

RESEARCH AND DEVELOPMENT INITIATIVES

1. Biological Control of Cabomba Research & Development Project

SunWater is a major supporter for the Lake MacDonald Catchment Care Group's biological control of Cabomba project, committing to a financial contribution of \$10,000 over two years.

Project Description

Biological control has not previously been attempted for Cabomba. Biological control is a powerful tool that has provided some excellent control of floating weeds and partial control of some submerged species. It is probably the only control option for Cabomba invading natural waterways, streams, rivers and large impoundments where use of herbicides is restricted, and access or costs would prevent the use of machinery. If successful, the biological control could assist in management of this weed in all situations.

The project aims to conduct the first ever surveys for potential biological control agents for Cabomba in the weed's native range in South America. The results of these surveys will be a list of natural enemies that are found attacking the weed.

Source: 'Biological Control of Cabomba – Preliminary surveys for natural enemies of Cabomba in its native range in South America.' June 2002 CSIRO & Lake MacDonald Catchment Care Group.

2. Mimosa Pigra Control Program

Mimosa Pigra is a native of tropical America, and was introduced into northern Australia some time before 1890. It was discovered on the foreshore of Peter Faust Dam in February 2001 by an adjoining landowner. A joint management plan involving several stakeholders has been formulated to manage infestations of the weed within the catchment of Peter Faust Dam. Preliminary control activities commenced in February 2001, and since this time, SunWater has continued to work in collaboration with the Department of Natural Resource, Mines and Energy, local council and other stakeholders in an attempt to completely eradicate this particular infestation and minimise the potential for its wider dispersal.

3. Stratification Literature Review Project

SunWater has engaged specialist scientists within the Department of Natural Resource, Mines and Energy to conduct a literature review on the causes and effects of stratification in freshwater ecosystems, as applicable to SunWater storages. The literature review will identify different options, and associated costs, currently available for managing stratification in storages. Recommendations will then be developed, identifying those management options that could potentially be adopted by SunWater.

It is intended that information provided in the literature review will help to improve SunWater's understanding of the causes of stratification in its storages, and identify options available for managing potential associated impacts on water quality.

4. Turtle Transfer Device Research Project

Professor Limpus of the Environmental Protection Agency approached SunWater to participate as a partner in research to determine the ability of turtle populations to migrate upstream and by-pass weirs. SunWater's role in this research is to provide temporary infrastructure at Ned Churchward Weir to assist with turtle migration. It is hoped that the results of the study, will provide further information on the ability of turtles to physically travel from the downstream side of the weir into the ponded area upstream. Information obtained may then be used in the development of turtle transfer systems, which could be incorporated into the future design of new infrastructure.

5. Biomanipulation Research & Development Project

SunWater's Maroon Dam in the Logan River Water Supply Scheme was the site of a scientific study to evaluate a long held theory that introducing large numbers of predatory fish into a storage can control blue-green algae, through their effect on the food web. It was reputed that big predatory fish eating smaller fish allowed tiny grazing water crustaceans, which are normally eaten by the small fish, to flourish. In turn the water crustaceans control the blue-green algae by eating it.

However Dr Matveev of CSIRO found that the theory only works up to a point. By introducing bass, that ate the smaller fish, the grazing water micro-crustaceans multiplied and thus blue-green algae levels decreased. However, as more bass were introduced the reverse effect began to appear and inexplicably the water crustacean numbers decreased, they were unable to control the blue-green algae, and a dramatic bloom resulted.

It was concluded that establishing a 'threshold stocking density', and setting an upper limit to the population of the big fish favoured by anglers, may alleviate the drastic shift to algal dominance that was experienced.

For more information on this particular project please contact Dr Vlad Matveev at CSIRO Land & Water, ph: 07 3214 2755 or Vlad.matveev@csiro.au



Maroon Dam heavily affected with a bloom of toxic *Microcystis* after overstocking with bass.