



## Flora Technical Note No. 3: Collecting and preserving plant specimens

The *Flora Technical Note Series* provides information for Forest Practices Officers on flora management in production forests. These technical notes are advisory guidelines and should be read in conjunction with the requirements of the Tasmanian *Forest Practices Code*.

Technical notes can be accessed on the Forest Practices Authority's website: [www.fpa.tas.gov.au](http://www.fpa.tas.gov.au)

### 1. Introduction

The information in this technical note will help you collect and preserve plant specimens, and record features and information that will assist with accurate identification.

The notes are designed for people collecting good quality material that would be suitable as herbarium specimens. In many instances, when identification of a plant is the main reason for collecting, a lesser standard of material is acceptable. However, accurate locality records are important in case the species needs to be collected again or the record is significant.

We strongly encourage District and company offices to maintain a herbarium of plants commonly encountered in their working area. It is very important that workers involved in preparing Forest Practices Plans are familiar with overstorey and understorey species that are used to identify communities.

It is worth making the effort to preserve good quality material and make thorough notes. The extra time involved is not great. Forestry workers are in a good position to find interesting species and collect valuable location records because many of the places in which they work have not been surveyed by botanists. Attempt to identify the specimens yourself – it is good practice and will give you a greater appreciation of what material is needed to allow specimens to be accurately identified. *Flora Technical Note No. 2* indicates some of the most useful books for plant identification.

In the digital age, photographic images can be used to create a good substitute for a herbarium. The information in this technical note will indicate the most useful plant and site details to photograph.

### 2. Collecting specimens

- 1) Try to collect fertile material (with flowers, fruit or spores present).
- 2) For small herbs, grasses etc. collect the whole plant, or at least include the lower leaves in the specimen. The rhizome (underground stem) may be useful in identifying some ferns, grasses and sedges. Try to collect both the fertile and sterile fronds of ferns.
- 3) When collecting herbs or small-medium shrubs try to collect a portion of stem that shows the branching pattern.
- 4) Try to select specimens that appear typical for the plant (rather than rare, mutant oddities) and that are free from fungal infections or insect damage.
- 5) It may be useful to collect more than one specimen from a plant or locality:
  - collect both fruiting and flowering stems (if both present) on a plant or in an area
  - collect flowers/fruit from separate male and female plants for those species that have flowers of one sex only (e.g. native pepper)
  - collect adult foliage and flowers, fruit, buds and juvenile foliage from eucalypts
  - collect more than one specimen for small herbs, grasses etc. and for species that only carry a few flowers or fruit per plant

- collect duplicate specimens if you think you will need to send material to someone to confirm identifications.
- 6) Specimens should fit onto a foolscap page. For most species this will pose no problem, though some may have to be bent or folded. It is better to collect too much than too little – excess material can be trimmed or discarded when you press the specimens. When dealing with large fern fronds that cannot be preserved or displayed in their entirety (e.g. tree ferns), it is important to include the basal section, a mid-frond piece and the apex, and make a note of the total frond length.
  - 7) Unless you have a press on hand, put fresh specimens in a plastic bag. For weak herbs that may dry out (e.g. orchids) or specimens with flowers that wither quickly (e.g. many legumes), wrap the plants (or parts of the plant) in paper towelling and add a few drops of water. Just make the towelling damp, not soggy, or the plants could rot.
  - 8) Specimens should be stored in the fridge in a plastic bag if they cannot be pressed or identified immediately. They will stay fresh for many days.
  - 9) Information such as locality and habit (e.g. height, shape, life-form, etc.) is important – if you are collecting a lot of specimens, do not rely on your memory. Put specimens from different localities into separate bags and label the bags clearly. If several species are being collected, label the specimens with a numbered tag and write down details corresponding to that number in a notebook (details that should be recorded are given later in this technical note). Photographs can provide good information on some characteristics of the plant (e.g. form and bark type of a tree) or site (e.g. vegetation structure).
  - 10) If a species is rare or sparse in an area, reduce the amount of material you take so that the population is not adversely affected by your collecting.
  - 11) Plants cannot be collected in National Parks, State Reserves or other reserves managed by the Parks and Wildlife Service without a valid permit. There would normally be no reason for forestry workers to collect plants from such reserves. If a reason does arise, a permit can be requested by contacting the Senior Botanist, Nature Conservation Branch, Department of Primary Industries, Parks, Water and Environment (see end of this technical note).
  - 12) Species listed on the Tasmanian *Threatened Species Protection Act 1995* cannot be knowingly collected without a permit. A permit may be requested (see above), but will only be given if the reason for collection is deemed appropriate (e.g. research).
  - 13) Contact the Forest Practices Authority Biodiversity Program if you need clarification about permit requirements.

### 3. Information to record

- 1) Make notes on the location, habit and habitat of a specimen. The notes can help with identification of the species, and will also provide information on its distribution and ecology for future reference. (As mentioned above, photographs can be used to capture useful information).
- 2) It is better to provide too much information than too little. Table 1 outlines the type of information to record.
- 3) A sheet of labels for recording useful information on collected specimens is attached. The sheet can be photocopied and cut up as required. Alternatively, you can develop your own label to suit your purposes.
- 4) If you are sending several specimens to a herbarium or to someone for identification, it may not be necessary to fill in all the items on the labels. For example, if collection numbers 105, 106, 107 and 112 were all collected from the same locality, you could put 'as for 105' on those items in specimens 106, 107 and 112 which were also common to specimen 105.
- 5) Time may not permit all the items on a label to be completed. However, it is essential that the following items be filled in: Collector, Date, Tasmap Grid Reference.

**Table 1. Information that should be recorded for each plant collection made (essential items indicated \*)**

<b>Collector *</b>	Collector's name
<b>Date *</b>	Date of collection (day, month and year)
<b>Collection number</b>	The individual number for the specimen. The same number should be attached to the specimen or the newspaper sheet it is contained in. Note: collection numbers are provided by official herbariums.
<b>Location</b>	General locality (e.g. Nichols Cap, Tahune Forest Reserve).
<b>Grid reference *</b>	Australian Metric Grid (AMG) using map sheets or GPS. Note whether AGM or GDA has been used.
<b>Accuracy</b>	Indicate the accuracy of the grid reference (e.g. $\pm 100$ m if taken from 1:25 000 or 1:100 000 map; or accuracy recording using GPS unit).
<b>Habit</b>	Include information on size, shape and life-form of specimen (e.g. spreading 2 m shrub, prostrate herb, tussock-forming), appearance of flowers and fruit and other details used for identification (e.g. bark type of eucalypts). For trees, record approximate height, canopy width and trunk diameter at 1.2m.
<b>Abundance</b>	Extent of species at the site (e.g. rare, occasional, common).
<b>Landform</b>	For example: broad ridge, gully, upper slope, creek line.
<b>Rock type</b>	For example: dolerite, sandstone, alluvial gravels.
<b>Rock cover</b>	Surface cover of rock, boulders, gravel etc.
<b>Land use</b>	Present land use of site e.g. light grazing, selectively logged, none.
<b>Fire history</b>	Fire regime (e.g. frequent, occasional, rare) and period since last fire.
<b>Associated vegetation</b>	Vegetation type and dominants e.g. sedgy <i>Eucalyptus nitida</i> low woodland; <i>Eucalyptus obliqua</i> wet sclerophyll forest; gallery rainforest dominated by Huon pine.
<b>Notes</b>	Any other notes that may help identify the species (colour of flowers and fruit; bark type of eucalypts), or assist in understanding its distribution or ecology (e.g. numerous seedlings present two years after fire, heavily browsed by native animals). Also record colour of flowers and fruit.

## 4. Pressing specimens

- 1) Wash or brush soil off roots or other underground parts of the specimen (if applicable).
- 2) Put specimens between sheets of newspaper. Ideally, each species should be placed in a separate sheet. Paper towelling can help in the drying process when pressing wetter specimens – place a piece of towelling either side of the specimen before placing in newspaper.
- 3) Make sure specimens are clearly labelled. Labels can be inserted in the newspaper with the specimen or, if using collection numbers (provided by official herbaria), write an identifying or collecting number on the sheet (or on a tag attached to the specimen). Provide notes (see above) on a label which has the same identifying or collecting number (this allows the label to be traced back to the specimen).
- 4) Arrange specimens by bending, folding or judicious pruning so that when dried they can be mounted on a herbarium sheet. Springing stems may be held in place by slipping rubber bands or slitted strips of paper over the bent parts.
- 5) Try to arrange one or more leaves with the lower side uppermost.
- 6) Try to present the flowers so that some are seen in profile and some straight on, as this may assist in identification and research. Pale coloured flowers may take up the newsprint and fragile flowers may shrivel easily. Put tissue paper around such flowers so they maintain their colour and form and to pad them so they are not disfigured by other parts of the plant (this

applies especially to woody species). It is important to make notes on the flower colour: some colours (e.g. purples, pinks and reds) may change during pressing.

- 7) Make sure thick (woody) or fleshy specimens are surrounded by several sheets of newspaper or corrugated cardboard. This assists drying (fleshy specimens) and prevents other specimens having the imprint of a woody stem or fruits pressed into them (woody specimens).
- 8) Fruits can be pressed fairly easily if they are small or if the specimen is robust (e.g. eucalypt stems with nuts). For some species with large or fleshy fruits, some padding may be needed so that leaves and stems around the fruits are pressed at the same pressure as the rest of the specimen, or to assist in drying fleshy parts. Seeds often fall out of fruit as they dry (e.g. eucalypts, banksias, hakeas, she-oaks and daisies). The seeds can be stored in a small envelope or cellophane bag for later attachment to the herbarium sheet. Don't forget to label the separate envelope or bag with the seeds in it.
- 9) Put the stack of sheets in a press. It can be as simple as two pieces of 3-ply, with two bricks on top, or pressure can be applied by ropes or belts. You can create a more up-market model by drilling four holes through the wood (near the corners) and using long bolts with wing nuts to tighten the press.
- 10) **Do not put too much weight or pressure on the press.** Plants dry because their moisture is absorbed by the paper and is extracted by air passing through the sheets of paper. If too much pressure is applied to the press, there is no airflow and the specimens can go mouldy, particularly if they were wet to begin with or contain fleshy parts.
- 11) Leave your plants in the press until they are dry. For most plant species this takes 1 – 2 weeks.
- 12) If your specimens are fleshy or wet, check them after they have been pressing for a day and change the paper if it is damp. Check again after a couple of days and continue to change the paper if necessary.

## 5. Mounting and distributing specimens

- 1) If you are making your own herbarium:
  - Mount specimens on card (about the thickness of a manila folder). The size of the sheets should be about 35 cm long and 25 cm wide.
  - Arrange the specimen and label so that all parts of the plant are attractively displayed and information on the label is not obscured. Try to display both sides of leaves if they are different.
  - Use a glue stick to attach the label to the sheet. Glue such as Aquadhere is best for the specimen - usually only a few small drops of glue are necessary. Weights may have to be strategically placed on the specimen to hold it down till the glue has dried. Try not to use glue on parts of the plant that may be important for later research or identification (e.g. flowers, fruit, etc.). Don't use sticky tape because it will lift and stain with age.
  - Seeds can be enclosed in an envelope or cellophane bag. This should be attached to the sheet in a manner that allows the seeds to be extracted if necessary. Label the envelope or bag with the specimen name and site in case it becomes separated from the herbarium sheet.
- 2) If your specimens will receive a lot of handling (e.g. if you are making a reference collection that will be used by many people), enclose each sheet in a plastic sleeve to reduce wear and tear on the specimen.
- 3) Herbarium sheets can be kept in lever-arch or ring-binder folders (in plastic sleeves) or boxes. Folders are probably best. Arrange folders by natural groups (e.g. plant families, eucalypts, ferns etc.).
- 4) If you intend collecting regularly for an established herbarium (e.g. Tasmanian Herbarium) contact the curator to establish their requirements for specimens and notes. You may be sent a collection book for noting required information – this is returned to the herbarium when you send in the specimens.
- 5) If you have collected duplicate specimens for identification, just send one of the specimens in for verification and keep the other(s). Make sure that any specimens sent for identification or for inclusion in a herbarium are well packaged and that labels or relevant information are enclosed.

## 6. Assistance with identifications and further information

There are several resources available to help with identification of plant specimens.

- Keys, images and descriptions are available in various books (see *Forest Practices Authority Flora Technical Note No. 2* for some recommended publications and web sites).
- The botany section of the Forest Practices Authority website ([www.fpa.tas.gov.au](http://www.fpa.tas.gov.au)) has images of many Tasmanian vascular species. Navigate to the 'Plant Identification Kit' and then use the scroll down menus to locate images, either using common or scientific names.
- The search engine 'Google' ([www.google.com](http://www.google.com)) is good for finding species images. Simply type the genus or species name, hit return, and use the 'images' tab to view thumbnail pictures resulting from the search. Click on any of these to view an enlarged version.

The Forest Practices Authority Biodiversity Program can assist if you have trouble identifying a specimen, or would like an identification confirmed (see the end of this technical note for contact details). There are a few options for sending material or images:

- Post a fresh specimen in a plastic bag (two week old sprigs extracted from the pocket of Gortex jackets are not preferred).
- Post a pressed specimen, padded with newspaper or bubble wrap so it doesn't shatter en route.
- Email a photo or scanned image of the specimen (put a ruler alongside it to indicate scale).

Herbaria staff can help with identification, and are grateful for receiving good quality specimens with good location details. The herbaria contain reference specimens which can be used to verify the identification of submitted plants. The two main herbaria in Tasmania are:

The Tasmanian Herbarium  
C/- University of Tasmania  
Private Bag 4,  
Hobart, Tasmania 7001  
Phone: (03) 6226 2635

Queen Victoria Museum and Art Gallery  
Wellington Street  
Launceston, Tasmania 7250  
Phone (03) 6331 6777

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2.1	Feb 2011	Nina Roberts	Note: the wording of this document is identical to that approved by the FPA Biodiversity Manager in early 2010, except for the addition of document control information.

FAMILY .....  
SPECIES .....  
COMMON NAME .....  
COLLECTOR .....  
DATE ..... COLL. NUMBER .....  
LOCATION .....  
TASMAP ..... GDA / AGD  
GRID REF ..... mE ..... mN ± ..... m  
HABIT .....  
ABUNDANCE .....  
HABITAT  
Altitude (m) ..... Aspect .....  
Landform .....  
Rock type .....  
Rock cover ..... Drainage .....  
Soil description .....  
LAND USE .....  
FIRE HISTORY .....  
ASSOCIATED VEGETATION .....  
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OTHER NOTES .....  
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FAMILY .....  
SPECIES .....  
COMMON NAME .....  
COLLECTOR .....  
DATE ..... COLL. NUMBER .....  
LOCATION .....  
TASMAP ..... GDA / AGD  
GRID REF ..... mE ..... mN ± m  
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FAMILY .....  
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