

## River Red Gum Forest Ecosystems Fieldwork

Name:

You work for State Forests as an ecologist. Prior to logging, State Forests must have a logging management plan. To ensure they use the forest in an ecologically sustainable way, State Forests have the following management policies. Your task is to survey Berry Jerry State Forest in preparation for the logging management plan.

### Logging Management Policies (Murrumbidgee Management Area)

- The yield of River Red Gum sawlogs (diameter 50-160 cm) shall be limited to an average of 8 000m<sup>3</sup> per year.
- The yield of small logs (thinnings - < 40 cm dia) shall be limited to 5 000m<sup>3</sup> per year.
- No tree larger than 170 cm dia shall be felled specifically for wood production.
- At least one and up to 5 suitable, mature trees with nesting hollows shall be retained per hectare for wildlife habitat. All such trees within 20 m of any stream, 10 m of lagoons and 60 m of the Murrumbidgee River shall be retained.
- Trees showing signs of Aboriginal markings shall be retained, recorded and protected.
- Trees identified as nesting trees of endangered fauna, specifically the superb parrot, shall be retained and protected.

### Landform

Description

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Explain how this landform developed.

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Describe what "runners" are and explain why they are important.

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Record evidence of flooding.

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### Soils

Soils are the nutrient base in most terrestrial ecosystems. What is the parent material of the floodplain soil and where did it come from?

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### Soil Description

Characteristic	Floodplain	Non-floodplain
colour		

<b>pH</b>		
<b>texture</b>		
<b>phosphorus (optional)</b>		
<b>potassium (optional)</b>		
<b>other</b>		

Describe how the soil tests were done.

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## Water

Dissolved chemicals from the upper catchment enter the floodplain soils during floods and are an important input of matter into the ecosystem. Water in runners and billabongs also acts as a store of nutrients and organisms which are released to the ecosystem during floods.

<b>Characteristic</b>	<b>Reading</b>	<b>Interpretation</b>
Turbidity ntu		
Nitrogen		
Phosphorus		
pH (0-14)		
Salinity (uS)		
Dissolved Oxygen		
Hardness (ca)		

Explain the impact two of these characteristics would have on the ecosystem.

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Describe the impact people have had on water quantity and inputs of matter into the ecosystem from flood waters.

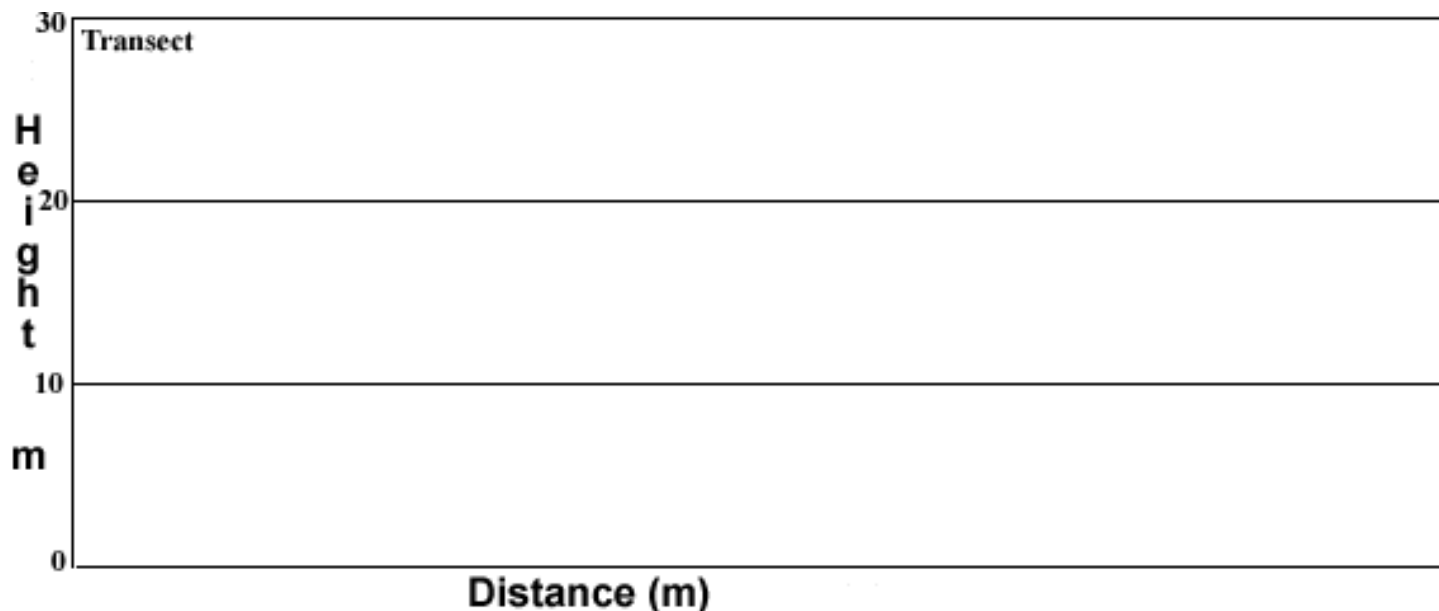
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### Vegetation

Transect: sample the trees with a transect 20 m long x 2 m wide. Record the height and d.b.h. (diameter at breast height) of each tree. Note any trees with nesting hollows and indicate the distance to runners, lagoons or rivers. Note any scratch markings on trunks or droppings by possums.



### Transect Analysis

Plants are adapted to live in particular environments. All of the plants growing in the one environment form a community. Features of plant communities include species diversity, form, structure and dominance.

Describe and explain the diversity of tree species.

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Describe and explain the vegetation form (tree, shrub, grass, herb, fungi, moss). Which major form is missing?

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Describe the community structure e.g. height and diameter of trees ( height layers, the more layers, the richer the habitat).

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Explain why old trees are important.

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### Understorey Quadrat

Randomly select an area 2 m x 2 m. Identify the plants in the quadrat. Record the species and their location in the square. Estimate the percentage cover for numerous plants and count individuals for others. Scientists suspect river red gum trees have an allelopathic affect on herbs and grasses decreasing the biodiversity of the

ecosystem. The decreased incidence of flooding has allowed toxic chemicals in the soil from red gums to build up.

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**Terrestrial animals, food chains and webs**

Animal	Food	Trophic Level*	Special Adaptations

Trophic level: 1 = producer (plant), 2 = primary consumer (herb), 3 = secondary consumer (carn)

Food Chain: draw 2 food chains to show the flow of energy through the ecosystem.

sun			
sun			

**Herbivory of leaves.**

Collect 10 leaves (random sample) and calculate the average percentage of leaf area damaged by herbivores.


What percentage of leaf energy follows the traditional food chain of plant, herb, carn? Where does the rest of the energy in this ecosystem go?

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**Distribution and Abundance of an Organism**

Describe the distribution and abundance of a single plant species (not a tree). Mark out quadrats 1 m x 1 m every 5 metres along a transect line. Record the number of your select species in each quadrat.

Selected plant species					
Quadrat	1	2	3	4	5
Number of plants					

Calculate the average abundance of your plant in number/m<sup>2</sup>

Describe the distribution of your plant (did it vary along the transect).

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Explain the distribution of your plant.

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### **Management**

List the various organisations who are involved in the management of river red gum ecosystems.

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What impact may river regulation have on:

river red gum trees

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soils and floodplains

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native fish

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aquatic birds

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What impact does State Forests logging operations have on age structure of the forest. How does this impact on native animals and tree dwelling birds?

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Explain the impact of grazing have on biodiversity?

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### **Summary Diagram**

Record as much information as you can from your fieldwork on the diagram below.

