

Midge Monitoring

The Cities of Wanneroo and Joondalup, in conjunction with the Department of Environment and Conservation (DEC), conduct monitoring of Lake Joondalup to determine the level of nuisance midge at the lake. The monitoring season commences when the water level starts to rise around July/August and continues weekly until the lake has dried at the majority of monitoring sites.

Midge appear in dense swarms and are one of the more obvious environmental problems associated with urban wetlands in Perth. Midge, which belong to the insect family Chironomidae, are often a nuisance in residential areas near wetlands because they are strongly attracted to lights. Some species are so small that they can pass through flyscreens. Unlike mosquitoes, they do not bite, and so are not vectors of disease.



Midge Life Cycle

Midge have four main stages in their life cycle

1. egg
2. larva
3. pupae
4. adult, only this stage is terrestrial.

Female midge lay their eggs in a wide range of aquatic habitats including wetlands, lakes and streams. Each female lays only one egg capsule, which may contain thousands of eggs. The eggs hatch into aquatic larvae known as bloodworms, which live in the sediment and feed on organic debris. The larvae grow and develop into pupae, which then rise to the surface of the water and hatch into winged adult midges. Under optimum conditions (warm temperatures and abundance of food) the whole life cycle may be completed in as little as 3 weeks.

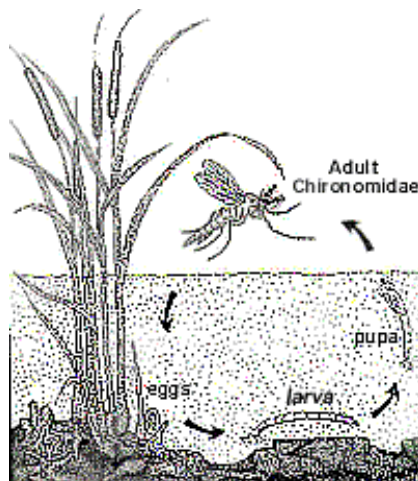


Diagram
outlining the
midge lifecycle

Factors Promoting Nuisance Midges

Wetlands such as Lake Joondalup usually have high nutrient levels. This is due in part to the removal of natural fringing vegetation, which acts as a filter and removes much of the nutrients in surface water runoff and groundwater before they reach the wetlands. Nutrients come from a number of sources including septic tank leachate, fertilisers and detergents. Nuisance midges are generally found in large numbers in wetlands with elevated nutrient levels. The high availability of nutrients fuels the growth of algae, which often form blooms in spring and summer. After a period of time these blooms will collapse and the algae will sink to the bed of the wetland where they provide a rich food source for the larval midges living in the sediments. As midges have a short life cycle they can take advantage of the algal blooms and quickly build up to very large numbers. During such blooms natural predation on midge larvae decreases as many predatory species rely on sight and dense algal blooms limit visibility. Other factors contributing to low predator density include the effects of pollutants, low oxygen levels and reduced habitat diversity associated with the loss of aquatic vegetation.

Midge Monitoring and Research at Lake Joondalup

During the warmer months, adult midge numbers may be seen in high numbers, causing a nuisance problem to the local community. The Cities of Wanneroo and Joondalup, along with the DEC, have been working with Edith Cowan University (ECU) to investigate midges at Lake Joondalup in an attempt to reduce the number of midges in an ecologically sustainable manner, without the use of chemicals. As the research being carried out by ECU investigates long term solutions, there are times when short term solutions, such as applying a chemical pesticide, may be utilised as a last resort to reduce the numbers of midges. The use of pesticide application as a nuisance reduction strategy although not ideal, is currently the only option available to reduce midge numbers within a short period of time. The decision to treat must be evidence based to verify the severity of the nuisance and eliminate any subjective influences. The Cities of Wanneroo and Joondalup are limited to no more than two treatments per season (one treatment contains two applications of chemical).

There are 22 monitoring sites at Lake Joondalup, with access to the sites being obtained either by boat or hovercraft. Core samples are taken to determine the number and type of midge larvae present in the lake. Water temperature, pH, conductivity and water depth are also measured.

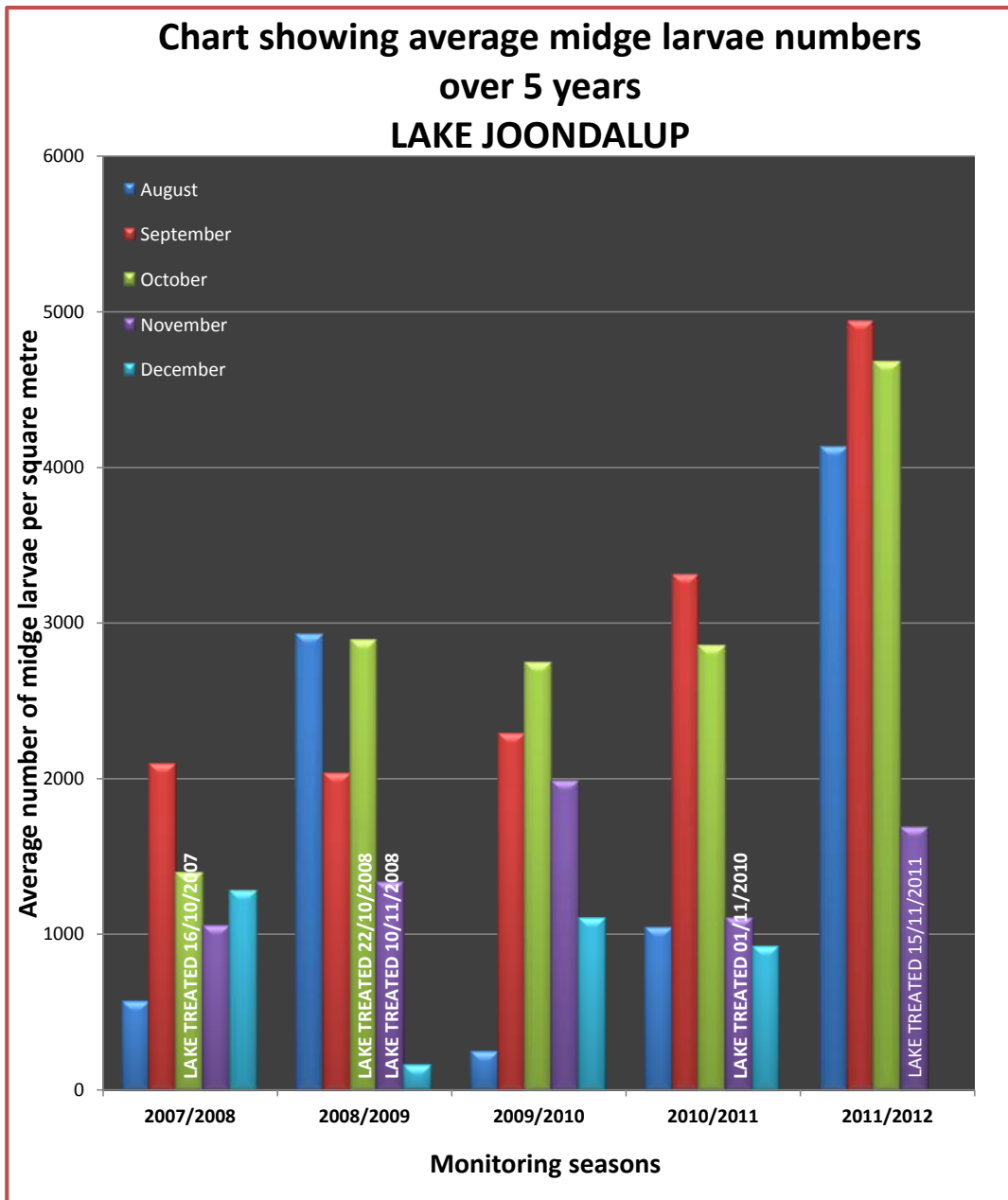
Previous research suggests that Beenyup Swamp (south of Lake Joondalup) is the major source of phosphorus entering Lake Joondalup. As phosphorus supports the growth of algae, it also indirectly supports nuisance midges. Ultimately, to reduce the levels of nuisance midges and to protect water quality in Lake Joondalup, it is necessary to reduce inputs of phosphorus. The Cities of Wanneroo and Joondalup, in conjunction with the Department of Environment and Conservation, have been working with Associate Professor Mark Lund and Dr Clint McCullough at Mine Water and Environment Research Group at the School of Natural Sciences at Edith Cowan University to investigate these issues.

In 2008, after a review of what was known about Lake Joondalup, they examined firstly the sediments of Beenyup Swamp to determine whether it was the source of nutrients. Results from this study clearly showed that the sediments of the Swamp to be high in phosphorus. The second study examined whether these nutrients were moving from the sediments into the water. Interestingly, the research found that although the sediments contained large quantities of nutrients, there was not a mechanism for them to be released into the water. Therefore, they were believed not to be the source.

The midge steering group is continuing to monitor the lake to measure the nutrients and water entering and leaving Beenyup Swamp. This will help researchers determine whether the nutrients entering Lake Joondalup are coming from Beenyup Swamp or Wallubuenup Swamp.

Current Midge Monitoring Data

The graph below illustrates the average midge larvae numbers over the last five seasons and includes the current season which commenced in August 2011:



Disclaimer: This information sheet is a guide only and is considered to be correct as of August 2011 and may be updated without any notice. The City of Wanneroo accepts no responsibility for errors or omissions.

Latest Midge Update

5 October 2011

The Midge Management Steering Committee, held a meeting on 30 September 2011 to discuss best management options in respect to the current high numbers of midge larvae and associated complaints. As a result of this meeting it was confirmed that the situation needed to be monitored for a further two weeks before making a decision to treat Lake Joondalup and Goollelal. This decision was based on the following factors:

21 October 2011

In order to control midge numbers as the warmer weather approaches, the treatment of these wetlands with Abate, a chemical larvicide is being planned. At this stage, treatment of Lake Goollelal will occur in the first week of November with the treatment of Lake Joondalup likely to occur at the same time. Any treatment date is subject to suitable weather conditions and the availability of a specified helicopter.

An assessment of the effectiveness of treatment will be undertaken in the days following any chemical larvicide application. Based on current midge larvae numbers, it is likely that Lake Goollelal will receive a second treatment in mid to late November.

As treatment is being planned in two weeks, sufficient time is provided for people who may be hypersensitive to chemicals to contact the Cities of Wanneroo and Joondalup. Both administrations maintain a register of persons who may be hypersensitive to chemical treatment.

25 November 2011

The City along with Joondalup and the Department of Environment and Conservation recently made the decision to treat the Lake Joondalup and Goollelal lake system in the first week of November 2011.

The helicopter required for treating the lakes was booked but unfortunately had to be cancelled due to stormy weather. These weather conditions also affected the Department of Health's mosquito control program who have priority use of the helicopter.

Treatment of Lake Goollelal was completed on Monday 14 November 2011. Treatment of Lake Joondalup commenced on the 14 November 2011 and was completed on the 15 November 2011.

The graph now shows a significant reduction in midge numbers.

Further updates will be made available when new information is received.

Advice for residents

The City would like to remind residents that midge play an important part of the Yellagonga wetlands ecosystem and occasionally environmental conditions can result in midge numbers increasing rapidly in these wetlands.

Residents wishing to assist the City with the management of midge and reduce the effect of midge in and around their homes can do so by taking the following steps:

1. Reduce the amount of outside lighting around the house, particularly around doorways.
2. Washing cars on the front lawn rather than the driveway or street
3. Using slow-release fertilisers on lawns and gardens and prevent any fertiliser spilling onto the road.
4. Disposing of household waste appropriately, not down stormwater drains.
5. Connect domestic wastewater plumbing systems onto the main sewer.
6. Decommission unused septic tank and effluent disposal systems.
7. Please contact the City's Environmental Health Officers regarding any proposed septic tank and effluent disposal decommissioning.
8. Ensure matter likely to leach nutrients into the soil is removed such as picking up and disposing of animal faeces appropriately.
9. Place sticky midge traps around the outside of the home.
10. The use of an insect zapper may give some relief however care should be taken to clean and maintain the zapper in accordance with the manufacturer's instructions.

Should you require any further information regarding this matter, please contact the City of Wanneroo's Health Services on 9405 5000