

Degraded riparian systems in agricultural regions:

An evaluation of riparian zone condition within the
Broughton River catchment, South Australia.

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Riparian zones are a vital component of many ecosystems, influencing water quality, supporting diverse floristic communities and providing important resources for wildlife. In South Australia, agriculture is a major land use adversely affecting the ecological condition of catchments in arable areas. Several projects have been implemented in the past within the Broughton River catchment to protect and improve areas which have been degraded. In 2013 as an honours project I conducted a study revisiting these areas and assessing the progress of past restoration projects as well as the current ecological condition within the Broughton River catchment.

For this study riparian zone condition was assessed using the Rapid Appraisal of Riparian Condition method (Jansen *et al.* 2006) coupled with water quality testing, macro-invertebrate assemblage identification, bank stability testing and observing use of sites by fauna. In total, 34 sites were assessed along four main tributaries of the Broughton River.

The results of this study showed that quantitatively the sites which had been maintained through on-ground works projects had at least retained a moderate level of riparian condition, if not improved in condition. The sites which were assessed that had not had any on-ground works completed were mostly in poor condition. The 'natural' areas of the Broughton River catchment were on average in moderate-good condition at best.

This study also collected information regarding the current condition within the catchment as baseline data for future use. The water quality testing found that the majority of the catchment is affected by pollution and macro-invertebrate sampling showed that the macro-invertebrate community is very limited. High salinity was an issue for the majority of the catchment with most readings 4,000-19,000 $\mu\text{s}/\text{cm}$, a healthy level for aquatic invertebrates and plants is under 2,700 $\mu\text{s}/\text{cm}$.

There is a need for more restoration and rehabilitation projects to be implemented throughout the catchment to continue to improve the ecological condition of this river system. Carefully planned re-vegetation seems to be the most useful especially when coupled with stock reduction or

exclusion. Several properties around the catchment have shown the potential for this type of work to be very effective in increasing bird species and controlling soil loss as well as increasing aesthetic value.

Overall the implementation of past riparian zone protection activities has led to an increased awareness of landholders about the importance of riparian areas. One important outcome from this project has been identifying the absolute necessity of implementing adequate follow up actions, measureable ecological goals and effective evaluation and monitoring after the initial on-ground works have been completed. These factors need to be considered and planned for within the initial project development and ensured to be continued into the future for these projects to be effective.



Stock excluded, weeds maintained. Broughton river just north of yacka.



Re-vegetated, stock excluded. Gully feeding into Broughton river nth of yacka



Heavily grazed section along rocky river near narridy



Heavily grazed by cattle. Belalie creek near spalding.