

# ALEP

*Aboriginal Landcare Education Program*

4

## Collect, Prepare and Preserve Plant Specimens



Learning Guide

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Student name:.....

Student number:.....

# INTRODUCTION

Welcome to *Collect, Prepare and Preserve Plant Specimens*. This learning guide covers the process of collecting and preserving plants. You might need to be able to collect plants when working for councils, carrying out bush regeneration work, ranger work or when managing your own country.

Training should be completed on the job or out in the field. It is best to use native plants but weeds could also be used.

It is recommended you undertake *Recognise Plants* before doing *Collect, Prepare and Preserve Plant Specimens*. *Recognise Plants* will give you the plant identification skills needed and will introduce you to pressing and storing plants.

## EQUIPMENT REQUIRED

To complete this training you will need the following:

1. Appropriate Personal Protective Equipment (PPE).
2. Safety gear for field work including first aid kit, maps and water.
3. Secateurs, plastic bags, notebook and pencil and other equipment for collecting plants.
4. A plant press, newspaper, herbarium paper and glue or sticky tape for pressing and mounting plants.
5. Labels and pens, folders and boxes for labelling and storing plants.

## ASSIGNMENTS

There are three assignments you will need to complete.

Some of these assignments may go towards your final assessment.

Section	Assignment	Competent (C) Not yet competent (NYC)	Date Achieved
<b>Collecting Plants</b>	Assignment 1. Project Risk Assessment		
<b>Pressing and Mounting</b>	Assignment 2. Plant Collection Sheets		
<b>Labelling and Storing</b>	Assignment 3. Plant Collection (Herbarium)		



## 1A. INFORMATION ABOUT COLLECTING PLANTS

It is important when collecting plants to be able to identify them. We recommend you work through the learning guide for *Recognise Plants* first as it has lots of information about identifying plants, including references. Some good documents about collecting plants are:

- *Collecting and Preserving Plant Specimens, A Manual* (2006) by Tony Bean from the Queensland Herbarium.
- *Collect, Prepare and Preserve Weed Specimens* (2005) by Jane Morton from the Cooperative Research Centre for Australian Weed Management (Weeds CRC).
- *Northern Australia Quarantine Strategy Weed and Plant Collection Manual* (2007) by the Weeds CRC and Australian Quarantine and Inspection Service.

There is also a wealth of information available online.

1. The Australian National Herbarium is a good place to find out about herbariums.

 <http://avh.ala.org.au>

2. Australia's Virtual Herbarium is another place to find out information.

 [www.ersa.edu.au/avh](http://www.ersa.edu.au/avh)

3. The Northern Territory Herbarium is responsible for naming, describing, surveying and storing the flora of the Northern Territory.

 [www.nretas.nt.gov.au/plants-and-animals](http://www.nretas.nt.gov.au/plants-and-animals)

## 1B. COLLECTING PLANTS SAFELY

When collecting plants you should use sunscreen and wear a hat, sturdy shoes, a long-sleeved shirt and long trousers to keep the sun off. This is called Personal Protective Equipment (PPE).


Some plants are very poisonous or should not be handled for spiritual reasons. Always ask your elders or trainer before handling any plants. Wear gloves in case the sap, fruits, seeds or dust from dried seeds is toxic or causes allergic reactions on the skin. Wear a hard hat if there is danger from falling branches or fruit.

Follow your organisation's health and safety procedures when working and carry a first aid kit. Carry plenty of water for drinking and washing hands, especially if handling poisonous or irritating plants. Make sure your vehicle is properly maintained. Check all safety equipment such as radios and mobile or satellite phones before you leave to see if they are working properly.

Always inform your trainer or supervisor about where you are going and when you expect to return. Ideally you should not go out into the field with less than three people. Before you set off check the weather, road and fire reports for your local area. Bring maps and any permits with you.



Before you begin, use this checklist to confirm you have followed good safety procedures.

SAFETY CHECKLIST ACTIVITY		✓
Long trousers, shirt and boots		
Hat (hard hat if necessary) and gloves		
Sunscreen, insect repellent and sunglasses		
Water		
First aid kit		
Notified others and have phone/ 2 way radio		
Checked weather, road and fire reports		
Permits (if required) and maps		



Cycads are threatened species



## 1C. PERMITS AND PERMISSION

Before collecting any plant you will need to get permission from the landowner. Most landowners are generally helpful and you can collect plants without too many problems but always ask first. In many communities you may also need permission from local traditional owners before collecting any plants. Some plants may have special significance and should never be touched (e.g. totemic plants, local restrictions, local protocols etc.). Always seek local advice before you start collecting plants – not afterwards.

Various laws protect all plants listed as threatened, and some common plants which are harvested from the wild. The main laws are the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* and the NT Government's *Territory Parks and Wildlife Conservation Act 2006*. These acts conserve biological diversity, and prevent the extinction and promote the recovery of, populations of threatened animals and plants and ecological communities. They also aim to stop processes that destroy or threaten the survival of these threatened plants and animals. Information on threatened plants can be accessed online.



[www.nretas.nt.gov.au/plants-and-animals](http://www.nretas.nt.gov.au/plants-and-animals)

The Northern Territory Government has restrictions on what native plants and seeds can be collected and has a permit system for collecting wildlife, including plants. See this website for the latest details.



[www.nt.gov.au/nreta/wildlife/permits](http://www.nt.gov.au/nreta/wildlife/permits)

## 1D. WHY COLLECT AND PRESERVE PLANTS?

Western scientists often preserve a specimen of a plant (or a part of larger plants) by pressing, drying, and mounting on thick paper or board. Pressed and mounted plants won't go mouldy and are easier to identify. Plants preserved in this way can last for hundreds of years.

One of the most common reasons for collecting a plant specimen is to try and find out the name of the plant. To get accurate plant identification you will need to have a very good plant specimen. Sometimes pressed plants need to be sent off to a local or interstate herbarium for identification.

A plant collection (called a herbarium) can provide a useful library of plants about an area and can help with identifying other plants later on.

### ACTIVITY

In your group make notes on butchers paper about what type of plants you will collect. Ideas might be:

- Plants from a certain family (eg. grasses).
- Native plants from a certain area (eg. the woodland behind the school).
- Weeds from a certain area.
- Plants you can eat.
- Plants with a certain colour flower.

## 1E. EQUIPMENT NEEDED FOR COLLECTING

- Secateurs (maybe long handled secateurs for tall plants)
- Plastic bags
- Tags for attaching to plants (often called jewellers tags)
- Notebook for writing down information
- Pencil (or pen)
- Camera
- GPS unit

## 1F. COLLECTING PLANT MATERIAL

Important things to remember when collecting plants:

- Collect flowers, fruit, seeds and pods, and leaves using secateurs – try and keep all these attached to the twig.
- Make sure the plant is no bigger than 30 cm (so it fits into the newspaper for pressing and on to your herbarium paper when mounted).
- If you need to collect a larger part you can bend it to fit on the paper.
- If plants are small then a number may be collected to fill the newspaper page. For small plants sometimes you need to dig up the root as well.
- Only collect what you need.
- Attach a tag to the plant with a number (or write a number on the newspaper if pressing straight away).

You should write as much information down as possible in your notebook (or on the newspaper if you are pressing it straight away):

- The number on the tag and date.
- The name of the plant if you have worked it out.
- The place you collected it (include GPS reading if you have it).
- Who collected the plant.
- The habit of the plant – see section 3B.
- The habitat it was growing in – see section 3C.
- Any interesting features.
- The picture number from your camera if you took a photo.

It is important to press the plants as soon as you collect them to stop them drying out and wilting. If this is not possible then plants can be stored for a short while in plastic bags with a few drops of water inside to keep them cool.

- Don't put too many plants in the one bag as plant material can get mixed up.
- Make sure all the plants are labelled.
- If possible roll the plants up in wet newspaper before they are loosely packed in the plastic bags.
- Store all bags in an esky or the refrigerator to keep them cool.
- Don't leave the plastic bags out in the sun.



### ACTIVITY

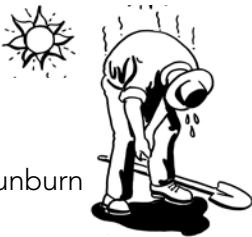


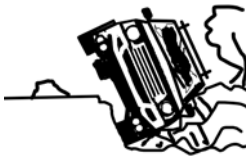

In your group practice collecting flowers and fruit from plants.



## PROJECT RISK ASSESSMENT



- Stop and think before starting work.
- What needs to be done so you can work safely?
- Complete the **What to do about it?** column – we have written one thing in each box – try and think of some others.
- Fill in all of the last row by adding a new hazard.

HAZARD and what can happen = the risk	What to do about it?
<p><b>SUN EXPOSURE</b></p> <p>Risk of: Heat exhaustion, dehydration and sunburn</p> 	<ul style="list-style-type: none"> <li>• Drink plenty of water</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<p><b>BITING INSECTS</b></p> <p>Risk of: Bites and stings</p> 	<ul style="list-style-type: none"> <li>• Use insect repellent</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<p><b>SHARP TOOLS</b></p> <p>Risk of: Injuries from being cut</p> 	<ul style="list-style-type: none"> <li>• Wear gloves</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<p><b>ROAD TRAVEL</b></p> <p>Risk of: Injury in vehicle accident</p> 	<ul style="list-style-type: none"> <li>• Wear seat belts</li> <li>•</li> <li>•</li> <li>•</li> </ul>
<p><b>POISONOUS AND PRICKLY PLANTS</b></p> <p>Risk of: Poisoning or skin injury</p> 	<ul style="list-style-type: none"> <li>• Wear long pants and shirt</li> <li>•</li> <li>•</li> <li>•</li> </ul>
	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>



## 2A. EQUIPMENT NEEDED FOR PRESSING AND MOUNTING

- Plant press
- Clean, dry, flat newspaper (or absorbent paper such as blotting paper)
- Cardboard
- Herbarium paper or blank stiff white paper (herbarium paper is normally 42 cm x 26 cm wide)
- PVA glue (white craft glue that dries clear) or sticky tape

If you do not have a plant press just put the folded newspapers containing plants in a pile on a flat surface such as a floor or table. Put a piece of plywood or other flat object on top of the pile and then a small weight such as a few books or a big brick.

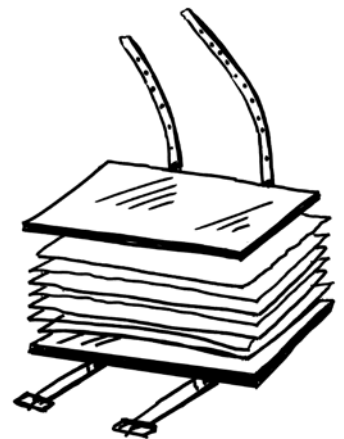
### ACTIVITY

Making A Plant Press.

- Get two pieces of plywood (other good ideas are old fridge shelves, louvred cupboard doors or even thick cardboard).
- A good size press is the same as a tabloid newspaper (like the NT News) – this is about the same size as herbarium paper.
- Cut pieces of cardboard up into the same size (about 10 pieces).
- The newspaper holding the plant goes between the pieces of cardboard.
- Bind it up tightly with a rope, bolts, belt or strap.



*A light weight field press will let you press plants as soon as you collect them.*



## 2 – PRESSING AND MOUNTING

### 2B. PRESSING AND DRYING PLANTS



1. Carefully position the plant sample on the newspaper, then fold the newspaper over the plant. Use a few newspaper sheets for each plant.
2. Put the newspaper between sheets of cardboard.
3. Place the newspaper and cardboard in the press. Do not use excessive pressure or weight when pressing, it is not necessary and may damage specimens.
4. Change newspaper at least every two days. More regular changing may be necessary in periods of high humidity. Put only dry paper in the press. If you do not have enough fresh newspaper then you will have to spread the damp papers out to dry.
5. Keep your press in the driest place you can find. In the wet season put it in air-conditioning or under a fan if you can. You could put it out in the sun during the day. The plants should be ready in about a week or two.

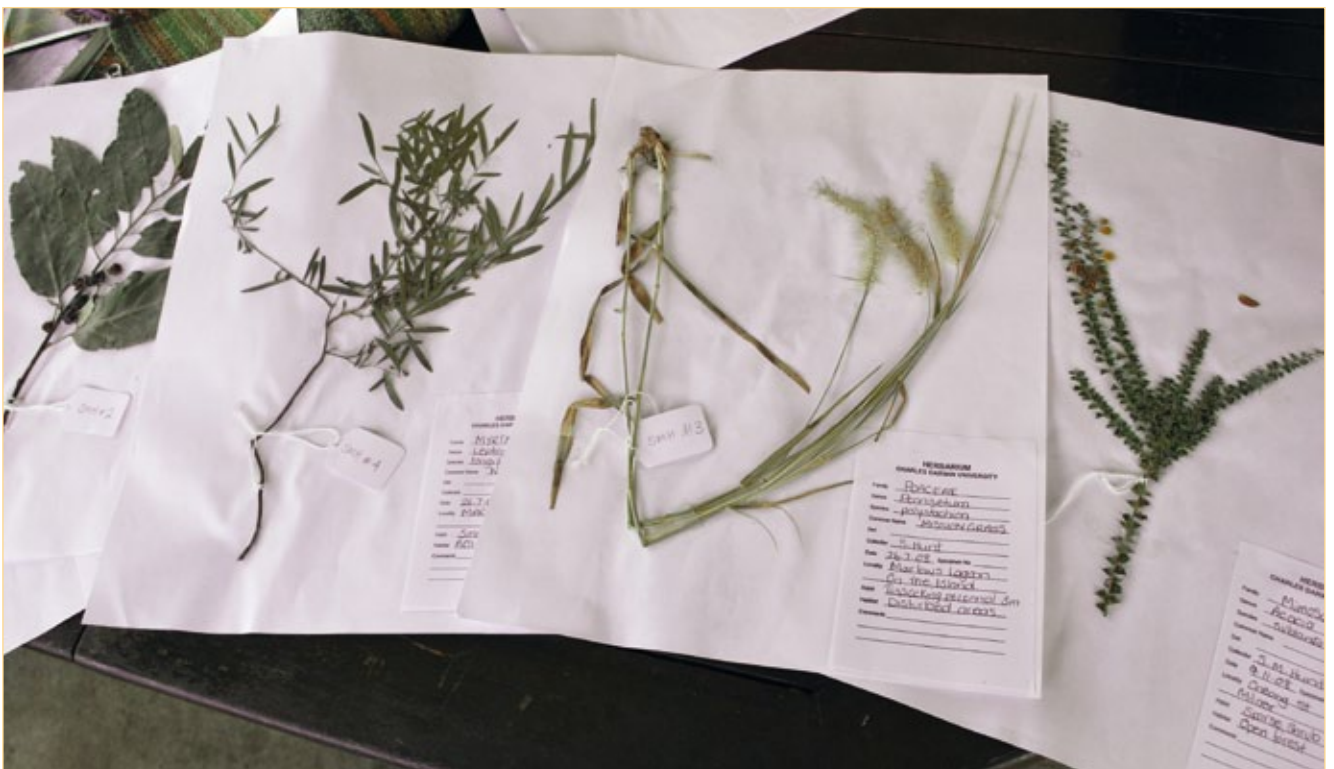
#### PRESSING TIPS:

- Delicate flowers can be placed between sheets of tissue paper for protection.
- Small delicate plants can be stored in alcohol rather than drying.
- All soil should be removed from the roots by brushing or washing.
- Long specimens such as grasses can be bent into a zig zag shape so that they fit in the newspaper.
- Large bulky fruits can be cut in half to save space.
- Spiny plants can be placed between extra cardboard and flattened by standing on prior to pressing.



## 2C. MOUNTING PLANTS

- Lay out the pressed plant neatly on the herbarium paper.
- Use the clear glue or sticky tape to stick the plant down.
- Do not mount plants until they are thoroughly dry or they will go mouldy.



## PLANT COLLECTION SHEETS

Collect, identify, press and mount 5 plants from your local area. Fill in this table about the plants.

Plant Feature	Plant 1	Plant 2	Plant 3	Plant 4	Plant 5
Botanical name					
Common name					
Local/ language name					
Draw or note any features of importance					

## 3A. LABELLING

Herbarium labels should be attached to the bottom right corner of the sheet. As much information as possible should be included on the label.

Sections 3B and 3C will help you with the habit and habitat parts. The Resource on page 16 will help you with plant identification words.

Example:

Family: MYRTACEAE
Genus: <i>Corymbia</i>
Species: <i>ptychocarpa</i>
Language or Common Name: Swamp Bloodwood
Identification: Smith, N. (2007) Native Plants for Top End Gardens p.80
Collector: Don Duggan
Date: 8 February 2008
Locality: Darwin airport 12.40681588 130.87766184
Habit: Large spreading tree to 10 metres high
Habitat: Riverine habitat on edge of woodland
Comments: Large leathery leaves

**Family:** Always written in CAPITALS.

**Genus:** Always type in italics or underlined if handwritten.

**Species:** Always type in italics or underlined if handwritten.

**Language or Common Name:** Use the name most used locally.

**Identification:** The reference source you used to identify the specimen. It could be a book, herbarium specimen or a person.

**Collector:** The person that actually collected the specimen.

**Date:** Date the plant was collected (date, month and year).

**Locality:** The precise place the plant was collected from. Include a GPS reference if you have one.

**Habit:** The growth form of the plant e.g. tree, shrub, vine, herb, fern, grass, parasite or epiphyte.

**Habitat:** The environment in which the plant is growing e.g. woodland, sandstone escarpment, coastal, mangroves, monsoon forest, riverine, wetland (if it is from a developed landscape describe it, e.g. cultivated field, parkland).

**Comments:** Any point you may feel is important or unique.

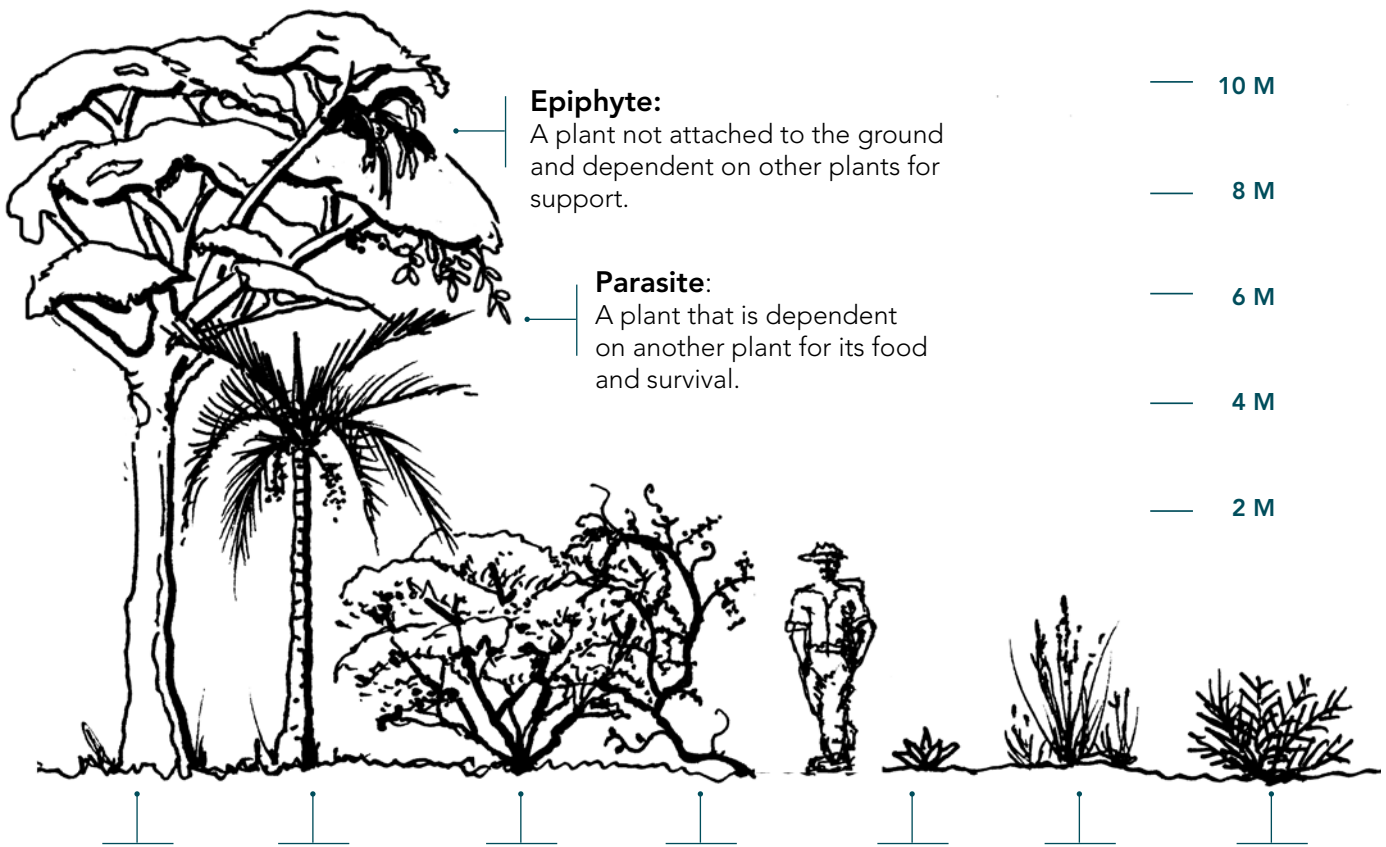
HERBARIUM CHARLES DARWIN UNIVERSITY	
Family	<i>Rhamnaceae</i>
Genus	<i>Alphitonia</i>
Species	<i>excelsa</i>
Common Name	Red Ash
Det	
Collector	S. Hunt
Date	26.7.08 Specimen No #2
Locality	Marlow's Lagoon
Habit	5-15m Tree
Habitat	ARTIFICIAL PARKLAND
Comments	

**ACTIVITY**

Make up at least 10 labels for your herbarium. You can use the example label from Assignment 3 and photocopy it, or design your own on the computer and print it out.

**3B. HABIT**

Habit refers to the shape of the plant.



**Epiphyte:**  
A plant not attached to the ground and dependent on other plants for support.

**Parasite:**  
A plant that is dependent on another plant for its food and survival.

**Tree:**  
A woody plant greater than 4 metres high with a single stem (tree shapes can be described as rounded, rectangular, like a cone, spreading, weeping or upright).

**Palm:**  
A tree crowned by large leaves shaped like hands with the fingers extended.

**Shrub:**  
A plant that is usually woody and multi-stemmed.

**Vine:**  
A plant that climbs or sprawls.

**Herb:**  
A small plant that is not woody.

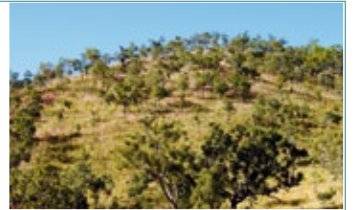
**Grass:**  
A plant having slender, strap like leaves (grasses can be described as clumping or spreading).

**Fern:**  
A flowerless, seedless plant with fronds that reproduces by spores.

### 3C. HABITATS

Often it is important to describe the habitat or the place the plant grows in. In the Top End there are seven main habitats.

**Woodland:** The most widespread habitat in the Top End, woodland has an overstorey dominated by eucalypts and an understorey mostly of tall grasses. It also contains many other trees, shrubs, cycads, grasses and herbs.



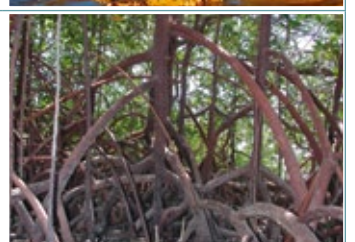
**Sandstone escarpment:** An escarpment occurs at the edge of a sandstone plateau. It is a rocky cliff-face that supports hardy woodland in the better-soiled areas, and spinifex in the drier, rockier parts. The plateau behind is covered by woodland vegetation, while waterfalls and gorges at the escarpment base support monsoon forests.



**Coastal:** Beaches and sand dunes line parts of the coast not fringed by mangroves and mudflats, and support a distinct coastal group of plants.



**Mangroves:** These plant communities form belts along the coast including tidal creeks and rivers. They are subjected to periodic inundation by seawater. Typically the mangroves grow in zones or belts of the same species, often parallel to the coast depending on the amounts of tidal inundation they receive. There are over 30 different species recorded from the Northern Territory.



**Monsoon forest:** These forests are dark green in appearance. Located in fire-protected areas around springs, water bodies, waterways, escarpment valleys, coastal areas and rocky outcrops, they typically cover small areas. They generally have a closed canopy with a sparse understorey including ground ferns, palms and saplings. Sometimes they are referred to as vine-forests and when found in gorges at the edge of escarpments are called gallery forests. Their structure varies considerably depending on water availability and soil type, those around permanent water on the deep-soiled lowlands (wet monsoon forest) being taller and more diverse than those found in coastal areas and on rocky outcrops (dry monsoon forest) where they may be thicket like in appearance.



**Riverine:** The Top End's rivers support corridors lined with a narrow belt of plants referred to as riparian vegetation. While some species are specific to this riparian habitat, many also occur in monsoon forests.



**Wetland:** The Top End's high rainfall produces large wetlands including floodplains and billabongs. The floodplains are extensive, flat and usually treeless. As the dry season sets in, water gradually recedes to the permanent billabongs. The edges of these permanent wetlands are fringed with trees.



## 3 – LABELLING AND STORING

### NOTE

To prevent insect attack the specimen may be frozen for 3 days every six months or so. Chemical insect deterrents are also available e.g. pest strips.

These will need to be replaced according to the manufacturer's instructions.



### 3D. STORAGE

Mounted specimens can be stored in any cardboard box however a Bx4 mailing box (43 cm X 30.5 cm X 14 cm), which is available from your local post office, is very suitable.

Individual herbarium sheets can be protected in the following ways:

- In clear plastic wallets.
- Sealed in contact.
- Laminated.
- In manila folders.

The specimens should be stored in alphabetical order by botanical name.

Keep the box in a cool dry place.

### 3E. RECORDING DATA

Ask your trainer if any further information needs to be written down.

Perhaps your community is making a herbarium and the plants need to be stored in a certain order (by plant name, family, location or colour maybe) – a list or catalogue will help find the plant later.

### 3F. DISPOSING OF UNWANTED PLANT MATERIAL

Unwanted plant material can be a health hazard, especially in relation to mouldy plants.

It is also important to remember that moving plant material can accidentally spread weeds. To stop this all unwanted material should be destroyed by burning or composting.

Some government agencies will accept unwanted weeds for incineration. These weeds need to be securely contained in thick plastic bags so they can be safely collected and transported.

#### Contact:

Weed Management Branch, NRETAS

[www.nretas.nt.gov.au/natural-resource-management/weeds](http://www.nretas.nt.gov.au/natural-resource-management/weeds)

Darwin and the Top End T: 8999 4567

Katherine T: 8973 8857

Alice Springs T: 8951 9210



**PLANT COLLECTION (HERBARIUM)**

Collect and present a plant collection (also known as a herbarium) for 10 local plants.  
Follow all instructions given by your trainer and the notes given on the previous pages.

**Example herbarium label:**

**Family:**

---

**Genus:**

---

**Species:**

---

**Language or Common Name:**

---

**Identification:**

---

**Collector:**

---

**Date:**

---

**Locality:**

---

**Habit:**

---

**Habitat:**

---

**Comments:**

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## RESOURCE: GLOSSARY OF BOTANICAL TERMS



**Alternate:** Leaf arrangement - leaves arising one by one along a stem.

**Annual:** A plant that germinates, grows, flowers and dies all in the one year.



**Anther:** Flower part - the part of the stamen in which the pollen is produced.

**Aril:** The material surrounding some seeds.



**Axillary bud:** Leaf part - a leaf bud that develops where the petiole meets the stem.

**Berry:** A simple pulpy or fleshy fruit with many seeds.

**Capsule:** A dry fruit that splits apart at maturity to release seeds.

**Conical:** Cone-shaped.

**Crown:** The live branches of a tree.

**Deciduous:** A plant with leaves that fall seasonally.

**Erect:** Upright or upwards habit.

**Evergreen:** A plant that keeps its leaves all year long.

**Family:** A group of related genera.



**Filament:** Flower part - the stalk in the stamen that holds the anther.

**Genus:** A group of related species (the plural is genera).

**Inflorescence:** The group or arrangement of flowers on the plant.



**Leaflet:** Leaf part - portion of a compound leaf.

**Lobe:** Leaf part - a divided portion of a leaf.



**Node:** Leaf part - the place on a plant stem where a leaf is attached.



**Opposite:** Leaf arrangement - leaves borne in pairs on opposite sides of the stem.



**Ovary:** Flower part - female reproductive part of a flower.



**Perennial:** A plant that lives for more than two years.

**Petal:** Flower part - often the largest and most colourful single part of the flower.

**Petiole:** Leaf part - the stem-like part that holds the leaf blade.



**Phyllodes:** A flat structure that performs the same function as a leaf especially in Acacias.



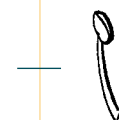
**Pod:** Flat or cylindrical dry fruit that splits open on two sides when mature to release seeds e.g. like a pea or bean.

**Prostrate:** Lying flat along the ground.

**Rhizome:** An underground stem.

**Species:** Name of a group of plants capable of interbreeding.

**Stamen:** Flower part - male flower part comprising anther and filament.



**Stigma:** Flower part - female part that catches pollen.



**Stipules:** Leaf part - a paired structure found at the base of the leaves.



**Style:** The female part of the flower that connects the stigma to the ovary.



# ALEP

**Aboriginal Landcare Education Program**

**ALEP Learning Guides.** These full colour, step-by-step guides provide practical, easy to follow instructions. Based in the Top End of the Northern Territory, they can also be adapted to other regions.



#### GETTING READY

1. ALEP Learning Guides – Trainer's Guide
2. Carry Out Natural Area Restoration Works

#### RECOGNISING PLANTS

3. Recognise Plants
- 4. Collect, Prepare and Preserve Plant Specimens**

#### GROWING PLANTS

5. Collect, Treat and Store Seed
6. Maintain Properties and Structures
7. Install Micro-irrigation Systems
8. Undertake Propagation Activities
9. Pot Up Plants
10. Tend Nursery Plants

#### MANAGING COUNTRY

11. Treat Weeds
12. Install, Maintain and Repair Fencing
13. Plant Trees and Shrubs
14. Perform Basic Water Quality Tests

**In this learning guide, *Collect, Prepare and Preserve Plant Specimens* you will learn how to:**

- COLLECT PLANTS
- PRESS AND MOUNT PLANTS
- LABEL AND STORE PLANTS

ISBN: 978-1-875345-97-7 (2012)

For further information contact Greening Australia (NT) Ltd on  
(08) 8947 3793 or [info@nt.greeningaustralia.org.au](mailto:info@nt.greeningaustralia.org.au) or go to [www.greeningaustralia.org.au](http://www.greeningaustralia.org.au)



Australian Government

**Greening Australia**

