

# INVERTEBRATE RESPONSE TO RIPARIAN RESTORATION AND BUGWISE EDUCATION

## overview of the project

The Australian Museum investigated the development of invertebrate communities through different stages of rehabilitation to develop suitable long-term methods for monitoring biodiversity. An important consideration in the selection of monitoring indicators was their potential for use by non-scientific bodies.

Invertebrates, particularly insects, are good measures of ecosystem complexity as they represent the majority of terrestrial biodiversity. They have been shown to be useful indicators of environmental impacts and restoration success. However, existing methods for monitoring invertebrates are costly and require high levels of expertise in identification.

This research project aimed to document how invertebrates respond to changes in riparian habitat and to identify useful biological indicators for assessing rehabilitation success. A number of simple monitoring tools were developed for use by community members. With the assistance of an education grant, the Museum ran five workshops to train the community in these new methods.



Spider webs can indicate successful rehabilitation

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## how the project was carried out

24 sample sites from 12 localities in the Upper Hunter catchment were chosen for investigation, with each site being surveyed four times over a two year period. In addition to invertebrate sampling, several other indicators were trialled including seed stores, burrows, leaf litter decomposition, dung decomposition, leaf damage, spider webs and butterflies.



Using a sweep net to catch insects

23 biological variables were tested to determine their suitability as 'response' indicators (that reflect changes as rehabilitated areas become more similar to mature riparian woodlands). 19 environmental variables were then selected and relationships between the biological and environmental variables were investigated.

During the research project, a variety of volunteer groups were used to test field indicators at workshops and field days. The reliability of data collected by volunteers compared with that collected by professional scientists was investigated by asking both groups to record data on habitat structure and leaf damage.

The final stage of the research project was to develop a monitoring program to evaluate rehabilitation outcomes in the Hunter Region. The subsequent education project determined whether this work was transferable to other regions of NSW and developed a training package for volunteers.

## outcomes now and in the future

This project has provided the basis of a monitoring approach using indicators that are both biologically meaningful and logistically feasible, and has uncovered a number of indicators that may be suitable for use by non-scientific bodies. Web-building spider numbers and species richness were two of the variables that showed promise as ecological indicators of change in riparian areas.

The initial project produced a number of educational materials including a website, field guides and a DVD. The BugWise website, [www.bugwise.net.au](http://www.bugwise.net.au), provides access to tools that have been developed, as well as information on projects undertaken using BugWise methodologies. These tools were refined during the education grant and 72 community members through five regional workshops were trained to survey spider populations as an indicator of ecosystem health.

## benefits, challenges & lessons learned

The biggest challenge faced by the project was the failure of many of the new plantings in the Upper Hunter River which were to be used as the major study site for the research. This required alternative rehabilitation sites to be located in the Hunter Valley. While the new sites provided a greater range of habitat states from degraded to mature, many of them were on private property and negotiating access was a lengthy process.

The field days revealed that, while agreement between data collected by volunteers and scientists was generally good, the data collected by scientists was collectively more accurate. The research showed while community monitoring can be valuable, the selection of variables needs to be carefully considered and tested.

This project has provided community groups with access to techniques which assess the improvement or otherwise in riparian biodiversity as a result of their rehabilitation activities. These techniques can be undertaken without the need for major financial commitments or access to scientific knowledge and equipment. It is hoped that this will result in more monitoring of rehabilitation success, and encourage groups to continue their involvement with projects long after the planting stage has been completed.