

# Water quality trends in Perry Lakes to 2025



Sustainability starts with you!



Become a Citizen Scientist & make a lasting impact!

# Water Quality Trends in Perry Lakes to 2025

The Town of Cambridge conducts biannual assessments of water quality in Perry Lakes and the Herdsman Main Drain (HMD), engaging a consultant to perform the measurements. Additionally, macroinvertebrate (visible water insects) surveys are used as indicators of ecosystem health. All results are evaluated against the Default Guideline Values (DGVs) for wetlands in south-west Western Australia. Not meeting a DGV is a warning signal, similar to a red light on a car dashboard.

# Current Conditions (as of November–December 2024)

The water level of the Lakes was about 3 m above sea level, a depth of around 20 cm.

• Salinity:

East Lake's salinity has increased due to the cessation of groundwater pumping, leading to concentration of salts through evaporation. Conversely, salinity in West Lake has decreased following the inflow of water from the HMD. Both lakes are freshwater lakes.

## • Dissolved Oxygen:

Levels were below the minimum DGV in both lakes and the HMD, suggesting excessive nutrients and organic matter. These conditions can harm aquatic life. Oxygen levels fluctuate daily, rising during the day as plants photosynthesize and falling at night due to respiration.

• Phosphorus:

As the key nutrient associated with freshwater algal blooms, total phosphorus has exceeded the maximum DGV in about 80% of samples from both lakes and the HMD since June 2019. No consistent trend has emerged.

### • Nitrogen in the water column:

Understanding nitrogen levels is complicated by the increasing presence of Azolla—a floating fern with symbiotic cyanobacteria capable of fixing atmospheric nitrogen—in West Lake. Nitrogen also enters West Lake via the HMD. Since 2019, nitrogen levels in both lakes and the HMD have fluctuated near the DGV without a clear trend.

• Chlorophyll-a:

High levels were first detected in 2025 in the western part of West Lake, near the Azolla bloom. This may signal the beginning of an algal bloom trend driven by phosphorus-rich inflows from the HMD.

## • Sediment Nutrients and Carp Impact:

Bottom-feeding carp—introduced to West Lake via HMD water diversion in February 2023 —can stir up sediments, releasing nutrients and heavy metals while increasing turbidity. This reduces sunlight penetration, hinders plant and macroinvertebrate growth, and affects wildlife like birds and turtles. Nitrogen in lake sediments can be converted to gases during dry periods and escape. Nitrogen and phosphorus compounds can also dissolve and leach from the lake into the aquifer.

• Heavy Metals:

Sediment samples show the highest concentrations of lead and zinc in East Lake, likely due to drainage from the Underwood Avenue road surface.

• Macroinvertebrates:

The 2024 survey of macroinvertebrates suggests that lake health remains relatively stable. The earlier 2023 survey found lower biodiversity in West Lake, potentially indicating early stages of nutrient-related degradation.

## **Summary and Recommendations**

Perry Lakes are nearing the threshold for unwanted toxic algal blooms, which may become more frequent as algal cysts accumulate. To mitigate this risk the following action is recommended:

### • Nutrient Management:

Phosphorus from the HMD should be removed through harvesting of Azolla and native reed species such as bulrush (Typha orientalis).

• Invasive Species Monitoring:

The ecological impact of carp requires ongoing observation due to their role in mobilising sediment-bound nutrients and metals.

### • Community Involvement:

More intensive monitoring of lake water and stormwater inflows should be conducted by trained Citizen Scientists under the guidance of the Friends of Perry Lakes, using handheld devices supplied by the Town. The Friends of Perry Lakes will gladly welcome volunteers to help with the monitoring.

# Authored by Dr. Don McFarlane , Education Officer, Friends of Perry lakes



Azolla growth in the west of West Lake in spring 2024



Reed growth in East Lake – Bulrush on the left, Jointed rush in the foreground and background.