Lake Ainsworth water quality snapshot

ballina shire council

February 2017

Ballina Shire Council has completed a preliminary investigation into the health of the water quality at Lennox Head's Lake Ainsworth. This factsheet provides a summary of those findings.

Background

Lake Ainsworth is an important recreational and environmental asset and remains a key visitor destination within the Ballina Shire Council region.

Lake Ainsworth is categorised as a typical acidic freshwater coastal dune lake and covers an area of 12.4 hectares. It's managed by NSW Crown Lands and the southern end reserve is managed by Ballina Shire Council.

The Lake is primarily used for swimming activities which is why the protection of the Lake's water quality is imperative for all stakeholders as well as the local environment.

To ensure the future health of the Lake and its recreational use, Ballina Shire Council commenced regular water quality monitoring in 2016. This report is a snapshot of Lake Ainsworth's water quality that includes key outcomes and recommendations for the future.

Planning for the future

One of the primary purposes of this report was to record and analyse baseline data of a wide range of variables and develop a more comprehensive understanding of the Lake's water quality. This information will inform a Coastal Management Program (CMP), should it be necessary in the future.

The aim of this study is to:

- identify current and future issues associated with water quality
- analyse available water quality data and calculate trigger values
- collate and organise current and historic data
- determine if available data is sufficient to analyse the impact of development and traffic on the Lake's water quality.

Report findings

To provide a water quality snapshot of Lake Ainsworth, data was collected from January to December 2016. Across this period, Ballina Shire Council regularly tested Lake Ainsworth for a variety of components including algae, *Enterococci*, nutrient levels, pH, hydrocarbons, heavy metals and pesticides.

National guidelines from the Australian and New Zealand Environmental Conservation Council (ANZECC) and National Health and Medical Research Council (NHMRC) were then used to analyse the results and understand the health of Lake Ainsworth within a national context.

The evaluation of water quality results from the 12-month snapshot indicates:

- physico-chemical parameters are within the expected range and will not affect the Lake's primary use of recreation
- there is a seasonal variation which reinforces the notion that Lake Ainsworth is a dynamic system therefore unpredictable
- the results of *Enterococci* abundance suggest that Lake Ainsworth is usually suitable for recreational use, however, there may be a slight risk of bacterial contamination (particularly up to three days after significant rain). This is generally typical of ecosystems with no or limited ocean flushing
- the results from the nutrient sampling suggest the Lake has high levels of nutrients in comparison to national guidelines.

see over

Findings cont.

- mean total phosphorous (TP) levels peak in the summer months which is typical of eutrophic systems
- high TP levels indicate that the natural occurence of blue-green algal blooms are likely to continue in favourable weather conditions and will need to be monitored.

Comparison phosphorous levels

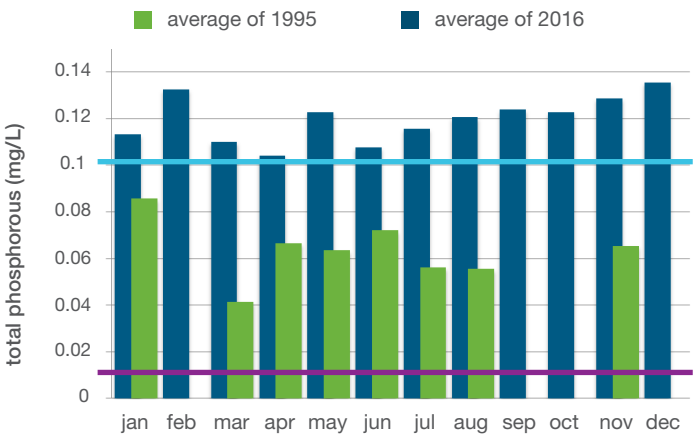

Figure 1. Mean monthly total phosphorous levels in Lake Ainsworth, Lennox Head in 1995 (green) and 2016 (navy blue). Data are from December 2015 to November 2016. N = 50 (1995); N = 270 (2016). N = number of replicate samples.

blue line indicates NHMRC guidelines for the maximum susceptibility of a water body to harbour blue-green algae

purple line indicates ANZEC guidelines for the eutrophication of a lake or reservoir in south east Queensland

Looking to the future

Through this report, further studies, and with more readily available data, Council will now be better able to understand the health of Lake Ainsworth. The establishment of water quality trigger values will enable any future changes to be detected and facilitate corrective action or management practices.

The results suggest the Lake's physico-chemical components are within the expected range and the Lake will remain suitable for recreational use by the community.

Moving forward, Council will continue to monitor the *Enterococci* and blue-green algae levels to ensure public safety and determine patterns of distribution and abundance.

The current sampling regime will continue in 2017 and the development of a Coastal Management Program (CMP) will provide a better understanding of water quality processes in Lake Ainsworth and prioritise actions to be considered. This CMP and on going management actions will ensure the Lake's water quality remains in a healthy state for the future.

For more information

Read the full report findings on Ballina Shire Council's website ***ballina.nsw.gov.au*** (search Lake Ainsworth).

If you have any questions please contact:

Ballina Shire Council, Development and Environmental Health Group ph 6686 1210
To view the full report visit Council's website *ballina.nsw.gov.au* (search Lake Ainsworth).

ballina