Lake Mulwala
Water Quality Study

Part 4

Developing a monitoring strategy;

Continued monitoring has been recommended to assess:

- Native fish numbers and vegetation to address changes in ecological conditions;
- Sediment quality to identify the level of pollutants including hydrocarbons, pesticides and heavy metals. This will provide information on the history of inputs into the lake;
- Long-term nutrient status of the lake to determine whether the lake is a source or a sink for nutrients;
- Effects of internal loading of nutrients which may be used to predict algal blooms;
- The extent and occurrence of algal blooms;
- Long-term changes in water acidity. Declines could seriously affect the lake's ecology.

So is water quality getting better or worse?

It is difficult to generalise, and currently insufficient data exists to confidently predict long term trends. Some parameters are quite good and no significant trends were identified. Improved monitoring programs recommended for Lake Mulwala will increase our understanding of water quality trends over time.

This study provides an excellent baseline compilation and assessment of existing knowledge about water quality issues in Lake Mulwala. Goulburn-Murray Water and other management agencies will use this information to build comprehensive monitoring programs, to improve understanding of water quality in Lake Mulwala and plan for the future management of the Lake.

This brochure is part one of a series which includes more detailed information on Lake Mulwala's vegetation and how you can contribute to a healthier lake. To obtain a brochure from the series contact:

Goulburn–Murray Water Yarrawonga Weir Office
03 5744 3137

Moira Shire Council
03 5871 9222

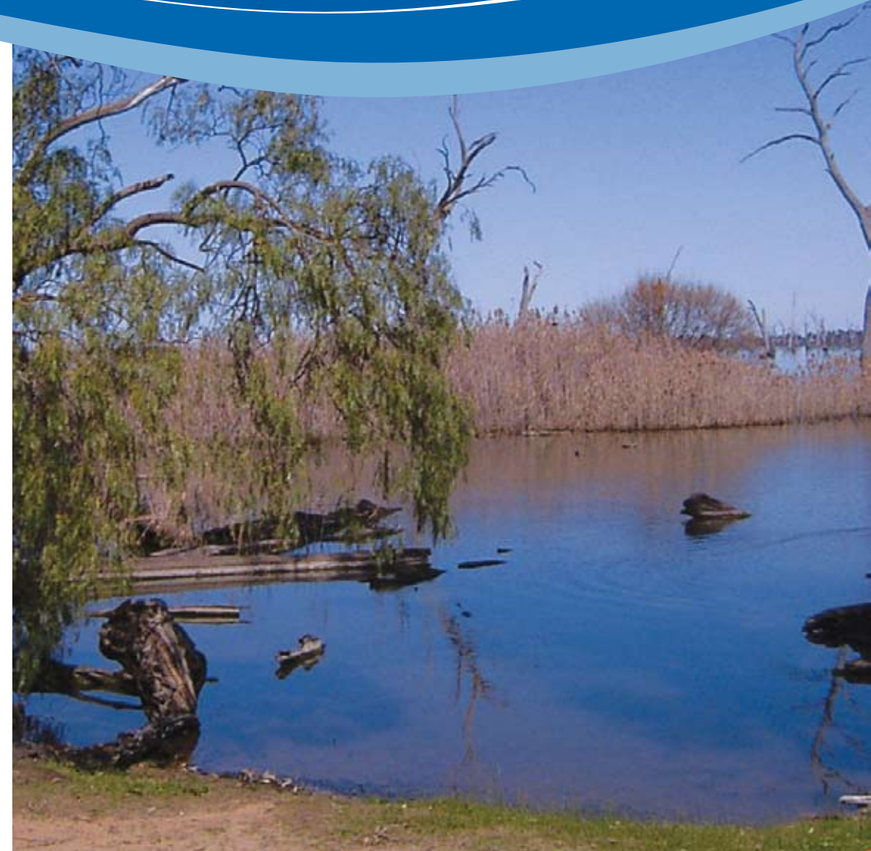
Corowa Shire Council
02 6033 8999

To view the Water Quality report or any brochures from the series online visit www.g-mwater.com.au

GOULBURN-MURRAY WATER

The Murray-Darling Freshwater Research Centre

Lake Mulwala Plan
Community Reference Group



Water Quality Study

Lake Mulwala is a source of drinking water and a critical component of the regional irrigation supply system. The lake provides a destination for recreation and a popular tourist attraction. It is integral to the social and economic fabric of the Yarrawonga-Mulwala region.

Until recently, information has been limited on the lake's water quality and ecology. A study undertaken by the Murray-Darling Freshwater Research Centre in 2004-2005 has developed a better understanding of the current water quality at Lake Mulwala.

The study was conducted in four parts:

1 Analysis of previously existing literature;

2 A summary of knowledge gaps identified;

3 Short-term sampling programs carried out and

4 Recommendations made for on-going monitoring.

The study found Lake Mulwala's water quality is reasonable, but with plenty of room for improvement. It also confirmed the lake is an important nursery for breeding native fish such as Yellow Belly and Murray Cod. In some areas, it exhibits exceptional ecological characteristics, which need to be conserved.

Results of the study will be used to help plan for the future and monitor water quality. The lake is a precious water source which must be nurtured for future generations. This brochure takes a snapshot of the Water Quality Study in four parts.

Part 1

Prior to the study, literature showed:

- Nutrient levels in the water are high – including phosphorous which contributes to blue-green algae outbreaks rendering water unsafe for drinking;
- Salt and turbidity levels generally fall within acceptable levels, but gradually increasing acidity is a concern;
- Lake Mulwala acts as a 'settling pond' for a range of substances, including nutrients, hydrocarbons, pesticides and heavy metals, although generally most contaminant concentrations are at levels that are not a concern;
- Lake Mulwala is an important fishery for Murray Cod, however, the population may be under stress;
- Algal blooms are a significant water quality issue in Lake Mulwala with a number of severe outbreaks in recent years.

Parts 2 & 3

Filling some knowledge gaps:

The study identified several critical knowledge gaps, including:

- The existence of thermal stratification;
- Our understanding of sediment quality;
- Factors affecting algal distribution;
- The condition of vegetation in and around the lake.

Results of short term sampling showed:

Thermally Stratification

Thermal stratification, or 'layering' of the lake occurs during late summer/autumn. This lowers oxygen levels (anoxia) which is detrimental to aquatic health and affects nutrient cycles. Increases in phosphorus during this time can fuel algal blooms.

Sediment Quality

Sediment quality generally meets recommended levels. However, nutrient levels were high enough to cause an outbreak of blue-green algae at any given time. Most pollutants such as metals and nutrients seem to enter the lake from upstream sources via the River Murray and Ovens River.

Stormwater which flows into Lake Mulwala from towns including Yarrawonga, Mulwala and Bundalong is also believed to contribute pollutants. While stormwater is of a lesser concern, it provides an opportunity to reduce inputs. Powerboats are also a cause of increased hydrocarbons.

Repeated sampling and analysis of contaminants in future will be useful for monitoring human impact on the lake over time.

Algal Distribution in the Lake

Unfortunately, during the study no algal blooms occurred and therefore it was not possible to investigate this topic. Future studies will aim to analyse the distribution of blue-green algae in the lake during algal blooms and the factors that affect algae in the lake.

Vegetation Assessment

For information on the vegetation at Lake Mulwala see brochure titled Lake Mulwala Water Quality Study – Vegetation Assessment.