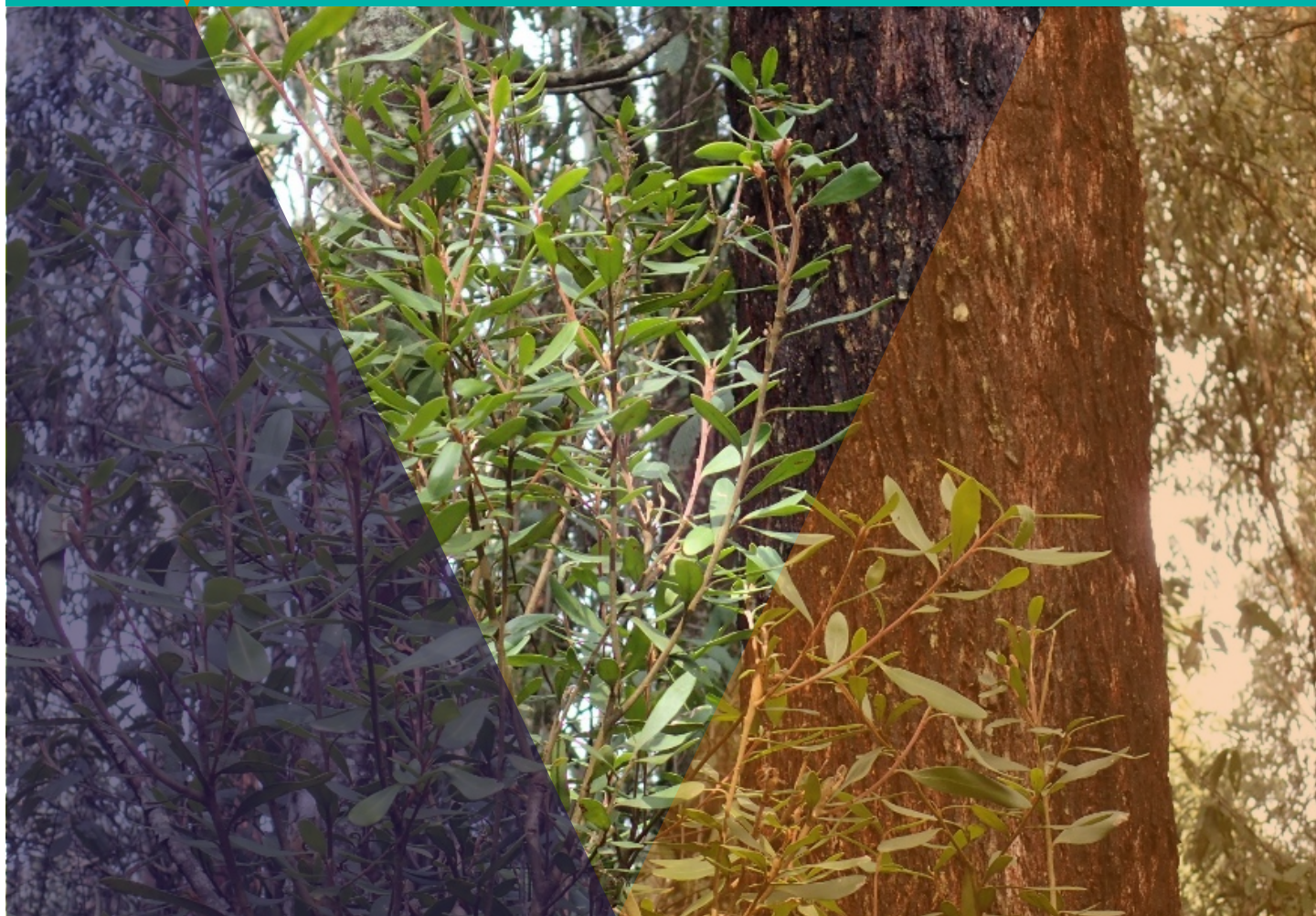


# Forest Protection Survey Program

Survey Guideline - Flora Survey (V4.1a)



## **Acknowledgements**

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## **Photo credit**

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# Flora Survey

## Context

Flora surveys are conducted to find identifiable flora species that may require protection on timber harvesting coupes. The Code of Practice for Timber Production 2014 (the Code) lists 325 flora species that are the principle target species for survey. Some additional species, such as those listed in the 2017 VEAC report “*Conservation Values of State Forests*” are also included as targets. However, many species listed in the Code are very cryptic or are quite unlikely to be detectable on coupes (e.g. many orchids) or are highly unlikely to be found in the types of forest harvested. Therefore, the list has been analysed and 76 species that have the highest likelihood of detection within areas planned for timber harvesting are identified in the flora data provided to further help focus survey effort on the most detectable species. All flora data are provided to contractors as a separate spreadsheet.

In addition to recording target species, vegetation communities or habitat features listed in the Code, contractors are required to record any other flora species or other values of interest, and to map vegetation communities of interest. These may include:

- species that are known to be rare or threatened but may not be on the list of target species
- species on the advisory list available at [https://www.environment.vic.gov.au/\\_\\_data/assets/pdf\\_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf](https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/50448/Advisory-List-of-Rare-or-Threatened-Plants-in-Victoria-2014.pdf)
- species that are at the very edge of their known range or that may constitute a new discretely disjunct population
- species that are previously unrecorded in Victoria
- vegetation communities or habitat features as specified e.g. Old Growth Forest
- other species and vegetation communities that the botanist considers to be of particular interest that may require protection from disturbance
- owl roosting and nesting sites
- species as advised by the FPSP team

Contractors are required to be cognizant of the broad habitat requirements of all flora species listed in the Code, or of interest, that potentially occur on or adjacent to coupes, prior to commencing field surveys.

A prioritisation process assists with the selection of which coupes to survey for which flora species. Inputs to this process include the detection probability of target species and habitat distribution models. Habitat distribution models have been generated that predict the likelihood of each prescribed species being found in a coupe. Note that only the 325 flora species that have a prescription in the Code are considered in the prioritisation process.

In addition to conducting flora surveys for target species and vegetation communities, Contractors are required to conduct at least one 20x20m quadrat in each coupe surveyed.

Contractors are also required to record target vegetation communities and selected habitat features outlined in this guideline.

## Objectives

To detect and record target flora species within, and adjacent to, identified coupes, that are able to be positively identified.

To record target vegetation observations within and adjacent to coupes e.g. quadrats.

To record habitat features of coupes

To record trees >2.5m DBH.

To collect specimens for later confirmation of identification or to submit as a specimen to a herbarium.

## Survey effort

Survey effort shall include:

- Conducting a desktop assessment prior to field survey as described below, to identify likely or unlikely presence of target species and vegetation communities on a coupe.
- Using the desktop assessment to determine likely habitat areas for the target species expected to be on the coupe. This will provide information as to where to focus survey effort on the coupe. Contractors are provided with the detection probabilities of the target species for each survey technique. Contractors are to target their surveys to those species with the highest detection probabilities in each coupe. The species with higher detection probabilities aid in determining the target species most likely to be detected by the survey technique and will thus inform survey parameters such as preferred habitat for survey, bait type, camera settings, etc.
- Conducting active searching on a coupe for target species. It is expected that field surveys will take between one to two days per every 30 hectares on average, and depending on number of target species, access and size of coupe.
- For each target species likely to be found in the coupe, checking their preferred habitat (i.e., rocky outcrop, wet drainage line, etc.) on the coupe.
- Conducting at least one general vegetation quadrat within each coupe as described below
- Collecting specimens for later confirmation of identification or for lodging of type specimens of unusual finds at the Herbarium.
- Vigilantly searching each coupe for target vegetation communities and recording sufficient information to determine whether a prescription trigger is met e.g. basal area, population extent, etc., as determined by the prescription in the Code.
- Recording of habitat vegetative features that may trigger a further survey or a management action e.g. potential presence of Old Growth, etc.

### Staff requirements

- Botanical or other relevant qualifications
- Extensive field flora survey experience
- Ability to collect flora voucher specimens to herbarium standards
- Ability to identify the target flora species

### Equipment for the technique

- ☐ Field data sheets or electronic recording device
- ☐ Site maps and aerial photos, and a search plan for the coupe
- ☐ Information about nearby, alternative coupes
- ☐ 10x hands lens
- ☐ Tape measure
- ☐ Digital or other Camera (with carry case, spare batteries, spare storage card) capable of including georeferencing data with each photo
- ☐ Diameter Tape
- ☐ Secateurs
- ☐ Plant tags
- ☐ Small paper bags/envelopes/ Voucher specimen containers
- ☐ Plant presses
- ☐ Newspaper and sheets of corrugated cardboard
- ☐ Pens, pencils, permanent thick black marker pen

### Survey preparation

Observers/contractors are expected to conduct a reasonable desktop assessment of each coupe prior to commencing field survey. Desktop assessment shall consist of the following as a minimum:



- Review the prioritisation results provided to determine list of target species in each coupe
- Review the flora target species list (available in the Flora Datasheet/form) to determine other flora species that may be potentially present but not prioritised for survey
- Ensure familiarity with the prescriptions for target species as outlined in the Code of Practice for Timber Production 2014
- Review the topographical location and layout of the coupe e.g. ridge, side slope, gully, etc.
- Review topographical aspects (north, south, etc.) and consider impact on vegetation community and target species presence/absence
- Using topographic maps, EVC maps and aerial photos, Google Earth, or any other source, determine what parts of the coupe are most likely to contain the most suitable habitat for any target species. These parts of the coupe will be the priority areas to search, and may include gullies, particular aspects, sharp breaks in slope, tops of embankments, etc.
- Note that areas recently burnt may also be of interest, as there may have been prolific post-fire germination, especially of uncommon obligate re-seeders
- Review information sources to understand as much as possible of each species' habitat requirements to predict where it may occur on a coupe if it is likely to be present at all
- Another source of species information is DELWP NatureKit. Load a shapefile of the coupes into NatureKit, or manually draw a polygon around each area of interest, check the species records that are found within that bounded area, and determine whether any of the species are on the prescribed list
- Some information is provided in the pre-harvest species datafile. Other sources of information include Flora of Victoria (<https://vicflora.rbq.vic.gov.au>), Viridans database ([www.viridans.com](http://www.viridans.com)), the Victorian Biodiversity Atlas ([www.vba.vic.gov.au](http://www.vba.vic.gov.au)), etc.

## Conducting the survey

Ensure all surveyors are familiar with the management action/prescription triggers within the Forestry Code of Practice e.g. is it a population, an individual or a growth stage that triggers a prescription? If the trigger or prescription is a population, then the population must be surveyed and mapped to enable decision making for application of the prescription.

Contractors are required to record a track log of the survey effort from the start to the end of surveying within each coupe. The track log is to be converted to a GIS shapefile and submitted with the shapefile attributes as outlined in the FPSP Standard Operating Procedure (note a shapefile template is provided by FPSP).

Navigate to the first pre-determined priority area of interest. Keep a continual eye out for any species that stand out as looking different or are less common. If you are unsure what species a plant is, record the location and other data required in the datasheet/form, take a specimen and identify it later. The rule of thumb here is, if you don't know what it is, it is probably uncommon and should be identified and its status determined. Such observations may be recorded as an "Interim" result in the "Results Status" field of the observation datasheet/form. Contractors are required to ensure the record is updated to "Confirmed" when positive identification is completed, and to inform the FPSP of this change in the data record.

At each area of interest, search for the target species identified during the desktop assessment. The plants may be on steep banks, in wet depressions, on shaded tree trunks, etc. As before, always keep an eye out for less common species or ones you don't recognise, as they might be on the prescribed list or be worth recording for other reasons of protection or interest.

If a target species or species of interest is detected, complete a full quadrat to record the typical vegetation in which the species is found. If no target species are found, undertake a general site quadrat as described below. If multiple target species are identified in a survey, undertake additional quadrats in the time available for each species of interest. Note that it is not required to conduct a quadrat for every occurrence of a species. If a particular target species was found in three separate locations in a coupe, only one quadrat for that species is required, unless the vegetation was very different at different locations within the coupe and there was enough time. Note, as outlined below that population extent data is also required to be mapped.

After all pre-determined areas of interest have been searched, do a general walk-through of the coupe to see whether any prescribed (or uncommon or unknown) species are detected.

### ***Recording species or other values observed***

If a target species is confirmed (or suspected) to be a target species or species of interest, record location details of the specimen as per the datasheet/form.

Contractors are required to submit at least one georeferenced photo of all observed flora species that are survey targets or of significance or interest and to include the general habitat area in which it is found in the photo, if possible. Record a Photo ID in the datasheet/form.

The extent of the population of identified target species or species of interest is to be surveyed and mapped in the field at the time of observation. To map the extent of a species population, determine and record the extent of the population within the coupe and up to 50 m outside the coupe boundary, recording data points at minimum 25 m intervals around the perimeter of the population (where practicable). Estimate the population extent where it is not practicable to map on ground. Population extent data are to be submitted as a GIS polygon shapefile for each discreet population recorded and shall be linked to the species observation in the datasheet/form and in the attributes table of the shapefile via the Polygon ID field.

Contractors are required to submit georeferenced photos of key identifying features of the habitat of identified target species or species of interest.

Record the estimated number (count) of individuals of the population (use whole numbers only, do not use < or > symbols), size of individuals, degree of reproductive maturity, and the habitat in which found, etc. in the comments section of the datasheet/form.

If further work is required to identify an individual to species or subspecies level, then take and label a plant specimen for later confirmation of identification.

Standard data shall be recorded in the datasheet/form for all incidental rare or threatened flora species found, to help improve their habitat distribution modelling.

Cover and Count fields are only required when recording data within a quadrat or when recording target species or species of interest and their populations.

### ***Plant specimens***

Plant specimens may be taken for the purpose of later identification or for lodging a specimen at an herbarium. Specimens may also be offered to the Herbarium at the Arthur Rylah Institute Ph: 03 9450 8600

The procedure and requirements for collection of information relating to the taking of plant specimens for lodging in a herbarium are to be consistent with the information provided on the Royal Botanic Gardens website <https://www.rbq.vic.gov.au/science/herbarium-and-resources/national-herbarium-of-victoria>, under 'Science', then 'Herbarium & Resources'. This includes information on collection and storage, how to press, what material are needed, what to put on the label, etc. The guidelines also include information about their (for fee) plant identification service.

#### ***Essential label information***

- Collector(s) name.
- A unique collecting number. The simplest system is for each collector to commence their numbering sequence with the number 1, and number their collections consecutively.
- Date of collection: e.g. 10 March 2019.
- Locality: place/area name, location name (could be coupe ID/name), description of location in reference to roads, road junctions and distance from nearest place/town name (e.g. Victoria, Errinundra Plateau. The Gap Scenic Reserve, Gap Rd, 3.9 km E of junction with Bonang Highway).
- Geocode: a latitude and longitude, MGA (Map Grid of Australia) coordinates or street directory reference (include the edition). It is helpful to indicate the source of the geocode, such as GPS or map, and the precision of the geocode (to the nearest 100 m, 1 km, etc.).

#### ***Other useful label information***

Note any information on characters and field observations that cannot be observed from the pressed specimen:

- Habitat: include a brief description of where the plant is growing (e.g. rocky outcrop, gully head; wet forest, etc.) and a list of other plants growing in association, if known.
- Habit: record the growth form (e.g. tree; shrub; vine; herb) and height (e.g. dense shrub to 2 metres high; sprawling herb). For trees, record the bark type and extent (e.g. rough bark up to 2 metres on main trunk,

smooth above). Bark type is especially important in *Eucalyptus*. Also record the colour of fresh stems, leaves, flowers.

- Abundance: number of plants at site. Frequency in the area (rare, occasional, frequent/common or abundant).

Collect plants in flower and/or fruit if possible. These are usually critical for identification.

- Make specimens large enough to present a fair sample of the plant, its manner of growth, branching and so on.
- With smaller plants, such as grasses, rushes, sedges, irises and lilies, collect whole plants (or a number of entire plants) including underground parts (i.e. bulbs, corms, rhizomes) still attached to aerial parts of plant.
- Specimens should be pressed when fresh (i.e. in the field). This results in better herbarium specimens, making them easier to identify.
- When pressing a specimen, carefully spread out structures (i.e. leaves, flowers) so that diagnostic features are clearly evident. Make sure that both the upper and the lower leaf surface are visible by turning over some leaves.

### Quadrats

When target species or species of interest are detected, at least one full quadrat of its typical habitat shall be undertaken as follows:

- Use the centre of the quadrat as the recorded location for each species identified in the quadrat
- Record a unique quadrat ID in the datasheet/form and assign to all observations within that quadrat.
- Estimate an area at least 20 m x 20 m centred around that point
- Record all vascular plant species rooted in or overhanging the quadrat, including canopy trees
- Estimate the Braun-Blanquet VBA cover class from the look up table in the datasheet/form..
- In the event that multiple species of interest are found, and their occurrence does not overlap, then multiple quadrats can be undertaken depending on the time available, prioritising prescribed species.
- Target species will not be found in all coupes or may not be identifiable in the field. In that instance observers are required to survey at least one full species quadrat in an area of the coupe:
  - representative of the predominant vegetation community on the coupe, a “typical” part of the coupe,
  - and/or that contains a suite of unusual species,
  - and/or in locations where the presence of rare/threatened (non-prescribed) species has been detected

## Vegetation Observations

### Observations of trees where DBHOB >2.5 m

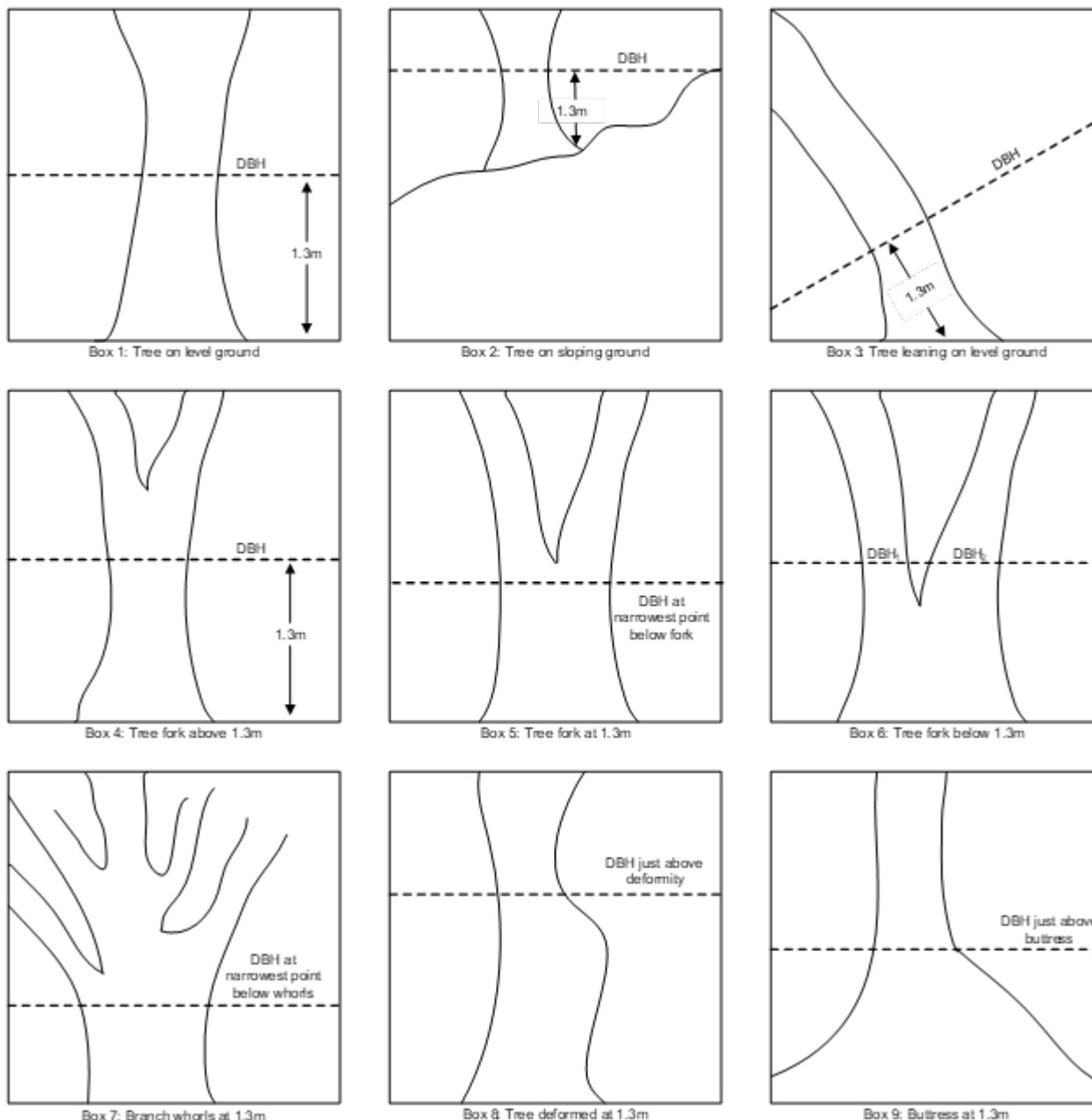
Measurements of trees with a stem diameter >2.5 m will be conducted as diameter at breast height over bark (DBHOB) at 1.3m above ground, see diagram below. Trees with a DBHOB >2.5 m are protected from harvesting and must be recorded in the data sheet.

Where trees with DBH >2.5m are being recorded:

1. please select “Trees >2.5m DBH” in the “ScientificName” column
2. there is no requirement to record cover or count for records of trees >2.5DBH (each tree >2.5DBH must be recorded separately)
3. then record the actual DBH measurement in centimetres in the “DBHOB (cm)” column,
4. then record whether the tree is alive or dead in the “Is Live?” column,
5. then record the “Tree Species Description”
6. The “Tree Species Code” data will then automatically populate.
7. Then record an additional separate record of each tree where DBH is >2.5m recording the **scientific name** of that tree. Include “cover” and “count” in this record if the record is within a quadrat.



Contractors are required to take a georeferenced photo of the diameter tape measure on the tree trunk indicating the measurement of the DBHOB, and to record the easting and northing of the location in the datasheet/form.



### ***Vegetation Community and Habitat Observations***

Contractors are required to record any instances within or adjacent to coupes where the presence of the following vegetation communities/values are observed in the field. Vegetation Community and habitat observations are to use the Scientific Name field to record the observation.

The extent of vegetation communities and habitats of interest is to be surveyed and mapped in the field at the time of observation. To map the extent, determine and record the distribution within the coupe and up to 50 m outside the coupe boundary, recording data points at around minimum 25 m intervals around the perimeter of the community or habitat (where practicable). Estimate the extent where it is not practicable to map on ground. Extent data are to be submitted as a GIS polygon shapefile for each discrete vegetation community or habitat recorded and shall be linked to the observation in the datasheet/form and in the attributes table of the shapefile via the Polygon ID field.

Record, in the observation datasheet/form, an easting and northing for the estimated centre point of recorded vegetation community polygons.

Contractors are required to record and submit several georeferenced photos of key confirming identifying features of the vegetation community.

### **Old Growth Forest**

All Old Growth (OG) Forest in Victoria is protected. Contractors are required to be familiar with the requirements for assessment of OG as outlined in the *Protection of old growth forest from timber harvesting Field Procedure*. If old growth is suspected to be present, then record the potential presence of Old Growth with comments to support the observation, in the datasheet/form and make a recommendation to FPSP for Old Growth survey to be conducted. There is no requirement to map the potential Old Growth as part of the flora survey.

### **Box Ironbark**

Selective harvesting is excluded from Box Ironbark forest in the East Gippsland and Gippsland FMAs. These forests are characterised by a canopy of box, ironbark and gum-barked eucalypts, growing to 25 m in height, over a sparse understorey of wattles, small-leaved and prostrate shrubs, herbs and grasses (EVC 61). The main tree species are Forest Red Gum (*Eucalyptus tereticornis*), Yellow Box (*E. melliodora*), Coast Grey Box (*E. bosistoana*), Red Ironbark (*E. tricarpa*), Red Box (*E. polyanthemus*), Blue Box (*E. baueriana*) and Yellow Stringybark (*E. muelleriana*). This vegetation community occurs on gently undulating rises, low hills and peneplains on infertile, often stony soils derived from a range of geologies.

### **Heathland**

Selective harvesting is excluded from Heathlands in East Gippsland and Gippsland FMAs and road construction is to be avoided. Heathlands are characterised by a dense layer of small-leaved shrubs, usually 1-2 m tall, over a ground layer of sedges, coarse lilies, rope-rushes, prostrate shrubs and herbs. In most places there are occasional small, short-trunked, spreading trees, to 15 m tall, which may form a sparse canopy on deeper soils. Three Ecological Vegetation Classes (EVC) are listed in the Management Standards and Procedures: Wet Heathland (EVC 8), Clay Heathland (EVC 7) and Riparian Scrub (EVC 191).

### **Montane Riparian Thicket**

Montane Riparian Thicket is protected in all FMAs. These stands contain at least 40 % canopy cover of Mountain Tea-tree (*Leptospermum grandifolium*). Key understorey species include Mountain Pepper (*Tasmannia lanceolata*) and a range of sedges, rushes and ferns. It typically occurs in montane and subalpine areas, often within Montane Damp Forest along drainage lines, streams with gentle gradients and in soaks at the heads of gullies on south-facing aspects (EVC 41). While most areas of Montane Riparian Thicket will already be protected within SPZs or Code exclusions, mapping of the extent of any patches of this vegetation type that are contained within the gross area of coupes will be required to check this assumption and identify any additional areas requiring protection.

### **Rainforest and Cool Temperate Mixed Forest**

Warm Temperate Rainforest (EVC 32) and Cool Temperate Rainforest (EVC 31) are protected from timber harvesting in eastern Victoria. There are extensive, existing processes for identifying and delineating rainforest patches, and these will continue to be used, rather than forming part of the forest protection survey program. Assessment will also be addressed under a separate DELWP project focused on RFA reform.

Contractors are required to record and report observations of Rainforest and Cool Temperate Mixed Forest (even if the upper canopy comprises mostly eucalypts) but are not required to map the extent unless this may be completed within the available time and it does not distract from surveying for target species and other vegetation communities. Rainforest may however be specifically surveyed for target or threatened plant species.

### **Glossy Black Cockatoo Habitat**

Cones of the Black She-oak (*Allocasuarina littoralis*) are the main food source of the Glossy Black Cockatoo in Victoria. Forest stands containing Black She-oak are therefore potential foraging habitat for this species, with the cockatoos preferring mature, sparsely distributed trees 2–10 m tall. Remnants of chewed cones and debris on the forest floor beneath these trees are an indication that cockatoos have been present. Glossy Black Cockatoos are generally considered to breed between March and August. They nest in large, old hollow-bearing trees and are known to use vertical or near-vertical spouts in senescent or dead trees. Nest sites are commonly clustered or grouped in the landscape.

If conducting flora surveys in the East Gippsland FMA, contractors are required to record any instances within or adjacent to coupes where the presence of a Black She-Oak stand (potential Glossy Black Cockatoo habitat) is observed in the field.

The definition of a Black She-oak stand is a group or groups of trees with a basal area equal to or greater than 10 m<sup>2</sup> in an area of 0.25 hectares.

If initial observations indicate presence of a potential stand the Contractor is required to determine whether the stand

meets the definition by mapping the perimeter of the stand and measuring the basal area/hectare within the stand.

## Data reporting requirements

Data requirements are outlined throughout this guideline and in the datasheet/form. Complete all required fields on the datasheet/form for each target observation.

- Record target flora species
- Record target species vegetation communities or habitat features listed in the Code
- Record any trees >2.5m DBH
- Record any flora species of interest
- Record the extent of flora populations within the coupe and up to 50 m outside the coupe boundary
- Record quadrat data
- Record a GPS track log for all survey work on coupe and submit as a Track Log shapefile
- Record and submit georeferenced photos and record a Photo ID
- Population extent data are to be submitted as a GIS polygon or polyline shapefile
- Where species identification requires post field survey effort, the observation is to be recorded in the "Results Status" field as "Interim"
- The FPSP does not accept records of inconclusive generic observations at family or genus level unless it is an interim observation pending a confirmed identification. All records must be to species or subspecies level.
- Record general comments about observations in the comments section.
- Ensure the CoupeID is entered correctly according to the survey package and in the format of xxx-xxx-xxxx
- Record your observations in the ObsAttributes page, with each observation being entered on a separate row.
- Ensure all **mandatory** fields are completed and in the correct format, failure to do so will result in submitted data being returned for review.
- A comprehensive list explaining the data entry fields and whether they are mandatory or optional can be found in the DataFieldsExplained page
- The TaxonIDLookUp page lists all VBA flora species list and some targeted vegetation communities e.g. Healthland, Cool Temperate Mixed forest or Trees >2.5m DBH
- When recording an observation, select "NotApplicable" or leave it blank, in those observation fields that are not relevant. For example if recording a vegetation community observation e.g. Old Growth, in Scientific Name field, then select "NotApplicable" in the Tree Species Description.
- **Please Note: As per the standard operating procedure, contractors are expected to submit highest quality data. Please ensure you double check your data entry before submitting data. Submitting incorrect or incomplete information will result in a delay to reporting and may impact on the program outcomes.**