

Field Work for Estuaries and Creeks



Creek Study

Level

5-8

Key question

What are the plants and animals associated with a creek or estuary?

Key outcome

An understanding of creek/estuarine life and the inter-relationships of organisms that live within and surrounding the creek.

Adapted from a series of field activities developed in the Royal National Park, Sydney and used at the MESA conference 1988.

What you need

Clipboard, paper, pencils
Field instructions or a white board with brief details
Paint, paintbrush, art board
Cardboard window

What you do

You should work as individuals with minimum instructions, using a field sheet of instructions or referring to a white board of activities. Activities can be done in any order. You may find it useful to have some groups closer to the estuary or mouth of the creek, and others placed further upstream.

(a) Living Things in the water

Lie very still on a rock with your eyes fixed a few inches above the water. Watch very closely where the water is fairly still. Make a list of all the living things that you see. For example; free moving – water beetles, tadpoles; clinging to stones – small worms, snails.

(b) Visitors to the water

In the late afternoon, sit very still on a rock in the creek and make a list of the visitors who come down to the creek to drink (birds, kangaroos, insects, others). Share your finding with your group.

OR

Sit near the pool on a hot summer day and notice which birds remain close to the pool, because there is no water elsewhere. Use a field guide book to help you to identify them.

(c) Living things near the water

Compare the stems of plants which live in or near the creek with stems of plants which live higher up the hill. Answer the following questions:

- Where do most plants with hard woody stems grow?
- Are there mosses and liverworts high up on the hill?
- Where do you find plants with soft green leaves?
- Where do the plants with stiff spiky leaves grow?
- Can you suggest why these plants grow in these areas?

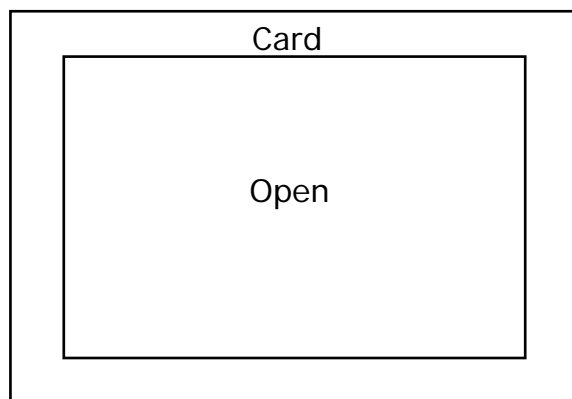
Creek Study

(d) Living things carried by the water

If you walk along the creek bank, you will sometimes find plants which are strangers to the area. They don't belong there (e.g. roses, watsonias). How did they get there? They are not native Australian plants. How many strangers can you recognise? Are they more plentiful than Australian plants at some points?

(e) Landscape painting - 'Down the Creek'

One of the hardest steps in making a painting is the selection of what to draw or paint. To help, you can make a small cardboard window (e.g. from a cereal box) through which you can look. This will frame part of the landscape.



When aiming for a naturalistic representation of a landscape, observation must be emphasised. Keep looking at the subject. Make sure you include a part of the creek in the composition. Draw with pencil or brush. Paint in basic colours so that the whole board is covered with paint. Add necessary details, for example, light and shade.

(f) Life of the creek

Try to allow yourself ample time to just sit and observe the birds, insects and other living things that live near, or in the creek.

Discuss life in the creek and the interrelationship of organisms in the creek.

Make preliminary drawings of imaginary animals that might come to the creek OR develop illustrations for a myth created on the spot. Use the painting at the creek to sustain the inspiration of the surroundings.

Sampling Sediment Animals

Level

8+

Key questions

How would you extract animals that live within sediments?

Are these different species living in different sediments?

Key outcome

Identify animals found on sedimentary shores.

Adapted from field notes of Charles Jacoby, CSIRO, WA, and Gee Chapman, University of Sydney, NSW.

Hazard warning!

Wear dive boots, old sneakers or gumboots, never thongs or bare feet!

Watch for slippery surfaces.

Ensure those participating wash their hands and nails carefully in clean water after handling sediments, as sediments may hold various toxic substances.

Major areas of sediment build up exist within bays and estuaries. Within these sediments are major habitats for plants and animals.

What each group needs

Spade

Core sampler (e.g. an open tube, or plastic bottles such as vinegar bottles with the end cut off, or pieces of PVC piping)

Sieve (usually 0.5 mm)

Containers or dishes to hold the sediments

Field guides or sheets to identify specimens, clipboard and paper

Magnifying glass

What you do

This activity is easier to perform from a boat ramp that has an exposed soft sedimentary shore at low tide (either along an estuary/ creek or on a sheltered beach).

1. Select an area close to the bank of an estuary at low tide. With the whole group assembled, dig a hole in the sediment to expose the different coloured sediments (one hole is sufficient). Note the colours of the top and bottom sediments. Brown or fawn layers indicate presence of oxygen, black or grey are usually anoxic (oxygen absent). Take a small sample from the black sediment and place in a container, to be sieved later. Refill the hole.
2. Working in small groups, select sampling sites. In an undisturbed area, push the core sampler into the sediment (approximately 5 cm) and carefully slide a solid piece of plastic or metal sheet under the open end, so the core is kept intact. Place the sediment core into a container and keep to be sieved.
3. Now sieve the sediment samples in the water at the edge of the boat ramp. Use a magnifying glass to count the numbers of animals and to identify as many as possible. Also keep a record of what is found in the black sediment samples.
4. Compare the findings between your sample and the sample taken from the black sediment. If there is a difference, give a possible explanation.

Extension

Compare with sediments of another area or creek estuary.

Measuring the Turbidity of Water

Level

7-8

Key questions

How do you measure the turbidity of water?

Why is it important to prepare a comparison in turbidity studies?

Key outcome

Monitor and describe the level of turbidity from various waterways.

Adapted from *Ecotrekker, an Environmental Mystery, Activity Guide accompanying the CD Rom*, published by CSIRO Information Services 1995, and utilised by Dr. Charles Jacoby, CSIRO, Perth, at Jervis Bay.

Turbidity, or the amount of suspended material, in water can be affected by human activity. The clearing of trees and vegetation means that the plant root systems no longer bind the topsoil. This may be swept into waterways by wind or rain. Sewage and industrial effluent also may contain material which can increase turbidity.

What you need

Plastic cups
Measuring vial
Funnel
Filter paper
Scales
Pencil
Paper
Clipboard

What you do

The level of turbidity in water can be measured using the following method.

Preparing samples for comparison:

1. Add about half a cup of soil to two cups of water.
2. Weigh a piece of filter paper and place it in a funnel.
3. Pour exactly 100 ml of the dirty water through the funnel so that the water (filtrate) passes through and the residue remains in the filter paper.
4. Allow the paper to dry. This may be sped up by placing it in an oven or under warm lights.
5. Weigh the paper.
6. Calculate the mass of residue on the paper by subtracting the mass of the paper.

Measuring samples

7. Collect water from the local waterways and use the above method to compare the amount of residue for each.

Measuring the Turbidity of Water

Questions

1. Which water sample tested in Step 7 had the most residue?
 - Which is the most turbid?
 - Why might this be?
2. Why do you think the level of turbidity differed between your samples?
3. Would the level of turbidity remain constant over a week? Explain your answer.
4. Why was a comparison prepared?