Forest Protection Survey Program

Survey Guideline - Flora Survey (V5.2)

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Flora Survey

Context

Flora surveys are conducted to detect and record flora species, vegetation communities and/or habitat features.

In addition to recording specified target species, surveyors are expected to record 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 for that survey
- species that are at the edge or outside of their known range or that may constitute a new discretely disjunct population
- species that are previously unrecorded in Victoria
- unusual or unrecorded discreet vegetation communities or habitat features 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
- Trees >2.5BH

All surveyors are required to be knowledgeable of the broad habitat requirements of all flora species that are the target of the surveys, or of interest, that potentially occur on or adjacent to survey sites, prior to commencing field surveys.

A prioritisation process assists with the selection of which sites 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 habitat being present on a survey site.

Objectives

To detect and record target flora species within, and adjacent to, identified survey sites.

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

To record habitat features of sites

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, to identify likely or unlikely presence of target species and vegetation communities on a survey site.
- Using the desktop assessment to determine most likely habitat areas for the target species expected to be on the survey site. This will provide information as to where to focus survey effort on the survey site.
- Review of detection probabilities of the target species for each survey technique where these are provided. Surveyors are to target their surveys to those species with the highest detection probabilities in each survey site. 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.
- Conducting active searching on a survey site for target species. It is expected that field surveys will take about one day per every 30 hectares on average depending on the number of target species and their habitat, access, vegetation density, topography and size of survey site. This is based on one day per about 30 ha per two surveyors is reasonable provided the target species habitats have been desktop assessed and these habitats targeted for on ground survey.
- For each target species likely to be found in the survey site, checking their preferred habitat (i.e., rocky outcrop, wet drainage line, etc.) on the survey site.
- Conducting at least one 20 x 20m vegetation quadrat within each survey site as described below.

- Collecting specimens for later confirmation of identification or for lodging of type specimens of unusual finds at the Herbarium.
- Recording of habitat vegetative features that may trigger a further survey or a management action e.g. potential presence of Old Growth, etc.

Surveyor 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 survey site
- ☐ Information about nearby, alternative survey sites
- ☐ 10x hands lens
- ☐ Tape measure
- ☐ GPS
- ☐ Basal wedge
- ☐ 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

Surveyors are expected to conduct a reasonable desktop assessment of each survey site prior to commencing field survey. Desktop assessment shall consist of the following as a minimum:

- Review the target species lists and their detection probabilities (where provided) to determine potential habitat in and main targets for each survey site.
- 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.
- Review the topographical location and layout of the survey site 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 survey site are most likely to contain the most suitable habitat for any target species. These parts of the survey site 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 survey site if it is likely to be present at all.
- Another source of species information is DEECA NatureKit. Load a shapefile of the survey sites 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.
- Other sources of information include Flora of Victoria (https://vicflora.rbg.vic.gov.au), Viridans database (www.viridans.com), the Victorian Biodiversity Atlas (www.vba.vic.gov.au), etc.

Conducting the survey

Surveyors are required to record a track log of the survey effort from the start to the end of surveying within each survey site. The track log is to be converted to a GIS shapefile and submitted using the shapefile template provided.

It is recommended that surveyors create a GPS waypoint of the location of their vehicle prior to leaving the vehicle, to assist navigating back to the vehicle.

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. Surveyors are required to ensure the record is updated to "Confirmed" when positive identification is completed.

At each area of interest, search for the target species habitat identified during the desktop assessment. The target species 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. Include at least one individual of the target species within the quadrat.

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 you are 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 survey site, only one quadrat for that species is required, unless the vegetation is very different at different locations within the survey site and there is 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 survey site to see whether any prescribed (or uncommon or unknown) species are detected.

Recording species or other values observed

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

Record separate records for individuals where a maximum of 10 individuals of the target species are visible in a discreet population.

Where >10 individuals of a species are visible in a discreet population, record one record of the species in the centre of the population with a count of the total number of individuals, and then map the population.

The extent 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, walk the perimeter of the population recording data points at minimum 25m intervals around the perimeter (where practicable). Estimate the population extent where it is not practicable to map on ground.

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 the population continues >50m from a survey site boundary and there is insufficient time available to continue the population mapping outside the site boundary, please note this in the comments section of the datasheets and provide a recommendation for further survey to finalise mapping of the population.

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.

Population extent data are to be submitted as a GIS polygon shapefile for each discreet population recorded and shapefile attributes data must be consistent with species observation in the datasheet/form linked via the Polygon ID field.

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/or their populations.

Surveyors 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.

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 Victoria website https://www.rbg.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 materials 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 survey site 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 (to 5 decimal places), 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 of 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 survey sites 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 survey site:
  - representative of the predominant vegetation community on the survey site, a “typical” part of the survey site,
  - 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

Tree Geebung (Persoonia arborea)

For the purpose of this instruction, Wet Forest is defined as that area covered by the Tree Geebung Habitat Importance Model (HIM). Tree Geebung is a species that is often associated with Wet Forest but not exclusively so. This species occurs within a range of vegetation communities including most commonly in Wet Forest, occasionally in Damp Forest, Cool Temperate Rainforest and Shrubby Foothill Forest and infrequently in Riparian Forest.

Tree Geebung can grow to around 10m tall but may be overlooked despite its size due to the heavily vegetated habitat it occurs within. Tree Geebung can occur in habitat where understorey shrubby vegetation is highly abundant (i.e. 50-75% cover abundance or more), and this can make detection challenging even with <30m transect spacing. Accordingly observers must take the time to ensure they are able to observe as many Tree Geebung as may be present in the conditions in which they occur.

The protection (2023 court order) requires: *“a protective buffer comprising at least a 50m radius circle, measured in the horizontal plane, of undisturbed vegetation around each specified Tree Geebung within the survey site, with each specified Tree Geebung located at least 15m horizontally from the perimeter of that circle.”*

To conduct a specific Tree Geebung survey, the following applies.

1. Tree Geebung surveys are to be conducted by a person experienced in the identification of Tree Geebungs specifically. The observers must be able to distinguish between Tree Geebung and similar species with maximum confidence. Note that *Pittosporum bicolor* is very similar to Tree Geebung with a very similar tree outline shape and size, similar looking leaves from a distance and both species occupy the same habitat.
2. Tree Geebung surveys will consist of straight line transects spaced at a maximum of 30 metres apart.
3. Transects will be conducted within and to 50m distance beyond the perimeter of the survey site boundary.
4. Tree Geebung is more likely to occur along drainage lines and more moist areas, and far less likely to occur in drier parts of the survey site.
5. It is recommended that transects are located along the contour rather than up and down the slope to maximise fatigue management and thus enable more attention to the survey.
6. Transects may be assessed by an individual observer, however each observer must be accompanied by a second observer assessing an adjacent transect e.g. two observers surveying two transects at the same time working 30m apart. Observers must be always within UHF radio contact.

7. Observers may deviate off the transect line to record observations up to 15 metres from the transect line (or for safety and access reasons) however observers must ensure they are not double counting the same individual when surveying adjacent transects.
8. The entire survey is to be recorded on a GPS track log and the track log submitted.
9. Observers are to create a unique observation record for each observed Tree Geebung with a diameter at breast height over bark (DBHOB) of at least 10cm including the GPS location and at least one photograph of each individual observed.
10. Records of Tree Geebungs with a DBHOB < 10 cm must be recorded as individual records if it's an isolated individual, or one record for a group with the count of the estimated number of individuals recorded in the count field. Where a population is being recorded (count >5) that does not contain a Tree Geebung with DBHOB>10cm, then an estimate of the edge of the population shall be recorded in a GPS and a GIS polygon of the estimated extent of the population shall be submitted with the survey results data.
11. If deer damage is noticed on Tree Geebungs, please record this information in the comments field as "Deer damage" and submit a photo if possible.
12. Sections of the survey transect may be abandoned if safe access is not possible or if the site lacks visibility of suitable/potential habitat for the target species. If sections >100m are abandoned the surveyor is to record the start and end locations and times where a survey was stopped and restarted by splitting the original transect record into two new separate transect records. The reason(s) for abandoning a section of transect are to be recorded in the comments section.

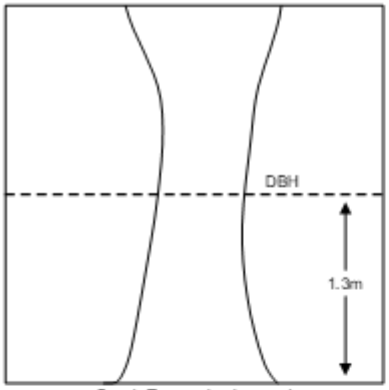
Observations of trees where DBHOB >2.5 m

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 in Victoria and all observations of trees >2.5m DBH must be recorded in the data sheet.

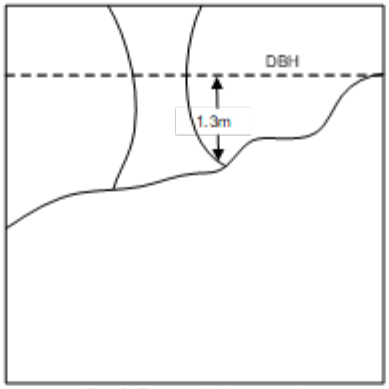
Where trees with DBH >2.5m are being recorded:

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 if identifiable. Include "cover" and "count" in this record if the record is within a quadrat.

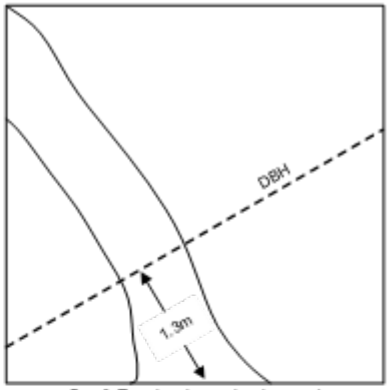
Surveyors are required to take a georeferenced photo of the diameter tape measure on the tree trunk indicating the measurement of the DBHOB, and to record the easting and northing of the location in the datasheet/form.



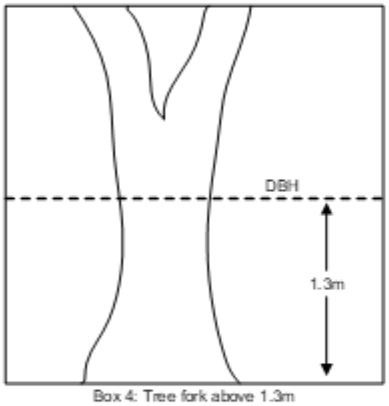
Box 1: Tree on level ground



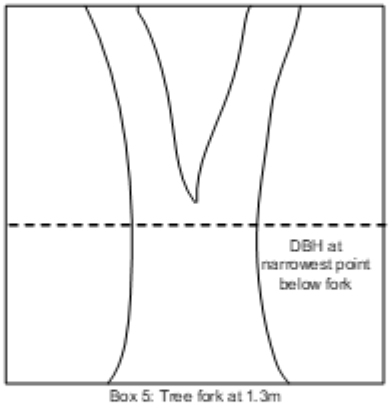
Box 2: Tree on sloping ground



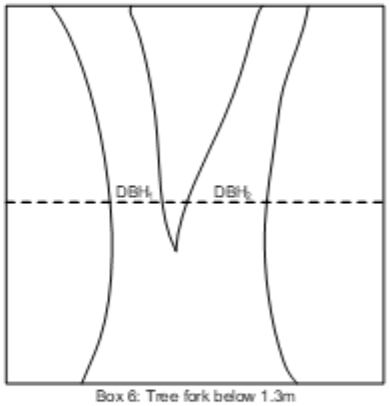
Box 3: Tree leaning on level ground



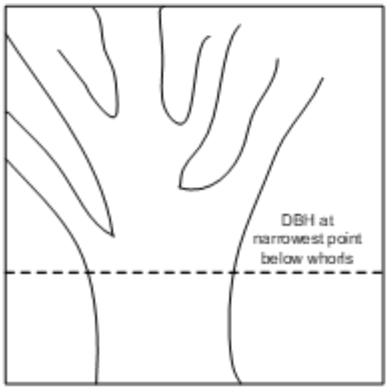
Box 4: Tree fork above 1.3m



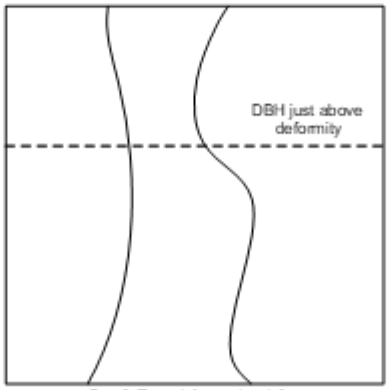
Box 5: Tree fork at 1.3m



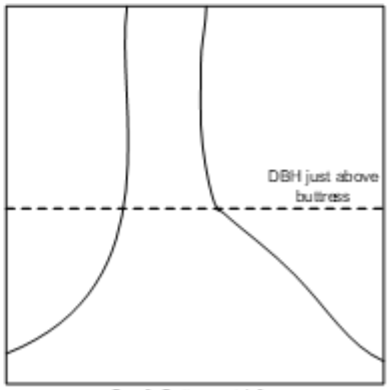
Box 6: Tree fork below 1.3m



Box 7: Branch whorls at 1.3m



Box 8: Tree deformed at 1.3m



Box 9: Buttress at 1.3m

Vegetation Community and Habitat Observations

Surveyors are required to record any instances within or adjacent to survey sites 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 survey site and up to 50 m outside the survey site 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 discreet 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.

Surveyors 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. Surveyors are required to be familiar with the requirements for assessment of OG as outlined in the *Survey Guideline - Old Growth Assessment*. 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 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

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. polyanthemos*), 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

Heathlands are characterised by a dense layer of small-leafed 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 target Ecological Vegetation Classes (EVC) are: 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 mapping of the extent of any patches of this vegetation type that are contained within the gross area of survey sites 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 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.

Surveyors 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, Surveyors are required to record any instances within or adjacent to survey sites 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^2 in an area of 0.25 hectares, measured using a basal wedge.

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, flora species of interest, vegetation communities or habitat features
- Record any trees >2.5m DBH.
- Map the extent of flora populations within the survey site and up to 50 m outside the survey site boundary.
- Record quadrat data for all mapped populations
- Record a GPS track log for all survey work on survey site 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”?
- Generally records of inconclusive generic observations at family or genus level are not accepted 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 SiteID or Survey site ID 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 of the datasheet.
- The TaxonIDLookUp page lists all VBA flora species and some targeted vegetation communities or other values e.g. Heathland, 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: Surveyors 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.**