# Roadside Vegetation Surveys

## Geraldton-Greenough

September 2007

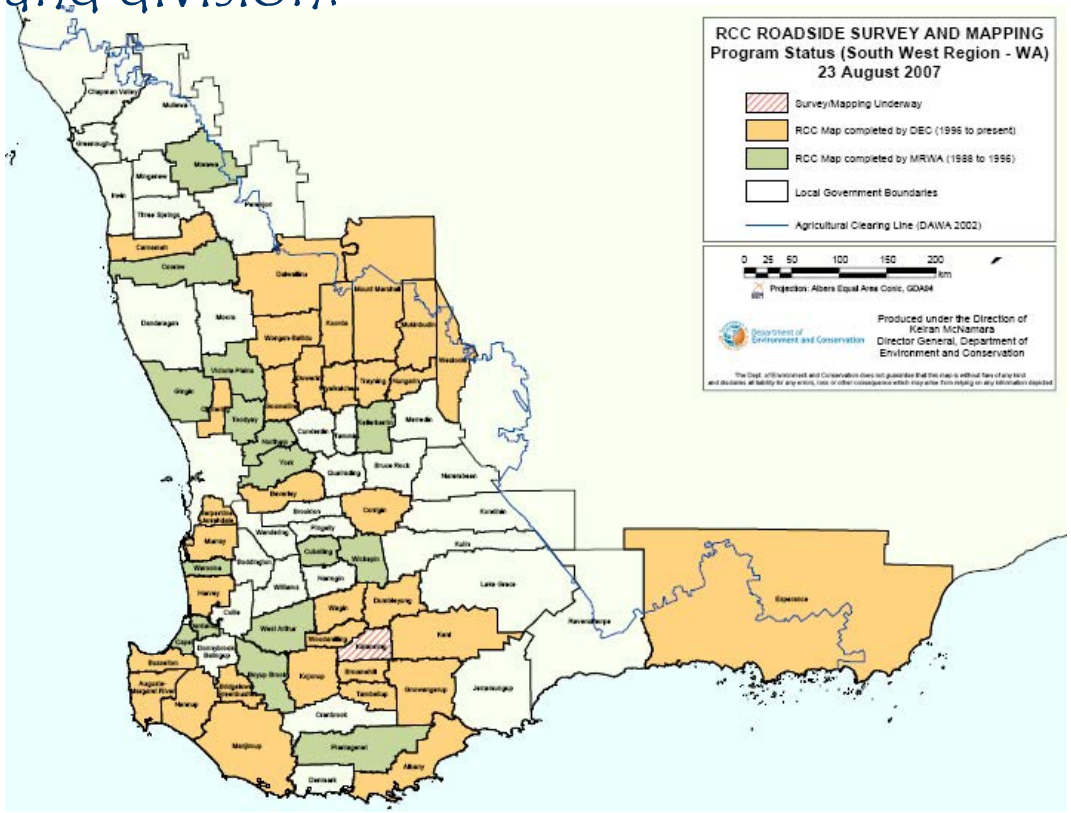
# Roadside Conservation Committee

The RCC's terms of reference:

'*to coordinate and promote the conservation and effective management of rail and roadside vegetation for the benefit of the environment and the people of WA'.*

# The Task Ahead: Roadside Surveys

- The RCC coordinates roadside surveys all the roadsides within the south west land division.
- Surveys have been completed in 50 shires.
- > 75,000 km of roadside being surveyed by local community volunteers.



# The Task Ahead: Roadside Surveys

- ‘snap shot’ study of the condition of roadside vegetation.
- designed to allow people with or without botanical expertise to participate.
- left and right hand sides surveyed.

# The information you record will help us to decide whether the roadside is...

High conservation value

Low conservation value

# Overview...

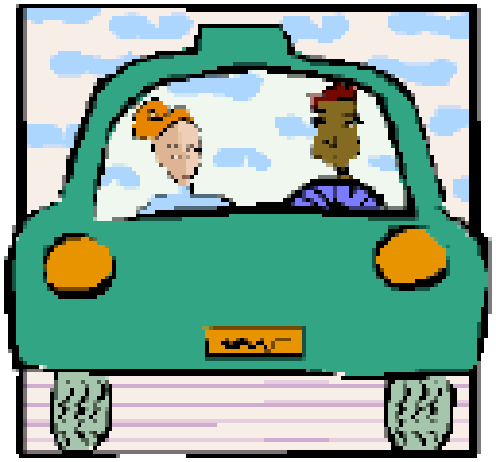
- ✓ An inventory of conservation values
- ✓ Useful for measuring changes over time
- ✓ Produces a map useful for landscape planning & management:

Weed control, Wildlife corridors,

Road works, Tourism,

Revegetation, Funding applications – NRM.

# Roadside Surveys...

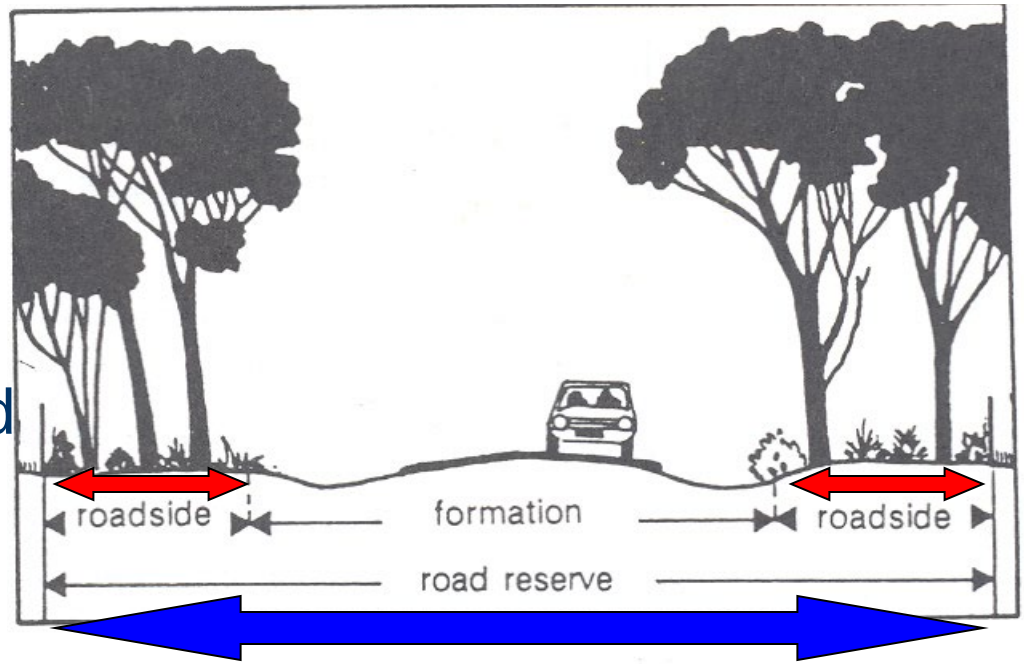


- **Survey procedure**
- **Roadside attributes and examples**

# Where is the Roadside?

The road reserve:

- road surface;
- shoulder;
- drain;
- batter/back slope; and
- roadside.




The roadside:

This is the area from the back of the back slope to the fence line.

# Survey is vehicle based...

- Best done with 2 people per vehicle:
  - **Driver (observe) and**
  - **Passenger (observe & record)**
- In most instances the survey can be done at approx. 30km/h.

Remember SAFETY FIRST when driving slowly or stopping.

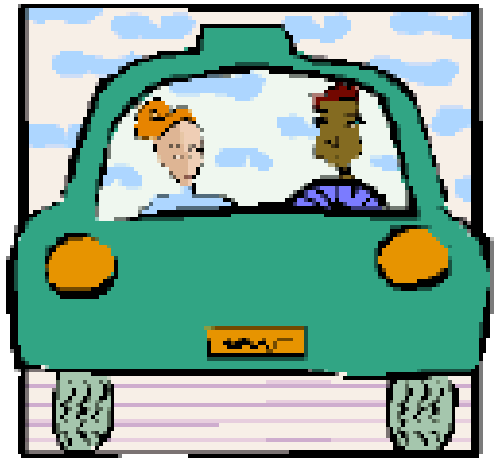
☞ *Average rate of survey is 20km of road per hour, so 100km = 5-6 hours.*

# You will need...


Make sure you know your left from your right!

- ✓ checklist and map of roads
- ✓ pens/pencil, highlighter
- ✓ survey pack:
  - **iPAQ**
  - **User's Guide**
  - **Power chargers**
  - **Weed ID photos**
- ✓ a good sense of direction, you MUST indicate direction of travel and odometer readings

# Survey Procedure...



Roadside surveys are done in ‘sections’ along the road.

This allows you to record changes in vegetation condition.

# Survey Procedure...

- Always start the survey at an intersection
- At the start of the road, set your trip meter to 0.0
- Before you start driving, look at the roadside in front of you, record general details such as:
  - road name
  - your name
  - direction of travel
  - name of road at intersection

# Survey Procedure...

- Drive slowly along the road.
- Start recording the roadside attributes for left and right hand sides (more about these later).
- Continue driving until the road ends or until there is a significant change in condition of roadside vegetation.

# A Significant Change...

Some roadsides are uniform along their length, and so can be surveyed as *one section* from start to finish.

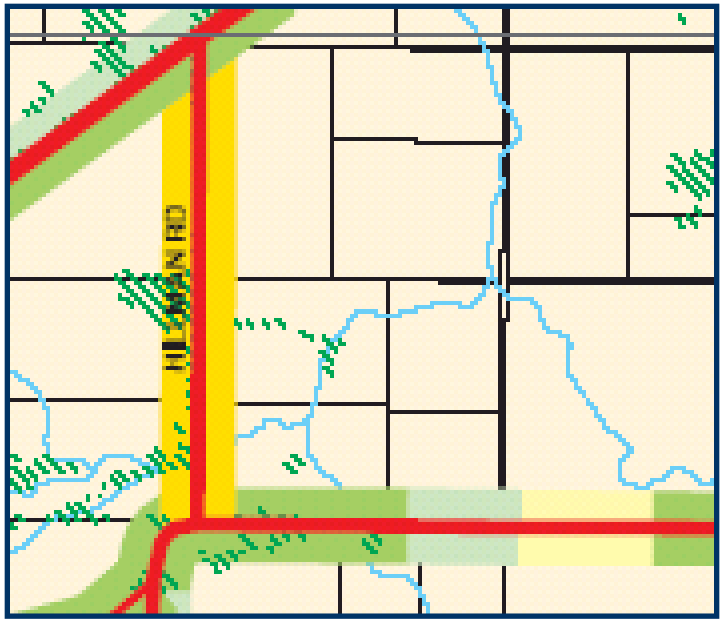
Other roadsides may be quite changeable. For example:

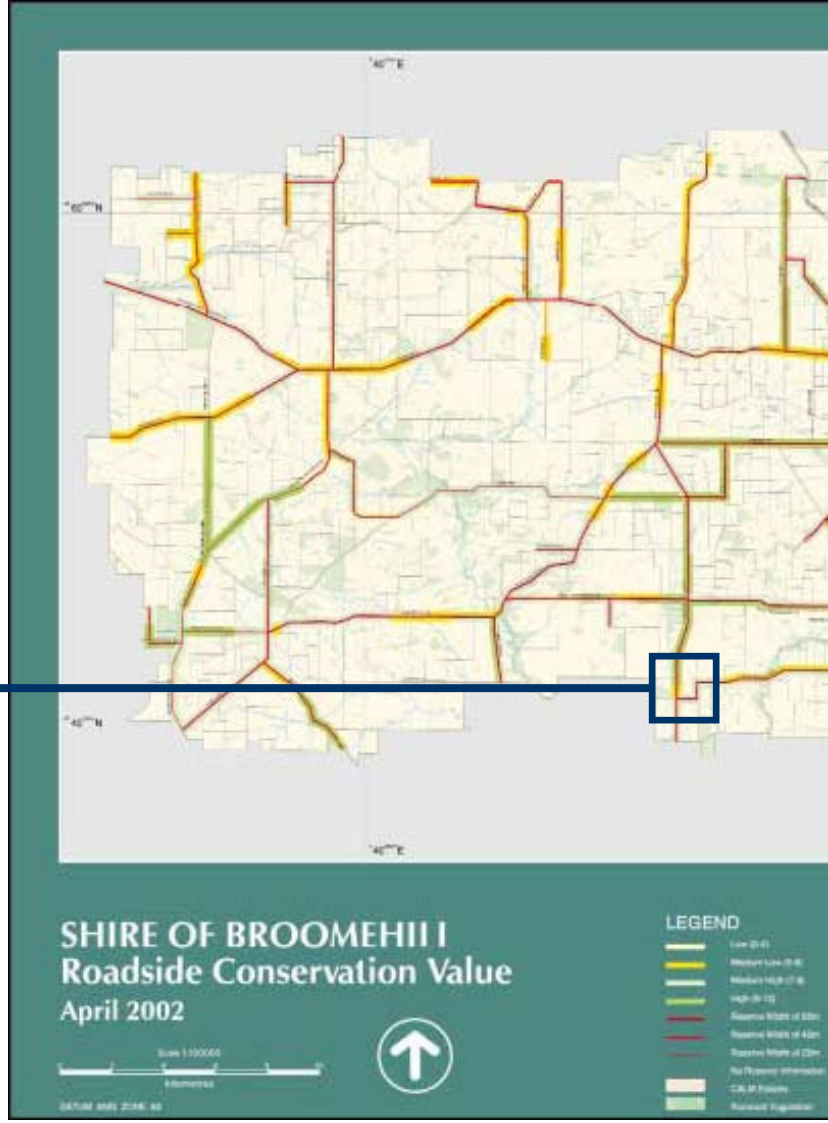
- ✓ adjoining landuse changes significantly, eg. from nature reserve to farmland;
- ✓ quality of roadside vegetation changes significantly, eg. from mostly native to mostly weeds.

Changes may occur on only one side or both sides of the road.

*Ignore small changes, i.e. less than 200m along the roadside.*

# Changing Sections




See how the colour (conservation value) changes along this road…?
Each coloured ‘section’ reflects when they started a new survey section.

# Changing Sections Procedure...

1. Note the odometer reading at change over point, this will give the length of Section 1 of the road.
2. Section 2 will continue until another marked change is observed, when section 3 will begin, etc.
3. Each subsequent section is numbered accordingly for this road (1,2,3,4 etc).

☞ *Please note down the odometer reading at any side roads you pass. This is very useful when mapping and checks the accuracy of your odometer!*

# Quick Refresher...

1. Would you start a new survey section if the:
   - weed cover increased/decreased dramatically?
   - adjoining land use changed from farmland to nature reserve?
2. Changes under ?? metres should be ignored?
3. Do you start a new section if the ‘change’ only occurs in one side of the road?

# There are 10 roadside attributes to record ...

- Width of road reserve;
- Width of vegetation on left and right sides;
- Structure of native vegetation;
- Extent of native vegetation;
- Number of native plant species;
- Value as a biological corridor;
- Degree of weed infestation;
- Nominated weeds;
- Adjoining land use; and
- Presence of utility (eg. water, power).

# 1. Width of Road Reserve

Historically, road widths were measured in chains (20.1m).

Select the width of the road reserve: 0, 20, 40, 60, 80, 100m.

# 2. Native Vegetation on Roadsides

Most native vegetation communities have more than one distinct layer.

The Geraldton Sandplains often have an upper (tree) layer, mid (shrub) layer & a ground layer.

If one or more of the layers is missing, the conservation value of the area is reduced.

# 2. Native Vegetation on Roadsides

Record whether the roadside contains a native tree, shrub and/or ground layer.

**NATIVE VEGETATION ON ROADSIDE**

| | Left | Right |
|---|---|---|
| **Tree** | ☐ | ☑ |
| **Shrub** | ☑ | ☑ |
| **Ground** | ☑ | ☐ |

## HEIGHTS

**Tree** = More than 3m tall

**Shrub** = Between 1m and 3m tall

**Ground Cover** = Less than 1m tall

# 3. Extent of Native Vegetation

Is the native vegetation continuous along the road section, or interrupted by weeds or other disturbances? e.g, fire, soil, rubbish, stockpiles.

**EXTENT OF NATIVE VEGETATION ON ROADSIDE**

| | Left | Right |
|---|---|---|
| **Less than 20%** | ☐ | ☐ |
| **20 - 80%** | ☑ | ☐ |
| **over 80%** | ☐ | ☐ |

# 4. Number of Native Species

This is a measure of the diversity of the native vegetation.

Make an average estimate along the length of roadside. It does not have to be done in detail.

| No. OF NATIVE SPECIES | Left | Right |
|---|---|---|
| 0 - 5 | ☐ ✓ | ☐ ✓ |
| 6 - 19 | ☐ | ☐ |
| 0VER 20 | ☐ | ☐ |

# 5. Weeds

Estimate average ‘weediness’ over the section being considered.

It should be estimated as a percentage of total plants along the section.

RIGHT: majority of the total plants are weeds

# 5. Weeds

RIGHT: Ground layer totally weeds

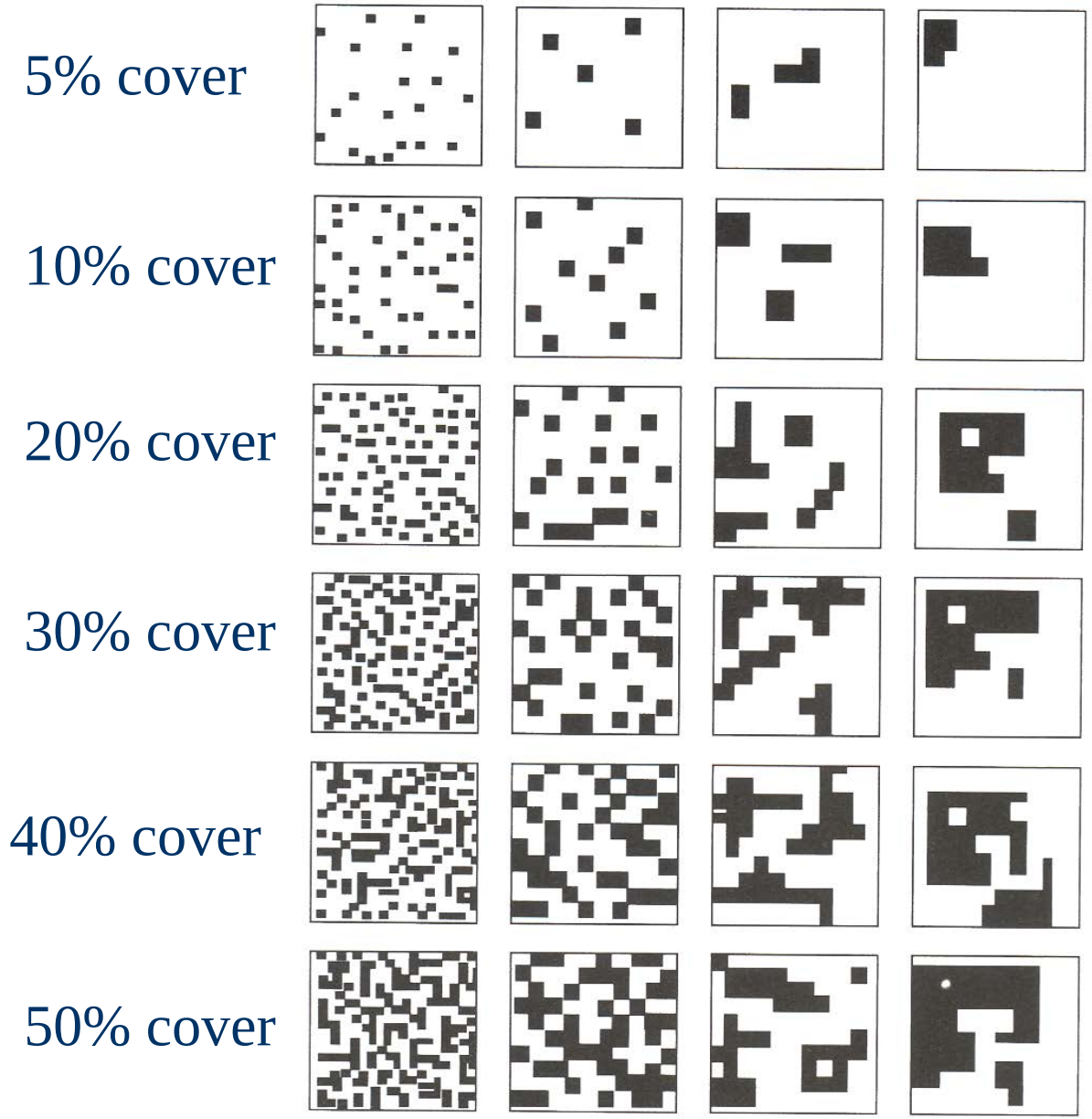
LEFT: Few weeds

**WEEDS**

| | Left | Right |
|---|---|---|
| Few weeds (<20% total plants) | ☑ | ☐ |
| Half weeds (20 - 80% total) | ☐ | ☐ |
| Mostly weeds (>80% total) | ☐ | ☐ |
| Ground layer totally weeds | ☐ | ☑ |

# 5. Weeds

Weeds may be clumped, or spread out within the road section.




Bayley, D (2001) Efficient Weed Management. NSW Agriculture Paterson NSW.

# 6. Nominated Weeds

Record roadside populations of these 6 weeds:

- Afghan Thistle
- Apple of Soddom
- Caltrop
- Saffron Thistle
- Onion Grass
- Wild Lantana

# Afghan Thistle (*Solanum hoplopetalum*)

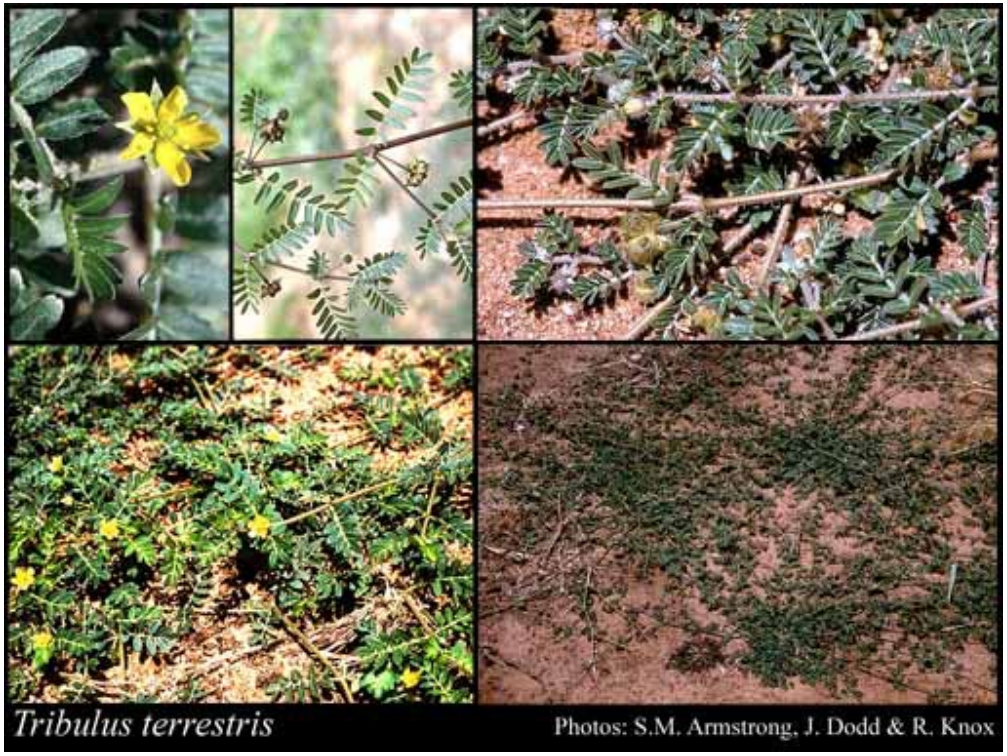
A native to the south-west of WA, it behaves like a weed on wasteland road and railsides, coping well with grading. Extremely prickly, growing annually in spring from underground stems. Every part of the plant is shiny, and prickles may be over 1cm long. Its leaves are oblong and lobed, and its flowers are white or pale bluish, appearing in spring and summer.

# Apple of Soddom (*Solanum linnaeanum*)

Declared in many Shires in the south-west. An erect, dark green bushy shrub to 5m high. Blue or purple flowers appear from Jan-May, then from Aug-Oct. Leaves are around 15cm long with deep, irregular lobes with long, curved spines on both surfaces of the leaf. Fruits are about 30mm in diameter, ranging in colour from green, to white, brown or black, depending on how ripe they are. It is a weed of pastures and roadsides.

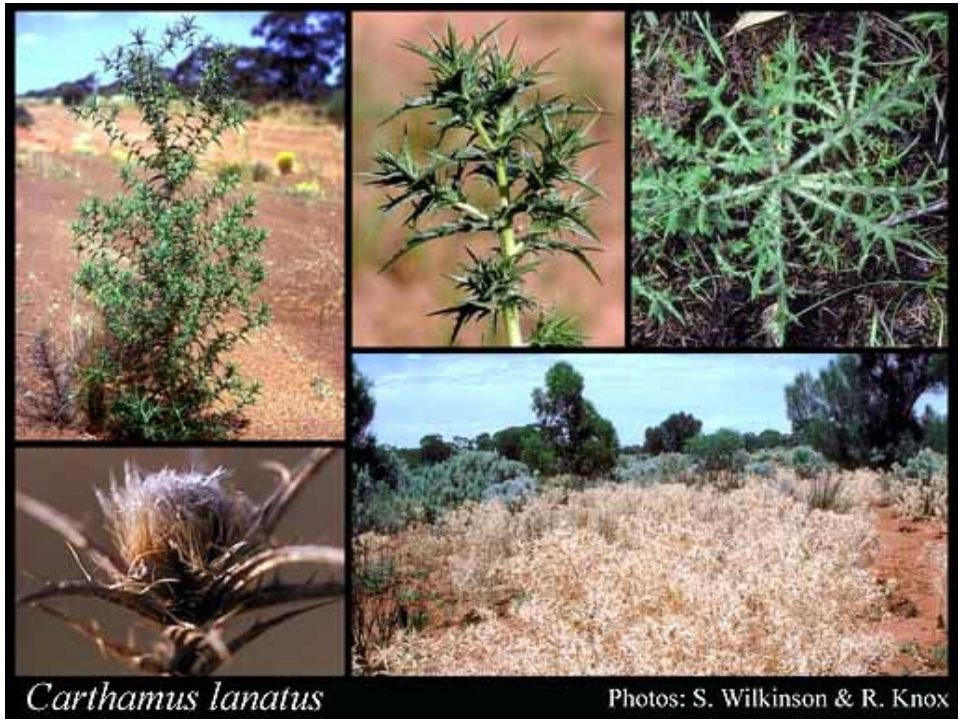

# Caltrop (*Tribulus terrestris*)

The trailing stems are long and wiry, and covered with fine hairs. Stems lie prostrate on the ground, radiating from a central tap-root. Leaves are fern-like and greyish green. Flowers are small, less than 1cm in diameter, and yellow with 5 petals. They appear within 3 to 4 weeks after rain. Wedge-shaped burrs are formed in clusters of 5, each with 4 or more long, sharp spines.



# Saffron Thistle (*Carthamus lanatus*)

**An annual from southern Europe that grows up to 70cm tall. The leaves are rigid, with spiny lobes. The yellow flower heads are surrounded by spiny bracts and are borne in terminal clusters. It flowers in spring and summer and is a serious weed of agricultural and pastoral areas as well as disturbed bushland throughout the South West.**



# Onion Grass (*Asphodelus fistulosis*)

A short-lived perennial that produces a clump of hollow, cylindrical leaves up to 40cm long. These look like onion leaves but they do not have an 'oniony' smell. The flowers, white with a brownish central stripe, are carried on a branched stalk to 60cm high and are produced in winter and spring. A widespread and invasive weed, particularly abundant along road and rail verges, invading disturbed bushland, including arid pastoral areas.. Native to southern Europe and India.

# Wild Lantana (*Lantana camara*)

Listed as a weed of national significance, Wild Lantana has spread to infest over 4 million hectares, and is known as one of the world's worst weeds. A multi-branched shrub forming thickets 2-4m high, but capable of climbing up to 15m with the support of vegetation. Stems are square-shaped, covered in short, curved and hooked prickles. Leaves are opposite, 2-10cm long, bright green on upper surface and pale and hairy on the underside. Flowers form in dense clusters varying in colour from red through to yellow and white, appearing 4-6 weeks after a 25mm rainfall event. Berries are borne in clusters, and vary in colour from green through to purple/black.

# 7. Value As a Biological Corridor

In cleared areas, the road reserve can be very important as a corridor, allowing the movement of fauna – especially birds – enabling them to seek out feeding and nesting areas.

**VALUE AS A BIOLOGICAL CORRIDOR**

| | Left | Right |
|---|---|---|
| **Connects uncleared areas** | ☐ | ☐ |
| **Flowering shrubs** | ☐ | ☐ |
| **Large trees with hollows** | ☑ | ☐ |
| **Hollow logs** | ☐ | ☑ |

# 8. Utilities

Electricity, power lines and pipelines often built in roadside.

To construct and maintain them, the roadside vegetation may be destroyed. Their presence may be detrimental.

| UTILITIES | Left | Right |
|---|---|---|
| Utility Absent | ☐ | ☐ |
| Utility Present | ☑ | ☑ |

| TYPE | | |
|---|---|---|
| Water | ☐ | ☐ |
| Electricity | ☐ | ☑ |
| Gas | ☐ | ☐ |
| Telecomm. | ☑ | ☐ |

# 9. Width of Vegetated Roadside

This is a measure of how much vegetation/land is left along the roadside. With practice, it is easy to recognise the width categories.

**WIDTH OF VEGETATION ON ROADSIDE**

| | Left | Right |
|---|---|---|
| **1 - 5 m** | ☐ | ☑ |
| **5 - 20 m** | ☑ | ☐ |
| **over 20 m** | ☐ | ☐ |

# 10. Adjoining Land-use

Different land uses have different impacts on the roadside.

Road reserves are most valuable as conservation areas where they act as a corridor of remnant vegetation in an otherwise cleared landscape.

Record the *predominant* adjoining land use.

# 10. Adjoining Land-use

| ADJOINING LAND USE | Left | Right |
|---|---|---|
| Agricultural crop or pasture | | |
| - completely cleared | ☐ | ☑ |
| - scattered | ☐ | ☐ |
| Uncleared land | ☑ | ☐ |
| Plantation of non-native trees | ☐ | ☐ |
| Urban or industrial | ☐ | ☐ |
| Railway Reserve | ☐ | ☐ |
| Drain Reserve | ☐ | ☐ |
| Other | ☐ | ☐ |

# 10. Adjoining Land-use

scattered

plantation
non- native

completely
cleared

# Wildcard Attribute

# Salt Affected Roadside

## The physical signs – what are you looking for?

Damage to road surface

Bare scolds and die back of deep rooted trees

# Using the iPAQs...

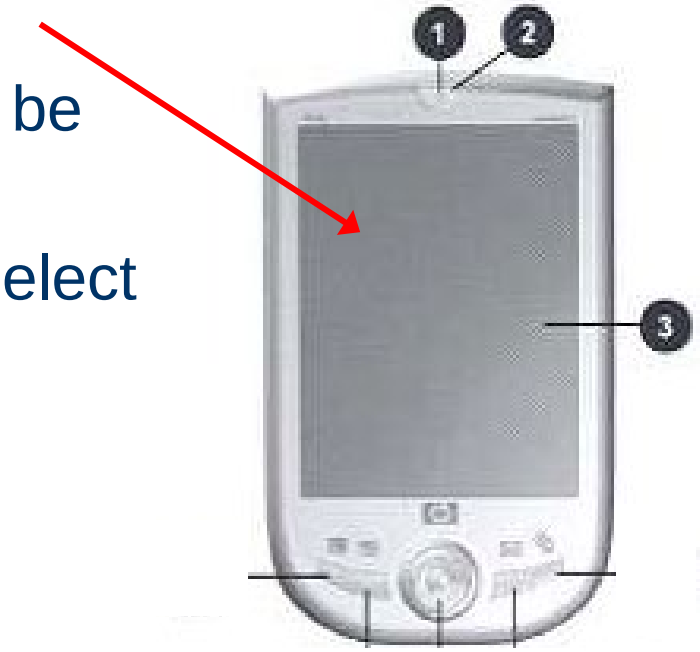
# Getting Acquainted...

1. Power: press & hold to turn screen on & off
2. Amber flash = battery charging
   Amber solid = battery charged
3. Display screen
4. Stylus pen: slide up to remove, slide down to store

# Getting Acquainted...

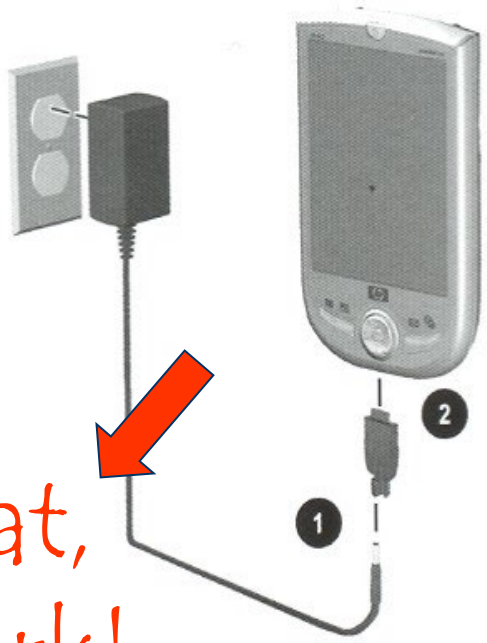
Use the stylus pen to tap or write on the screen.

- ✓ The screen is sensitive, so be careful with your fingers...
- ✓ Simply ‘tap’ the screen to select open an item.
- ✓ Tapping is like pressing a keyboard key.



# Charging the iPAQ…

- Make sure the iPAQ is fully charged before use, and charge again at the end of each day. Approx. 4 hours.




If the battery goes flat, you will lose your work!

# To protect your work...

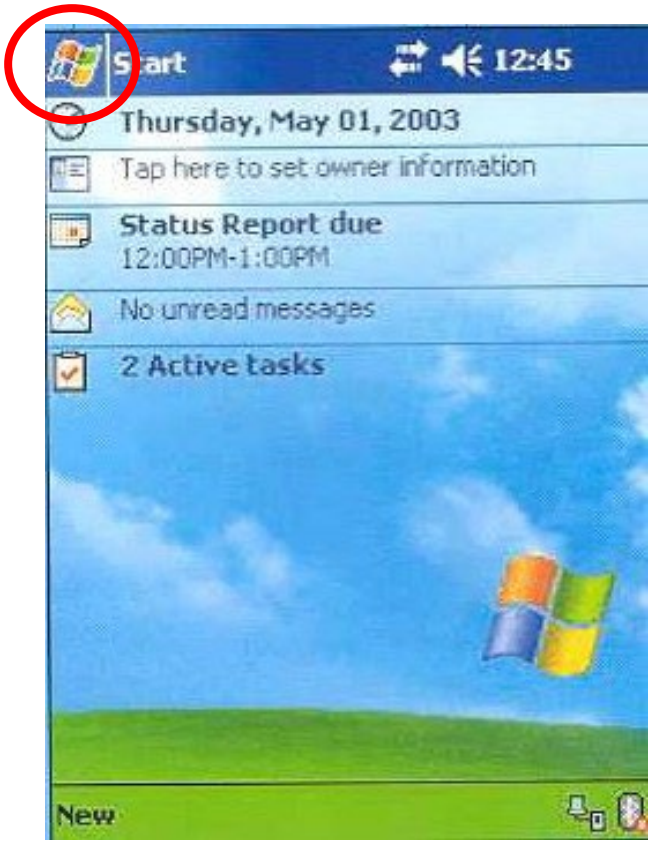
- A program *(Sprite Backup)* saves your information onto a memory card daily at 5pm. If you are using it at this time, you may need to follow the prompt and tap ‘OK’.

- Automatically backs up if battery is low. Press ‘OK’ if prompted to do this.

# Getting Started

**1.** Turn the iPAQ on.

**2.** Using the stylus pen, tap this icon: (top left corner, next to the word ‘Start’).




**3.** Select ‘**RCC survey’**.

The program may take a few seconds to start up.

*Make sure the device is fully charged.*

# Starting the Survey

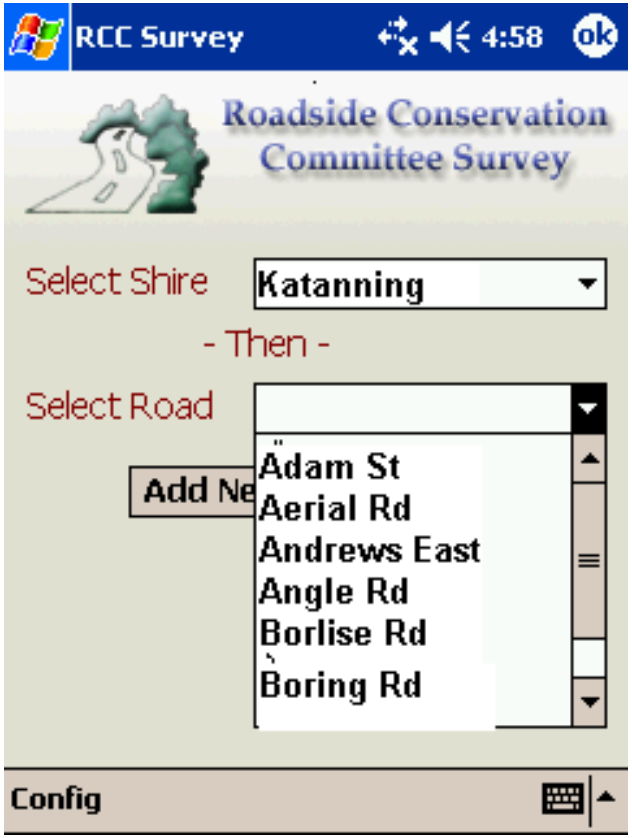
1. Select the name of the **Shire** from the drop-down menu.

2. Select the name of the **road** you are going to be surveying: Test Rd 1

If a road is not listed, select '**Add New Road**'. In the space provided, type the road name. Press **OK**.

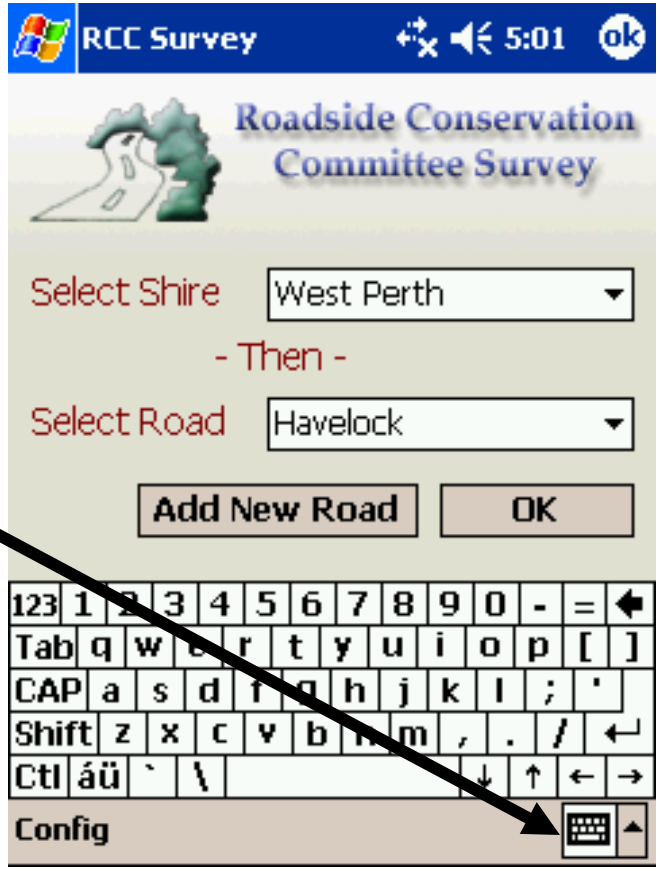
3. You are now ready to begin the roadside survey for the selected road.

Tap 'Start'.



# Starting the Survey

- There is a keyboard you can use for typing in details.
- It is located at the bottom right corner of the screen.



# Details

Record the following:

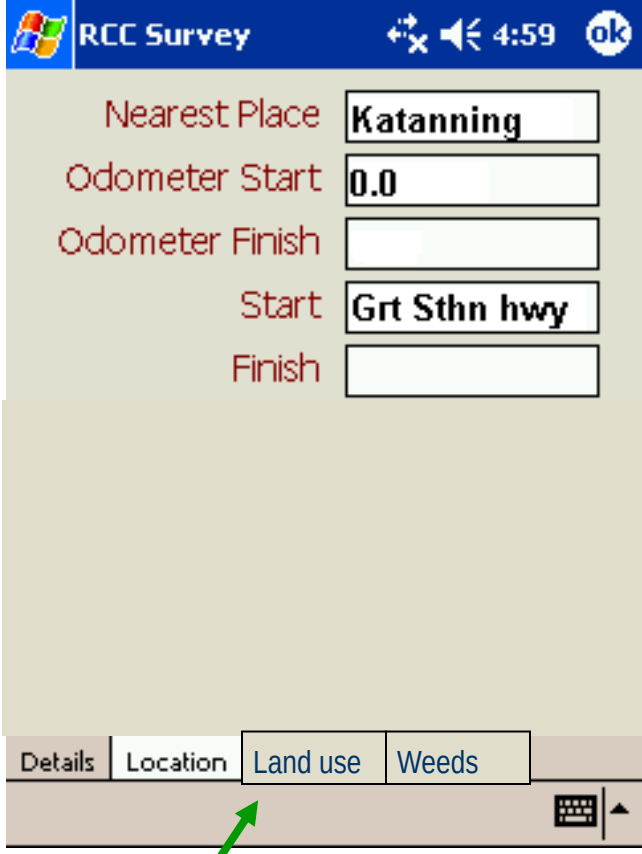
- **Section** number (1,2,3,etc)
- **Observer**
- **Date**
- **Width** (m)
- **Direction**


Go to the next tab, named **Location**.

# Location

Record the following:

- **Nearest Place**
- **Odometer Start** (eg. 0.0)
- **Odometer Finish** (eg. 5.6)
- **Start:** start point, eg. Grt Sthn Hwy
- **Finish:** finish point, eg. Boundary Rd



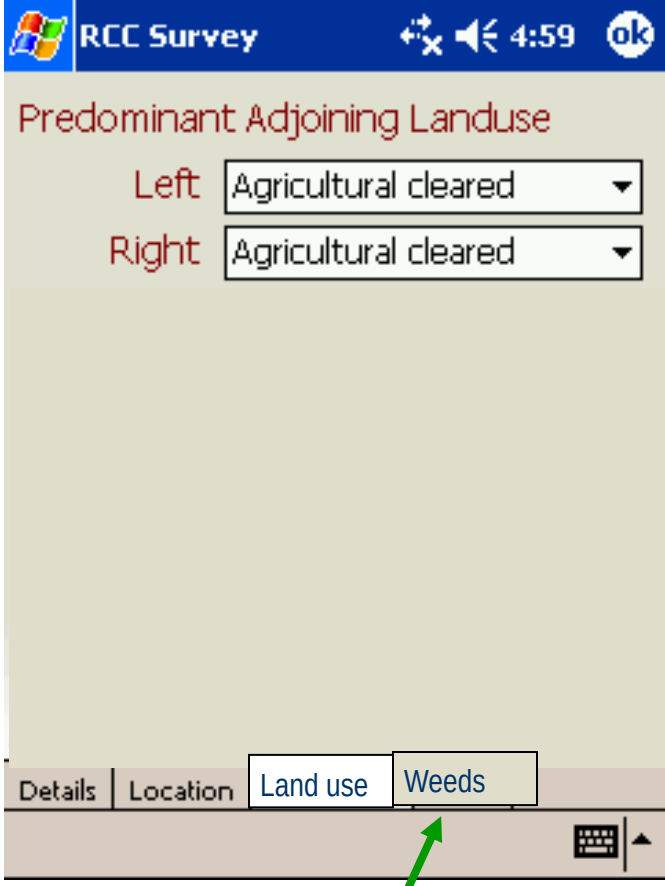

You will need to come back to this page later to fill in Odometer finish and Finish point.

Go to the Land use Tab

# Land use

Record the:

- **Predominant Adjoining Landuse:** select the dominant land use from the drop-down menu.
- Remember to record both the left and right sides.

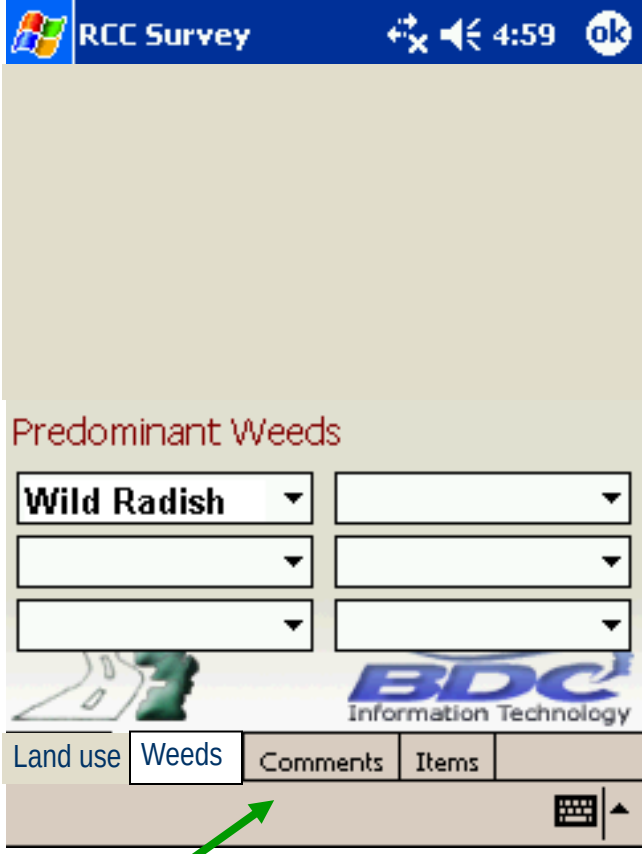



Go to the next tab, named **Weeds.**

# Weeds

- **Predominant Weeds:** record the presence of 6 pre-determined weed species. Select from drop-down menu.
- Afphgan Thistle, Apple of Sodom, Caltrop, Onion Grass, Saffron Thistle and Wild Lantana
- Leave blank if not present.

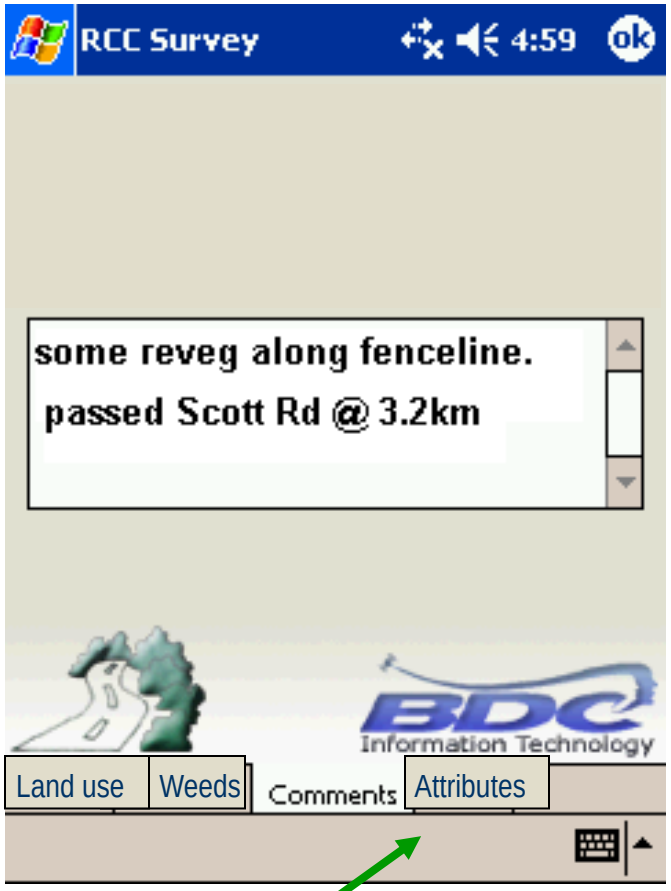
Go to next tab, **Comments.**



# Comments

**Comments:** you may like to enter other details.

- Please note down any side roads and the odometer reading. This helps greatly in the GIS map production.




Go to the next tab, named **Attributes.**

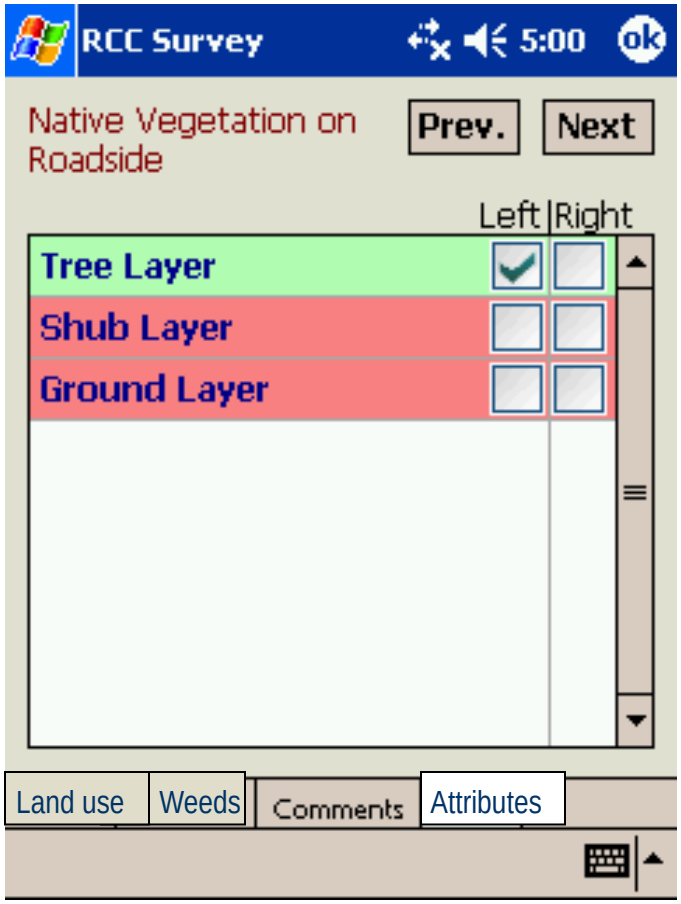
# Attributes

Record the **8 roadside attributes** that, when combined, make up the roadside conservation value.

Record the left and right sides independently.

The options will change from red to green, indicating that you have made a selection.

Press **Next** once all options have been changed to green**.**



# Attributes

Tick the box if present and press ‘Next’.

Record the other 7 attributes…

# Finishing the Section

- The last attribute page will be ‘Salt-Affected Roadside’. Press **Next**.
- You will receive an error message:

  “*Please go back and fill in the Odometer Finish field. Go to the Location tab.”*

  Press ‘ok’.

- Continue driving along the road until there is a significant change, or until the road ends.
- When this happens, pull over or slow down, enter the **Odometer Finish** and **Finish** point on the **‘Location’** page.

! Next, go back to the **‘Details’** page.

# Finishing the Section

On the **Details** page select either:

- **Change Road:** to begin surveying a new road; or
- **Next Section:** if you are still on the same road, and have to start surveying a new section.

# Roadside Surveys

- Roadside survey groups/teams.
- Volunteer forms filled out…?
- Map of Shire.

# Concurrent Sessions...

- A: groups of 4 to go for practice run (20 mins);
- B: others plan their survey teams and roads, mark onto a central map, and organise roster for using/sharing iPAQs.

# Review

- Survey procedure;
- Roadside survey attributes;
- Using the iPAQs;
- Survey teams and allocated roads;
- Roster to share iPAQs;
- Other questions…

# Thank-you…

**For further information please contact**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