, with fire patterns entrenching other vegetation types that form the fire-related successional series that commences with moorland and proceeds through scrub, wet sclerophyll forest and mixed forest. The latter vegetation types are the most important for wood production in the region, with the two main production nodes being located in the north of the region (e.g. South Arthur area) and the east, centred on the Florentine Valley and Clear Hill area. Blackwood forests occur locally in poorly drained lowland sites. Dry sclerophyll forests are largely confined to coastal areas.

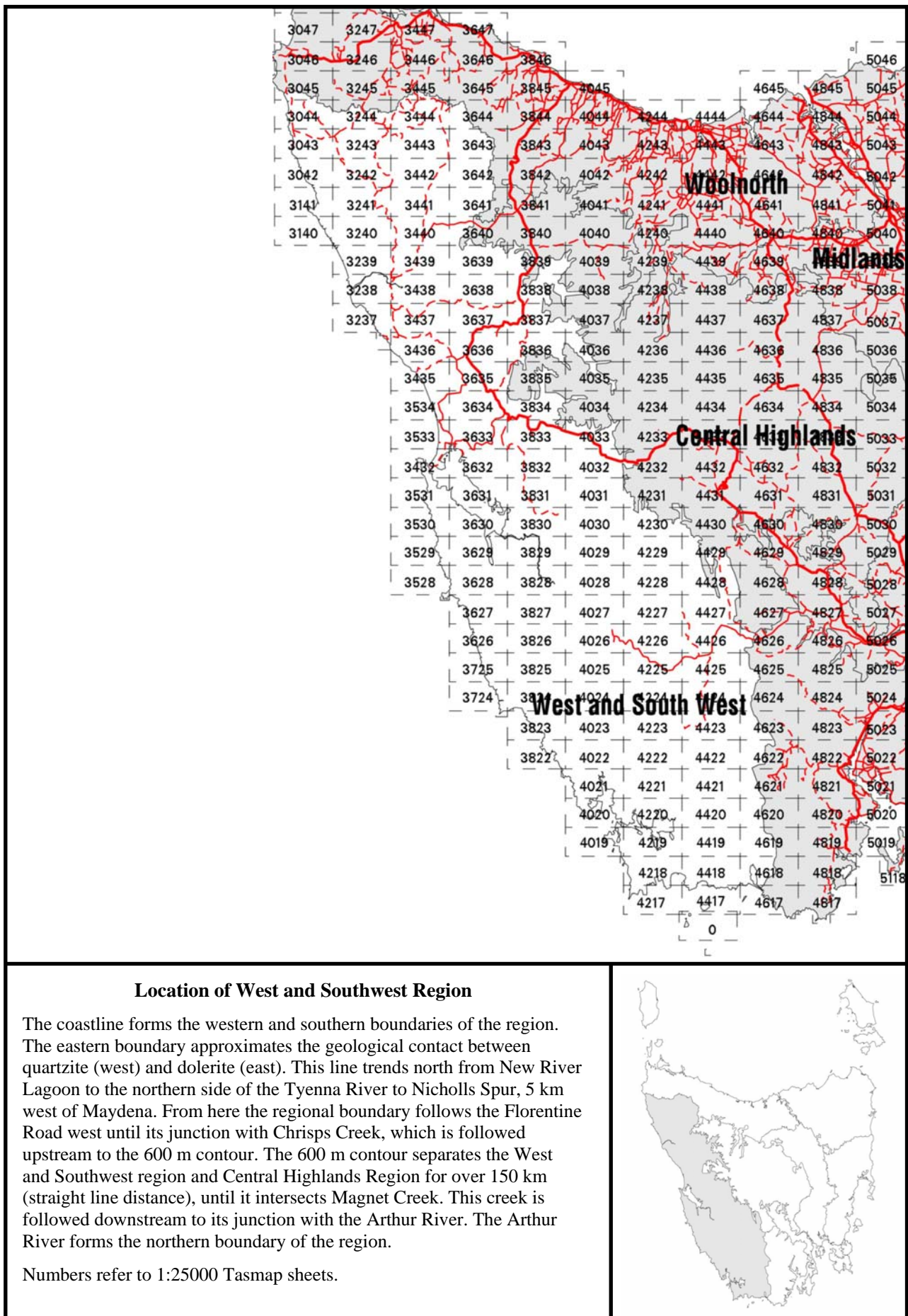
The West and Southwest Region contains between 500 and 600 species of native vascular, about one third the number known to occur in the State. About 130 of these species are endemic, about one third the number of endemic species occurring in Tasmania. A high proportion of endemic species is associated with infertile substrates such as quartzite and serpentinite. Detailed research has been undertaken on the ecology of some species, including Huon pine. Trees in a clonal stand of this species near Lake Johnston have been aged at 2600 years and are amongst the world's oldest living plants.

The non vascular flora of the region (i.e. mosses, liverworts, lichens and fungi) is very diverse because of the variability of vegetation coupled with a very wet climate. Non vascular diversity is highest in rainforest: 55 species of bryophytes (mosses and liverworts) and 79 species of lichens were recorded growing on a single Huon pine tree in the Teepookana area.

Clearance for agriculture and settlement has had a relatively small effect on native vegetation of the region. Localised disturbance is associated with hydro-electric projects, tourism developments, mining and logging. Regeneration of native vegetation has occurred following the cessation of some of these activities. Wood production is concentrated in wet eucalypt forests in the north of the region (e.g. South Arthur area) and the east (centred on the Florentine Valley and Clear Hill area), and a small softwood plantation node near Strahan.

A substantial proportion of the West and Southwest Region is formally reserved. Larger reserves include the Southwest National Park, Wild Rivers NP and parts of Cradle Mountain – Lake St Clair NP (all forming part of the Western Tasmania World Heritage Area), Savage River NP, Sumac Forest Reserve, Arthur – Pieman Conservation Area and Mt Dundas Regional Reserve. Recent additions to the public reserve system have improved the conservation status of many species and communities in the region. Some well reserved species and rainforest and alpine communities remain threatened because of their susceptibility to wildfire. Some threatened species and communities with a high priority for conservation are associated with commercial forests, and require additional protection through prescription or reservation on public land (e.g. through Special Management Zoning on State Forest).

An overview of the vegetation of West and Southwest Region and its relationship with the environment is given in Kirkpatrick (1977), Richley (1978) and Pemberton (1989). Several other references describe the vegetation of sites within the region. Some useful references on plant species and vegetation types are given in *Flora Technical Note 2*.



Section 2 FOREST COMMUNITIES

This section provides keys to the native vegetation types and native forest communities occurring within the West and Southwest Region. Tables indicate the potential conservation priority of forest communities. The explanatory notes should be read before the keys and tables are used. The FPP *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 the West and Southwest Region has a high priority for conservation, contains threatened species or is susceptible to disturbance or disease. There are guidelines in the *Forest Practices Code* to avoid disturbance to localised environments that contain these vegetation types. Seek botanical advice in all cases where native non-forest vegetation will be affected by forestry operations.

USING THE KEYS AND TABLES

The forests occurring in West and Southwest 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. In the Manual these are called **floristic communities**. 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 types 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 the West and Southwest Region is likely to contain 3 to 4 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 West and Southwest Region there are eight mixed forest floristic communities dominated by *E. delegatensis*. These are all included in the RFA "tall *E. delegatensis* forest." Most of the *E. delegatensis* 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 West and Southwest 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 the West and Southwest Region.

- R E *Notelaea ligustrina* and/or *Pomaderris apetala* closed forest
- R E *Melaleuca ericifolia* coastal swamp forest
- E Shrubby *E. ovata* - *E. viminalis* forest
- R V *E. viminalis* and/or *E. globulus* coastal shrubby forest
- R V King Billy pine - deciduous beech forest
- R V Pencil pine forest
- R V Pencil pine - deciduous beech forest
- V King Billy pine forest
- V *E. brookeriana* wet forest
- E. rodwayi* forest

The tables in this section of the West and Southwest 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 vegetation characteristics (e.g. tree height), site characteristics (e.g. rock type) or co-occurring species.

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 for some forest communities.

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. nitida*. 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. brookeriana* are codominant in a wet sclerophyll forest, the community can be identified as an *E. obliqua* wet sclerophyll forest community or an *E. brookeriana* 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).

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 dominant Swamp forest and related forest or scrub (go to 2.2)
- ❷ Forest or tall scrub with other species dominant Other forest or scrub (go to 2.3)

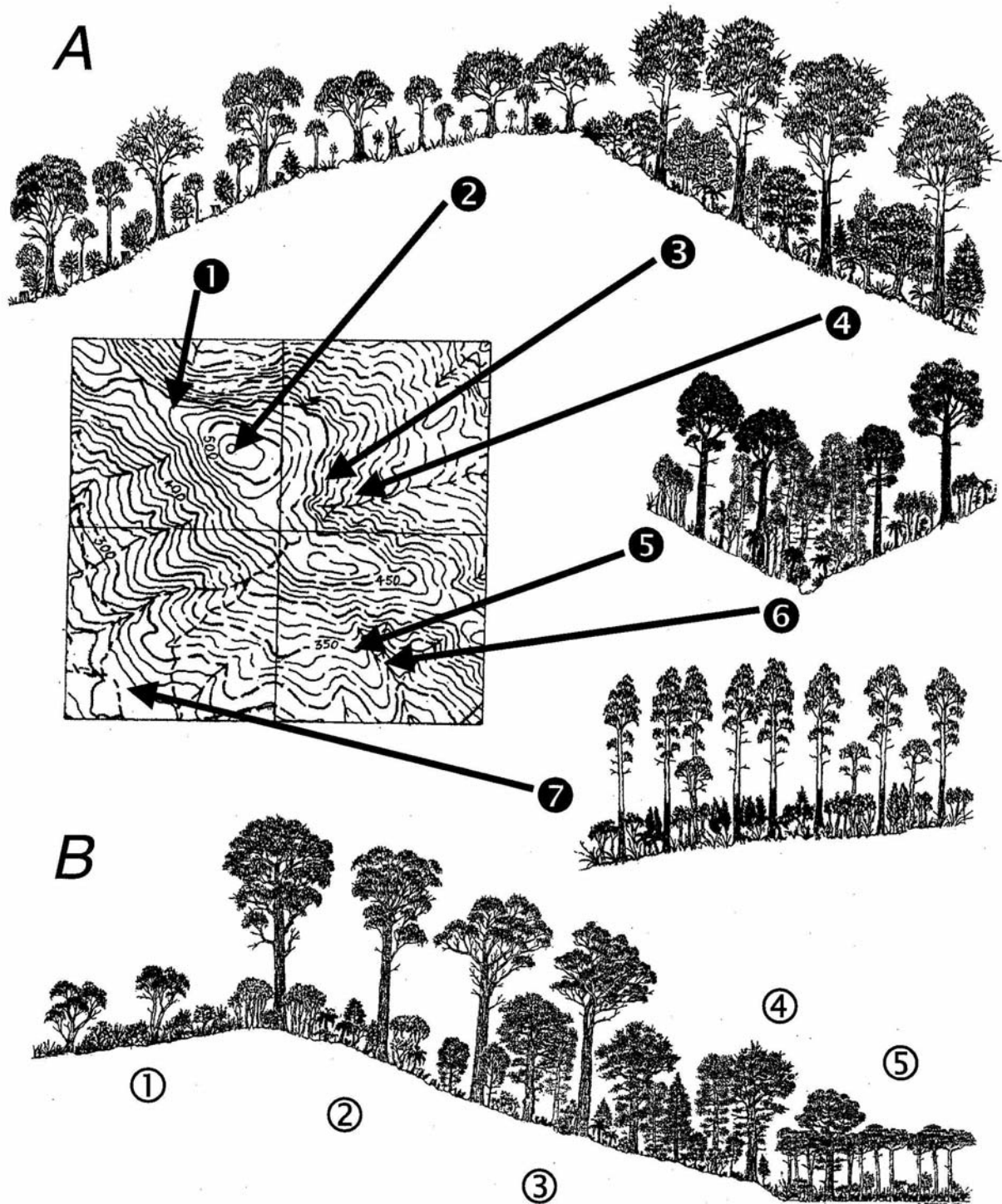
❶ Eucalypts present with greater than 5% cover

- ❷ Myrtle, sassafras, leatherwood or celery-top pine prominent as secondary trees or shrubs Mixed forest (go to 2.4)
- ❷ Understorey dominated by tall tea-trees or paperbarks Wet 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 High altitude sites dominated by a mixture of low species Alpine vegetation
- ❶ Dominated by sedges or buttongrass; low to high altitudes, often on the boundary of sedge woodland or tea-tree scrub forest Moorland/sedgeland
- ❶ Dominated by native grasses and saggs; 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 or 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)

Tasmanian cool temperate rainforest is defined as vegetation with trees taller than 8 m, dominated by the following species: myrtle, deciduous beech, sassafras, leatherwood, horizontal, celery-top pine, King Billy pine, Huon pine, Cheshunt pine or pencil pine. Rainforest in West and Southwest Region is extensive and diverse, and includes the largest tracts of cool temperate rainforest in Australia.

Callidendrous rainforest dominated by myrtle and sassafras is found on relatively fertile and moist sites, mainly in the northern part of the region. Thamnic and implicate rainforests, characterised by the presence of endemic species (e.g. leatherwood, horizontal, celery-top pine, Huon pine) are associated with infertile substrates in the humid western and southern parts of the region. Gallery rainforest containing Huon pine is restricted to the banks of major rivers, but at higher altitudes Huon pine can occur locally on long-unburnt sites – they include stands at Lake Johnstone and the Hardwick Valley that contain some of the world's oldest living organisms. Montane communities dominated by King Billy pine and deciduous beech occur at high altitudes that have escaped fire – they include the largest stands of deciduous beech forest in the State, at Mt Dundas and Mt Read.

The rainforest communities in the West and Southwest Region form complex mosaics with a range of other forest and non-forest communities. The nature of these mosaics is governed by site characteristics (fertility, altitude and aspect), and its history of fire and land use. The exploitation of rainforest for endemic conifers, notably celery-top pine, King Billy pine and Huon pine, is an important part of the history and legend of western Tasmania. More recently, some of these species have been utilised for research into climatic trends.

Most rainforest communities in the West and Southwest Region are well reserved. However, the susceptibility of rainforest communities to fire, particularly in high altitude areas, needs to be taken into account in planning for forestry operations in the region.

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 Musk common..... RAIN-C3.1
 - ❸ Musk sparse or absent
 - ❹ Celery-top pine or native laurel present..... RAIN-CT1
 - ❹ Celery-top pine and native laurel absent..... RAIN-C1.1
 - ❷ Sassafras dominant; myrtle usually sparse or absent
 - ❸ Musk common..... RAIN-C3.2
 - ❸ Musk sparse or absent
 - ❹ Celery-top pine or native laurel present..... RAIN-CT1
 - ❹ Celery-top pine and native laurel 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 King Billy pine dominant or codominant; myrtle often subdominant
 - ❸ Understorey dominated by archeriaRAIN-T4.3
 - ❸ Understorey dominated by trochocarpaRAIN-T6.2
 - ❸ Understorey dominated by dwarf leatherwoodRAIN-T5.2
 - ❸ Understorey dominated by scopariaRAIN-T9.1

- ② King Billy pine not dominant or codominant; myrtle generally dominant
 - ③ Huon pine present
 - ④ Understorey dominated by horizontal RAIN-T1.4
 - ④ Understorey dominated by whitey wood RAIN-T2.1
 - ④ Understorey dominated by native laurel RAIN-T3.2
 - ④ Understorey dominated by archeria RAIN-T4.2
 - ③ Huon pine absent
 - ④ Understorey dominated by horizontal
 - ⑤ Pandani present RAIN-T1.2
 - ⑤ Pandani absent..... RAIN-T1.1
 - ④ Understorey dominated by whitey wood RAIN-T2.2
 - ④ Understorey dominated by native laurel RAIN-T3.1
 - ④ Understorey dominated by archeria RAIN-T4.1
 - ④ Understorey dominated by trochocarpa
 - ⑤ Understorey dominated by *Trochocarpa gunnii*; sassafras present..... RAIN-T5.1
 - ⑤ Understorey dominated by *Trochocarpa cunninghamii*; sassafras absent
 - ⑥ Flax lily present RAIN-T7.1
 - ⑥ Flax lily absent..... RAIN-T6.1
 - ④ Understorey dominated by native plum RAIN-T8.1
- ① Forests of low to moderate height with broken, uneven canopies and tangled understoreys
 - ② Woolly tea-tree common in overstorey RAIN-I3.1
 - ② Woolly tea-tree sparse or absent in overstorey
 - ③ Huon pine present..... RAIN-I1.2
 - ③ King Billy pine present
 - ④ Deciduous beech present..... RAIN-I2.1
 - ④ Deciduous beech absent
 - ⑤ Scoparia present RAIN-I1.4
 - ⑤ Scoparia absent..... RAIN-I1.3
 - ③ Huon pine and King Billy pine absent (often dominated by celery-top pine)
 - ④ Tea-tree or paperbark common; trochocarpa sparse or absent..... RAIN-I1.1
 - ④ Tea-tree or paperbark sparse or absent; trochocarpa common..... RAIN-I4.1
- ① Low forests in highland situations; canopy dominated by pencil pine and often open
 - ② Deciduous beech and pandani common; myrtle absent..... RAIN-M1.1
 - ② Deciduous beech and pandani sparse or absent
 - ③ Myrtle present; understorey relatively open with conifers prominent RAIN-M2.2
 - ③ Myrtle absent; understorey relatively open with sphagnum or sedges prominent RAIN-M5.1
- ① Forests containing riverine tea-tree (*Leptospermum riparium*) growing along watercourses.....RAIN-G1.1
- ① Dwarf forests growing along the coastal foreshore; with typical rainforest and wet sclerophyll forest species Dwarf littoral forest / OTHER-14

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		Cons. priority		Distribution in West and Southwest Region
					Floristic	RFA	
OTHER-14	Dwarf littoral forest		—	Non forest	B	N	Sheltered coastal environments (e.g. swales).
RAIN-C1.1 Callidendrous	<i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> over <i>Dicksonia</i> and/or <i>Polystichum proliferum</i>		M+	Callidendrous & thamnic rainforest on fertile sites	np	N	Humid and relatively fertile sites (e.g. basalt) at lower altitudes in northern part of region (e.g. Balfour, Julius River, Savage River, Sumac).
RAIN-C1.2 Callidendrous	<i>Atherosperma moschatum</i> over <i>Dicksonia antarctica</i> - <i>Polystichum proliferum</i> - <i>Blechnum watsii</i>		M+	Callidendrous & thamnic rainforest on fertile sites	B	N	Occasional in the northwest in protected gullies and along creeks (e.g. Sumac), often in drier environments than RAIN-C1.1.
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>		M+	Callidendrous & thamnic rainforest on fertile sites	np	N	Occasional in the northwest on fertile sites in protected gullies and along creeks (e.g. McCarthy Creek, Balfour).
RAIN-C3.2 Callidendrous	<i>Atherosperma moschatum</i> over <i>Olearia argophylla</i> with <i>Dicksonia antarctica</i> - and/or <i>Polystichum proliferum</i>		M+	Callidendrous & thamnic rainforest on fertile sites	B	N	Very localised in the northwest on fertile sites in protected gullies and along creeks.
RAIN-CT Callidendrous – thamnic intermediate	Varies		M+	Callidendrous & thamnic rainforest on fertile sites	np	N	Widespread in transition zones between callidendrous and thamnic rainforest (e.g. Parsons Hood, Savage River, Sumac, Balfour), Mt Read).
RAIN-G1.1 Gallery	<i>Leptospermum riparium</i> scrub	Huon pine present	H	Huon pine forest	np	N	Riverine sites on major rivers subject to periodic flooding (e.g. Franklin River, Pieman River, Gordon River).
		Huon pine absent	M-	Thamnic rainforest on less fertile sites	np	N	
RAIN-I1.1 Implicate	<i>Phyllocladus aspleniifolius</i> - <i>Nothofagus cunninghamii</i> - Myrtaceae species over a diverse tangle with <i>Agastachys odorata</i>		M–	Thamnic rainforest on less fertile sites	np	N	Widespread on infertile sites (e.g. Norfolk range, Mt Dundas, Savage River, lower Gordon River, Louisa River).
RAIN-I1.2 Implicate	<i>Lagarostrobos franklinii</i> - <i>Nothofagus cunninghamii</i> - Myrtaceae species over a diverse tangle with <i>Agastachys odorata</i>		H	Huon pine forest	np	N	Lower altitudes in south and west of region, mainly associated with major rivers – most sites previously logged for Huon pine (e.g. Davey River, Wanderer River, Jane River).
RAIN-I1.3 Implicate	<i>Athrotaxis selaginoides</i> over a diverse tangle with <i>Agastachys odorata</i> - <i>Richea pandanifolia</i>		X	King Billy pine forest	A	Y*	Less fertile sites to 600 m (e.g. Mt Murchison, Mt Read, Bradshaws Road).

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Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in West and Southwest Region
					Floristic	RFA	
RAIN-I1.4 Implicate	<i>Athrotaxis selaginoides</i> over a diverse tangle with <i>Agastachys odorata</i> - <i>Richea scoparia</i>		X	King Billy pine forest	A	Y*	Higher altitude form of RAIN-I1.3.
RAIN-I2.1 Implicate	<i>Athrotaxis selaginoides</i> (- <i>Diselma archeri</i>) over a diverse tangle with <i>Nothofagus gunnii</i>		F	King Billy pine with deciduous beech	A	Y*	Montane sites in west of region (e.g. Mt Dundas, Mt Read).
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>		M-	Thamnic rainforest on less fertile sites	np	N	Poorly drained lowland sites in west and southwest of region (e.g. Bernafai Ridge, Stanley River, Balfour). Related to some swamp forest communities.
RAIN-I4.1 Implicate	<i>Phyllocladus aspleniifolius</i> - <i>Nothofagus cunninghamii</i> over <i>Trochocarpa</i> species – <i>Prionotes cerinthoides</i>		M–	Thamnic rainforest on less fertile sites	np	N	Occasional on infertile sites at low to mid altitude sites in southwest of region.
RAIN-M1.1 Montane	<i>Athrotaxis selaginoides</i> / <i>Athrotaxis cupressoides</i> over <i>Nothofagus gunnii</i> - <i>Richea pandanifolia</i>	King Billy pine dominant	F	King Billy pine with deciduous beech forest	A	Y*	Uncommon on sheltered sites at high altitudes; King Billy pine mainly on steep, rocky slopes; pencil pine near streams and lakes (e.g. Mt Read, Mt Dundas).
		Pencil pine dominant	PD	Pencil pine with deciduous beech forest			
RAIN-M2.2 Montane	<i>Athrotaxis cupressoides</i> over <i>Diselma archeri</i> in a park like understorey		PP	Pencil pine forest	A	Y*	Uncommon on sheltered sites at high altitudes; (e.g. Mt Read, Mt Dundas).
RAIN-M5.1 Montane	<i>Athrotaxis cupressoides</i> over <i>Sphagnum</i>		PP	Pencil pine forest	A	Y*	May occur locally on poorly drained high altitude sites.
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 sparse u/s	M+	Callidendrous & thamnic rainforest on fertile sites	np	N	Widespread in region at lower altitudes (usually below 600 m); often associated with creeks (e.g. Savage River, Mt Ramsay, Parsons Hood, Balfour, Sumac, Franklin River, Gordon River).
		Trees <20 m over dense u/s	M–	Thamnic rainforest on less fertile sites			
RAIN-T1.2 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Eucryphia lucida</i> - over <i>Anodopetalum biglandulosum</i> - <i>Richea pandanifolia</i>		M–	Thamnic rainforest on less fertile sites	np	N	Occurs at higher altitudes than RAIN-1.1 (e.g. Mt Ramsay).
RAIN-T1.3 Thamnic	<i>Athrotaxis selaginoides</i> over <i>Anodopetalum biglandulosum</i> - <i>Richea pandanifolia</i>		X	King Billy pine forest	A	Y*	Local at higher altitudes in west of region (e.g. Red Hills, Mt Read).

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Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in West and Southwest Region
					Floristic	RFA	
RAIN-T1.4 Thamnic	<i>Lagarostrobos franklinii</i> - <i>Nothofagus cunninghamii</i> over <i>Anodopetalum biglandulosum</i>		H	Huon pine forest	np	N	Floodbanks along West Coast rivers (e.g. lower Gordon River, Sprent River, Denison River) and associated plateau (e.g. Teepookana).
RAIN-T2.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Eucryphia lucida</i> over <i>Acradenia frankliniae</i>	Trees >20 m over sparse u/s	M+	Callidendrous & thamnic rainforest on fertile sites	np	N	Lowland sites along West Coast rivers and creeks (e.g. Pieman River, Gordon River, King River, Teepookana).
		Trees <20 m over dense u/s	M–	Thamnic rainforest on less fertile sites			
RAIN-T2.2 Thamnic	<i>Lagarostrobos franklinii</i> - <i>Nothofagus cunninghamii</i> over <i>Acradenia frankliniae</i>		H	Huon pine forest	np	N	Banks of major rivers and creeks (e.g. Gordon River, Pieman River, Donaldson River).
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	np	N	Widespread on well-drained sites, mainly below 300 m (e.g. Henty, Balfour, Sumac, Louisa River, Birchs Inlet, Pieman River).
		Trees <20 m over dense u/s	M–	Thamnic rainforest on less fertile sites			
RAIN-T3.2 Thamnic	<i>Lagarostrobos franklinii</i> - (<i>Nothofagus cunninghamii</i>) over <i>Anopterus glandulosus</i>		H	Huon pine forest	np	N	Occasional on banks of major rivers (e.g. Jane River, Wanderer River, Dave River, lower Gordon River).
RAIN-T4.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Eucryphia lucida</i> - (<i>Phyllocladus aspleniifolius</i>) over <i>Archeria eriocarpa</i> /A. <i>hirtella</i>		M–	Thamnic rainforest on less fertile sites	np	N	Local on sites of low to moderate fertility, often along creeks and rivers (e.g. Savage river, Mt Dundas, lower Gordon River).
RAIN-T4.2 Thamnic	<i>Lagarostrobos franklinii</i> - (<i>Nothofagus cunninghamii</i>) over <i>Archeria eriocarpa</i>		H	Huon pine forest	np	N	Banks of major rivers and creeks, in west and south (e.g. Gordon River, Spero River, Yellow Creek, Davey River).
RAIN-T4.3 Thamnic	<i>Athrotaxis selaginoides</i> - <i>Nothofagus cunninghamii</i> - <i>Eucryphia species</i> over <i>Archeria eriocarpa</i> /A. <i>hirtella</i> – <i>Richea pandanifolia</i>	Myrtle dominant	M–	Thamnic rainforest on less fertile sites	np	N	Moderate fertility sites, mainly above 600 m (e.g. Mt Read).
		King Billy pine dominant	X	King Billy pine forest	A	Y*	
RAIN-T5.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> - <i>Eucryphia lucida</i> over <i>Trochocarpa gunnii</i>	Trees >20 m over a sparse u/s	M+	Callidendrous & thamnic rainforest on fertile sites	np	N	Occasional on sites of moderate fertility at 500-700 m altitude (e.g. Norfolk Ranges, Mt Ramsay, Savage River).
		Trees <20 m over dense u/s	M–	Thamnic rainforest on less fertile sites			

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Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in West and Southwest Region
					Floristic	RFA	
RAIN-T5.2 Thamnic	<i>Athrotaxis selaginoides</i> (and/or <i>Nothofagus cunninghamii</i>) - <i>Eucryphia milliganii</i> over <i>Trochocarpa</i> <i>gunnii</i> - <i>Richea pandanifolia</i>	Myrtle dominant	M–	Thamnic rainforest on less fertile sites	np	N	Occasional on mountain slopes above 700 m (e.g. Mt Louisa, Ray Range, Mt Anne, Mt Read).
		King Billy pine dominant	X	King Billy pine forest	A	Y*	
RAIN-T6.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Phyllocladus</i> <i>aspleniifolius</i> over <i>Trochocarpa</i> <i>cunninghamii</i>		M–	Thamnic rainforest on less fertile sites	np	N	Occasional at high altitude – grades into high altitude callidendrous forest.
RAIN-T6.2 Thamnic	<i>Athrotaxis selaginoides</i> over <i>Trochocarpa cunninghamii</i>		X	King Billy pine forest	A	Y*	Local at mid to high altitude on less fertile sites.
RAIN-T7.1 Thamnic	<i>Phyllocladus aspleniifolius</i> - <i>Nothofagus</i> <i>cunninghamii</i> <i>Eucryphia lucida</i> over <i>Cenarrhenes nitida</i>		M–	Thamnic rainforest on less fertile sites	B	N	Local on moderate fertility sites below 400 m in west and northwest of region (e.g. Sumac).
RAIN-T8.1 Thamnic	<i>Nothofagus cunninghamii</i> - <i>Phyllocladus</i> <i>aspleniifolius</i> – <i>Eucryphia lucida</i> over <i>Cenarrhenes nitida</i>		M–	Thamnic rainforest on less fertile sites	np	N	Moderate fertility sites in west and southwest of region, below 600 m
RAIN-T9.1 Thamnic	<i>Athrotaxis selaginoides</i> over <i>Richea</i> <i>scoparia</i> - <i>Nothofagus cunninghamii</i>		X	King Billy pine forest	A	Y*	Dolerite mountains in south of region at altitudes above 750 m.

2.2 SWAMP FOREST AND RELATED FOREST OR SCRUB COMMUNITIES

Major Reference: Pannell (1992); Kirkpatrick, Barker, Brown, Harris and Mackie (1995)

Swamp forests have a closed canopy of blackwood, tea-trees or paperbarks, and typically occupy poorly drained flats. Most communities are confined to low altitude parts of Tasmania, with their greatest extent and diversity being found in the far Northwest (Woolnorth Region). Riparian blackwood forests contain typical wet sclerophyll shrubs and occur on better drained riparian environments, extending to slopes on disturbed sites that previously supported rainforest.

Most of the forest communities recorded from Woolnorth Region also occur in the West and Southwest Region, but are much less extensive. They are mainly associated with larger rivers and coastal plains in the north and west of the region. Most late-successional swamp forest and riparian forest communities grade into rainforest. Scrubs dominated by tea-tree or paperbark are more widespread and well reserved, in coastal and hinterland environments and as part of fire-related successions on relatively infertile sites. Montane tea-tree forests may occur locally at higher altitudes on basalt in the north of the region.

The key includes some communities that have not been recorded in the region, but have the potential to be present, based on their habitats. Most sites are potentially important for conservation.

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 Huon pine presentSWAMP-B6
 - ❷ Huon pine absent
 - ❸ Horizontal present
 - ❹ Manfern common; scented paperbark usually absent.....SWAMP-B2
 - ❹ Manfern sparse or absent; scented paperbark present
 - ❺ Cutting grass commonSWAMP-B1
 - ❺ Cutting grass sparse or absent.....SWAMP-B3
 - ❸ Horizontal absent
 - ❹ Trochocarpa present
 - ❺ Fishbone fern or cutting sedge common; celery-top pine sparse or absent.....SWAMP-B4
 - ❺ Fishbone fern and cutting sedge sparse or absent; celery-top pine commonSWAMP-B5
 - ❹ Trochocarpa absent
 - ❺ Manfern common; scented paperbark usually absentSWAMP-B1
 - ❺ 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 present SWAMP-C5
 - ❹ Sassafras absent
 - ❺ Woolly tea-tree prominent; scented paperbark sparse or absent SWAMP-C4
 - ❺ Swamp paperbark prominent; 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 and 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; myrtle sparse or absent SWAMP-D4
 - ❻ Dogwood, lancewood or sword sedge sparse or absent; myrtle occasional... SWAMP-D6
 - ❶ **Woolly tea-tree dominant and montane sites (usually above 500 m)**
 - ❷ Myrtle sparse or absent
 - ❸ Silver wattle codominant or common SWAMP-E1
 - ❸ Silver wattle sparse or absent SWAMP-E1
 - ❷ Myrtle codominant or common (silver wattle sparse or absent) SWAMP-E2
 - ❶ **Tea-tree (manuka) usually dominant or codominant; usually lowland sites**
 - ❷ Rainforest trees (e.g. myrtle, leatherwood, celery-top pine, horizontal) present.....SWAMP-F3
 - ❷ Rainforest trees absentSWAMP-F1
 - ❶ **Shiny tea-tree dominant** OTHER-01
 - 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 West and Southwest Region
					Floristic	RFA	
OTHER-01	<i>Leptospermum nitidum</i> closed forest/scrub		—	Non-forest	np	—	Riparian vegetation, at lower altitudes along major rivers in west and southwest of region.
OTHER-02	<i>Leptospermum glaucescens</i> - <i>Leptospermum scoparium</i> closed forest/scrub		L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Localised thickets on infertile sites (e.g. quartzite) mainly in coastal areas but may extend to ridges (e.g. Wilson River).
SWAMP-A1	Depauperate callidendrous swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	B	N	Not recorded from region, but may occur locally on recently disturbed or burnt sites with little peat accumulation (e.g. Arthur River area).
		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	Later successional stage of SWAMP-A1.
		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	Not recorded from region. May occur on poorly drained flats adjacent to eucalypt forest.
SWAMP-A4	Callidendrous myrtle swamp forest		BF	<i>Acacia melanoxylon</i> forest on flats	B	N	Long unburnt swamp sites where peat has developed (e.g. Arthur River area).
SWAMP-A5	Callidendrous fern swamp forest		BF	<i>Acacia melanoxylon</i> forest on flats	B	N	Sites with impeded drainage along creeks and rivers (e.g. Kelly Basin area, Arthur River flats).
SWAMP-B1	Thamnic leatherwood swamp forest	Tea-tree or scented paperbark dominant	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	B	N	Less fertile swamp sites and extending to gullies (e.g. Sumac area).
		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	B	N	Often associated with SWAMP-B1; but usually on sites with better peat development.
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in West and Southwest 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	Occasional on poorly drained, low fertility sites at higher altitudes than some other swamp forest communities (e.g. Zeehan and flats in Mt Dundas and Mt Read area).
		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 (e.g. 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	Infertile sites with deep peat (e.g. flats adjacent to Arthur River).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats			
SWAMP-B6	Thamnic Huon pine swamp forest	Huon pine sparse	L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	A	N	Local on poorly drained flats at low altitudes (lower Gordon River, Brisbane Bay).
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. Macquarie Harbour).
SWAMP-C2	Depauperate coastal paperbark swamp forest		ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Coastal flats that are periodically disturbed by fire or flood (e.g. Macquarie Harbour).
SWAMP-C3	Coastal paperbark/ <i>Carex</i> swamp forest	Swamp paperbark dominant	ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Flats adjacent to coastal river systems that flood in winter (e.g. Henty River).
		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	B	N	Coastal and sub-coastal swamps and floodplains subject to periodic floods (e.g. 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	B	N	Not recorded from region, but later seral stage of 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 on less brackish sites with well-developed peat (e.g. Bird River).
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats	B	N	

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Floristic community code and name		Qualification		RFA community code and name		Conservation priority		Distribution in West and Southwest Region
						Floristic	RFA	
SWAMP-D1	Riparian blackwood/ paperbark forest	Swamp paperbark dominant	ME	<i>Melaleuca ericifolia</i> coastal swamp forest	A	Y*	Occasional on fertile, well-drained banks of streams and swamps of West Coast and Macquarie Harbour.	
		Blackwood dominant	BF	<i>Acacia melanoxylon</i> forest on flats	np	N		
SWAMP-D2	Riparian blackwood/wattle forest	On flats	BF	<i>Acacia melanoxylon</i> forest on flats	B	N	Well-drained sites on floodplains adjacent to rivers subject to winter flooding(e.g. Arthur River); may extend to slopes elsewhere.	
		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	Recorded from close to region on fire-disturbed riparian sites or slopes.	
SWAMP-D4	Riparian blackwood/dogwood forest	On flats	BF	<i>Acacia melanoxylon</i> forest on flats	np	N	Well-drained gullies and slopes capable of supporting rainforest in the absence of fire or disturbance (e.g. Zeehan, Stanley River area).	
		On rises	BR	<i>Acacia melanoxylon</i> forest on rises				
SWAMP-D5	Riparian blackwood myrtle/dogwood forest	On flats	BF	<i>Acacia melanoxylon</i> forest on flats	A	N	Moist gullies and slopes capable of supporting rainforest in the absence of fire or disturbance (e.g. Zeehan, Stanley River area).	
		On rises	BR	<i>Acacia melanoxylon</i> forest on rises				
SWAMP-D6	Riparian blackwood rainforest	Myrtle dominant		M+	Callidendrous and thamnic rainforest on fertile sites	B	N	On banks and flood plain of rivers and creeks; (e.g. Arthur River, Bird River); extends to burnt or disturbed slopes capable of supporting rainforest (e.g. Rebecca Creek).
		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 dominant		M+	Callidendrous and thamnic rainforest on fertile sites	np	N	On banks and flood plain of rivers and creeks; (e.g. Arthur River); extends to burnt or disturbed slopes capable of supporting rainforest (e.g. Queenstown area, Parsons Hood, Sumac, Bernafai Ridge, Teepookana).
		Myrtle not dominant	On flats	BF	<i>Acacia melanoxylon</i> forest on flats	np	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	B	N	May occur locally on flats, often disturbed, in more fertile uplands.
		Silver wattle sparse or absent		L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	B	N	May occur locally on basalt at higher altitudes – mainly on flats with impeded drainage (e.g. Mt Pearse area).

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in West and Southwest Region
					Floristic	RFA	
SWAMP-E2	Montane myrtle tea-tree forest		M+	Callidendrous & thamnic rainforest on fertile sites	A	N	May occur locally in a matrix with rainforest and mixed forest on basalt at higher altitudes (e.g. Mt Pearse area).
SWAMP-F1	Depauperate tea-tree scrub forest		L	<i>Leptospermum</i> species - <i>Melaleuca squarrosa</i> swamp forest	np	N	Early successional community that intergrades with swamp forest on frequently burnt infertile sites – widespread in region.
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. Macquarie Harbour area, lower Pieman River).
		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, widespread in region (e.g. Dundas area, Queenstown, Macquarie Harbour).

2.3 OTHER FOREST OR SCRUB COMMUNITIES

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

This section covers forest communities that are not dominated by rainforest species, eucalypts, tea-trees or paperbarks. In other parts of Tasmania such communities 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. 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.

In the West and Southwest Region, relatively few forest or scrub communities have been identified, in current vegetation classifications, which are not dominated by rainforest species, eucalypts, tea-trees or paperbarks. There may be other distinct communities that occur in the region – these most likely occur in reserves, but should be referred to FPA if they are found in operational areas.

KEY TO OTHER FOREST OR SCRUB COMMUNITIES

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

- ❶ Dogwood (native pear) dominantOTHER-03
- ❶ Blanket bush dominantOTHER-06
- ❶ Native olive (dorrel) dominantOTHER-07
- ❶ Silver wattle dominantOTHER-10

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 West and Southwest Region
					Floristic	RFA	
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	May occur locally in drier and more fertile parts of the region, 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*	May occur locally in well-drained creeks and gullies on fertile sites in drier parts of the region.
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	May occur locally in drier and more fertile parts of the region, where very poor eucalypt regeneration has occurred following logging or clearing of wet forest.
		Not as above	—	None appropriate	A	—	May occur locally in well-drained creeks and gullies on fertile sites in drier parts of the region.
OTHER-07	<i>Notelaea ligustrina</i> closed forest		NP	<i>Notelaea ligustrina</i> and/or <i>Pomaderris apetala</i> closed forest	A	Y*	May occur locally in rocky fire-shadow gullies and on rocky sites in wet forest.
OTHER-10	<i>Acacia dealbata</i> forest		SI	<i>Acacia dealbata</i> forest	B	N	Usually created by successive fires, poor eucalypt regeneration or failed attempts at clearing on moist sites. Not recorded from the region, but may occur on fertile sites.

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.

The most extensive areas of mixed forest in the West and Southwest Region are found on more fertile substrates in the far north and the Florentine Valley and Lake Gordon areas. These forests are dominated by *E. obliqua*, *E. regnans* or *E. delegatensis* (higher altitudes) and have a callidendrous or thamnian rainforest understorey. Less fertile sites often support *E. nitida* mixed forest with an implicate rainforest understorey.

KEY TO MIXED FOREST COMMUNITIES

- ❶ Dominated by *E. amygdalina* WET-AM0
- ❶ Dominated by *E. coccifera* WET-COC11
- 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. delegatensis*
 - ❷ Leatherwood, horizontal or native laurel present
 - 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 absent
 - ❸ Silver wattle, manfern or musk common; waratah and pink mountain berry sparse or absent
 - ❹ Celery-top pine or cutting grass common
 - ❺ Dogwood, musk or bracken common
 - ❻ Stinkwood, goldeywood or lancewood common; blanket bush and musk sparse or absent WET-DEL0111
 - ❻ Stinkwood, goldeywood and lancewood sparse or absent; blanket bush or musk often common 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; blanket bush and musk sparse or absent WET-DEL0111
 - ❻ Stinkwood, goldeywood and lancewood absent; blanket bush or musk often common WET-DEL0110
 - ❺ Silver wattle and bracken sparse or absent; epiphytic ferns often common... WET-DEL1000
 - ❸ Silver wattle, manfern and musk sparse or absent ; waratah or pink mountain berry common
 - ❹ Hakea, blanket bush or bauera common; cathead fern usually absent
 - ❺ Lancewood, prickly beauty or cutting grass common; dogwood and musk sparse or absent WET-DEL1110
 - ❺ Lancewood, prickly beauty and cutting grass sparse or absent; dogwood or musk common WET-DEL2
 - ❹ Hakea, blanket bush and bauera sparse or absent; cathead fern present WET-DEL1100

- ❶ Dominated by *E. gunnii*..... WET-GUN01
- ❶ Dominated by *E. johnstonii*..... WET-JOHN1
- ❶ Dominated by *E. nitida*
 - ❷ Horizontal, trochocarpa or native pepper present; manfern and dogwood absent..... WET-NIT0
 - ❷ Horizontal, trochocarpa and native pepper absent; manfern or dogwood present..... WET-NIT1
- ❶ Dominated by *E. obliqua*
 - ❷ Manfern, cathead fern or leathery shield fern present
 - ❸ Cutting grass usually common; 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 sparse or absent; epiphytic ferns usually common
 - ❺ Leatherwood, celery-top pine, horizontal or native laurel present; musk absent; usually less fertile sites WET-OB1001
 - ❺ 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 absent
 - ❸ Leatherwood or horizontal common
 - ❹ Huon pine present WET-OB11011
 - ❹ Huon pine absent WET-OB11010
 - ❸ Leatherwood or horizontal sparse or absent
 - ❹ Prickly mo, lancewood or coral fern common; native willow and dogwood sparse or absent..... WET-OB1110
 - ❹ Prickly mo, lancewood or coral fern sparse or absent; native willow or dogwood common
 - ❺ Flax lily present; tea-tree usually absent WET-OB2
 - ❺ Flax lily absent; tea-tree usually present WET-OB1111
- 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
 - ❸ Leathery shield fern, musk or kangaroo fern present; celery-top pine and lancewood absent; more fertile sites..... WET-REG110
 - ❸ Leathery shield fern, musk and kangaroo fern absent; celery-top pine or lancewood present; less fertile sites..... WET-REG111
- ❶ Dominated by *E. subcrenulata*
 - ❷ Native plum, pandani, waratah or native pepper common; leatherwood usually absent..... WET-SUB1000
 - ❷ Native plum, pandani, waratah and native pepper sparse or absent; leatherwood often present..... WET-SUB1001

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 West and Southwest 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	Occasional on fertile sites (often basalt outcrops) north of Savage River and Waratah.
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 north of region. (e.g. Pieman River)
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 and dolomite near the Julius River.
WET-COC11	<i>E. coccifera</i> – <i>Trochocarpa cunninghamii</i> - <i>Cyathodes glauca</i> subalpine mixed forest		C	<i>E. coccifera</i> forest	np	Y	May extend into eastern parts of the region on high altitude sites.
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 on moist, shaded slopes, gullies and drainage headwaters on fertile sites above 300 m.
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	Not recorded from region but likely to occur on less fertile sediments above 300 m (e.g. Florentine Valley).
WET-DEL1000	<i>E. delegatensis</i> - <i>Nothofagus cunninghamii</i> - <i>Grammitis billardiarei</i> mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Localised but fairly common on moist, shaded slopes and creeklines on fertile upland sites protected from fire (e.g. Luina).
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 often on flatter sites with poorer drainage (e.g. Savage River, Clear Hill area).
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	Infertile upland sites in east of the region (e.g. Gordon Range, Mt Wedge).
WET-DEL1011	<i>E. delegatensis</i> - <i>Monotoca glauca</i> - <i>Hymenophyllum rarum</i> mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Infertile upland sites (e.g. Gordon Range, Mt Wedge, Savage River).

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Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in West and Southwest Region
					Floristic	RFA	
WET-DEL1110	<i>E. delegatensis</i> - <i>Hakea lissosperma</i> - <i>Monotoca glauca</i> subalpine mixed forest		DT	Tall <i>E. delegatensis</i> forest	np	N	Infertile sites at high altitudes (e.g. Cheyne Range).
WET-DEL2	<i>E. delegatensis</i> - <i>Phyllocladus aspleniifolius</i> - <i>Cyathodes juniperina</i> mixed forest		DT	Tall <i>E. delegatensis</i> forest	B	N	Not recorded from region, but may occur at higher altitudes on rocky sites in Florentine Valley area (e.g. Gordon Range).
WET-GUN01	<i>E. gunnii</i> / <i>E. delegatensis</i> / <i>E. rodwayi</i> - <i>Monotoca linifolia</i> subalpine mixed forest		C	<i>E. coccifera</i> forest	B	N	May extend into region on poorly drained high altitude sites in north (e.g. Mt Pearse area).
WET-JOHN1	<i>E. johnstonii</i> mixed forest	Grades into <i>E. subcrenulata</i> forest	SU	<i>E. subcrenulata</i> forest	B	N	Local on wet, acid soils mainly on sandstone at 400-700 m (e.g. Mt Field 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	Widespread at low and mid altitudes on fire-shadow sites on infertile substrate (e.g. Sumac, Boco area, south of Macquarie Harbour).
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	Common at low and mid altitudes on fire-shadow sites on more fertile substrate than WET-NIT1 (e.g. Balfour, McCarthy Creek).
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	Lower altitudes on humid slopes and gullies with deep soils and good drainage, often on Cambrian mudstone (e.g. Milkshake Hills, Julius River, Boco, Florentine Valley).
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	Widespread on humid slopes and gullies on less fertile sites than WET-OB1000 (e.g. Balfour, Lake Chisholm, Florentine Valley).
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	Common on low to mid altitude sites often on drier sites and less fertile sites than WET-OB1000.
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	Widespread at low altitudes on less fertile sites (e.g. Boyd River, Heazlewood Hill, Savage River).
WET-OB11010	<i>E. obliqua</i> – <i>Orites diversifolia</i> – <i>Cyathodes juniperina</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	B	N	Less fertile, rocky sites, with seasonal poor drainage (e.g. Clear Hill area).

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Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in West and Southwest Region
					Floristic	RFA	
WET-OB11011	<i>E. obliqua</i> – <i>Lagarostrobos franklinii</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	A	N	Riparian forest fringing major rivers (e.g. Gordon River, Pieman River).
WET-OB1110	<i>E. obliqua</i> - <i>Anopterus glandulosus</i> - <i>Acacia verticillata</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	np	N	Localised on less fertile sites with poor drainage, mainly in northwest (e.g. Wes Beckett FR).
WET-OB1111	<i>E. obliqua</i> – <i>Acacia mucronata</i> – <i>Nothofagus cunninghamii</i> mixed forest		OT	Tall <i>E. obliqua</i> forest	np	N	Occasional on less fertile sites with poor drainage (e.g. Heazlewood Hill).
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 steep slopes and ridges in north of region on Precambrian and Cambrian sediments (e.g. Balfour Track).
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	Sheltered valleys and slopes with deep soils and good drainage (e.g. Florentine Valley, Mt Field area).
WET-REG110	<i>E. regnans</i> - <i>Nothofagus cunninghamii</i> - <i>Atherosperma moschatum</i> mixed forest		R	<i>E. regnans</i> forest	B	N	Sheltered valleys and slopes with deep soils and good drainage at low to mid altitudes (e.g. Florentine Valley, Gordon Range).
WET-REG111	<i>E. regnans</i> - <i>Atherosperma moschatum</i> mixed forest		R	<i>E. regnans</i> forest	B	N	Sheltered valleys and slopes with deep fertile soils in the north of the region (e.g. Wylds Crag area, Mt Mueller, Gordon Range).
WET-SUB1000	<i>E. subcrenulata</i> - <i>Richea pandanifolia</i> - <i>Cyathodes glauca</i> mixed forest		SU	<i>E. subcrenulata</i> forest	np	N	Local at high altitude benches on sandstone, drainage impeded (e.g. Mt Arrowsmith).
WET-SUB1001	<i>E. subcrenulata</i> / <i>E. delegatensis</i> - <i>Grammitis billardiarei</i> mixed forest		R	<i>E. subcrenulata</i> forest	np	N	Moderately infertile sites, where drainage is better than sites supporting SUB1000 (e.g. Clear Hill, Gordon Range).

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 in height. As with the related mixed forest, 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 understorey is dominated by broad-leaved shrubs and is generally dense, preventing continuous regeneration of shade-intolerant species such as eucalypts. Ferns are often prominent in the ground layer.

Much of the wet sclerophyll forest in the West and Southwest Region is found in relatively dry or exposed forest environments. In more humid and fertile parts of the region, wet sclerophyll forest has often resulted following major disturbance (typically from wildfire or forestry operations) in more successional advanced mixed forest. In the absence of further disturbance, the regrowth wet sclerophyll forests will succeed to mixed forest. Wet sclerophyll forest in the region includes some of Tasmania's most commercially valuable eucalypt forests. Most wet sclerophyll forest communities in the region are well reserved.

KEY TO WET SCLEROPHYLL FOREST COMMUNITIES

- ❶ Dominated by *E. amygdalina* WET-AM0
- ❶ Dominated by *E. brookeriana*
 - ❷ Blanket bush, musk or bracken common; prickly mo and sword sedge sparse or absent WET-BR11
 - ❷ Blanket bush, musk and bracken sparse or absent; prickly mo or sword sedge common WET-BR2
- ❶ Dominated by *E. delegatensis*
 - ❷ Guitar plant or prickly beauty common
 - ❸ Mountain currant, waratah or tussock grass common; rocky subalpine sites WET-DEL0010
 - ❸ Mountain currant, waratah and tussock grass sparse or absent; not on rocky subalpine sites
 - ❹ Dogwood, manfern or cutting grass common
 - ❺ Stinkwood or goldeywood common; blanket bush absent WET-DEL0111
 - ❺ Stinkwood and goldeywood sparse or absent; blanket bush often present WET-DEL0100
 - ❹ Dogwood, manfern and cutting grass sparse or absent WET-DEL0001
 - ❷ Guitar plant and prickly beauty sparse or absent
 - ❸ Cutting grass or sword sedge common
 - ❹ Woolly tea-tree common; goldeywood or stinkwood sparse or absent WET-DEL3
 - ❹ Woolly tea-tree sparse or absent; goldeywood or stinkwood common WET-DEL0111
 - ❸ Cutting grass and sword sedge sparse or absent
 - ❹ Mountain currant, waratah or tussock grass common; rocky subalpine sites WET-DEL0010
 - ❹ Mountain currant, waratah and tussock grass sparse or absent; not on rocky subalpine sites
 - ❺ Dwarf musk, viscid daisy bush or bracken common; drier sites WET-DEL0101
 - ❺ Dwarf musk, viscid daisy bush and bracken sparse or absent; moister sites (myrtle or sassafras may be present) WET-DEL0110
- ❶ Dominated by *E. johnstonii* WET-JOHN2
- ❶ Dominated by *E. nitida*
 - ❷ Paperbark or tea-tree common WET-NIT2
 - ❷ Paperbark and tea-tree sparse or absent
 - ❸ Dogwood, manfern or bracken common WET-NIT1
 - ❸ Dogwood, manfern and bracken sparse or absent WET-NIT0

❶ Dominated by *E. obliqua*

- ❷ Bauera common WET-OB3
- ❷ Bauera sparse or absent
 - ❸ Paperbark, tea-tree, sword sedge or cutting grass common WET-OB111
 - ❸ Paperbark, tea-tree, sword sedge and cutting grass sparse or absent
 - ❹ Flax lily common; silver wattle and blackwood absent WET-OB2
 - ❹ Flax lily sparse or absent; silver wattle and blackwood often present WET-OB110

❶ Dominated by *E. ovata*

- ❷ Understorey dominated by paperbark or tea-tree; cutting grass or sword sedge usually common WET-OV00
- ❷ Understorey dominated by broad-leaved shrubs; cutting grass or sword sedge usually sparse or absent WET-OV01

❶ Dominated by *E. regnans*

- ❷ Bracken, cutting grass or sword sedge common; (myrtle or sassafras generally absent)
 - ❸ Dwarf musk, prickly mo, stinkwood or goldeywood common WET-REG1000
 - ❸ Dwarf musk, prickly mo, stinkwood and goldeywood sparse or absent WET-REG1001
- ❷ Bracken, cutting grass and sword sedge sparse or absent; (myrtle or sassafras often present) WET-REG101

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 West and Southwest 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	Occasional on well-drained sites of moderate fertility in north of region.
WET-BR11	<i>E. brookeriana</i> - <i>E. obliqua</i> - <i>Bedfordia salicina</i> wsf		BA	<i>E. brookeriana</i> wet forest	A	Y*	May occur locally in north of region in damp gullies and flats at lower altitudes.
WET-BR2	<i>E. brookeriana</i> - <i>Leptospermum</i> species - <i>Lepidosperma elatius</i> wsf		BA	<i>E. brookeriana</i> wet forest	A	Y*	Local on poorly drained flats at low altitudes.
WET-DEL0001	<i>E. delegatensis</i> - <i>Acacia melanoxydon</i> - <i>Bedfordia salicina</i> wsf		DT	Tall <i>E. delegatensis</i> forest	B	N	Lower altitudes for <i>E. delegatensis</i> forest, often on rocky scree slopes (e.g. Florentine Valley area).
WET-DEL0010	<i>E. delegatensis</i> - <i>Olearia phlogopappa</i> - <i>Olearia viscosa</i> subalpine wsf		DT	Tall <i>E. delegatensis</i> forest	B	N	May extend into region on dolerite block streams and screes (e.g. Florentine Valley area).
WET-DEL0100	<i>E. delegatensis</i> - <i>E. viminalis</i> - <i>Acacia melanoxydon</i> wsf		DT	Tall <i>E. delegatensis</i> forest	B	N	Not recorded from region but may occur on fertile lower altitude sites for <i>E. delegatensis</i> forest, often disturbed (e.g. Florentine Valley 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	Lower altitude sites for <i>E. delegatensis</i> forest, on fertile sites (e.g. Florentine Valley area).
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 on moist, shaded slopes, gullies and drainage headwaters on fertile sites above 300 m.
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	Not recorded from region but likely to occur on less fertile sediments above 300 m (e.g. Florentine Valley).
WET-DEL3	<i>E. delegatensis</i> - <i>Leptospermum lanigerum</i> - <i>Gahnia grandis</i> wsf		DT	Tall <i>E. delegatensis</i> forest	B	N	Regrowth community associated with drainage headwaters and poorly drained flats.
WET-JOHN2	<i>E. johnstonii</i> wsf		SU	<i>E. subcrenulata</i> forest	B	N	Local on benches on sandstone in southeast of region.

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Floristic community code and name		Qualification	RFA community code and name		Cons. priority		Distribution in West and Southwest Region
					Floristic	RFA	
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	Widespread at low and mid altitudes on fire-shadow sites on infertile substrate (e.g. Sumac, Boco area, south of Macquarie Harbour).
WET-NIT1	<i>E. nitida</i> - <i>Pomaderris apetala</i> - <i>Dicksonia antarctica</i> wsf		NT	Tall <i>E. nitida</i> forest	np	N	Common at lower altitudes on more fertile sites than WET-NIT1 (e.g. Balfour, McCarthy Creek).
WET-NIT2	<i>E. nitida</i> - <i>Melaleuca squarrosa</i> - <i>Monotoca glauca</i> wsf		NT	Tall <i>E. nitida</i> forest	np	N	Local on poorly drained sites on infertile substrates, but can extend to better drained sites (e.g. Mt Murchison, Badger River).
WET-OB0110	<i>E. obliqua</i> - <i>Acacia dealbata</i> - <i>Olearia argophylla</i> wsf		OT	Tall <i>E. obliqua</i> forest	np	N	Lower altitudes on fertile sites with good drainage (e.g. Florentine Valley).
WET-OB0111	<i>E. obliqua</i> - <i>Melaleuca squarrosa</i> - <i>Monotoca glauca</i> wsf		OT	Tall <i>E. obliqua</i> forest	np	N	Common regrowth community on lower slopes and flats on less fertile sites at low altitudes (e.g. Wild Wave River, Sumac).
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	Relatively dry and fire prone sites on slopes and ridges (Precambrian and Cambrian sediments).in north of region (e.g. Balfour Track).
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 lower slopes and flats on less fertile sites at low altitudes.
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.
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*	May occur locally on lowland flats with drainage less impeded than most <i>E. ovata</i> communities.
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	B	N	Regrowth community on shaded slopes and gully flanks, in transition zone between <i>E. obliqua</i> wsf and wetter <i>E. regnans</i> communities.
WET-REG1001	<i>E. regnans</i> - <i>Acacia dealbata</i> - <i>Pomaderris apetala</i> wsf		R	<i>E. regnans</i> forest	B	N	Moist sheltered slopes with more sheltered aspects than WET-REG1000 (e.g. Florentine Valley, Gordon Range).
WET-REG101	<i>E. regnans</i> - <i>Atherosperma moschatum</i> - <i>Acacia dealbata</i> - <i>Olearia argophylla</i> wsf		R	<i>E. regnans</i> forest	np	N	Common in sheltered valleys and slopes with deep soils and good drainage (e.g. Florentine Valley, Mt Field 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 mainly found on dry, infertile and exposed sites in the West and Southwest Region. Dominants and understorey species vary in response to substrate, altitude, drainage and fire history. Throughout the region, dry sclerophyll communities form mosaics with wet eucalypt forest, rainforest and non-forest communities. Most within the region are well reserved.

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

Many lowland dry sclerophyll communities in the West and Southwest 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 saggs are the dominant or most prominent feature of the understorey. Typical species include tussock grass and wallaby grass and graminoids (e.g. flag iris). Note that buttongrass and cutting grass are actually sedges, and forests and woodlands 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. The eucalypt canopy is often fairly open; species include *E. delegatensis* and *E. gunnii* in upland parts of the region.

Sedgy forests

Sedges or rushes are the dominant or most prominent feature of the understorey. Typical species include sword sedge, cutting grass, buttongrass and rushes. Coral ferns are often present. Shrubs such as tea-trees and paperbarks are present on many sites. The eucalypt canopy is often fairly open. *E. nitida* is the most widespread dominant of sedgy forests in the West and Southwest Region. 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, and on infertile sites that have been burnt frequently or recently. Succession to scrubby forests can occur in the absence of fire. Sedgy dry sclerophyll forest and woodland communities are relatively extensive in the region.

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. *E. nitida* is the most widespread dominant of sedgy forests in the West and Southwest Region. 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, *Allocasuarina* species, banksia, tea-tree and paperbarks. 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. Most heathy forest communities in Tasmania occur on siliceous sites in coastal and subcoastal environments. In the West and Southwest Region, heathy forests dominated by *E. nitida* are widespread on well-drained sites on siliceous substrates (e.g. quartzite). They often form mosaics with sedgy and scrubby forests.

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. They include wattles, blanket bush, mountain berry, banksia, prickly beauty 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 the West and Southwest Region, they include *E. delegatensis*, *E. obliqua* and *E. nitida*. Lowland shrubby forests tend to occupy more fertile sites, or more shaded and humid environments, 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. delegatensis* dominant DRY-gDEL
 - ❷ *E. gunnii* dominant DRY-gGUN
 - ❷ *E. rodwayi* dominant DRY-gROD
- ❶ Understorey dominated by sedges, cutting grass or buttongrass; tea-trees or paperbarks often present; mainly on sites with impeded drainage (e.g. flats and marsh edges)
 - ❷ Sedges or cutting grass prominent
 - ❸ *E. amygdalina* dominant DRY-sdAM
 - ❸ *E. gunnii* dominant DRY-sdGUN
 - ❸ *E. nitida* dominant DRY-sdNIT
 - ❸ *E. ovata* dominant DRY-sdOV
 - ❸ *E. rodwayi* dominant DRY-sdROD
 - ❷ Tea-trees or paperbarks prominent
 - ❸ *E. amygdalina* dominant DRY-scAM
 - ❸ *E. gunnii/archeri* dominant DRY-scGUN
 - ❸ *E. nitida* dominant DRY-scNIT
 - ❸ *E. ovata* dominant DRY-scOV
 - ❸ *E. rodwayi* dominant DRY-sdROD

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, sand or quartzite, or on serpentinite (Zeehan area)

- ② *E. amygdalina* dominant DRY-hAM
- ② *E. globulus* dominant DRY-hGLOB
- ② *E. nitida* dominant DRY-hNIT
- ② *E. obliqua* dominant DRY-hOB
- ② *E. viminalis* dominant DRY-hVIM

① 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 or sheltered sites of moderate fertility

- ② *E. amygdalina* dominant DRY-shAM
- ② *E. globulus* dominant DRY-shGLOB
- ② *E. coccifera* dominant DRY-shCOC
- ② *E. delegatensis* dominant DRY-shDEL
- ② *E. gunnii* dominant DRY-shGUN
- ② *E. nitida* dominant DRY-shNIT
- ② *E. obliqua* dominant DRY-shOB
- ② *E. subcrenulata* dominant DRY-shSUB
- 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

* – Communities 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 West and Southwest Region
					Floristic	RFA	
DRY-gDEL	Grassy <i>E. delegatensis</i> forest/woodland		D	Dry <i>E. delegatensis</i> forest	B	N	Local on basalt at higher altitudes in north of region (e.g. Hatfield, Mt Pearse area).
DRY-gGUN	Grassy <i>E. gunnii</i> forest/woodland		C	<i>E. coccifera</i> forest	B	N	Poorly drained flats and frost hollows at higher altitudes (e.g. Hatfield area).
DRY-gROD	Grassy <i>E. rodwayi</i> forest/woodland		RO	<i>E. rodwayi</i> forest	A	Y	Local on upland flats adjacent to marshes and frost hollows (e.g. Micklethwaite Marsh).
DRY-hAM	Heathy <i>E. amygdalina</i> forest		AC	Coastal <i>E. amygdalina</i> forest	B [#]	N	Very local on flats on infertile sites. Recorded from Mt Murchison area.
DRY-hGLOB	Heathy <i>E. globulus</i> coastal forest		G	<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	A [#]	Y*	May occur locally in coastal areas around Macquarie Harbour.
DRY-hNIT	Heathy <i>E. nitida</i> forest		N	Dry <i>E. nitida</i> forest	np [#]	N	Widespread on infertile substrate (e.g. quartzite) throughout region.
DRY-hOB	Heathy <i>E. obliqua</i> forest		O	Dry <i>E. obliqua</i> forest	B [#]	N	Occasional on well drained sites at low altitudes.
DRY-hVIM	Heathy <i>E. viminalis</i> coastal forest		G	<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	A [#]	Y*	May occur locally in coastal areas around Macquarie Harbour.
DRY-sdAM and DRY-scAM	Sedgy <i>E. amygdalina</i> forest/woodland Scrubby <i>E. amygdalina</i> forest/woodland		AC	Coastal <i>E. amygdalina</i> forest	B [#]	N	Very local on drainage lines and poorly drained flats on infertile sites. Recorded from Mt Murchison area.
DRY-sdGUN and DRY-scGUN	Sedgy <i>E. gunnii</i> forest/woodland Scrubby <i>E. gunnii</i> forest/woodland		C	<i>E. coccifera</i> forest	B	N	May occur on poorly drained flats and frost hollows at higher altitudes (e.g. Mt Pearse area).
DRY-sdNIT and DRY-scNIT	Sedgy <i>E. nitida</i> forest/woodland Scrubby <i>E. nitida</i> forest/woodland		N	Dry <i>E. nitida</i> forest	np [#]	N	Widespread on poorly drained and infertile substrate throughout region.

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Floristic community code and name		Qualification	RFA community code and name		Conservation priority		Distribution in West and Southwest Region
					Floristic	RFA	
DRY-sdOV and 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*	May occur locally on poorly drained flats, mainly at low altitudes.
DRY-sdROD and DRY-scROD	Sedgy <i>E. rodwayi</i> forest/woodland Scrubby <i>E. rodwayi</i> forest/woodland		RO	<i>E. rodwayi</i> forest	A	Y	Local on better drained flats adjacent to marshes and frost hollows at higher altitudes (e.g. Micklethwaite Marsh).
DRY-shAM	Shrubby <i>E. amygdalina</i> forest	.	AC	Coastal <i>E. amygdalina</i> forest	B [#]	N	Very local on flats on infertile sites. Recorded from Mt Murchison area.
DRY-shCOC	Shrubby <i>E. coccifera</i> forest		C	<i>E. coccifera</i> forest	np	N	May extend into eastern parts of the region on high altitude sites.
DRY-shDEL	Shrubby <i>E. delegatensis</i> forest		D	Dry <i>E. delegatensis</i> forest	B	N	Occasional on well drained upland sites that are relatively dry or exposed.
DRY-shGLOB	Shrubby <i>E. viminalis</i> coastal forest		G	<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	A [#]	Y*	May occur locally in coastal areas around Macquarie Harbour.
DRY-shNIT	Shrubby <i>E. nitida</i> forest		N	Dry <i>E. nitida</i> forest	np [#]	N	Occasional on drier sites throughout region (e.g. Norfolk Range).
DRY-shOB	Shrubby <i>E. obliqua</i> forest		N	Dry <i>E. obliqua</i> forest	np	N	Occasional on infertile sites in west of region (e.g. Heazlewood Hill) and drier or more exposed sites in the north (e.g. Milkshake Hills).
DRY-shSUB	Shrubby <i>E. subcrenulata</i> forest		SU	<i>E. subcrenulata</i> forest	B	N	Not recorded from region, but likely to occur locally at higher altitudes on dolerite and sandstone.
DRY-shVIM	Shrubby <i>E. viminalis</i> forest		G	<i>E. viminalis</i> and/or <i>E. globulus</i> coastal shrubby forest	A [#]	Y*	May occur locally in coastal areas around Macquarie Harbour.

Section 3 PRIORITY SPECIES

Species listed in this section have some priority for conservation, and are known or likely to occur in the West and Southwest 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).

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 (<http://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	Hs	<i>Persoonia gunnii</i> subsp. <i>oblanceolata</i>	Gunn's geebung
	R	Hs	<i>Persoonia muelleri</i> subsp. <i>angustifolia</i>	Mueller's geebung
Ferns	E		<i>Cyathea cunninghamii</i>	Slender tree fern
	V		<i>Pneumatopteris pennigera</i>	Lime fern
Herbs	R		<i>Australina pusilla</i> subsp. <i>muelleri</i>	Small shade nettle
	R		<i>Senecio velleioides</i>	Forest groundsel
Orchids	E		<i>Thynninorchis nothofagicola</i>	Myrtle elbow orchid
Grasses	R		<i>Ehrharta juncea</i>	Forest wire grass
Other monocots	R		<i>Carex gunniana</i>	Mountain sedge
Non-vascular	E		<i>Budophorum notatum</i>	Lichen
	R		<i>Calycideum polycarpum</i>	Lichen
	V		<i>Hypotrachyna laevigata</i>	Lichen
	E		<i>Menegazzia minuta</i>	Lichen

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

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
			<i>Eucalyptus globulus</i>	Tasmanian blue gum
	R		<i>Spyridium vexilliferum</i>	Winged spyridium
	R		<i>Westringia angustifolia</i>	Scabrous westringia
Herbs	R		<i>Stellaria multiflora</i>	Rayless starwort
Grasses	R		<i>Deyeuxia minor</i>	Small bent grass
Other monocots	R		<i>Uncinia elegans</i>	Handsome hook sedge

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	Hs	<i>Epacris curtisiae</i>	Curtis' heath
	E	Ms	<i>Epacris glabella</i>	Funnel heath

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Life form	Status	Pc	Botanical name	Common name
Trees & shrubs			<i>Eucalyptus</i> aff. <i>tenuiramis</i>	Silver peppermint
	E	Prb	<i>Hibbertia obtusifolia</i>	Hoary guinea flower
	E	S	<i>Lomatia tasmanica</i>	King's holly
	V		<i>Micrantheum serpentinum</i>	Serpentine micrantheum
	V		<i>Microstrobos niphophilus</i>	Microstrobos
	R	S	<i>Monotoca submutica</i> var. <i>autumnalis</i>	Round leaf broom heath
	R		<i>Muehlenbeckia axillaris</i>	Matted lignum
	R		<i>Orites milliganii</i>	Milligan's orites
	R		<i>Persoonia moscalii</i>	Moscal's geebung
	R		<i>Pimelea milliganii</i>	Milligan's rice flower
	R		<i>Planocarpa nitida</i>	Shiny cheeseberry
	R		<i>Planocarpa sulcata</i>	Furrowed cheeeseberry
	R		<i>Spyridium parvifolium</i> var. <i>parvifolium</i>	Australian dusty miller
Ferns	R		<i>Isoetes</i> sp. nova "Maxwell River"	Maxwell River quillwort
			<i>Lycopodiella serpentina</i>	Bog clubmoss
Herbs	V		<i>Brachyscome rigidula</i>	Hairy cutleaf daisy
	R		<i>Colobanthus pulvinatus</i>	Cushion colobanth
	R	Prb	<i>Comesperma defoliatum</i>	Leafless milkwort
	R		<i>Crassula moschata</i>	Musky crassula
	R		<i>Cullen microcephalum</i>	Dusky scurf pea
	R		<i>Epilobium pallidiflorum</i>	Showy willow herb
	E		<i>Euphrasia collina</i> subsp. <i>tetragona</i>	North coast eyebright
	R		<i>Euphrasia gibbsiae</i> subsp. <i>pulvinestris</i>	Gibb's eyebright
	R		<i>Geum talbotianum</i>	Mountain geum
	R		<i>Lepidium flexicaule</i>	Springy peppergrass
	R		<i>Lotus australis</i>	Austral trefoil
	R		<i>Parietaria debilis</i>	Pellitory
	R		<i>Oreoporphantha petalifera</i>	Hill poranthra
	R		<i>Ranunculus acaulis</i>	Dune buttercup
	R		<i>Rhodanthe anthemoides</i>	Chamomile sunray
	E		<i>Sagina diemensis</i>	Pearlwort
	R		<i>Scaevola albida</i>	Pale fanflower
	R		<i>Senecio squarrosus</i>	Rigid grassland groundsel
	R		<i>Stackhousia viminea</i>	Slender candlesticks
	R	Prb	<i>Stylidium inundatum</i>	White flowered trigger plant
	V		<i>Veronica novae-hollandiae</i>	New Holland veronica
	R		<i>Viola hederacea</i> subsp. <i>curtisiae</i>	Curtis' violet
	E		<i>Vittadinia australasica</i> var. <i>oricola</i>	Sticky New Holland daisy
	R		<i>Xerochrysum bicolor</i>	White alpine everlasting
Orchids	R		<i>Caladenia caudata</i>	Tailed spider orchid
	V		<i>Caladenia dienema</i>	Wind swept spider orchid
	V		<i>Caladenia patersonii</i>	Paterson's spider orchid
	R		<i>Caladenia pusillus</i>	Tiny caladenia
	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>Orthoceras strictum</i>	Horned orchid
	E		<i>Prasophyllum favonium</i>	Western leek orchid
	V		<i>Prasophyllum secutum</i>	Northern leek orchid
	E		<i>Pterostylis cucullata</i>	Leafy greenhood
	R		<i>Pterostylis falcata</i>	Sickle greenhood
	E		<i>Pterostylis rubenachii</i>	Arthur River greenhood
Grasses	R		<i>Agrostis australiensis</i>	Southern bent grass
	R		<i>Amphibromus neesii</i>	Swamp wallaby grass
	R		<i>Deschampsia gracillima</i>	Slender hair grass
	R		<i>Deyeuxia densa</i>	Heath bent grass
	R		<i>Lachnagrostis aequata</i>	Even blown grass
	R		<i>Lachnagrostis robusta</i>	Tall blown grass
	R		<i>Poa poiformis</i> var. <i>ramifer</i>	Island purple grass
	R		<i>Sporobolus virginicus</i>	Salt couch grass

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Life form	Status	Pc	Botanical name	Common name
Other monocots	R		<i>Baumea gummii</i>	Slender twig rush
	R		<i>Bolboschoenus caldwellii</i>	Sea club rush
	R		<i>Carex cephalotes</i>	Mt Eliza sedge
	R		<i>Carex hypandra</i>	Hypandra sedge
	E		<i>Centrolepis pedderensis</i>	Pedder centrolepis
	R		<i>Juncus amabilis</i>	Gentle juncus
	R		<i>Juncus prismatocarpus</i>	Branching rush
	R		<i>Juncus vaginatus</i>	Clustered rush
	R		<i>Lepilaena patentifolia</i>	Spreading water mat
	R		<i>Luzula atrata</i>	Dark woodrush
	R		<i>Milligania johnstonii</i>	Johnston's milligania
	R		<i>Milligania longifolia</i>	Pendant milligania
	R		<i>Triglochin minutissimum</i>	Tiny arrowgrass
Non vascular	R		<i>Ambuchanania leucobryoides</i>	Lichen
	R		<i>Calycideum cuneatum</i>	Lichen
	R		<i>Erioderma solediatum</i>	Lichen
	R		<i>Parmelina whinrayi</i>	Moss
	V		<i>Pseudocephaloza paludicola</i>	Liverwort
	E		<i>Rocellinastrum neglectum</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. Most of these sites are of low or marginal timber value, and are not suitable for forestry activities or agricultural development. Other sites may be of greater commercial interest, for example forests on basalt or areas with the potential to contain mineral deposits. Many of the sites of potential significance in the West and Southwest 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 the West and Southwest 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
Forested river flats and floodplains	<i>E. brookeriana</i> , <i>E. ovata</i> , blackwood, rainforest species, woolly tea-tree, paperbark	Variable	Variable	Priority communities	Arthur River floodplains, Henty River floodplains
Frost hollows and marshes (not buttongrass)	<i>E. ovata</i> , <i>E. rodwayi</i> , woolly tea-tree, paperbark	Variable, often scrubby, sedgy or grassy	Variable, often E5, S or Wg	Priority communities and species (e.g. <i>Epilobium pallidiflorum</i>)	Micklethwaite Marsh, Romney Marsh
Serpentinite landforms	<i>E. nitida</i>	Heathy, sedgy or scrubby	E4, E5	Priority species (e.g. <i>Micrantheum serpentinum</i> , <i>Epacris glabella</i>)	Bronzite Hill, Heazlewood Hill
Rocky outcrops including plates, large boulders, cliffs and scree fields	Variable	Variable	E5, S, Wr	Localised vascular and non-vascular species; susceptibility to disturbance	Granite Tor
High altitude vegetation	Rainforest species, non-forest species	Variable	Often S or Wr	Priority communities and species, and very fire-sensitive vegetation	Eldon Range, Mt Arrowsmith, Mt Dundas, Mt Read, Wylds Crag

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
Riparian forest associated with major rivers	Rainforest species, <i>E. obliqua</i>	Rainforest	S or T; >E3 often present	Priority communities and species (e.g. <i>Cyathea cunninghamii</i>) and fire-sensitive vegetation	Pieman River, Gordon River, Arthur River, Denison River
Coastal landforms (especially around Macquarie Harbour)	Variable e.g. <i>E. viminalis</i> , <i>E. globulus</i> , tea-tree, paperbark or none	Heathy, scrubby, shrubby, sedgy, or grassy	S, V, W	Priority communities and species (e.g. <i>Eucalyptus globulus</i> , <i>Stackhousia viminea</i> , <i>Cullen microcephalum</i>)	Henty Dunes

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, grasstrees), 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 the West and Southwest Region, including in reserves. 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. Fifteen of these are located in the West and Southwest Region, mainly in the World Heritage Area.

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 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.

There are very few areas of remnant forest or woodland in the West and Southwest Region that are potential candidates for forestry operations. Some remnants may be associated with settled areas and plantation nodes. Some remnant forests in the West and Southwest Region have the potential to 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 those with understoreys which have been 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. FPOs may need to consider if constraints in areas excluded from logging (within or adjacent to the FPP area) could affect practices in operational areas. Examples include where there may be constraints on burning or logging because of the presence of threatened species or communities susceptible to disturbance (e.g. relict rainforest).
4. 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.)
5. **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 5 ASSESSING THE BOTANICAL VALUES OF AN AREA

ATTRIBUTES OF AREA	QUALIFICATIONS	ACTION BY FPO
② Priority A or Y community (likely to be) present	In all cases	Contact FPA Botanist or Ecologist and supply details. Queries about operational areas should generally be referred to FPA Ecologist: <ul style="list-style-type: none">A botanical survey may be needed;Prescriptions or reservation may be needed to comply with flora requirements of the <i>Forest Practices Code</i>, RFA or other legislation or policies;Recommendations may depend on the intended land use following the operation as well as the flora values in the area.
② Priority Yog community (likely to be) present	If forest is oldgrowth	
② Priority B community (likely to be) present	If FPP area is proposed for conversion <u>or</u> if operation will affect priority A or Y communities or priority species outside FPP area	
② FPP will affect native non-forest vegetation	In all cases	
② FPP will affect forest communities that are very susceptible to <i>Phytophthora</i>	If prescriptions in <i>Flora Tech Note 8</i> can't be applied	
③ Priority species present or likely to be present	In all cases	
② Only non-priority communities and species (likely to be) present	If operation will affect priority communities, species or sites outside FPP area (or if community susceptible to <i>Phytophthora</i> is present)	
④ FPP will affect sites of significance (Table 4A): <ul style="list-style-type: none">Forested river flatsFrost hollows and marshes (not buttongrass)Serpentine landformsRocky outcropsHigh altitude vegetation	In all cases	
⑤ FPP contains <i>Phytophthora</i> record or is in <i>Phytophthora</i> Management Area	If prescriptions in <i>Flora Tech Note 8</i> can't be applied	
⑤ FPP in remnant forest	If conversion of native forest is proposed	
⑤ FPP adjacent to gazetted reserve, SMZ (flora) or other flora reserve	If planned operations (including regeneration burning) may affect flora values in reserve	No changes to FPP are needed to comply with flora requirements of the <i>Forest Practices Code</i>, RFA and other legislation or policies
IF ABOVE ATTRIBUTES + QUALIFICATIONS DO NOT APPLY		

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