

# Environmental Change & Management

## Sackville North

*The Hawkesbury Nepean River and surrounds has been a vital but changing landscape for many thousands of years. It played a key role in the lives of Indigenous Darug People living in the area, the early European Settlers, and is important to many thousands of people today. This Geographical Inquiry will help you understand environmental functioning and the interconnectedness between humans and environments at Sackville North, NSW. It is an investigative study of the causes and consequences of environmental change and management over time at Brewongle Environmental Education Centre.*

### ***Inquiry Question:***

- **How do environments function at Brewongle EEC?**
- **What are the causes and consequences of environmental change at Brewongle EEC?**
- **How can these changes be managed?**



### **Health and Safety Issues**

As you are working out in the field you need to be aware that:

- Ground material is often covered in moss and can be very slippery.
- Vines and dense undergrowth can trip.
- Fallen trees can be rotten and weak.
- Some animals can deliver painful or venomous bites.
- On slopes, rocks can be easily dislodged.

### **Outcomes**

- GE5-2:** Explains the processes and influences that form and transform places and environments
- GE5-3:** Analyses the effect of interactions and connections between people, places and environments
- GE5-4:** Accounts for perspectives of people and organisations on a range of geographical issues
- GE5-5:** Assesses management of places and environments for their sustainability
- GE5-7:** Acquires and processes geographical information by selecting and using geographical tools for inquiry
- GE5-8:** Communicates geographical information to a range of audiences using a variety of strategies

Student Name: \_\_\_\_\_

# Inquiry Aim:

The aim of this Geographical Inquiry is to investigate the natural environment at Brewongle EEC, Sackville North and to discover how environmental change can be managed over different time scales.

To conduct your Geographical Inquiry, you will assess, analyse and explain the influences, management and change through time of the local environment at Brewongle EEC.

## Pre-Visit Activity One

Use our excursion webpage to help answer these questions.

<https://brewongleeec.com/stage-5-geography-environmental-change-and-management/>

The [Atlas of Living Australia](#) is an online record of Australia’s biodiversity follow the link on our excursion webpage to discover living things within a 5km radius of Brewongle EEC.

Aproximately 200 different species of birds have been recorded near Brewongle EEC. Using the map provided on the webpage, list some reasons why the local environment supports such a variety of birds.

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Identify the 5 most common mammal species found at Brewongle EEC

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Define the term ‘wildlife corridors’. Is Brewongle EEC connected by a wildlife corridor to other larger areas of bushland (use the map!).

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Explain how a wildlife corridor could help improve biodiversity at Brewongle EEC

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## Pre-Visit Lesson Two: Geographical Questions

*Geographical questions are questions which help you identify the information you need to answer the inquiry questions. Your inquiry questions are written on Page 1.*

Brainstorm: What are some geographical questions you might ask for this Inquiry?

Example: What is the current type of vegetation growing at Brewongle EEC?

Geographical Question 1: \_\_\_\_\_

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Geographical Question 2: \_\_\_\_\_

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Geographical Question 3: \_\_\_\_\_

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Geographical Question 4: \_\_\_\_\_

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Geographical Question 5: \_\_\_\_\_

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# Pre-Visit Lesson Three: Planning Your Inquiry

Answer the following questions for each of the Geographical Questions you came up with last lesson:

1. What information is needed to answer this geographical question and where can you find that information?

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2. What are the geographical tools you need to access the information?

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3. Develop a system for recording the information you get.

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## Fieldwork Activity One: Environmental Function ~ Fauna

You will utilise handheld GPS units and the map provided to find and assess as many of our habitat boxes as you can in 30 mins. Utilise our unique pole cameras to investigate and identify species present. Share your data with other groups.

List any wildlife or evidence of wildlife that you found.

Box	Species	How many?	behaviour/comments

## Fieldwork Activity Two: Environmental Function ~ Flora

Utilise the iPad field guides provided to identify the dominant tree species at Brewongle EEC.

Common Name	Scientific Name.

Utilise the iPad app “How High Far” and the tape measure to find the height of the tallest tree in your vicinity.

Height \_\_\_\_\_ Species \_\_\_\_\_

Use the mirrors on wooden boards provided to assess the percentage canopy cover of three different locations nearby.

1.	2.	3.	Average:
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Use your results for **tree height** and **average canopy cover** and the sheet provided to find the vegetation classification (use laminated sheet):

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Count how many tree hollows you can see in the near vicinity: \_\_\_\_\_

What would be your visual assessment of the average age of trees in this environment (please tick)

Young (10-50 yrs)      Medium (50-100)      Old (100-200)      Very old (200+)

What is the role that trees play in supporting animal biodiversity at Brewongle EEC?

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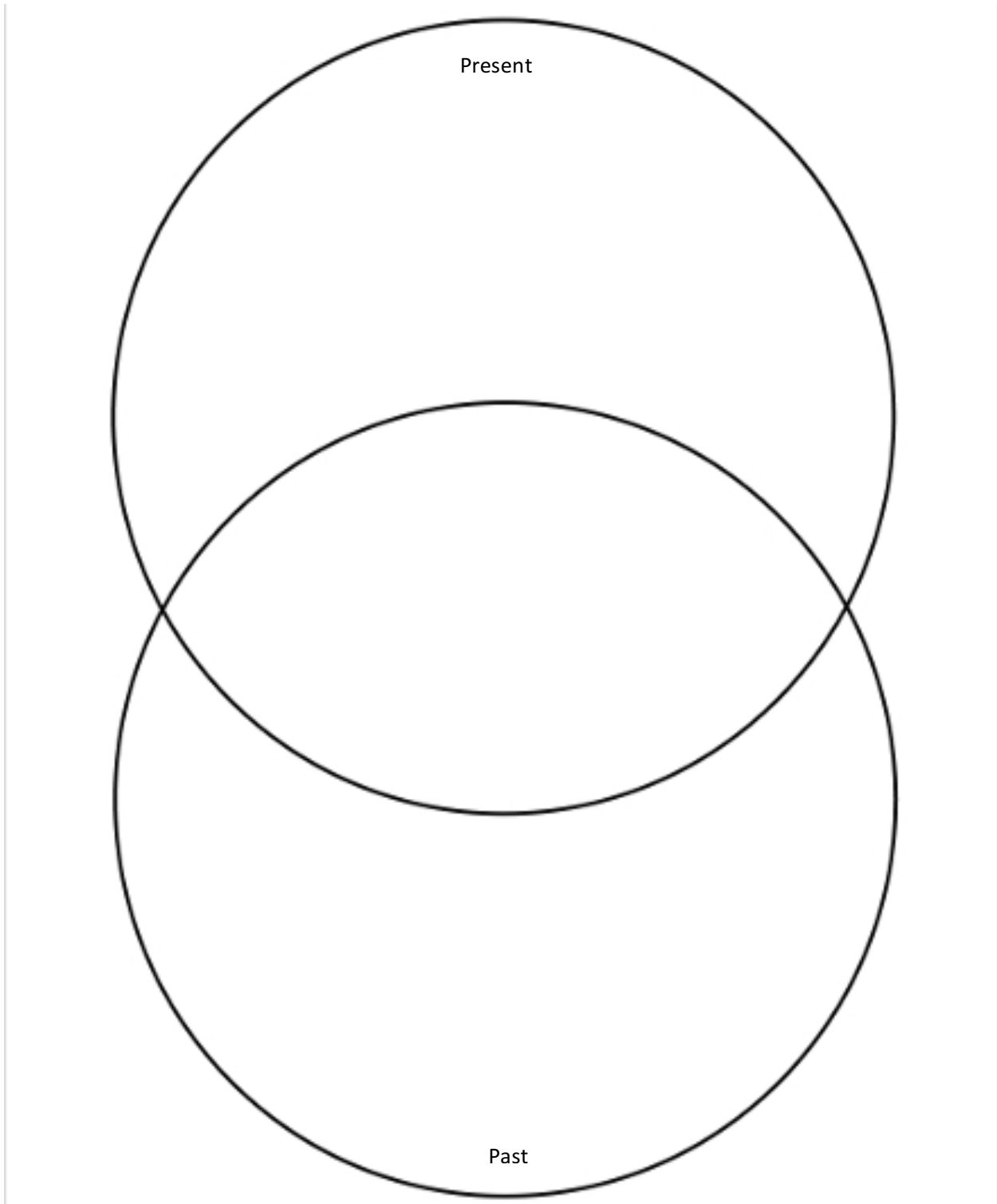
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## Fieldwork Activity Three: Environmental Change through time

Navigate using your map and compass to the photopoints shown on the map you have been given. Utilise the of each site photographs record similarities and differences in the Venn diagram below. Include points on the habitat features.



What was the cause of this alteration to the landscape in the recent past (150 yrs)?

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What reasons might have contributed to the landscape returning to a more 'natural' state since then?

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Complete the human impacts survey on the next page.



## Human Impacts on a Vegetation Community

There are many ways in which a vegetation community can be disturbed and each disturbance can have a varying degree of impact.

Observe the vegetation community around you to complete the following checklist.

1. Has the soil been disturbed by;

	None (0)	minor (1)	major
(2)			
erosion (sheet, rill, gully)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
mining of soil, clay or sand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
dumping of rubbish/garden waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
bushrock collection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
access roads, paths or tracks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Has the vegetation been disturbed by;

	None (0)	minor (1)	major
(2)			
weed invasion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
logging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
past clearing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
off road vehicle use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
nutrient/sewage seepage from adjacent farmland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Is the site;

	No (0)	Yes (2)
adjacent to an urban area	<input type="checkbox"/>	<input type="checkbox"/>
adjacent to recreational facilities	<input type="checkbox"/>	<input type="checkbox"/>
showing evidence of feral animals	<input type="checkbox"/>	<input type="checkbox"/>

### Score:

Poor	=	21 - 30
Average	=	11 - 20
Good	=	0 - 10

Recorded score:

Observe as many alterations to the vegetation community at the study site.

Alteration	Environmental Impact

## Fieldwork Activity Four:

# Environmental Management over time

Aboriginal land management of the Darug people pre-1788. Answer the following questions as you listen to our Aboriginal Educator give a cultural talk.

List some ways that the Darug people managed vegetation to ensure their survival and that of other species:

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In what ways did Darug people 'farm' the land and manage the natural resources to ensure a steady food source:

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Describe how the Darug people used seasonal calendars to manage food resources

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Continue over page.

Draw and label 2 different artefacts and describe **how they were used to manage flora and fauna.**


## Fieldwork interpretation

Explain some of the processes and influences that have transformed the natural environment at Brewongle EEC over time.

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## Post-Visit Lesson One:

Use the stimulus material provided on the excursion webpage to analyse the current management techniques at Brewongle EEC.

<https://brewongleeec.com/stage-5-geography-environmental-change-and-management/>

What has been the major environmental problems in the last 10 years at Brewongle?

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Explain the methods used to manage these problems by Brewongle EEC staff.

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*What role does vegetation play in maintaining animal biodiversity?*

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*How has Brewongle EEC staff helped improve biodiversity at the Centre?*

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*Compare the sustainability of current environmental management at Brewongle EEC with that of the Darug people pre-1788*

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# Post~Visit Lesson Two~Three:

## Processing the Data

Below is a list of Geographical Tools used to collate, review and evaluate data and information. Choose at least 5 of these tools to analyse and present your data in a Word Document.

The information you create here will be used in your documentary assessment task.

- Using ICT software, use a **topographic map** or **satellite image** as a base map, locate Brewongle and identify surrounding natural and man-made features.
- Collate data from your in-depth study into a **table** to summarise your findings.
- Create **flowcharts** to demonstrate your understanding of the ways the environment changes through time as a result of natural and human influences.
- Assemble and annotate **photographs** to provide a visual representation of the site. Analyse and label interconnections.
- Develop **consequences charts** to explain human impacts (positive and negative). Show the impacts on [Google Tour Builder](#). Use photos taken on the day to match parts of the tracks we walked.
- Use a **T-chart** to represent data on advantages and disadvantages of population increases in the Hawkesbury Nepean River Catchment.
- Create a **mind map** summarising how different groups of people (stakeholders) value the area you studied. Include Traditional Owners, National Parks Rangers, Local Residents, Local Farmers, and any others you can think of.
- Construct a **flow chart** or **concept map** to explain the role of government, and other major stakeholders in sustainably managing natural areas.

# Assessment Task:

## Communicating Geographical Information

**Develop a 5-6 minute documentary on the causes, consequences and management of environmental change at Brewongle EEC at surrounds.**

Include answers to the inquiry questions on page 1. Work in small groups. Your documentary should include:

- A clear description of the dominant flora and fauna species of Brewongle EEC and the vegetation classification;
- An evaluation on how these features above are influenced by people, and how people can reduce negative impacts;
- Tools to support your information, such as maps, satellite images, graphs, statistics, flowcharts, labelled photographs, diagrams, illustrations/sketches and other labelled visual representations;
- Information on the traditional management of the place by Darug people;
- Information on the types of land use by early European settlers;
- A description of the role of government in organising or managing the place as well as the perspectives of other stakeholders, for example developers, conservationists, recreationists and local residents;
- A description and justification of a course of action to decrease the impact of changes to the natural environment around Brewongle EEC.