ALEP

20

Aboriginal Landcare Education Program

OBSERVE & REPORT PLANTS AND/OR ANIMALS

CONTENTS

PUBLICATION NOTES

The second series of ALEP Guides is aligned with a number of units of competence from the *Training Package AHC10 – Agriculture, Horticulture and Conservation and Land Management* (Release 8.0). The units selected are frequently used within Certificates I to III in Horticulture and Conservation and Land Management. As such they cover, where possible, the elements, performance criteria and required skills and knowledge of each unit.

The principal goal of these resources is to support the learning process; the learning activities may complement a trainer's assessment plan. The intent is that they will be used in an interactive manner with learners rather than as self-paced study guides. The structure and sequence have been designed to follow the logical steps of the practical tasks wherever possible. Concepts are introduced and then consolidated with discussion and/or practical activities.

The writers consider that these guides can provide a sound technical foundation but also strongly encourage trainers to complement the guides with additional, authentic resources from relevant industry texts and websites. The guides can be used in part or in their entirety but should always be linked to practical activities to strengthen the teaching and learning.

Genuine consideration was given to the level of language used in the guides. The goal has been to find a balance between simplifying the language to an accessible level and ensuring that the vocational concepts are addressed. The writers contend that with appropriate support these texts can provide an opportunity for students to strengthen their language, literacy and numeracy skills, which may be required for pathway progression.

A number of Aboriginal people have been involved in developing this ALEP Guide, which is considered suitable for use within a program based on Aboriginal pedagogies.

INTRODUCTION

Welcome to *Observe and report plants and/or animals*. In this unit you will observe, record and report on the presence of plants and/or animals in your region. This will include those that are threatened, notifiable or not often seen in your region.

This learner guide will provide a structure for learning how to conduct a survey, record data and report information. The species you observe will vary between regions, and the procedures you follow will vary between workplaces. It is necessary that the learning for this unit is also done practically in the workplace.

It is recommended that learners study the units *Recognise plants* and *Recognise fauna* before starting this unit, as they provide strong foundations for the content of this unit. There are ALEP Guides for both of these units. This guide assumes the learner has developed a basic understanding of classification and scientific naming conventions.

EQUIPMENT REQUIRED

To complete this training you will need the following:

1. Appropriate Personal Protective Equipment (PPE)
2. A range of plant and animal references, including texts and experts
3. Access to the internet for research (preferred, but not essential)
4. Equipment needed for chosen survey method

LEARNING ACTIVITIES

There are four kinds of activities to complete. These activities may go toward your final assessment.

SECTION	ACTIVITY	SATISFACTORY (Y/N)	DATE
RESEARCH ACTIVITIES			
2.2	Assessing importance of species		
2.6	Fauna in the local area		
DISCUSSION ACTIVITIES			
1.1	Hazards in survey work		
1.3	Standard Operating Procedures		
1.4	Reasons for conducting a survey		
3.1	Interpret data		
3.3	Effective reports		
WORKBOOK ACTIVITIES			
2.3	Botanical terms		
2.3	Plant genera		
3.2	Using a grid reference on a map		
PROJECTS			
1.9	Plan a survey		
2.5	Participate in a plant survey		
2.8	Participate in a fauna survey		
3.3	Report on a plant or fauna survey		

1 GET READY

A HAZARD is anything that can cause injury to or damage the health of a person or animal. RISK is the chance of a hazard causing injury.

The most common way to observe and report on plants and animals in a workplace is by doing a survey.

1.1 WORKPLACE HEALTH & SAFETY

With every job, you and your work team need to think about the hazards involved and ways to minimise the risk of harm. The things you wear (PPE) and the things you do to minimise risk are called **controls**.

There may be hazards specific to survey work, depending on the kind of survey you are doing.

HAZARDS	CONTROLS
Irritation or allergies from plants	• Learn about any poisonous plants or plants that could trigger allergies • Wear gloves, safety glasses, long sleeves, trousers and safety boots
Animal scratches or bites causing injury and/or infection	• Learn how to safely handle animals • Disinfect hands after handling animals or scats • Pay special attention to where you are walking • Have a well-stocked first aid kit, including dressings and disinfectant
Trips, slips and falls	• Pay special attention to where you are walking, because your attention is often on other things such as looking upwards
Pointy plant material	• Wear safety glasses • Be aware when you are walking, bending down, turning

Many of the other hazards with survey work will be the same as other jobs where you:

• Work outside
• Travel away from your base
• Travel in remote areas

DISCUSSION ACTIVITY

What are the hazards you need to think about if you are planning to drive away from base to do a survey? What controls can you apply to minimise the risk of harm?

HAZARDS	CONTROLS
....	....
....	....
....	....
....	....

1.2   LEGISLATION

When doing a survey you will be working under several state or national laws. The legislation you need to follow depends on where you are living and the kind of survey you are doing. Below are the previous ALEP Guides that include sections about each relevant area of the law. It will be useful for you to revise the sections in these guides.

Participate in OHS processes

WHS legislation

Participate in environmentally sustainable work practices

Sustainability legislation

Recognise fauna

Legislation

PERMITS & ETHICS APPLICATIONS

In some states and territories, collecting any specimens of native plants or animals requires a permit. You always need to get a permit for survey work where you will take specimens of protected species.

The ethics approval will detail:

- Why you are doing the survey
- How you will do the survey
- Who is involved in the survey

Your supervisor or partner organisation will usually take care of getting the required permits. You need to know if you are working with a permit and if there are any restrictions.

CULTURAL PERMISSION

It is very important to check if approval is needed from the Aboriginal owners of the site you are visiting. Some sites should not be visited by men, others not by women, or not at particular times of year. Sometimes you will need to take the custodian of that place with you on your trip.

In some Aboriginal cultures, taking parts of certain plants or sharing certain knowledge is forbidden. To show respect, always listen to and follow the instructions given by the custodian about what you are allowed to do.

The chairperson of the local community council can tell you who you need to speak with about a particular area.

NOTE

In some states and territories, your workplace may need to get a permit or ethics approval to trap any mammal.
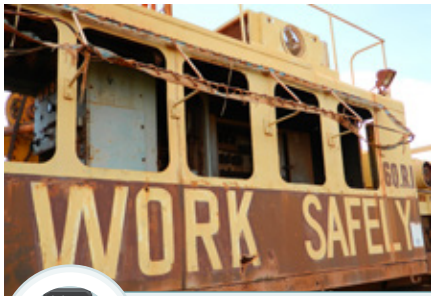
1.3 WORKPLACE PROCEDURES

Workplace procedures are written to help you and your work team follow the law, protect the area you are working in and make sure you work safely.

Your work team should also help your supervisor to do the Job Safety Analysis (JSA) before you start.

DISCUSSION ACTIVITY

Does your workplace or partner organisation have a Standard Operating Procedure (SOP) for doing plant or fauna surveys?

If yes, read through the SOP as a group.

If not, work with your trainer and supervisor to develop a SOP that you can use in the future. You may be able to get a sample one from your state department of parks and wildlife or equivalent.

See the *References* section for examples: Brocklehurst et al. (2007), Clarke (2009)

NOTE

Data from the first survey done in a particular area is called baseline data. It tells us current conditions and numbers of species.

Results from future surveys can be compared with baseline data. This gives information about changes resulting from fire, development, pollution, etc.

1.4 PURPOSE OF SURVEY – WHY

There are many reasons why your workplace might organise a survey. You might do routine surveys of the region as part of your everyday operations for the following reasons:

- Employee familiarisation with the region's species
- Monitor biodiversity
- Monitor pest species
- Monitor regeneration (e.g. after a fire or as part of a project)
- Monitor vulnerable, threatened species
- Gather baseline data
- Ethnobiological research (e.g. looking at bush tucker species)

Or it might be a project for an outside organisation that is interested in:

- Scientific and/or higher education research
- Proposed development of the region
- Mapping
- Development of reference guides
- Ground truthing (checking findings from satellite and aerial images)

DISCUSSION ACTIVITY

What are some of the reasons your workplace has been involved in survey work in the past?

....

....

1.5 EXISTING INFORMATION

It can be helpful to find any relevant existing information before doing the survey.

You can find out if there have been previous plant and/or animal surveys done in the region by:

- Searching the internet

- Contacting your regional parks and wildlife services

- Contacting other organisations active in your area, e.g. World Wildlife Fund, CSIRO, Greening Australia, NRM groups

It is also useful to ask people who have knowledge about the region, e.g. Aboriginal elders, community rangers, special interest and other community groups, such as bird watchers and bush walkers.

1.6 LOCATION – WHERE

If the purpose of your survey is to monitor and document a particular area, then you will already know your location. However, if you are looking for something specific, such as a threatened species, then you need to know where this species lives so you can find it. To work out the location, you need to think about the following things.

PLANTS

- What is its habitat? e.g. woodland, escarpment, watercourse, spinifex plains, coastal, mangroves, etc. (see ALEP Guide *Recognise plants* for general information about habitat)

- Soil and rock types, e.g. clay, sand, dolerite, granite

- Plant associations – what other plants does it generally grow around?

ANIMALS

- What is its preferred habitat?

- What are its food sources? Where are they found?

- Migration/residency patterns – where can it be found at this time of year?

If you don't know this information, then you might need to do some research to find out.

- Speak with the groups mentioned above

- Use reference books

- Refer to previous survey reports

1.7   SEASONS – WHEN

Ideally, survey work is done over several years as the prevalence of plants and animals in particular locations varies over time. To work out the best time of year to find a target species, you need to think about a number of factors.

ACCESS TO LOCATION

When are roads or tracks okay to travel on? Think about river crossings, floodplains, washouts, etc.

FLOWERING & FRUITING TIMES

It may be easier to find plants when flowering or fruitng, so learning about this will help you work out when they are best to survey. For example, if a plant flowers after winter rain, it will be better to look for it in spring.

If looking for fauna, it will also be useful to know if the target species feeds from a particular plant's flowers or fruit and time your survey to fit in with this. This information can also assist with identifying the most suitable location.

PLANT CHARACTERISTICS

Is the target species annual, perennial, deciduous, etc.? It is easier to find and identify a plant when it is actively growing than during a period when it has died back or dropped its leaves.

WEATHER EVENTS

Droughts, floods, rains and cyclones affect the location of fauna and prevalence of plants. If you understand how the target species is affected by these events, it can help you work out when it is best to do a survey.

IMPACT OF FIRE

If fire has damaged a habitat, then you might need to wait until the following year. Some plant species, however, grow quickly after fire and this may bring animals into the area. You need to know how your target species is affected by fire.

BREEDING & MATING TIMES

If you know that certain animals breed in a particular location during a particular season, this will be important in working out when best to do your survey. You don't want to disturb animals at these important times, but it may be safe to observe them.
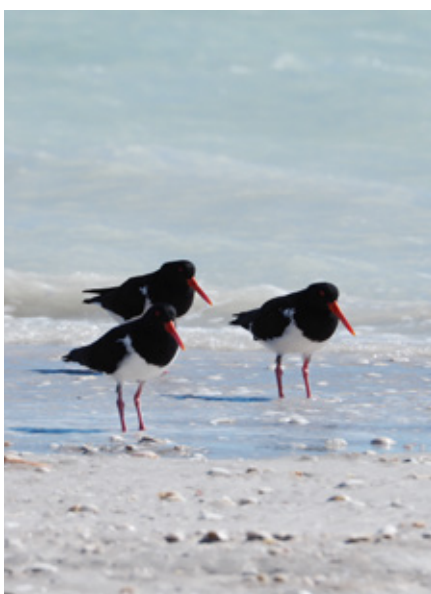
MIGRATION PATTERNS

What time of year does the target species live in your region? This is particularly important, if you are looking for migratory birds.

1.8   SURVEY METHODS – HOW

When deciding on the most appropriate survey method(s) to use, you and your supervisor may consider all we have covered so far in this guide and the following things as well.

- How easy will it be to find the targeted species?

- How easy will it be to count or estimate the number of each species?

- What are the weather conditions, and how will they affect the survey?

- How much time and money are available?

- Where do you need to go to do the survey? Think about accessibility, terrain, distance, cultural significance of the site, etc.

- What level of information do you need to report? Detailed information such as measurements, or broad information such as general plant habits?

- How broad is the diversity? Are there many different species or just one or two dominant species?

Thinking through these questions will help you to work out the most suitable method(s). Some common methods are described below.

Visual count of species in intertidal zone

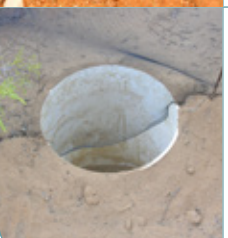| SURVEY METHODS FOR PLANTS AND ANIMALS		
	Visual count	• Count or estimate the number of species in a particular location
	Opportunistic sighting	• Record sightings or evidence of the target species as you do your daily work
	Visual search	• Search for particular species in likely habitats

SURVEY METHODS FOR PLANT OBSERVATION

	Line transects	• Record details of species found along plotted parallel lines of a given length and distance apart through the survey area.
	Quadrats	• Record details of species found within a series of given-sized plots within the survey area.

SURVEY METHODS FOR ANIMAL OBSERVATION
Generally it is best to survey animals over several days or nights

	Call survey	• Listen for and document animal calls
	Camera trap	• Use a camera with motion sensors to get pictures of animals
	Hair funnel (Image of Faunatech Hair Funnel courtesy of Faunatech Austbat PL)	• Use sticky tubes to get hair samples from mammals
	Scat and sign search	• Look for and record evidence of fauna, such as tracks, scratches, nests, feeding marks, etc.
	Set nets or traps	• Catch the animal to study and then release it

1.9 EQUIPMENT

Next you need to think about the resources and equipment you need. Some of these will have been identified in the JSA and SOP. The equipment you need will depend on the kind of survey you do.

GENERAL	
Reference books, previous survey data Notebooks and pens	
Drinking water and food	
PPE	
Appropriate vehicle, safety checks done, fuel, spare tyres	
GPS, maps	
Paper and snap-lock plastic bags for seeds or scats	
Stickers or tags for specimens	
Camera and binoculars	
Head torch and batteries	
First aid kit	

PLANT SURVEY	
Secateurs	
Plant press and newspaper	

ANIMAL SURVEY	
Elliott traps, cage traps, camera traps	
Buckets and drift fence for pit traps	
Mist net	
Scales, tape measure, ruler	
Calico bags	
Baits	

REMOTE TRAVEL	
Satellite phone	
Swags, camping gear, cooking gear	
Recovery gear	

PROJECT – PLAN A SURVEY

PURPOSE
Why is your workplace doing this survey, and what are you looking for?

....

....

....

SEASONS

Through discussion with your work team and supervisor, find out if it is a good time to be doing a survey for the species you are looking for. Why is this the best time of year to do this survey?

....

....

LOCATION

Where will the survey be done?

....

PERMITS

Is it necessary to get a permit or other permission to do the survey?   YES / NO

If a permit is needed, who is responsible for getting it?

....

Who issues the permit (government department or community council)?

....

LEGISLATION

What laws are relevant to this survey in your state?

....

....

P PROJECT – PLAN A SURVEY

WHS

Help your supervisor complete a JSA together with your work team.

Read through the SOP for the work your team will be doing. This might include procedures for the following tasks. Tick the relevant ones and add in others you refer to.

- ☐ Conducting a survey
- ☐ Trapping and handling animals
- ☐ Establishing a plant survey site

- ☐ Travelling in a remote area
- ☐ ....
- ☐ ....

EQUIPMENT

List the equipment your work team needs for the survey. Also write who is responsible for packing it.

EQUIPMENT	PERSON RESPONSIBLE FOR PACKING

P PROJECT – PLAN A SURVEY

EXISTING INFORMATION

Where can you find out existing information about the species you are looking for?

....

....

....

....

Access these resources and make notes here about what you learn.

....

....

....

....

....

....

....

....

....

....

....

Photograph: G Lienert

2.1   TREAD SOFTLY

As you travel to and through the survey site, you must avoid damage to the environment as much as possible. Be mindful to:

- Protect animal breeding sites
- Avoid erosion by driving carefully
- Take care of protected plants and animals
- Take away all rubbish, and make sure the camp fire is out

2.2   ASSESSING IMPORTANCE

Some species will be of particular interest to your workplace, partner organisation or traditional owners. It is important that you are aware of these and collect as much data as possible.

If a species is rare, it may be protected. This means there are laws to stop people from destroying it and its habitat (ecological community). All native species in a particular habitat fit into the local ecosystem. The disappearance of one species can have a bad effect on other species in the food web for that area.

If a species is a pest, then it will need to be monitored and maybe treated. Plants and animals are listed as pests when they have the potential to do damage to the ecosystem they are living in. They are seen as a threat to the biodiversity of the area.

Some species are of interest because there isn't much known about them. These are called 'data-deficient species'. Your state department of parks and wildlife will have a list of these. You might be required to collect data and samples of these if you find any.

RESEARCH ACTIVITY

Find out the plant species in your region that fit in the following categories. Your trainer or supervisor will help you find this information. *Resource R1, page 36, has a list of useful websites.*

EXISTING INFORMATION

Extinct, vulnerable and endangered plant species

....

....

....

....

Noxious weeds and Weeds of National Significance

....

....

....

Extinct, vulnerable and endangered animal species

....

....

....

Pest animal species

....

....

....

2.3 IDENTIFY PLANTS

When you first begin doing survey work it will take time to learn about the plants and their scientific names. The best way to learn is to go out with an expert and talk with them. This can include people with scientific or general plant knowledge, for example, community members, old people, and botanists. You can also refer to books, use dichotomous keys, visit a herbarium and access websites (see the list in the *Resources* section). To use these though, you need to be able to describe the plant and its environment.

OBSERVE THE ENVIRONMENT

The first thing to notice is the environment where you find the plant. Look around generally and pay attention to the things listed in the table below.

WAYS TO DESCRIBE THE ENVIRONMENT	
Topography	Mountainous, hilly, plains, rocky outcrop, water bodies nearby, catchment area
Habitat	Coastal, desert, escarpment, floodplain, forest, grassland, mangroves, marine, rainforest, riverine, scrubland, wetland, woodland
Soil type	Clay, sand, rock, loam, silt, peat
Water content	Waterlogged, saline, dry

OBSERVE THE PLANT

Next you need to look at the plant so you can describe it. It will be much easier to use reference books, websites and keys when you can do this using scientific language. There are many words to describe the parts and characteristics of plants. Learning these is like learning a new language.

Not all plants have all of these features, and you don't need to describe them all to identify a plant. The more you can describe, the easier it will be to find the name. Plan to remember some of these over time.

A good introduction to these terms can be found in the ALEP Guide *Recognise plants.* Other guides with more detail are also available.
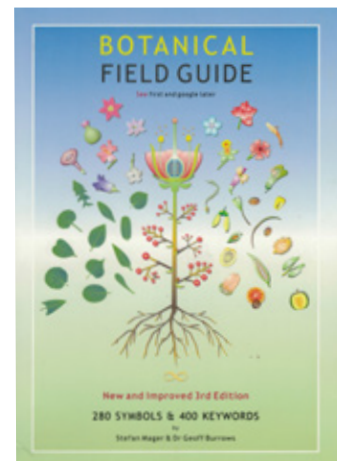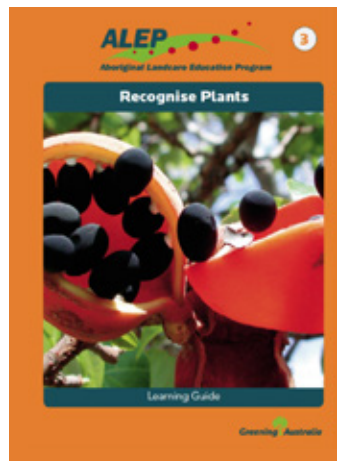
WORKBOOK ACTIVITY

Use the terms from the table opposite and begin to develop your own dictionary of botanical terms. Use reference books and internet searching to help you learn the language of botany.

WAYS TO DESCRIBE PLANTS		
Habit or form	The shape of the plant: tree, palm, mallee, shrub, vine, herb, grass, fern, sedge, parasite	
Flower parts	Corolla type, stamen (comprising anther and filament), stigma, style, ovary, calyx (comprising sepals)	Habit or form
Inflorescence	Colour, size, density, type	
Inflorescence type	Solitary, head, umbel, raceme, spike, corymb, panicle, indeterminate, determinate	
Fruit and seeds	Monocotyledon or dicotyledon Dry – dehiscent (split at maturity) capsule, follicle, silique, legume Dry – indehiscent (don't split at maturity) achene, caryopsis (grain), samara, nut, schizocarp, loment Fleshy – drupe, berry, pepo, hesperidium, pome, aggregate Non-flowering – gymnosperm	Inflorescence Fruit and seeds
Vegetative spread	Methods of asexual reproduction – stolon, corm, rhizomes, tubers, bulbs, bulbil	
Stems	Size, number, shape Bark – corky, cracked, fibrous, fissured, flaky, peeling, scaly, smooth	
Roots	Aerial, adventitious (fibrous), taproot, tuberous Pneumatophores – buttress, pencil, prop	
Leaf arrangements	Simple or compound Alternate, equitant, opposite, radical (basal, rosulate), whorled Trifoliate, palmate, pinnate, bipinnate, tripinnate Leaf stalks – petiolate (yes), sessile (no)	Bark Leaf
Leaf shapes	Acicular, cordate, deltoid (deltate), elliptical, falcate, lanceolate, linear, obcordate, oblanceolate, oblong, obovate, orbicular (circular), oval, ovate, reniform, spathulate	
Leaf veins	Dichotomous, palmate, parallel, pinnate, reticulate	
Leaf margins	Ciliate, crenate, dentate, entire, lyrate, pinnatifid, serrate, revolute, involute	
Modified parts	Tendril, thorn, prickle, spine, spur, barb	

COMMON PLANT GENERA

One genus has many species that are all closely related. It is very useful to learn the names of the common plant genera in your region. This will help to narrow down finding their scientific name. Below is a list of some of the most common Australian native tree and shrub genera. Learning the features of these is a good place to start.

WORKBOOK ACTIVITY

List some common species growing in your region for each of the relevant genera in the table below. Use reference books and the support of experts if you need to. You might already know many of these by common or Aboriginal language names. This activity will help you learn the scientific names.

COMMON AUSTRALIAN PLANT GENERA

GENUS	FEATURES	SPECIES IN LOCAL AREA
Acacia (wattle)	Seedlings have compound pinnate leaves. The mature plants of most species have *phyllodes* – modified leaf stems flattened to look like leaves. Phyllodes have parallel veins. Inflorescences are made up of a number of flowers and often form a ball or cylindrical shape. Most species have yellow flowers that produce a legume seed pod.	
Banksia	The most well-known characteristic is the large inflorescence. It has a woody axis covered in long, thin flowers that are often shades of yellow. The flowers contain a lot of nectar, so are popular with many species of birds. When the flower dies off, a large woody fruit is left.	
Callistemon (bottlebrush)	Identified by their cylindrical inflorescence, they are often red, but there are also other colours. The flowers have small petals and long stamens. When the flower dies back, you can see a woody cluster of fruiting capsules. The leaves are linear to lanceolate.	

GENUS	FEATURES	SPECIES IN LOCAL AREA
Eucalyptus (gum)	The flowers have no petals. The often brightly coloured stamens extend from a cap that later develops into a fruit. This cap is known as a hypanthium. The fruit is waxy and roughly cone-shaped. The leaves have a tough, waxy feel and produce a lot of oil with a characteristic strong odour. The mature leaves are often lanceolate in shape and alternate in arrangement.	
Grevillea	Plants vary from a ground cover to shrubs and trees. An inflorescence usually contains multiple flowers with an elongated style emerging from a tubular corolla. The inflorescence is often likened to a hairbrush.	
Leptospermum (teatree)	This genus is very closely related to the *Callistemon* genus. Habit varies from shrubs to trees. Bark may be smooth, fibrous or papery. The flowers are small, with petals larger than stamens. Fruits are small woody capsules with many clustered together on a stem.	
Melaleuca (paperbark)	Trees or shrubs with flaky, often very papery, bark. Inflorescences are clustered along stems. This genus is closely related to the *Leptospermum* and *Callistemon* genera. The significant difference between this genus and *Callistemon* is the arrangement of the stamens. In a *Melaleuca* the stamens are bundled, whereas in a *Callistemon* the stamens are freely attached to the floral tube.	
Terminalia	Trees or shrubs, many of which have highly valued edible fruits. Leaves have pinnate venation; the margin is entire; and the shape is elliptic, oblong, ovate or obovate depending on the species. Inflorescence type is spiked. Flowers do not have a corolla.	

2.4 RECORD PLANT DATA

Data is a collection of facts. It becomes information when you think about the data then organise and present it.

During the survey, your focus is to collect data and record it. If you collect good data, then later you can analyse it and produce good information. This can be very important, because politicians and government departments may read this to make policies that affect your region. Collecting good data can help look after country. Data is good if it is accurate and plentiful.

The kind of data you need to collect will depend on the reason you are doing the survey.

FIELD NOTES

If you are doing the survey for your own learning purposes, then you can write field notes to collect information. You might want to take note of things such as:

- Plant name

- Habit

- Flowers and fruit

- Other plants growing nearby

- Condition

It is also useful to make drawings or take photos to help you remember the plants later. Make sure you know which photos relate to which notes. A numbering system is a good way to do this.

DATA COLLECTION SHEET

If the survey is part of a more formal project, then you will probably need to fill in a structured data collection sheet. This can be done on paper or using an electronic tablet.

The data you record might need to be:

- General – about the area, habitat, dominant species, etc.

- Specific – about the individual plants

An example of a sheet is given in the *Resources* section. If you are working with a partner organisation, they will probably give you a data collection sheet to fill out.

The important thing is to ask for help if you need it, to make sure the data is as accurate and complete as possible. If you can't identify a species, then capture as much information as you can in your field notes and take a sample (if you are permitted to). You can identify it when you get back to your base.

R2

2.5 COLLECT PLANT SAMPLES

As part of the survey you may need to collect samples of plants. Remember that you might need to have a permit to take samples. There are a few reasons to collect samples:

- To help you identify anything you're not sure of back at your base

- To add to your personal or workplace herbarium

- To send to your state herbarium for identification

- To send samples of data-deficient species to the state herbarium

While you are learning the species in your area, you will probably take samples of most plants. This will help you learn the scientific names.

COLLECTING

Use sharp secateurs to cut samples from larger plants.

Collect enough material to cover an A3 sheet – that's the same area as two pages of this guide. An ideal sample should have as few pieces as possible and contain:

- Flower or buds

- Leaf

- Fruit

- Bark (for trees)

For smaller plants collect several whole plants, including the basal area and roots.

Leave bulbs in the ground.

TRANSPORTING

Store in an open plastic bag until you're ready to put them into a plant press. This will need to be done as soon as possible to prevent wilting and/or mould.

Wrap small specimens and seeds in paper inside sealed snap-lock bags so they don't get lost.

Make sure you keep samples in a cool place out of direct sunlight.

If you are collecting for a herbarium, you might need to use voucher labels. Your supervisor will explain the process you need to follow.

PRESSING

You need to put your samples in the plant press as soon as possible. It must be done by the end of each day.

Follow these steps:

1. Remove any soil from roots using a brush or by washing

2. Remove as much water as possible from leaves and roots by blotting with a paper towel or newspaper

3. Place plants between sheets of blotting paper or paper towel and then place 3–4 sheets of newspaper on each side

4. Lay out one sample at a time to show the natural arrangement of the living plant

5. Fold long specimens, but don't cut them up or break them into smaller parts

6. Include information about where you found the sample, and cross-reference it in your field notes and/or data sheet

7. Place corrugated cardboard between each specimen

8. Fasten and tighten the press using ropes or straps

9. Change the paper every day or two until the specimens are dry (the faster the drying, the better the colour will last – but don't heat it)

10. Use naphthalene flakes or flyspray if there are any borers or other insects in your samples

Ⓟ PROJECT

Participate in the survey project you planned in the first section of this guide.

During the survey you will:

- Use a Data Collection Sheet to record what you see

- Collect samples of plants for later identification (and perhaps for your herbarium)

- Use references to identify plants you don't know

R2

See plant survey data collection sheets
Resource R2, pages 38–40

2.6 IDENTIFY ANIMALS

As with plants, it will take some time to learn the scientific names of the animals in your region. The more time you spend identifying animals, the quicker you will become familiar with the scientific language. It will help if you look through reference books, talk with experts and practise using the terms in your workplace.

Understanding the system of classification for animals will help. Make sure you are familiar with the common classes of animals (refer to ALEP Guide *Recognise fauna*).

RESEARCH ACTIVITY

If you completed the Record of Local Fauna in the ALEP Guide *Recognise fauna*, then look through it again now.

OR

If you didn't do the activity, do it now. The template is in the *Resources* section.

TIPS FOR LEARNING NAMES

1. Start by remembering the names of the animals you see most often. It might be easiest to learn the common or language name first. Then you can work with a friend to test each other on the scientific names. Use books and photos to help.

2. If there is more than one animal of the same genus, look for the characteristics that show they are related. Make notes about the similarities.

3. Find out the meaning of the Latin or Greek words making up the scientific name. Sometimes they will help you remember. For example, rock wallabies are in the genus *Petrogale*. 'Petra' means rock and 'gale' means weasel (a furry little animal). So *Petrogale* means furry little animal in the rocks.

ANIMALS YOU HAVEN'T SEEN BEFORE

While doing surveys you will probably come across animals that you haven't seen before. It is important, as it is with plants, to look at the environment as well as the features of the animal.

ENVIRONMENTAL FEATURES

- Topography
- Habitat
- Vegetation types
- How close to water
- Time of day
- Phase of moon
- Weather

Photograph: G Lienert

INDIVIDUAL FEATURES

- Class
- Size
- Colour
- Markings
- What was it doing?
- Behaviour
- Sounds it made
- Was it with other animals? Mate, young, group – how many?

If you have this information, you can find out the name of the species by using one or more of the following sources of information:

- Reference books
- Internet
- Dichotomous keys
- Experts (amateur and professional)
- Your work mates, supervisor and/or trainer

IMPORTANT

When doing animal survey work, it is extremely important that you do not cause any unnecessary stress to animals either through observation or capture.

If trapping animals you must:

- Follow Standard Operating Procedures
- Learn how to handle animals correctly from an expert
- Release protected species immediately without handling
- Minimise the amount of handling of non-protected species
- Release animals as soon as practical – rise early in the morning if you are trapping overnight
- Practice good hygiene to avoid transmission of pathogens

Photograph: G Lienert

2.7 RECORD FAUNA DATA

The kind of data you need to collect will depend on the kind of survey you are doing and the reason for the survey.

FIELD NOTES

If you are doing the survey for your own learning purposes, then you can write field notes to collect information. You might want to take note of things to help you identify the animal. Writing down the environmental and individual features, listed in 2.6. page 26, will help with this. There is a Field Notes template in the ALEP Guide *Recognise fauna* that you can use.

It is also useful to make drawings or take photos to help you remember the animals later. Make sure you know which photos relate to which notes. A numbering system is a good way to do this.

DATA COLLECTION SHEET

If the survey is part of a more formal project, then you will probably need to fill in a structured data collection sheet. The sort of information to collect will vary widely depending on the class of animals you are surveying and the survey methods used.

The data you record will need to be:

- General – about the area, habitat, dominant plant species, etc.
- Specific – about the individual animal

If you are working with a partner organisation, they will have a data collection sheet to use.

There are some links in the *Resources* section to websites with a set of data collection sheets for a range of survey methods.

2.8 COLLECT FAUNA SAMPLES

It will not be common in your role to have to collect samples of fauna species. If you find a dead animal that is in good condition, you can send it to the museum in your state. This is called a voucher specimen. You should send it with as much information as possible about the location where you found it. The practicality of doing this obviously depends on where you live.

Permits are required to kill, take, trade, keep or move a listed species, a listed migratory species or a listed marine species.

You might collect samples of scat. These tasks require expert skills. Use gloves to collect the scat and store in a snap-lock plastic bag. These can be analysed to work out the species and what it has been eating. Sometimes they are DNA tested. If you see scat that is relevant to the survey work, take photos of it before you move it. Also make field notes about the immediate environment. Some data collection sheets will have a specific page to record this information.

IMPORTANT

It is very important that you are as accurate as possible and fill in as much as you can. You must talk with your supervisor or trainer if you are unsure about what to write in each section of the sheet.

R1 **R2** **R3**

See *Resources R1, R2 and R3*, pages 36–41

NOTE

You may take samples of arthropods and other invertebrate species for identification. It is best though to take plenty of photos and leave the animal in its habitat.

PROJECT

Participate in an animal survey. During the survey you will:

- Use a data collection sheet to record what you see, if this is required by your workplace
- Make field notes and take photos to assist in identification later
- Use references to identify animals you don't know

3 REPORT

When you return from your field trip, you need to organise the data you have collected. You will help turn the data into useful information. This information can then be used to make decisions and/or evaluate success.

3.1 INTERPRET DATA

The first step in turning data into information is interpretation. To interpret data is to explain its meaning. You need to read the data, then think about how it relates to the purpose of the survey and the reporting needs. Often you do this in your head without realising. When you are in a workplace, you may need to talk about data with other people and work out the meaning together.

If your survey was to monitor a pest species, then the data you collected might help you and your work team decide if you need to change the management plan for that pest.

SCENARIO 1

The data from a monitoring survey showed how many weed plants were found in a particular area. The rangers who did the survey needed to interpret this data. First, they looked at the data from the monitoring survey the year before. This showed that there are more weed plants now than at the same time last year. The data also showed that the species is now found in a sensitive wetland area, and it wasn't there last year.

They talked about this and decided that the weed is spreading and is now presenting an environmental risk to the biodiversity of the wetland area. This is useful information. They will now develop a management plan for the weed.

Some monitoring surveys are done to look for evidence of endangered species. If your workplace has been working on a project to preserve the habitat of such a species, then your interpretation might be different.

SCENARIO 2

A ranger group had funding from a government department to preserve the habitat of two vulnerable species of birds and a small mammal species.

They have been doing a feral cat trapping program and a fire abatement program for the last three years as part of this project.

They compared the data from their most recent survey with that from other surveys over the past five years. They noticed that the number of vulnerable species observed had increased slightly, and the evidence of feral cats had decreased.

The data helped to show that their habitat protection program was working. They were able to use the information to report back to the government department. This also helped them get more funding to continue their work.

Other ranger groups were interested in what they were doing. They also used this information to present at a conference about land management to share their techniques with others.

Sometimes you won't need to do much interpretation. You might have done a survey for your own learning purposes. Your interpretation will then be reviewing the data collected and becoming familiar with the species in your region. You might create a herbarium as part of this process.

If you were working for another organisation, you might only need to complete the data collection forms and send them in. They do the interpretation. For example, sighting of a threatened fauna species needs to be reported to your local parks and wildlife office. They then compile reports based on all sightings.

DISCUSSION ACTIVITY

Think about the purpose of your most recent survey. Read through the survey data.

- What is your interpretation of the data?
- Does it tell you anything new?
- Does it confirm something you thought but couldn't prove?

3.2 USING GRID REFERENCES

It is always important to be able to let other people know where you observed a particular species. This is often done using GPS coordinates but can also be done by making reference to a map. Maps use grid references to indicate a particular area on the map. For example, C5 is the grid reference for the Bream Creek crossing.
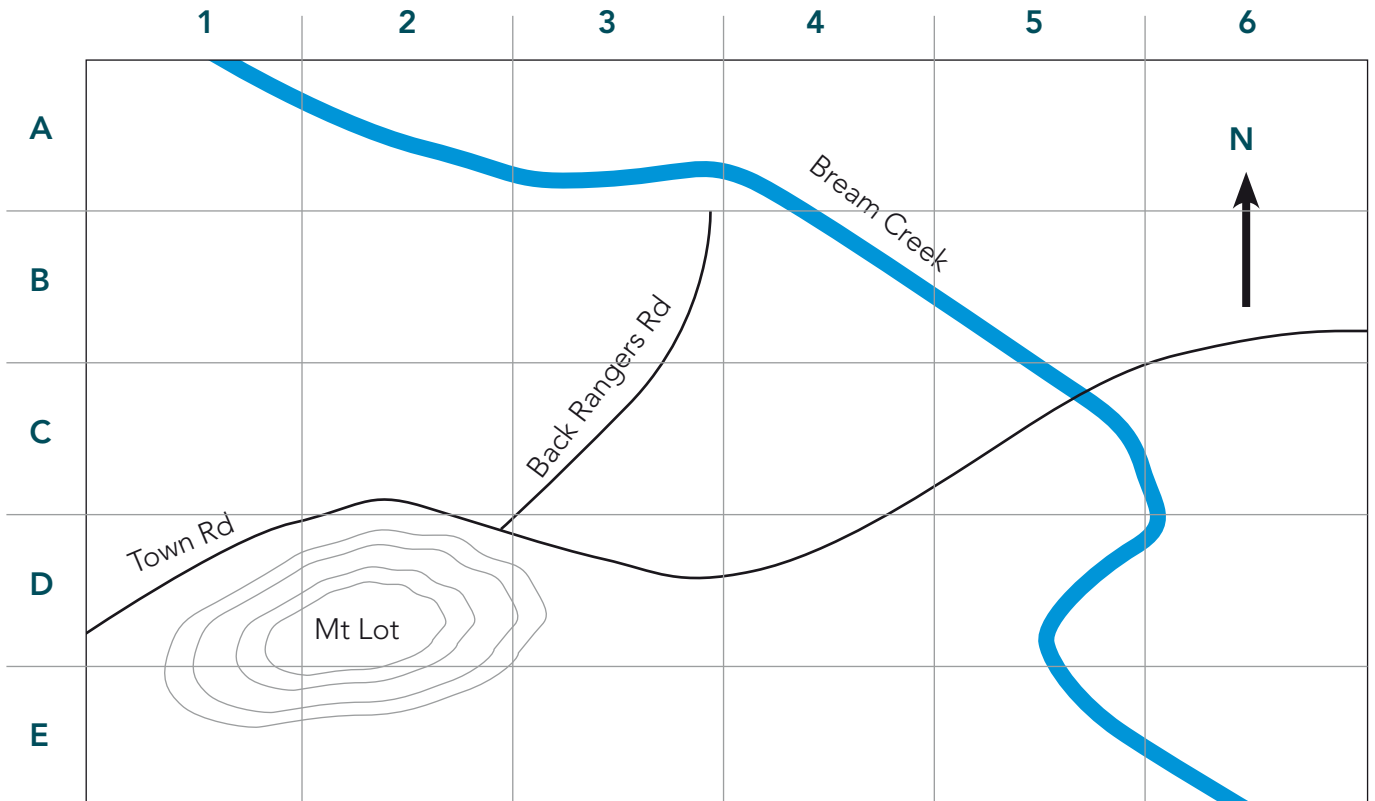
WORKBOOK ACTIVITY

A *Litoria dayi* (the critically endangered Australian lace-lid frog) was observed on the south bank of Bream Creek just near the end of Back Rangers Rd. Mark the map where the frog was found.

What is the grid reference for this location? ....

An *Aponogeton bullosus* (an endangered tuberous plant) was observed right near the crossing of Bream Creek over Town Rd. Mark the map where the plant was found.

What is the grid reference for this location? ....

Scat from a feral cat was found at the top of Mt Lot. Mark on the map where this is.

What is the grid reference for this location? ....

3.3 COMPLETE REPORTS

It is important that you communicate with your supervisor about the reporting requirements for each survey you do. The format for reporting will vary between different survey types and between workplaces. Ask your supervisor to explain what is needed if you are unsure of your workplace requirements. Following are some of the methods you might need to use.

- Oral report – tell your supervisor or others about what you observed

- Written report – write a report using text, maps and photos

- Presentation – use both of the above methods

- Form submission – fill in forms to report to outside organisations

- Data entry – enter data into a database using specialised software

- Sample submission – mount plant samples to include in a herbarium

FEATURES OF A REPORT

Report writing is a style of writing. Reports are written to give information to other people. There are certain features that help make a report effective.

- Contains only facts

- Uses section headings

- Uses plain language, no poetic or descriptive words

- Has diagrams and tables to summarise data

- Gives photos to show something explained in the text

DISCUSSION ACTIVITY

Look at previous survey reports prepared by your workplace. Discuss the effectiveness of these reports.

PROJECT

Talk to your supervisor about the kind of reporting you need to do for the surveys you completed in this unit. Prepare your reporting requirements as directed.

OR

If your workplace does not have a reporting requirement, then prepare a summary report as a group and give a presentation to your trainer or other interested members of your community. You can use the PowerPoint planning template on the opposite page if it is suitable.

SURVEY REPORT

- Survey date
- Location
- Report prepared by

Map of area

- Mark where you did the survey

Overview of survey

- Explain the purpose
- List participants or groups
- Explain timing of survey
- Describe how long it took

Existing information

- Endangered or vulnerable species in survey area
- Pest animals or weeds in the survey area
- Data from previous surveys
- Knowledge gained from other people or books

Survey method(s)

Survey site observations

- Habitat
- Topography
- Soil type
- Weather conditions
- Phase of moon

Species observations

- Use a table to summarise the data
- Add photos
- Show samples

What we learnt

- Your interpretation of the data

R1   USEFUL WEBSITES

If the links to these sites are no longer available, you can try using a search engine to look for the name of the site.

THREATENED SPECIES

http://www.environment.gov.au/topics/threatened-species-ecological-communities

PLANT & FAUNA WEBSITES

Atlas of Living Australia (plants and animals, including by location) http://www.ala.org.au/

Species Bank
http://www.environment.gov.au/biodiversity/abrs/online-resources/species-bank/index.html

PLANT WEBSITES

IDENTIFICATION

PlantNET NSW Flora Online (has a really good online glossary)
http://plantnet.rbgsyd.nsw.gov.au/

FloraBase: the Western Australian Flora
https://florabase.dpaw.wa.gov.au/

The Plant List: A working list of all plant species (international)
http://www.theplantlist.org/

Australian National Herbarium
http://www.anbg.gov.au/cpbr/herbarium/index.html

Australian Tropical Herbarium
http://www.ath.org.au/

Flora of Australia Online
http://www.environment.gov.au/biodiversity/abrs/online-resources/flora/main/index.html

National Herbarium of Victoria
http://www.rbg.vic.gov.au/science/herbarium-and-resources/national-herbarium-of-victoria

Northern Territory Herbarium
http://www.lrm.nt.gov.au/plants-and-animals/herbarium#.U3v4l_mSzD4

NSW Herbarium
http://www.rbgsyd.nsw.gov.au/science/Herbarium_and_resources/nsw_herbarium

Queensland Herbarium
http://www.qld.gov.au/environment/plants-animals/plants/herbarium/

State Herbarium: Government of South Australia
http://www.environment.sa.gov.au/Science/Science_research/State_Herbarium

Tasmanian Herbarium
http://www.tmag.tas.gov.au/collections_and_research/tasmanian_herbarium

WA Herbarium
http://www.dpaw.wa.gov.au/plants-and-animals/wa-herbarium

The Virtual Herbarium (plants of the Murray and Murrumbidgee)
http://www.csu.edu.au/herbarium

WEEDS

International Environmental Weed Foundation
http://www.iewf.org/weedid/iewf_front_id.html

Weeds of Australia identification tool (interactive site to identify weeds based on any number of plant characteristics with photos and information sheets)
http://www.business.qld.gov.au/industry/agriculture/land-management/health-pests-weeds-diseases/weeds-and-diseases/weed-identification-tool

Weeds Australia: An Australian Weeds Committee National Initiative
http://www.weeds.org.au/

National weeds lists
http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/index.html

FAUNA WEBSITES
EXAMPLE DATA COLLECTION FORMS

Fauna survey data sheets from Queensland
http://www.ehp.qld.gov.au/ecosystems/biodiversity/pdf/fauna_survey_datasheets.pdf

Field data sheets from NSW
http://www.environment.nsw.gov.au/resources/howyoucanhelp/18FieldDataSheets.pdf

WA Threatened Species Fauna Report form
http://www.dpaw.wa.gov.au/images/documents/plants-animals/monitoring/forms/Fauna_Report_Form_Simple_July2013.pdf
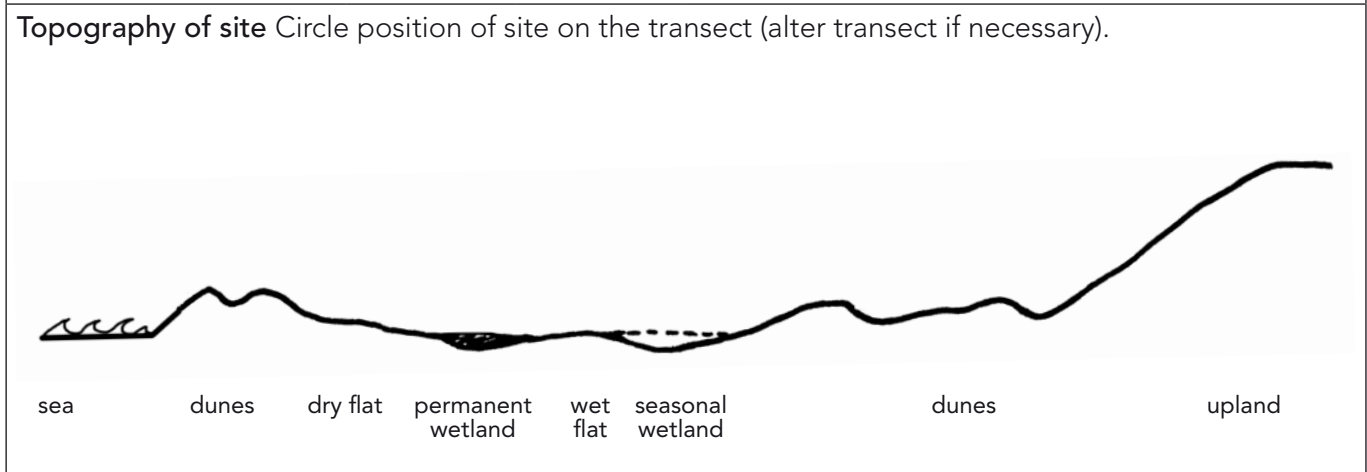
PLANT SURVEY DATA COLLECTION SHEETS

Area name		
GPS coordinates	Site number	Date
Recorders		

1. SITE DETAILS

Mud map of location

Topography of site Circle position of site on the transect (alter transect if necessary).

| sea | dunes | dry flat | permanent wetland | wet flat | seasonal wetland | dunes | upland |

Soil colour	Soil type

Exposed rock type

2. VEGETATION CONDITION

		Comment
PRISTINE		
EXCELLENT		
VERY GOOD		
GOOD		
DEGRADED		

3. VEGETATION STRUCTURE AND COVER

For each layer, record habit, cover class and dominant species

Cover classes	2–10% 10–30% 30–70% over 70%

Upper layer	TREES			MALLEES	
	over 30 m	10–30 m	under 10 m	over 8 m	under 8 m
HABIT					
Cover class %					
Dominant species					

Middle layer	SHRUBS		
	over 2 m	1–2 m	under 1 m
HABIT			
Cover class %			
Dominant species			

Ground layer	GRASSES	HERBS	SEDGES	OTHER
HABIT				
Cover class %				
Dominant species				

4. SPECIES PRESENCE

Record plant name, type, quantity, if flowering and ID checked				
SITE No.			Date	
No. = plant number FL= tick if plant is flowering ID = tick when ID has been checked TYPE: **TR**=TREES **SH**=SHRUBS **HE**=HERBS **MA**=MALLEES **GR**=GRASSES **SE**=SEDGES				
PLANT NAME	TYPE	No	FL	ID

TOTAL	TR	SH	HE	MA	GR	SE

RECORD OF LOCAL FAUNA

REGION	
CLASS	

Common/language name	Scientific name

GLOSSARY

Accessibility	Accessibility describes how easy something is to get. It can also describe how easy somewhere is to get to. The accessibility of an area is good if it is easy to get to. If accessibility is poor, then it is difficult to get to.
Amateur	A person who does something without getting paid. For example, an amateur bird watcher probably has another job, but they watch birds as a hobby.
Biological	Biology is the study of living things. When something is biological, then it is about living things.
Botanical	Botany is the study of plants. When something is botanical, it is about plants.
Custodian	A custodian is a person responsible for taking care of something.
Deciduous	A deciduous tree drops all its leaves every year. A non-deciduous tree doesn't drop all its leaves at once. A voluntarily deciduous species of tree will drop all its leaves if the conditions are too harsh.
Deficient	If something is deficient, then it doesn't have enough of something.
Dichotomous key	A dichotomous key is a document or computer program. It asks a series of questions and, based on your responses, leads you to work out the classification of the animal or plant you are looking at.
Dominant	Someone who is dominant has power and influence over other people. A dominant plant species is the main species in an area; it influences which other species will survive there.
Ecosystem	An ecosystem is a community of interacting organisms.
Effectiveness	Effectiveness describes how good something or someone is at getting the job done. Something with a high level of effectiveness gets the job done well.
Endangered	When a species is endangered, it is at serious risk of extinction.
Erosion	The gradual destruction of soil or rock in a specific area. This occurs naturally through wind and water. It can happen too quickly if good land management practices are not used.
Genus / Genera	Genus is a taxa (classification) containing closely related species. When you are talking about more than one genus, you use the word genera (not genuses).
Habitat	A habitat is the kind of area where a species likes to live.
Inflorescence	An inflorescence of a plant is the form that the flower takes. This might be grouped or individual. It includes the whole part of the flower, including petals and stalk(s).

Noxious	When something is noxious, it is poisonous or harmful.
Opportunistic	Something is opportunistic if it takes advantage of an opportunity.
Pathogens	A microorganism that can cause disease, e.g. bacteria, virus.
Perennial	A plant that lives for several years is perennial. Other plants are annuals, because they live for only one year.
Prevalence	Prevalence describes how common something is. If something is prevalent then it is common. If a species has a high prevalence, it is very common. A species with low prevalence is not common.
Significance	Significance describes how important something is. If a species has high significance, then it is important.
Specimen	A specimen is an individual plant or animal used for scientific study or display. This is a tricky word because it is singular but ends in 'men', so it might sound like it is plural. If you have more than one specimen you have several specimens.
Terrain	Terrain is a stretch of land. We usually talk about terrain in relation to its physical features, e.g. rough terrain, gentle terrain.
Topography	Topography is the layout of the land. For example, you can say that an area has mountainous topography or flat topography.
Transmission	Transmission means to pass something on.
Vulnerable	When something is vulnerable, it is easily damaged and needs special care or protection. Young children are vulnerable. A species that has a decreasing population may be referred to as vulnerable.
Add your own words and meanings here	

REFERENCES

Animal Ethics Infolink. *Collection of Voucher Specimens* [Website]. Retrieved from http://www.animalethics.org.au/policies-and-guidelines/ wildlife-research/voucher-specimens

Australian National Botanic Gardens. *Australian National Herbarium* [Website]. Retrieved from http://www.anbg.gov.au/

Australian Native Plants Society (Australia). *Melaleuca and Callistemon: Why are they different?* [Website]. Retrieved from http://anpsa.org.au/mel-cal.html

Brocklehurst, P., Lewis, D., Napier, D., & Lynch, D. (2007). *Northern Territory guidelines and field methodology for vegetation survey and mapping. Technical report no. 02/2007D.* Palmerston, NT: NT Government, Department of Natural Resources, Environment and the Arts.
Retrieved from http://www.lrm.nt.gov.au/__data/assets/pdf_file/0005/18743/ guidelines_fieldmethods.pdf

Clarke, V. (2009). *Establishing vegetation quadrats.* Perth, WA: WA Government, Department of Environment and Conservation.

Department of Industry. (2014). *Workplace English language and literacy: Conservation and land management.* West Perth, WA: WestOne Services.

Eyre, T.J., Ferguson, D.J., Hourigan, C.L., Smith, G.C., Mathieson, M.T., Kelly, A.L., Venz, M.F. & Hogan, L.D. (2012). *Terrestrial vertebrate fauna survey assessment guidelines for Queensland.* Brisbane, Queensland: Queensland Government, Department of Science, Information Technology, Innovation and the Arts.

Heard, L. and Channon, B. (eds) (1997). *Guide to a native vegetation survey (agricultural region): Using the biological survey of South Australia methodology.* Adelaide, SA: SA Government, Department of Housing & Urban Development.

Keighery, B. (1998). *Bushland Plant Survey: A guide to plant community survey for the community.* Nedlands, WA: Wildflower Society of WA (Inc.).

Mager, S. and Burrows, G. (2007). *Botanical field guide*, 3rd edition. Mullumbimby, NSW: Aracaria Biodynamic Farm.

NSW Government, Office of Environment and Heritage. (2013). *Field Survey Methods* [Website]. Sydney, NSW: Author.
Retrieved from http://www.environment.nsw.gov.au/threatenedspecies/ surveymethodsfauna.htm

ALEP
Aboriginal Landcare Education Program

OBSERVE & REPORT PLANTS AND/OR ANIMALS

This learning guide will help you learn how to participate in a survey, record data and report on the presence of plants and/or animals in your region. You will focus on those that are threatened, notifiable and not often seen in your region.

Topics include:

- WORKPLACE HEALTH & SAFETY

- LEGISLATION

- PLAN A SURVEY

- IDENTIFY PLANTS & ANIMALS

- COLLECT & RECORD DATA

- ASSESS IMPORTANCE OF SPECIES

- TAKE SAMPLES

- REPORT INFORMATION

bhpbilliton
resourcing the future

Greening Australia