

## Program

Time	Day 1	Day 2	Day 3
9:00 am	<b>Orientation</b>	<b>Finding Out -</b> Biological controls of Bitou CSIRO scientist & Tanya	<b>Sorting Out -</b> Analysing data
10:00 am	<b>Tuning in -</b> Team building initiative activities	Hear about, see & measure the latest scientific controls of bitou bush	<b>Drawing Conclusions</b> What have we learnt about Bitou Bush?
11:30 am	<b>Deciding directions -</b> Tanya - our scientist - Weed ID using ICT		<b>Social Action-</b> What can we do about the Bitou Bush Problem?
1:30 pm	<b>Preparing to find out</b> setting contracts, risk assessment, selecting equipment	Canoeing Minnamurra River rotation with transects & quadrats to measure bitou bush on Minnamurra Spit	Mountain Biking in rotation with completing herbarium samples
2:00 pm	<b>Finding Out -</b> Digital photography, drawing and labelling weeds, making herbarium	Data entry, log book updates	2:45 pm Evaluation
7:00 pm	<b>After dark</b>  Journal update-reflection  Hike to Mystics Beach for Spotlighting, owl calls & games	Tanya discusses her work as a scientist  Frogging: Swamps after dark	Thanks to our scientist and teachers  3:00 pm students depart

## Logistics

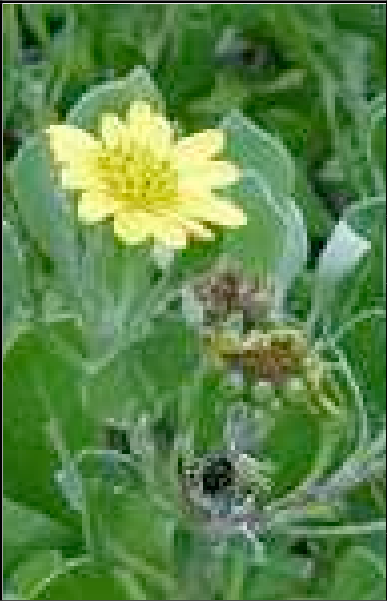

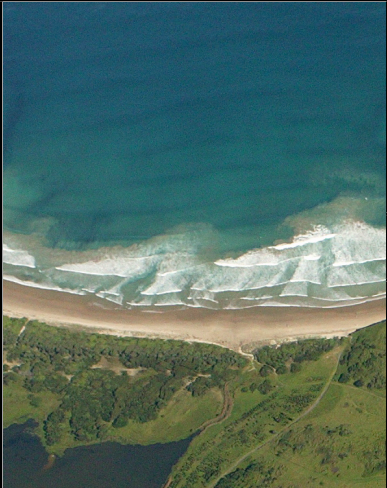
Day 1: Students sign on at the centre and parents/drivers are directed to take students to the bunkhouse where sleeping bags etc. are left. Parents/drivers then return students to the centre. Morning tea, lunch afternoon tea will be at the centre. 4:30pm students make their way to bunkhouse and are allocated their rooms. Ball games or quiet time in camp area. Evening meal will in the camp kitchen followed by after dark activities.

Day 2: After breakfast (8:15 am) students make their way to the centre with sunscreen swimmers etc. in preparation for canoeing. Morning tea and lunch at the centre. Students make their way to Minnamurra River for canoeing and conducting transects and quadrats on Minnamurra Spit. 4:30pm students make their way to camp area. Ball games or quiet time. Evening meal will in the camp kitchen followed by after dark activities.

Day 3: Students pack up and leave all belongings in one of the larger bunkhouse rooms. After breakfast (8:15 am) students make their way to the centre. Morning tea and lunch at the centre. Parents/drivers to pick up students from the centre and make their way to the bunkhouse to collect all belongings.

### Expedition Bitou Bush - Assessment Survey

To assess what you learn during the expedition, answer the following questions at the beginning and again on the last day of the expedition.

	What do you know about the work of your expedition's scientist?	
	Day 1	Day 2
	Are the coastal dunes of Killalea important ecosystems? Why?	
	List the steps in planning a scientific investigation.	
		
	What information will you need to investigate bitou bush?	
	How does scientific research help to conserve ecosystems?	
		
	List uses of technology in investigating bitou bush.	

### Recording Our Learning

Create a TWLH chart to find out prior Knowledge, determine questions you Want to know answers to, document what has been Learned based on evidence of How we know.

What we think we know	What we want to learn	What we learned	How we know

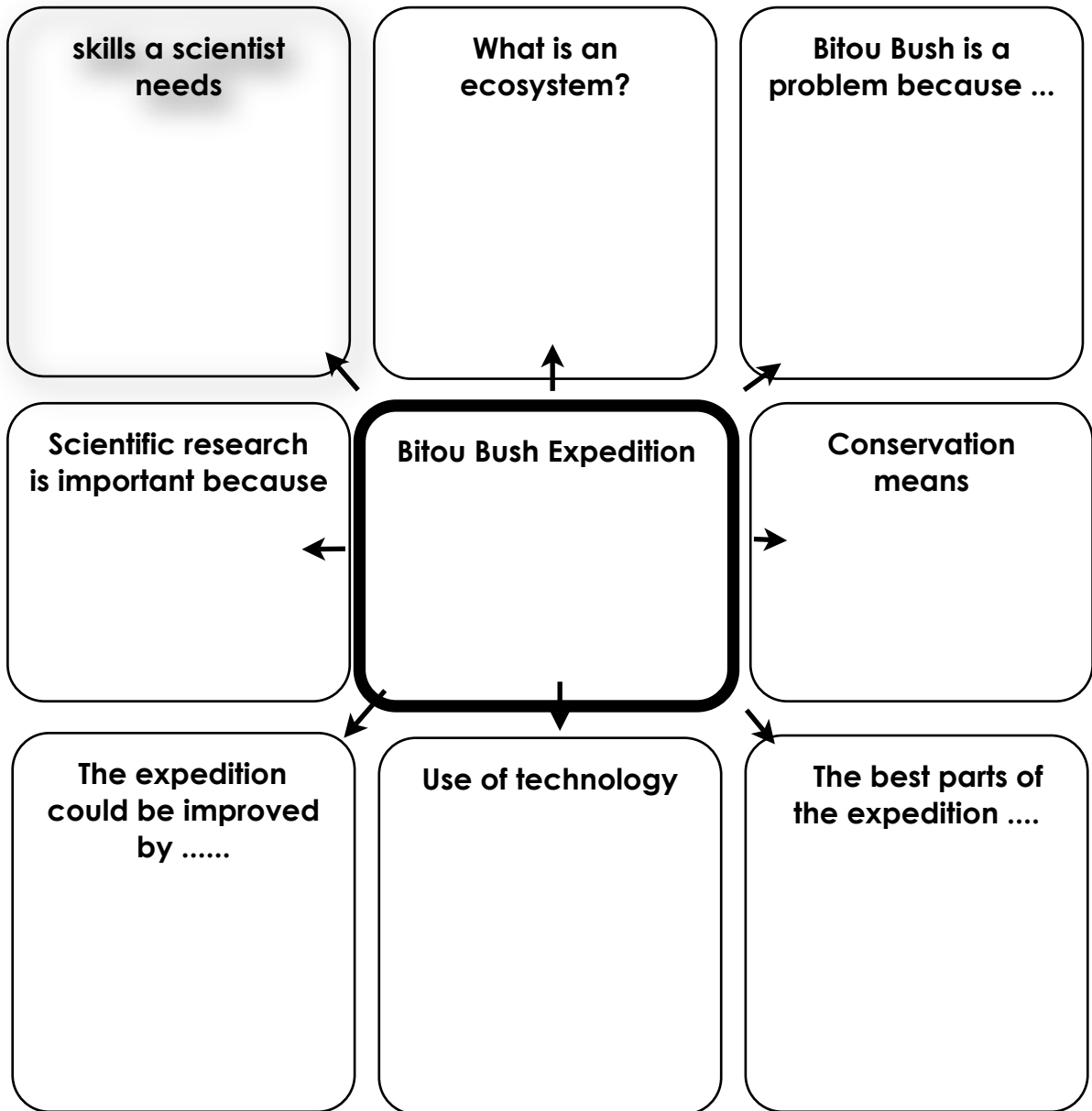
### Our Word Wall

During the expedition a list of important words for your science research will be made at the centre. List the words in the table and write their meanings.

Words	Meanings

### Concept Map

Complete the concept map to express your understanding and values about scientific research for conservation.



## Getting to Know Tanya Mason-research scientist

**Read** about Tanya Mason, the Bitou Bush Expedition research scientist.

**Answer** the questions.

I have been interested in ecology and the environment for as long as I can remember: family bushwalking trips and hiking expeditions with friends gave me a respect for the natural world. This appreciation, plus school and media awareness of human changes to the environment inspired me to pursue a career in ecology.

I am researching the impacts of weed invasion in coastal dunes of New South Wales. I am focussing on the impacts of bitou bush (*Chrysanthemoides monilifera* ssp. *rotundata*), a South African shrub which has colonised and spread through fore and hind dune communities. I have been researching this topic as part of my University of Wollongong studies for over three years.

I hope my research will benefit the scientific community by providing better understanding of how to control bitou bush. In addition, I hope my research will assist managers in protecting dune communities from future bitou invasion.

I recently went to an ecology conference in Montreal, Canada. I also enjoy drawing and etching: I often get inspiration from bushwalking and natural landscapes.

### 1. Match the beginnings and endings of the sentences.

- |   |                |
|---|----------------|
| a. Tanya's scientific research involves investigating       | Canada.        |
| b. Tanya's hobbies include                                  | South Africa.  |
| c. As part of her work, Tanya has travelled overseas to     | bushwalking.   |
| d. Bitou bush has been introduced to Australia from         | coastal dunes. |
| e. Tanya's research will benefit people wishing to conserve | weeds.         |

### 2. Express your values about ideas to conserve our coastal dune ecosystems.

Tick a box: **A - Agree**    **U - Unsure**    **D - Disagree**

- |  |          |          |          |
|--|----------|----------|----------|
| a. Coastal dunes are important ecosystems.                       | <b>A</b> | <b>U</b> | <b>D</b> |
| b. Scientific research of coastal dunes will help conserve them. | <b>A</b> | <b>U</b> | <b>D</b> |
| c. Bitou bush should be conserved to grow in coastal dunes.      | <b>A</b> | <b>U</b> | <b>D</b> |
| d. Tanya enjoys being outdoors in natural environments.          | <b>A</b> | <b>U</b> | <b>D</b> |
| e. Bitou bush has invaded much of our coastal dunes.             | <b>A</b> | <b>U</b> | <b>D</b> |
| f. Ecology is the study of living things in the environment.     | <b>A</b> | <b>U</b> | <b>D</b> |
| g. Scientists must communicate their work to the community.      | <b>A</b> | <b>U</b> | <b>D</b> |
| h. Scientists are very important in shaping our world.           | <b>A</b> | <b>U</b> | <b>D</b> |

### Describing Weeds

Answer these questions while working in cooperative learning teams. Take turns at sharing the roles of Manager, Speaker and Director for each task.

1. Write your team's best definition of what is a weed?

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2. Collect one weed that is flowering.
  - a. Use the flex cam to draw a labelled diagram of the weed.
  - b. On your drawing you need to label: leaf margin, flower, stem, fruit, seeds, leaf length, leaf width and two other features.
  - c. Draw arrows from each label to the part of the flower being described.
  - d. Add a heading and magnification (for example magnification 10x).

3. Use the proscope and/or computer microscope to observe the same flower. Describe two advantages of these technologies over the flex cam.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
4. Use the Geographical Positioning System to find your team's plant. What is the plant? \_\_\_\_\_ Classify the plant as a weed or native. \_\_\_\_\_

## Making an Herbarium

Scientists collect, press, preserve and describe plant samples to help identification. A scientific collection of preserved, labelled plants is called an herbarium.

In your cooperative learning team find three weeds to match the pictures.

1. Find a good specimen with flowers and/or fruit.
2. Cut a specimen no more than 30 cm long.
3. Place the specimen on flat newspaper folded in half.
4. Write your name on one side of a tag and the date and location on the other side. Attach the tag to the specimen.
5. Also write this same information on the outside of the newspaper.
6. Place the specimen between folded newspaper. Make sure the leaves, flowers, fruit and stems are arranged to make a good display of the plant.
7. Sandwich the paper between boards in a press. Apply pressure.
8. Take notes to describe the plant on an herbarium form (shown below).
9. Change the newspaper every day or second day for at least two weeks.
10. The dried sample is mounted onto mounting sheets using gummed paper.
11. The herbarium form is placed in the lower right hand corner of the card.

### Illawarra Environmental Education Centre

Plant Family \_\_\_\_\_

Scientific Name \_\_\_\_\_

\_\_\_\_\_

Locality \_\_\_\_\_

\_\_\_\_\_

Notes:

Collector \_\_\_\_\_

Date \_\_\_\_\_ No \_\_\_\_\_

