GOVERNMENT OF WESTERN AUSTRALIA

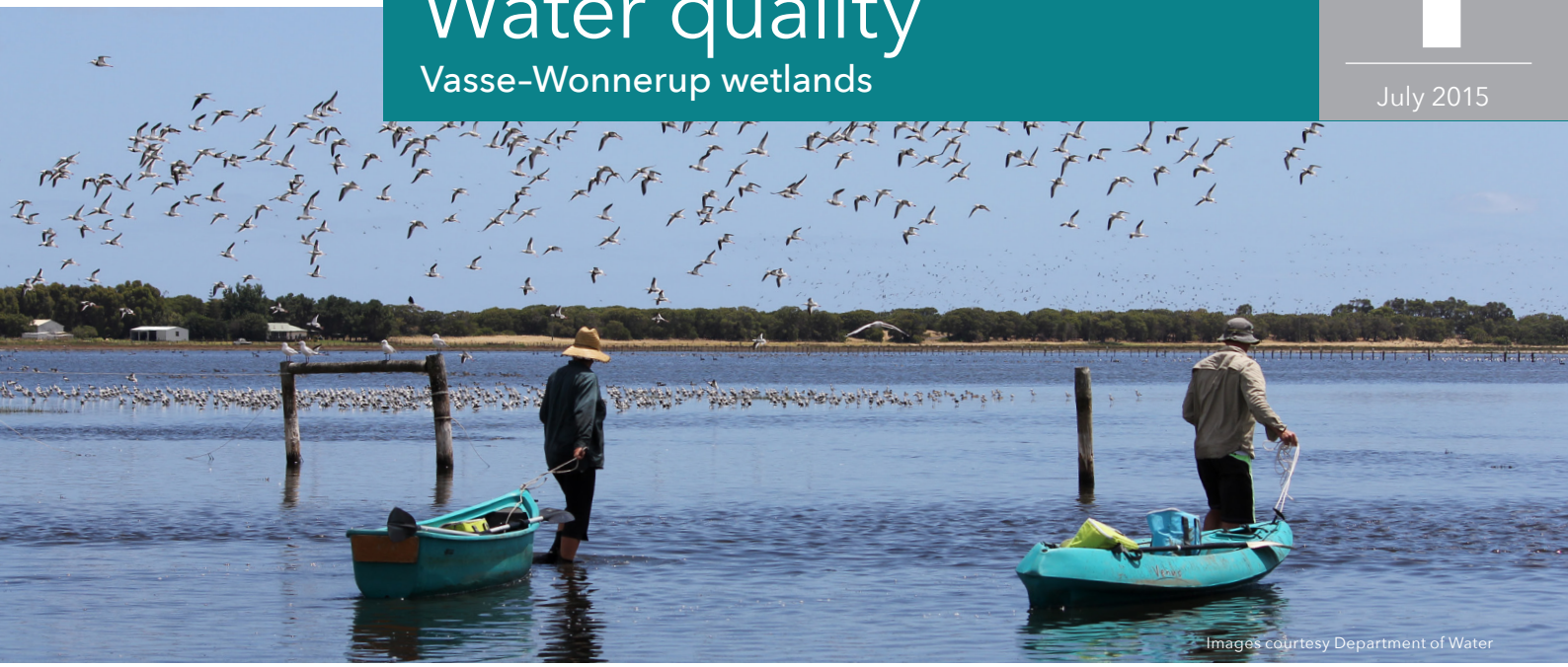
An initiative of the Vasse Geographe Strategy

Factsheet 1

July 2015

Water quality

Vasse–Wonnerup wetlands



Images courtesy Department of Water

The Vasse–Wonnerup wetland system is considered to be one of the most nutrient enriched (eutrophic) aquatic ecosystems in Western Australia.

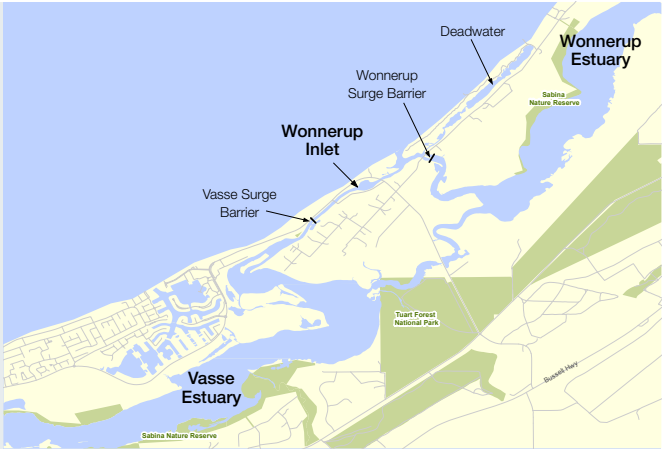
The main sources of nutrients, nitrogen and phosphorous are essential for plant health. Elevated nutrient levels increase primary productivity within the wetlands, supporting seagrass meadows and blooms of macro-algae. These are an integral part of the aquatic food web and help to sustain the thousands of waterbirds that use the wetlands. Unfortunately, high nutrient levels have environmental impacts, called eutrophication, which can result in regular toxic algal blooms, causing poor water quality, reduced visual appeal and occasional fish deaths.

The water quality of the system is also characterised by highly variable temperature and salinity. Salinity ranges from freshwater in winter to hypersaline conditions (up to three times the concentration seawater) over the summer/autumn period. These extremes in seasonal salinity are associated with evaporation rates and declining water levels. Freshwater conditions are restored following sufficient winter rains.

Eutrophication is considered the biggest threat to the integrity of the wetland ecosystem. Major sources of nutrient input are from agricultural fertilisers and dairy effluent. Over the last decade GeoCatch and partners have been working with farmers to reduce nutrient input. This involves revegetation, fencing of rivers and improving the management of fertiliser and dairy effluent. Substantial reductions in nutrients are essential to improve water quality conditions in the wetlands.

SNAP SHOT

- **Vasse–Wonnerup wetlands are highly eutrophic (rich in nitrogen and phosphorus)**
- **Salinity of the wetlands varies seasonally**
- **Research and monitoring is being undertaken to support management**
- **Reducing nutrient input is a high priority**



An estimated reduction of

41% phosphorus and **55%** nitrogen

required to meet water quality targets.

Monitoring and research

Monitoring the water quality of waterways gives management agencies important information about the health of aquatic ecosystems. Water quality monitoring has been conducted on the wetlands over the last two decades, and has increased in intensity in the last five years. Dissolved oxygen, pH, temperature and salinity are monitored continuously at sites near the Vasse Estuary surge barrier (flood gates). This information supports measures to prevent fish kills in the Vasse Estuary. Additional monitoring in recent years has assessed the impact of allowing seawater inflow into the Vasse Estuary over the summer months.

A long-term study by Murdoch University has found strong links between water quality and aquatic plant composition. Better water quality conditions were found to support seagrass beds. As the water quality declined the conditions favoured macro-algae and then toxic phytoplankton. This information, together with investigations on wetland sediments, has greatly improved our understanding of the ecology of the Vasse–Wonnerup wetlands.

What the future holds

Intensification of agriculture and expanding urban development in the Vasse–Wonnerup catchment is likely to increase the amount of nutrients entering the wetland system. Combined with reductions in annual rainfall and water flow in local rivers and streams (associated with climate change), this could further intensify the eutrophic conditions. Reducing nutrients off the catchment and improving water quality in the wetlands is therefore a critical priority for the future management of the system.

More information

More information about the Vasse–Wonnerup wetlands is available under Resources on the GeoCatch website.
www.geocatch.asn.au

Be involved

Community members will have the opportunity to be involved in the development of a management plan for the Vasse–Wonnerup wetlands. Opportunities will be promoted on the GeoCatch website or contact GeoCatch.

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