

River Health in the Fleurieu Peninsula and Kangaroo Island



Mecopteran larva (*Nammochorista* species)

Aquatic macroinvertebrates in the Fleurieu Peninsula and Kangaroo Island

The region is highly diverse, with more than 350 types of aquatic macroinvertebrates being recorded from 1994–1999. The most common members include worms, the crustacean *Austrochiltonia australis*, hydrobiid snails, various chironomid midge larvae, blackfly larvae and corixid waterbugs such as *Micronecta* and *Agraptocorixa* species.

Several rare macroinvertebrates are also found in the region. They prefer permanently flowing, cool, moist localities; conditions that limit their distribution in South Australia. They include stoneflies (e.g. *Newmanoperla thoreyi*), various caddisflies (e.g. *Apsilochorema gisbum*, *Tasimia* species, *Orthotrichia bishopi*, *Leptorussa darlingtoni* and *Atriplectides dubius*), uncommon midge larvae (*Stempellina* species), mecopteran (scorpion fly) larvae (*Nannochorista* species) and riffle beetle larvae (e.g. *Kingolus* and *Elmiidae* species).



Riffle beetle larvae (Elmiidae species) live in cool, flowing water and are mostly restricted to the Fleurieu Peninsula and Kangaroo Island in the State.

Photo: M. Marchetti, California State University

Since 1994 scientists from the Environment Protection Authority and the Australian Water Quality Centre have been assessing the ecological health of rivers and streams throughout South Australia.

As part of this work, 78 sites on Kangaroo Island and the Fleurieu Peninsula have been assessed. This brochure describes the monitoring methods and the overall condition of rivers and streams on Kangaroo Island and the Fleurieu Peninsula.

The AUSRIVAS Program

This work is part of the AUstralian RIVer ASessment System (AUSRIVAS), and represents the first national biological assessment of river health to be conducted on a continental scale anywhere in the world. It has involved sampling over 6000 sites across Australia, including about 650 sites in South Australia.

What is river health?

Defining 'river health' is similar to defining human health, as it provides an overall assessment of the health of waterways. It is important to note that the concept of 'health' often has different meanings to different people, and largely depends on each person's values and knowledge. However, for our purposes when we describe river health we are really talking about the ecological condition of a waterway.

It's not just about rivers, but also includes streams, creeks and earthen drains.

How do we measure river health?

We measure river health by comparing the condition of a river to similar rivers of the same type in an undisturbed, unimpacted state (i.e. reference condition). To provide a nationally consistent approach, all States and Territories have used aquatic macroinvertebrates as the major biological indicator group to focus on and model. Our assessments provide a measure of the degree of similarity between the aquatic macroinvertebrates found at each site and those predicted to occur at the site if it were not impacted.

What are macroinvertebrates?

Macroinvertebrates are aquatic animals without backbones that are large enough to be seen with the naked eye. They include insects, crustaceans, snails, worms, mites and sponges. The insects include the larvae of flying insects (e.g. midges, two-winged flies, dragonflies, mayflies, stoneflies and caddisflies) and adults of some groups (e.g. waterbugs, beetles, springtails). The more familiar crustaceans include yabbies, and freshwater shrimps and prawns.



Water boatmen (e.g. *Sigara* species) are aquatic predatory bugs that prefer still-water habitats.

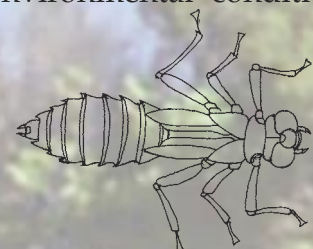
Photo: Peter Bryant

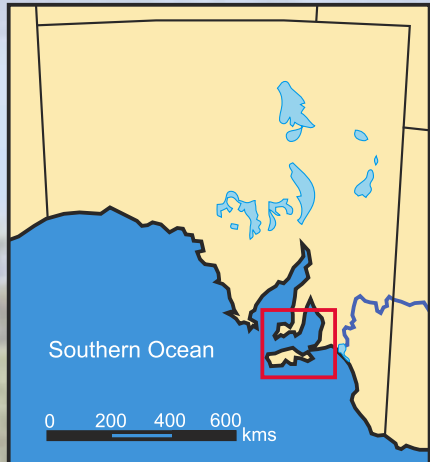
Why use macroinvertebrates?

Macroinvertebrates are most commonly used in biological monitoring studies because they are common, widely distributed, easily sampled and most can be readily identified by experienced biologists.

Why worry about river health?

The decline of water quality, blooms of blue-green algae, contamination with pesticides, nutrients and sediment, microbes that threaten drinking water supplies, fish deaths, and the threats posed by increasing salinity are some of the widespread issues that affect many waterways in Australia. This often leads to questions about the overall health of rivers and streams and the actions we should take to improve the environmental condition of our waterways.



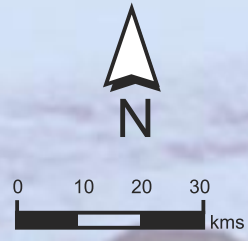


Site Description

- More biologically diverse than reference sites (needs detailed investigation) (X)
- ▲ Reference site
- Reference condition (A)
- Significantly impaired (B)
- Beyond the capacity of current AUSRIVAS models (?)

Land Type

- Lake
- Land
- Ocean
- River
- Towns
- Streams



* Site that varies in condition from one year to the next (eg. B / C)

Riverine environments in the Fleurieu Peninsula and Kangaroo Island

Kangaroo Island is merely an extension of the Southern Mt Lofty Ranges known as the Fleurieu Peninsula, and is separated from it by the waters of Backstairs Passage. Consequently, both areas share a similar geology, soils and climate and indeed many of the plants and animals are also very similar.

The general climate is cool and temperate, with a distinctive rainfall peak in winter. Average rainfall ranges from more than 900 mm on the highest parts of Kangaroo Island (Gumridge and Allandale) and the Fleurieu (Second Valley Forest and Deep Creek Conservation Park) to less than 500 mm on the low-lying lands between Redbanks and North Cape on NE Kangaroo Island. The high rainfall creates near-permanent streams throughout the region, although many contract to isolated pools during summer, particularly during dry years. Typical habitats range from near-permanent freshwater streams on the western end of Kangaroo Island and most coastal streams on the Fleurieu Peninsula, to permanent and temporary saline streams on the central and eastern parts of the island.

Major freshwater streams on Kangaroo Island include the Rocky, Breakneck and North West rivers in the Flinders Chase National Park and Middle River to the north of the island. The larger saline waterways include the Cygnet, Eleanor and Willson rivers.

On the Fleurieu Peninsula, the major streams include the Myponga, Yankalilla, Inman and Hindmarsh rivers and Deep Creek.

River health in the Fleurieu Peninsula and Kangaroo Island

The map provides an overall assessment of the health of individual sites in the region. Most sites are in good condition and similar to other reference rivers in the State. This is not surprising given the wet climate, high amount of vegetation cover on the landscape, and less severe land use impacts in this region compared to more urban areas. Biodiverse sites were located in the Carrickalinga area and in the Inman River catchment. The sites that were below reference condition included the Inman River downstream from the wastewater treatment plant discharge, Myponga River downstream from the reservoir and No Where Else Creek (high nutrients). Impacted streams on Kangaroo Island include sites on Middle River (poor habitat, reservoir), Timber Creek (salinity, habitat), Springy Water Creek (habitat) and Willson River near the estuary (salinity, habitat).



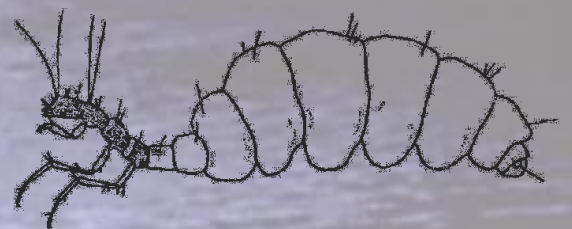
Caddisfly larvae (e.g. *Atriplectides dubius*) construct their portable homes out of sand, twigs and leaves.

Photo: Vlad Tsybal



The common yabby (*Cherax destructor*) lives under rocks or in holes dug into the river bank.

Photo: Jim Rathert, Missouri Dept. of Conservation



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Additional details are available at
<http://ausrivas.canberra.edu.au>
<http://www.ea.gov.au/water/rivers/nrhp/index.html>



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