

Values and Pressures of McLeod Creek

The McLeod Creek supports a valuable aquatic biodiversity. It supports a high species richness of fish and crayfish compared to other rivers in south-west Western Australia.

Three native freshwater crayfish and eight native fish species were found, including the threatened mud minnow. Ten of these species are found only in the south-west. Evidence suggests the Creek supports key spawning and nursery habitats for several species. Two exotic species were found across two sites: mosquitofish and one-spot livebearer.

The system has a diverse aquatic macroinvertebrate community including the priority four freshwater mussel and new larval forms of caddisfly. Evidence suggests that some species expected to occur naturally in reach 6 were absent, possibly due to intrusion of estuarine water from the Blackwood River. This may be natural or may reflect reduced flow conditions in the Creek; further work is needed to confirm this.

The movement of aquatic biota may be influenced by in-stream barriers including three minor dams and a number of road crossing points. The influence of these structures needs to be confirmed.

Water quality was generally within guidelines with a few exceptions;

- Dissolved oxygen was low and the temperature range was high at reach 1, likely due to the shallow water and limited shading of the Creek upstream.
- Total nitrogen was elevated in reaches 3 and 6; evidence suggests fertiliser is a possible source.
- Salinity in reach 6 was high in one sample, likely due to intrusion of estuarine water.

Fringing vegetation covered over 70% of the length of most reaches, to an average width of 30 m. The exception was reach 1 where only 29% of the length was vegetated with an average width of 11m. Exotic species were sparse in the ground cover layer at most sites except reach 1 where they formed 50-75% of the ground cover. Cover of exotic species was low or absent in the shrub and tree layers at all sites.

There is limited flow data available for McLeod Creek, however at nearby Chapman Brook a 40% decline in mean annual flow has been measured (2001 to 2012 compared to 1975 to 2012), most likely due to climate change (reduced rainfall), and human use including storage in dams.

Farm dams in the McLeod Creek catchment can hold approximately 4% of mean annual flow for the Creek (compared to 10% in the Chapman Brook).

Parts of the Creek were dry during summer, however in-stream dams and the lower reaches of the creek may provide a permanent water refuge for biota during summer. Further work is required to identify other refugia.



This snapshot is a joint initiative of the South West Catchments Council & the Department of Water through funding from the Australian Government and the Government of Western Australia.

More Information

A number of studies have been conducted that examine the condition and values of the McLeod Creek. These are available through the South West Catchments Council.

Most information in this snapshot came from a collaborative study by South West Catchments Council and the Department of Water. For further details of the study please contact South West Catchments Council.

McLeod Creek Blackwood River Basin

A snapshot of the condition of the McLeod Creek



Lower catchment of the McLeod Creek



This snapshot provides a baseline summary of waterway condition for the McLeod Creek, based on assessments conducted in 2012 to 2013. A number of key values and threats to the system are highlighted.



McLeod Creek Blackwood River Basin Lower Blackwood Catchment

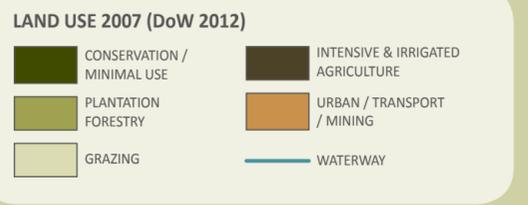


Catchment Description

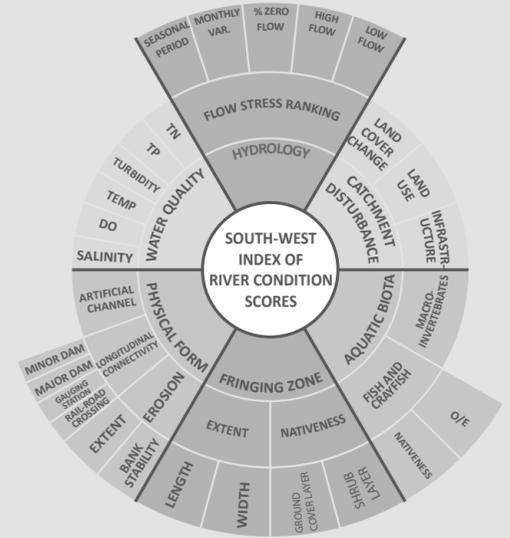
The McLeod Creek, in the lower catchment of the Blackwood River, extends 18 km from the top of catchment to the confluence with the Blackwood River. The catchment area is 92 km².

Land use in the catchment includes;

- 63% conservation/minimal use
- 29% grazing
- 6% plantation forestry
- 2% urban/transport
- 1% intensive/irrigated agriculture.



Methods for Assessing River Condition



Ecological Themes

Hydrological Change is assessed using the Flow Stress Ranking, which assesses the current hydrological pattern (e.g., seasonal flows, magnitude of high flows, and period of no flows) against expectations of flow without the influence of vegetation clearing and damming.

Catchment Disturbance is the primary pressure indicator of the SWIRC. Catchment Disturbance assesses the amount of human derived disturbance in a catchment, considering land uses, infrastructure types and loss of vegetation. Impacts of different land uses and infrastructure types are weighted according to their varying influences on river condition. Additional stress due to loss of vegetation is factored.

Aquatic Biota is the primary response indicator of the SWIRC. For this study, aquatic biota was assessed based on comparison of observed communities of fish and macroinvertebrates (richness, abundance and the presence of exotic species) against expectations for a healthy ecosystem.

Fringing Zone assesses the buffering protection provided by streamside vegetation to inputs from adjacent land use, and provides an indication of bank stability, shade and the organic material provided for habitat and food to support the aquatic food-web.

The quality of the fringing zone is assessed based on the extent (width and longitudinal continuity) at a reach scale and proportion of exotic species present at a site.

Physical Form indicators examine aspects of aquatic habitat at three scales:

1. erosion (extent and bank stability) assesses potential impacts to microhabitat;
2. artificial channel evaluates impacts to macrohabitats; and
3. longitudinal connectivity assesses the availability of the whole system as habitat to aquatic biota and the potential for natural flushing. This considers the presence of dams and road and rail crossings and other in-stream structures.

Water Quality is both an indicator responding to catchment disturbance and a stressor for aquatic biota.

Water quality is assessed through field measured and modelled data for nutrients, turbidity, temperature, dissolved oxygen and salinity. Data is compared against available guidelines and literature based on tolerance of aquatic biota. Additional contaminant data are collected where required. This is reported separately; not included in the standard scoring suite.

A Snapshot of the Condition of McLeod Creek 2012/2013

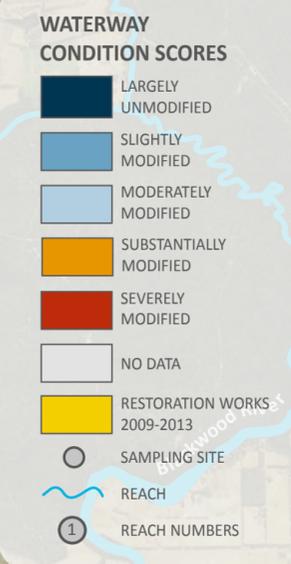
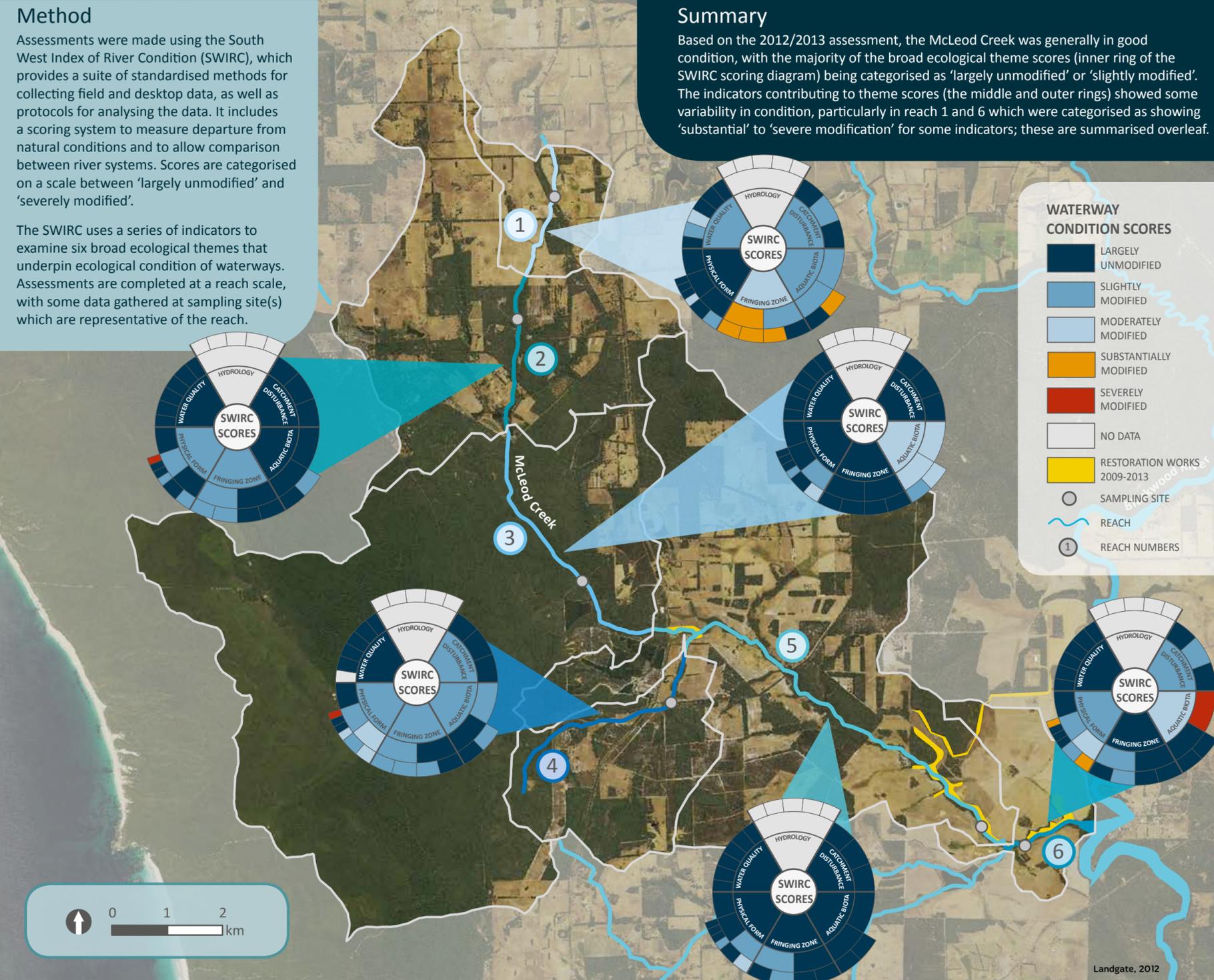
Method

Assessments were made using the South West Index of River Condition (SWIRC), which provides a suite of standardised methods for collecting field and desktop data, as well as protocols for analysing the data. It includes a scoring system to measure departure from natural conditions and to allow comparison between river systems. Scores are categorised on a scale between 'largely unmodified' and 'severely modified'.

The SWIRC uses a series of indicators to examine six broad ecological themes that underpin ecological condition of waterways. Assessments are completed at a reach scale, with some data gathered at sampling site(s) which are representative of the reach.

Summary

Based on the 2012/2013 assessment, the McLeod Creek was generally in good condition, with the majority of the broad ecological theme scores (inner ring of the SWIRC scoring diagram) being categorised as 'largely unmodified' or 'slightly modified'. The indicators contributing to theme scores (the middle and outer rings) showed some variability in condition, particularly in reach 1 and 6 which were categorised as showing 'substantial' to 'severe modification' for some indicators; these are summarised overleaf.



Restoring the Lower Blackwood Together

The South West Catchments Council (SWCC) works with the community to care for our south west environment.

One area SWCC works in is the Lower Blackwood High Ecological Value Aquatic Ecosystem (HEVAE), a nationally recognised aquatic ecosystem. The HEVAE incorporates the lower reaches of the Blackwood River and tributaries including the Upper Chapman and Chapman Brooks, McLeod and Rushy Creeks.

A biological hotspot, the HEVAE is recognised for its unique aquatic ecosystems (swamplands, permanent freshwater rivers and streams) which support a diverse number of plant and animal species.

Many of the species are threatened including the white bellied frog, the orange bellied frog, Balston's pygmy perch and a Reedia sedge community.

SWCC have partnered with landholders along the tributaries to restore and protect riparian areas on private land. This has involved removing aggressive weeds - predominantly blackberry, fencing off riparian areas and revegetating with local species.

SWCC will continue to support local landholders with riparian restoration. For advice or to find out about funding opportunities please contact SWCC on email: swcc@swccnrm.org.au or phone: (08) 9780 6193.