

Riparian habitat assessment



Riparian Habitat Assessment

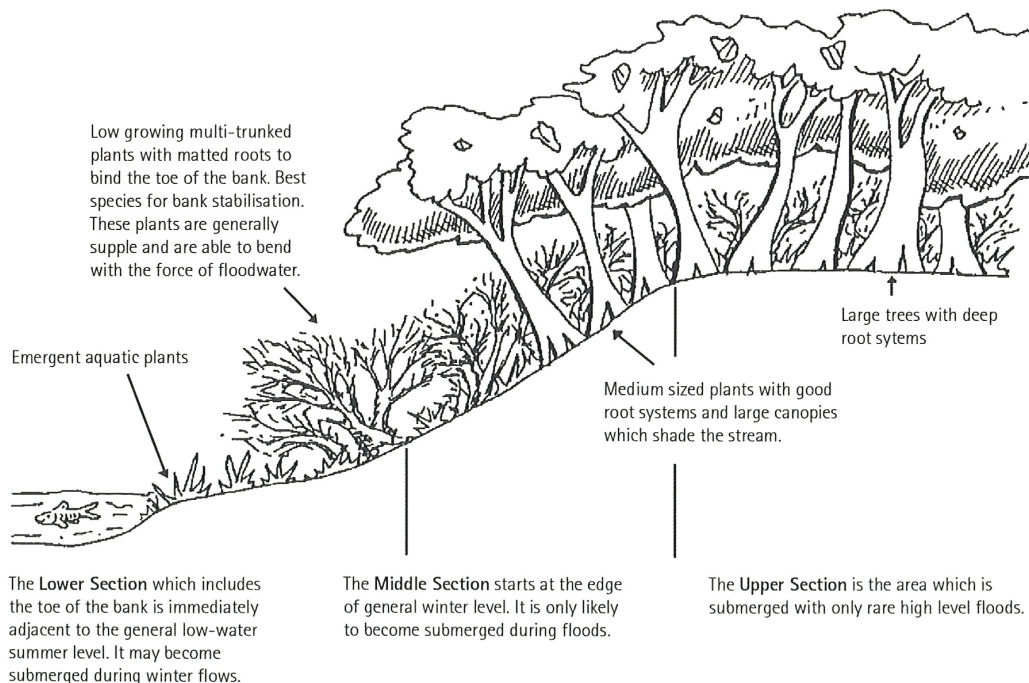
Plants growing along the edge of the waterbody are called riparian vegetation. Riparian vegetation includes native and introduced species that ideally form a broad band (the riparian zone) along the edge of a waterbody. For an estuary, the riparian zone starts from the highest high tide mark. Riparian vegetation protects the waterbody from agriculture and other human activities near the stream.



Natural riparian vegetation is a valuable source of food and shelter, for animals on the land as well as for freshwater organisms. Leaf litter, insects and fallen branches from overhanging native trees give year-round food, habitats and shelter for native fish, invertebrates and many other animals.

Riparian vegetation shades the stream and the banks, making the water in small waterways as much as 10°C cooler than the water in equivalent unshaded streams. Temperatures that are higher than expected for the season can be lethal to many freshwater plants and animals.

The riparian environment



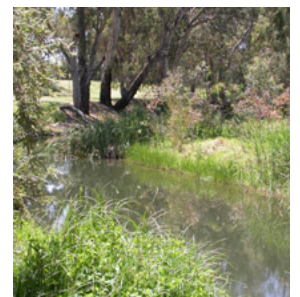
Source: Munks S, 1996

The roots of suitable species of riparian vegetation bind the soil of the banks, holding it together against erosion by the water. Aboveground plant parts interrupt any overland movement of water, sediment, nutrients, pesticides and herbicides into the water.

In contrast, where there is either little riparian vegetation or only introduced riparian plants, especially those that lose their leaves in winter such as willows, the waterbody may be deficient in good food supplies, or in snags and other underwater habitats; it may be contaminated by pesticides and sediment, or be subject to wide temperature variations.

from Waterwatch Australia National Technical Manual

<https://webarchive.nla.gov.au/awa/20110601173405/http://www.waterwatch.org.au/publications/module3/habitat.html>



Physical shape of the waterbody

Streams often have pools and riffles and runs, and this variety of habitats is able to support a variety of species. A riffle is a section of a river or stream where shallow water flows over rocks in rapid turbulent flow. Riffles are important for aerating the water (adding air and therefore oxygen) and for providing a habitat for many macro-invertebrates. Large slow-flowing rivers may not have riffles but may have quiet pools, which suit fish more than macro-invertebrates. Lakes can have beaches and inlets that are shallow and stony, as well as deep areas.

When waterbodies have been affected by human activities they may be deeper, shallower, straighter or less braided than unaffected waters. Although shape variations like these occur naturally between waterbodies, they can also be a result of gravel extraction, sedimentation, channel straightening and other river engineering works.

The condition of the habitat influences the physical and chemical quality of the water and the kinds and numbers of animals that live at a site. Habitat surveys and ratings can help your group determine if poor water quality is caused by a loss of riparian vegetation and by eroding waterbody banks or by stresses elsewhere in the catchment.

Assessing the habitat at your site

To assess the health of the habitat around the stream you are monitoring, you will need to consider five features:

- quality of verge vegetation
- quality of bank vegetation
- extent of in-stream cover
- degree of bank erosion and stability
- variety of riffles, pools and bends.



Bank vegetation refers to trees, shrubs, grasses etc. actually growing on the bank. This vegetation provides food and shelter for aquatic animals in the form of fallen leaves, twigs and branches.

Verge vegetation is considered to be stream side vegetation up to 40m from the bank of wide rivers or 10-20m from the bank of small streams. The verge vegetation can be quite extensive but many streams in urban areas have almost no verge vegetation at all. The condition and type of vegetation around a water body gives a good indication of the quality of the aquatic environment. It helps to explain physical and chemical changes and the macroinvertebrates found in the water.

In-stream cover refers to the diversity of living places available to aquatic life and includes aquatic vegetation, woody debris, snags, fallen trees, logs and rocks. Streams with a rich diversity of in-stream cover allow animals to shelter from the current, feed and reproduce. Aquatic plants supply food and oxygen, and protruding snags form roosting and preening sites for birds.

Bank erosion and stability. Streams naturally erode, usually on the bends of meanders. However, changes in adjacent land use can cause a stream to become unstable, resulting in continuous erosion along its channel. Such changes include increased run-off from impervious surfaces and piped tributaries, stock access or direct interference such as straightening or channelling the stream. If it has been stabilised with concrete banks, the stream will be stable but should not be ranked highly as it is not ecologically healthy.



Riffles, pools and bends. The variety of habitats found in riffles, pools and bends helps to support a variety of living things. Before you consider assessing this part of the habitat, make sure that riffles, pools and bends are a natural part of the catchment being studied. For example, large slow flowing rivers may not have riffles but the bends provide different habitats because the cutting action of water at bends provides deeper areas.



What to do

Individually or in small groups, conduct a habitat survey at your monitoring site using the Riparian Habitat Assessment table on page 5. Survey both sides of the stream for approximately 100m and extending out from the water by 40m for a medium/large waterway or 10-20m for a small stream.

Tally the point scores then check your habitat rating on the chart on page 6.

Learning extensions

Identify the different habitat zones at your site:

- Create diagrams or models to represent the different habitat areas.
- Record the variety of plant species present in each zone
- Describe the plants using the table below and/or the Water Plants key on page 7.
- What are the functions of these plants in the aquatic environment?
- Collect plant samples for further identification or create a Herbarium (check for permission first; some species are protected and you not allowed to collect plant samples from areas designated for conservation, such as national parks or conservation parks).



Plant Types

<p>Trees and Shrubs</p> <p>Riparian zone, woody stems, bank stabilisation, buffer zone, habitat.</p>	<p>Emergent</p> <p>Riparian zone (verge) and In-stream, rooted in substrate, stems/ flowers project above the water.</p>
<p>Submerged</p> <p>In-stream, rooted in substrate, leaves normally fully submerged.</p>	<p>Floating attached</p> <p>In-stream, rooted in substrate, leaves normally floating on the surface.</p>
<p>Free Floating</p> <p>In-stream, unattached, float at the surface, may attach to mud and rocks when water levels drop.</p>	<p>Your local ranger or regional ecologist can help with plant identification or advise on weed eradication and re-vegetation projects.</p>

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Record sheet

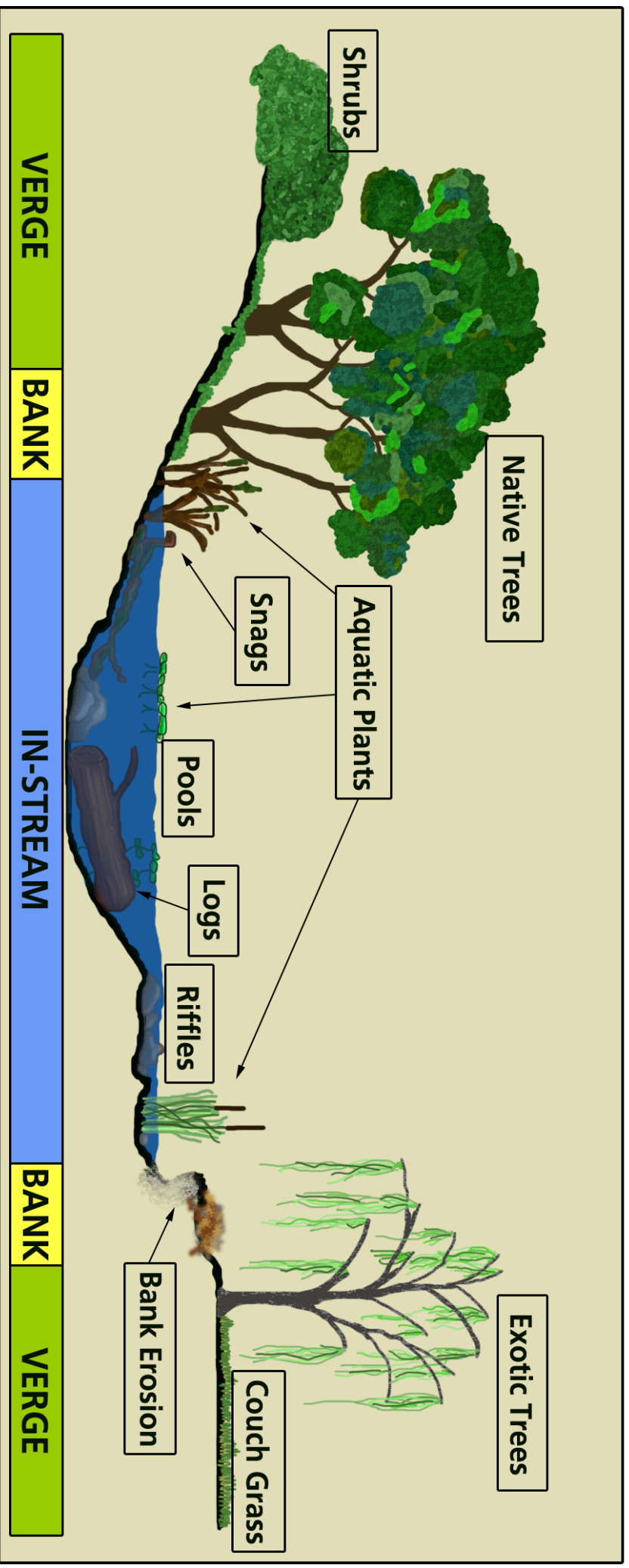
School: _____ Date: _____

Class conducting the survey: _____ Start time: _____

Site name: _____ Site code: _____

Verge Vegetation	1A 4 points <input type="checkbox"/> Mainly undisturbed native vegetation on both sides of stream. Verge more than 30m wide.	1B 3 points <input type="checkbox"/> Well-vegetated side verge corridor. Some introduced plants or reduced cover of native vegetation.	1C 2 points <input type="checkbox"/> Narrow corridor of native or introduced vegetation.	1D 1 point <input type="checkbox"/> Bare cover or introduced grass cover such as lawn, couch grass or pasture land.
Bank Vegetation	2A 4 points <input type="checkbox"/> Native plants in their natural condition. No signs of site alteration.	2B 3 points <input type="checkbox"/> Mainly native shrubs, trees and reeds with some introduced plants. Few signs of site alteration.	2C 2 points <input type="checkbox"/> Introduced groundcover. Few native shrubs, trees or reeds. Mostly introduced plants.	2D 1 point <input type="checkbox"/> Introduced grass with lots of bare ground. Vegetation is sparse. Includes sites with concrete-lined channels.
In-Stream Cover	3A 4 points <input type="checkbox"/> Abundant cover. Frequent snags, logs or rocks with large areas of native aquatic plants. Many overhanging branches.	3B 3 points <input type="checkbox"/> Moderate cover of snags, logs or rocks with moderate areas of native aquatic plants and overhanging branches.	3C 2 points <input type="checkbox"/> Little cover. Stream is mostly cleared, with few snags and few native aquatic plants or overhanging branches.	3D 1 point <input type="checkbox"/> No cover. No snags, rocks, native aquatic plants or overhanging branches. Includes sites with concrete-lined channels.
Erosion	4A 4 points <input type="checkbox"/> No erosion. Deposition present. No undercut banks. Usually gentle bank slopes, with lower banks covered with root mat grasses, reeds or shrubs.	4B 3 points <input type="checkbox"/> Spot erosion occurring. Little undercutting of banks, good plant cover, usually gentle bank slopes, no significant damage to bank structure.	4C 2 points <input type="checkbox"/> Larger areas of active erosion, especially during high flows. Large areas of bare banks, little plant cover.	4D 1 point <input type="checkbox"/> Almost continuous erosion. Over 50% of banks have some erosion. Little vegetation cover.
Pools & Riffles	5A 4 points <input type="checkbox"/> Wide variety of habitats. Riffles and pools present of varying depths. Bends present.	5B 3 points <input type="checkbox"/> Good variety of habitats. Riffles and pools or bends and pools. Variation in depth of riffle and pool.	5C 2 points <input type="checkbox"/> Only slight variety of habitat. All riffle or pool with only slight variation in depth.	5D 1 point <input type="checkbox"/> Uniform habitat. Straight stream, all shallow riffle or pool of uniform depth. e.g. channelled stream or irrigation channel.

Tally the point scores for each habitat type to give your overall rating --->



What's What?

Bank Vegetation - Bank vegetation is found on the immediate edges of waterways and may extend slightly into the water in the case of water reeds.

Verge Vegetation - The verge vegetation is considered to be within 30m from the water's edge. Separate to bank vegetation.

Pools & Riffles - Rocks in a stream may create shallow areas over which water rushes quickly. This is called a riffle. Upstream of a riffle the water is often quiet and still and may form a pool.

In-stream Cover - In-stream cover includes water plants, snags, logs, rocks, branches and islands.

Tally the point scores for each habitat type then check your overall rating on the table.

Score	Rating	Habitat Condition
18-20	Excellent	Site in natural or virtually natural condition.
13-17	Good	Some alteration from natural state.
8-12	Fair	Significant alterations from the natural state but still offering moderate habitat; stable.
5-7	Poor	Significant alterations from the natural state, with reduced habitat value; generally has erosion and/or sedimentation problems.

Water Plants

