

Ithaca Intact School Based Activities

Activity Name: Habitat Monitoring

Activity Objective: To introduce students to the concept of habitats and the role of monitoring waterway habitats in indicating stream condition. The activity also aims to develop skills in habitat monitoring procedures. This activity provides a snapshot assessment (as opposed to ongoing assessment) of Ithaca Creek.

Materials Required:

- Digital camera (and batteries!)
- Gumboots
- Measuring tapes/lengths of rope
- Depth measurer
- Vegetation field guide
- Picture card of in-stream habitat
- GPS (if access to one)
- Worksheets
- Pencils
- Tent pegs with bank boundary names attached
- Health and safety equipment/ First Aid Kit
- Protective clothing (hat, sunscreen, covered shoes etc)

Safety Notes: This activity is low - medium risk, depending upon how close the students are to the creek. In the case of working outside, students should have sun protective clothing, sunscreen, water bottles and sturdy footwear. Students should be advised not to touch any animals with their hands without the supervision of an adult. Students should wash their hands after handling any organic materials. Students should be warned of appropriate conduct whilst working close to the waterway. A site inspection should be carried out prior to activities to ensure a suitable site is selected for sampling.

Why is it important to measure habitat?

- Bank stability, stream and riparian habitats are vital to the functioning of freshwater systems.
- Bank and stream bed instability can result in erosion
- The nature of habitats in stream and on stream will influence the nature of animal assemblages located in the area
 - For example, complex systems comprised of many microhabitats has the potential to fill the needs of a greater number of species
- It is extremely important to assess riparian habitat diversity and structure also as
 - roots provide habitat for fish and small animals, reduce erosion and can aerate the soil in some cases
 - Roots can also filter the soil and reduce rubbish/litter reaching the water (mechanical filtration)
 - Trees provide food and shelter for a variety of species, regulate temperature and reduce weeds
- Monitoring is a very effective way of determining the success of rehabilitation work or to measure the impacts of human based activities, such as land clearing

What is typically measured with regards habitat?

- Bank and bed stability
 - Indicates sedimentation process (erosion/deposition)
- Stream habitat availability
 - This will give an indication of the species that may be able to inhabit the area
 - In-stream habitat and channel habitat
- Riparian zone disturbance
 - Riparian (bordering the river/stream) vegetation is important in filtration, temperature regulation and bank stabilisation, providing leaves and organic material, provides food for animals living in the creek/waterway, wildlife corridor and habitat for fish
 - The riparian strip also acts as a buffer between the waterway and the potential uses of land

Designing a study requires reflection on the following questions

- What will I measure?
 - What is the objective
- How often and when should I measure?
 - Monitoring surveys should be undertaken during the drier months of the year
 - What budget do I have?
 - How many people will it involve?
 - What is the objective
- How do I define the site?
 - Should include both the in-stream and riparian aspects
 - Should be representative of the total conditions
 - Min length should be 100m
 - Where possible the site should include
 - 2 pools, a riffle and run habitats
 - Both banks should be assessed
 - In labelling your records, the right bank is considered the one on your right when you are facing downstream
- How and where should I place my monitoring sites?
 - Consider what you questions you are trying to answer
 - Accessibility and safety

Assessing Bank and Bed Stability

- Erosion (bank) occurs from
 - Removal of vegetation
 - Can occur naturally or be accelerated by land use practices/human disturbances/stock
- Slumping occurs when part of the bank erodes away and undercuts the stream bank
- Stream bank/bed aggradation is the accumulation of sediment on the stream bank/bed
 - Occurs when sediment is carried in the water column and is deposited on the stream bank/bed

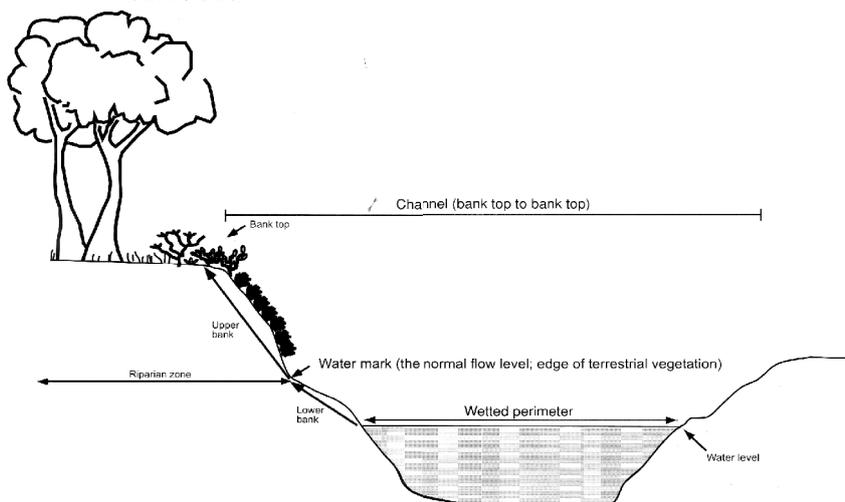


Image taken from the Queensland community waterway quality monitoring manual

Determine the Site

1. Write a description of the weather and the time of day on the worksheet
2. Determine site to be assessed
 - Depending upon the age of the students and the time available, the site may be predetermined
3. Two transect lines/ropes can be laid to mark the ends of the site
4. Determine which sides of the site are left and which are right
5. Determine the bank boundaries as a group, use the tent pegs to mark it out
6. Record the air temperature and water temperature
7. Record the water level
8. Record any obvious signs of litter, pollution or disturbance on the creek

Riparian Vegetation Assessment Activity Procedure

8. Estimate the width from the stream of vegetation growing along each bank
9. Estimate the number of gaps in the canopy that are greater than 5m
10. Mark the presence of weed common weed species
11. Identify the dominant form of vegetation (weed vs native)
12. Along a transect line, measure the structure of the vegetation along the line
 - Use a piece of string/rope to measure the circumference of the trees
 - Large trees will have circumference of >
 - Medium trees will have circumference of between
 - Small trees will have a circumference <

Stream Habitat Assessment Activity Procedure

13. Students are to identify the different channel habitats present in their site
 - a. Waterfalls, riffles/rapids, runs/glides, pools, backwaters
14. Students should sketch the site on their worksheet. This should be done as a birds-eye view
 - b. Include dimensions, lengths, widths, direction of flow where possible
 - c. Include large logs, estimates of canopy cover, root/bank overhangs, vegetation etc
15. As a group add measurements to the diagram
16. Students are to identify different in-stream habitats present in their site
 - d. Logs, rocks, branches, leaves, aquatic plants, roots
 - e. Also include man-made structures
 - f. These can also be added to the diagram
17. Students are to describe stream canopy cover

Stream Bed Assessment Activity Procedure

18. Complete a sketch or diagram of the site (Right bank). Students should include features, measurements and labels that will help identify the areas and any areas of concern. The diagram should make reference to any areas of erosion, slumping or aggrading of the bank or bed. They can also make reference to stable sections or sections lacking vegetation.
 - g. Keys may be a good way of saving time
19. Repeat the above process for the left bank
 - h. If limited time is available, split the students into 2 groups
20. Students should give the bank an overall rating of 1-5 (1 being extremely unstable)
21. Students determine whether the stream bed is predominantly eroded, stable, aggrading. Include an overall rating of 1-5 (1 being extremely unstable)
22. Add the values determined in steps 10 and 11 to obtain an overall rating

Additional Notes:

- Students should be reminded to respect the environment within which they are working
 - No running or sliding as it may cause erosion
 - Return any logs/rocks to how they were found, as they provide important micro-habitats
 - Be gentle and slow whilst sorting through the sample to avoid damaging the animals
 - If vertebrate animals are caught, they should be noted, counted and returned to the waterway immediately
 - Animals should be returned to the same habitat they were sampled from
- Students will be required to share equipment and take turns

Note: Parts of this procedure have been adapted from the Streamwatch Sampling Kit and the Queensland Community Water Quality Monitoring Manual.