

River Health on Eyre Peninsula



Blackfly larva (*Simulium ornatipes*)

Aquatic macroinvertebrates on Eyre Peninsula

The region is not very diverse, with less than 250 types of aquatic macroinvertebrates being recorded from 1994–1999. The high salinity of most streams in the region excludes many species that prefer freshwater environments. The most common members include amphipod crustaceans (*Austrochiltonia australis*), chironomid midge larvae (e.g. *Chironomus* and *Tanytarsus* species), blackfly larvae (*Simulium ornatipes*), hydrobiid snails, oligochaetes (worms) and nematodes (roundworms).

A number of rare types of macroinvertebrates are found in streams in the region. They include the saline tolerant caddisfly larva (*Symphitoneuria wheeleri*) that occurs in low numbers in Salt Creek north of Cleve. A number of uncommon species occur in the Tod River catchment including hydra, nemertean (proboscis worms), Corophiidae crustacean amphipods and dytiscid beetle *Onychohydrus scutellaris* larva. Other regionally rare examples include the mayfly *Cloeon* species from Coonta Creek, aquatic bug *Hydrometra* species from Yeldulknie Creek, midge larva *Botryocladus petrophilus* from Meadows Creek and dragonfly larva *Diplacodes bipunctata* from Waterfall Creek.



The hydrophilid beetle *Laccobius zietzi* is salt tolerant and commonly found in Eyre Peninsula streams.

Photo: Vlad Tsymbal

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

As part of this work, 25 sites on Eyre Peninsula have been assessed. This brochure describes the monitoring methods and the overall condition of the rivers and streams on Eyre 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.

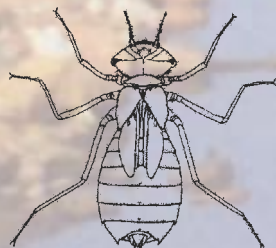
What is river health?

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.

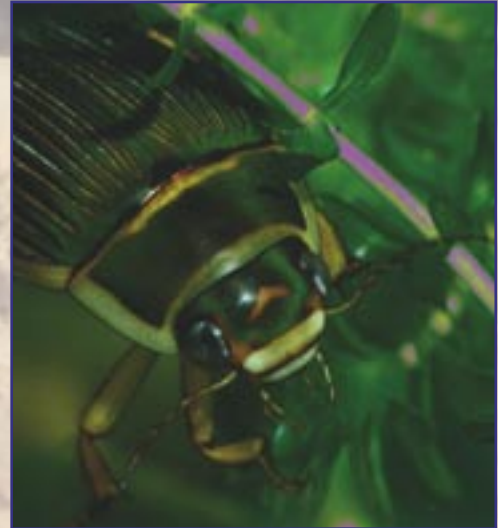
How do we measure river health?

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.



Dytiscid beetles can be found in most still or slow-flowing bodies of water, including many of the saline streams on Eyre Peninsula.

Photo: Gerard Visser, Holland

(see 'Water Beetle World' www.lifsci.utexas.edu/faculty/sjasper/beetles)

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)
- Severely impaired (C)
- Beyond the capacity of current AUSRIVAS models (?)

B / C - Site that varies in condition from one year to the next

Land Type

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



Riverine environments on Eyre Peninsula

A vast plain with many isolated peaks and low, discontinuous ranges to the north, east and south dominates the Eyre Peninsula.



The climate in the region consists of long, dry and hot summers and cooler, moderately wet winters. Mean annual rainfall ranges from about 250 mm in the Gawler Ranges in the north to greater than 550 mm south of Port Lincoln.

Most streams in the region are seasonal (dry during the summer months) and range from saline to brackish waters. They generally occupy the eastern side of the peninsula, apart from Salt, Edillilie and Minniribbie creeks that drain the Edillilie to Wangary area. The larger streams north of Arno Bay include the highly saline Dutton River and Salt Creek.

The only significant surface water resource in the region is the Tod River, with a catchment area of about 395 km² to the north of Port Lincoln. Land clearance has increased the salinity of surface water in the Tod reservoir since 1930, and the current average salinity in the river is over 6000 mg/L.

The rainfall patterns and low topography create a range of different stream habitats. Despite the lack of flow and surface water during summer, many systems flow for several months during autumn and spring. They include Pillaworta Creek, parts of Tod River, Mine Creek and a few sites on Salt Creek near Mangalo.

Other creeks had low flows in autumn and were only isolated pools in spring. They include Meadows Creek, Rock Valley Creek, parts of Tod River, and one site from Salt Creek at Yorkies Crossing.

The other major stream type in the region consists of still water pools in autumn and spring. Examples include Coonta, Yeldulknie, Salt, Minniribbie, Waterfall, Pokalalie and Millalee creeks and the Dutton River.



Coxiella species is a salt tolerant snail.

Photo: Vlad Tsybal

River health on Eyre Peninsula

The map provides an overall assessment of the health of individual sites in the region.

The better waterways were typically located in the Tod River catchment and several nearby coastal streams. Coonta Creek and a small, unnamed creek south of the Tod River both had more species present than expected for lowland brackish streams, and were given a biodiverse rating. Sites from Edillilie and Minniribbie creeks were generally in good condition in relation to other saline streams in the State.

The waterways that rated poorly were generally from the most saline streams such as Dutton River, Driver River, some sites from Salt Creek near Cleve and several smaller salty waterways.



The larval stage of the caddisfly *Symphitoneuria wheeleri* is salt tolerant, and is only found on Eyre Peninsula.

Photo: Vlad Tsybal

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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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