

# North Central Dryland Catchment area Environmental Quality Monitoring

**Annual Report  
2002-2003**

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## Executive Summary

### A. Background

Environmental Quality monitoring is a component of the Victorian Statewide Salinity Monitoring Strategy, a document that provides guidelines for tracking the effectiveness of the Victorian Salinity Program and individual Salinity Management Plans.

Environmental Quality monitoring involves the assessment of the condition of significant wetlands and remnant vegetation in a Plan's area to determine if salinity levels and salinity mitigation works are improving, stabilising or degrading the current condition of the environment being monitored.

To meet the requirements of the Victorian Salinity Program, an Environmental Monitoring Program was developed and implemented for the Avoca, Avon-Richardson, Campaspe and Loddon Dryland Catchments in North Central Victoria between 1996-1997.

There are 17 remnant vegetation and five wetland sites being monitored across the four catchments that make up the North Central Catchment Management Authority (NCCMA) dryland area. These sites have depth to watertable monitored monthly and annual surveys of vegetation composition and vegetation health. Vegetation surveys include assessments of tree canopy health, amount of regeneration and photo points to illustrate any changes occurring within the vegetation quadrats. Wetlands have water quality and macroinvertebrate samples collected and analysed when applicable.

Monitoring sites were selected based on their location in high priority for salinity sub-catchments and are at immediate or future risk from salinity. Sites also contain vegetation types representative of those found prior to European settlement and are accessible at all times of the year (for bore monitoring). Some of these sites may have had salinity mitigation works occurring on nearby properties. Therefore monitoring is important to determine whether these works are having a positive impact on the dryland salinity problem.

## **B. Summary of Major findings since 1996**

- Groundwater levels have fallen, which in turn has temporarily masked the possible impacts of dryland salinity. Dry seasonal conditions have persisted since the commencement of monitoring, causing the fall in water table readings.
- Groundwater salinity concentrations recorded in the Campaspe catchment were generally lower than those recorded from the other three North Central catchments (Avoca, Avon-Richardson and Loddon).
- There had been a steady trend of a slight increase in additional plant species (mostly introduced species) from the 1997 survey results. However the last two years of surveys have recorded a reduction in the number of species present and the level of abundance of many introduced grass species has been reduced. These results are attributed to the extended dry conditions.
- Dry conditions have caused minimal changes in the vegetation composition and structure at most sites. Some regeneration of the tree and understorey layer has been recorded at some sites but most sites have been affected by heavy grazing pressure from wallabies, rabbits, hares and kangaroos.
- Tree health results have been variable with most decline attributed to drought. This appears to be species related as *Eucalyptus camaldulensis* (Red Gums) have experienced decline either from insect attack or crown dieback. Box trees however have generally recorded an improvement in health.
- A result of concern is the *E. albens* (White Box) community at Runnymede Flora Reserve listed as endangered under *the Environment Protection & Biodiversity Conservation Act* (EPBC 1999) is in serious decline. The main causes for this decline appear to be from the effects of drought, small patch size and isolation from other remnants.
- Some sites are recording an increase in salt indicator species from the Chenopodiaceae (saltbush) family. This does not necessarily indicate that dryland salinity is affecting these areas, rather dry seasonal conditions and reduced competition from introduced grasses maybe allowing the recolonisation of native saltbush species.

**It needs to be stated that no site appears to be improving in environmental condition.**



### **C. Recommendations**

- Very interesting photo point data has been gathered and is providing an idea of the environmental processes at work across the six sites. However longer term data collection is required before statistical analysis can calculate definite trends.
- The program to date has only collected results in response to drought. Sites need to be measured when wet conditions occur again to capture the full suite of environmental conditions. Only then can the effects of dryland salinity with respect to tree health decline be separated from the impacts of drought.
- Consistent management of sites is critical. Dry seasonal conditions have exerted heavy grazing pressures on some vegetation quadrats. These need to be fenced to exclude stock, rabbits, hares and wallabies. Eliminating this variable will make it more likely to determine whether vegetation is responding to salinity by not being adversely affected by grazing.
- A review of the program would be beneficial to check that the original program aims and questions are being answered effectively using the current monitoring techniques. Two important issues that need to be resolved are
  1. Is the purpose of environmental quality monitoring to measure holistic environmental change or to simply measure changes induced by dryland salinity?
  2. Is it possible to separate changes induced by dryland salinity from all other factors that are causing environmental change?

### **D. Annual site result summaries**

From 1997 to 2001 BRIT have conducted the tree health assessments, photography of quadrats, analysis of bore and groundwater data and surrounding land use surveys for the Avoca and Avon Richardson catchments. However, the Department of Primary Industries have carried out these studies for 2002/2003.

Tree health assessments, photographs and leaf samples were collected from sites from October to November 2002. Vegetation surveys commenced in mid October 2002 and were completed by mid November 2002.

This document outlines the results of collected from July 2002 to June 2003 at the 22 sites in the NCCMA dryland catchment area. The following section provides a brief summary of the results for each monitoring site and an indication of the site's environmental stability.