Wetlands and water quality

One of the most important benefits that wetlands provide is their capacity to maintain and improve water quality.

When healthy, wetlands have a rich natural diversity of plants and animals. These can act as filtering systems, removing sediment, nutrients and pollutants from water. The capacity of wetlands to maintain and improve water quality is under threat because human activity and extreme weather conditions have had a significant impact on water flows, nutrient balance and biodiversity.

Wetland values

Wetlands in Australia improve water quality supplied to downstream environments in a number of ways. By spreading out and slowing down flows they reduce erosion and prevent sediment being transported downstream where it might affect the ecology and productivity of other environments, in particular estuaries, seagrasses and reefs. When healthy, their soils and vegetation can capture, process and store nutrients and/or contaminants, and if the natural rhythms and flows of the wetland are undisturbed, the release of potential stressors such as sediments, nutrients, acids and/or metals from the soil can be prevented. Healthy wetlands can assist in removing harmful bacteria, and wetlands can also be important in the management of urban stormwater and effluent by improving the removal of nutrients, suspended material and pathogens from water prior to its return to the environment.

Pressures

Wetlands are threatened by earthworks, drainage, water extraction, climate change, poor agricultural practices, feral animals such as wild pigs, invasive plants and uncontrolled fires. Impacts of these activities and encroachments include:

- erosion, resulting in an increased sediment that blocks out light to aquatic plants and smothers aquatic animals
- introduction and mobilisation of contaminants such as herbicides, insecticides and fungicides
- an oversupply of nutrients, resulting in rapid and unpredictable growth of plants and algae, blocking out light and, in the case of blue green algal blooms, producing toxins that affect wildlife, stock and humans
- rising water tables as a result of loss of vegetation
- increased soil salinity as the salts naturally found in soils move closer to the surface where than can hinder vegetation growth

WAT375B.0116

- release of acids and metals into the soil, which then affects water quality. This may result in fish disease, dominance of acid-tolerant species, contamination of groundwater, reduction in agricultural productivity and damage to infrastructure through corrosion.

Progress to date

The primary responsibility for water quality and wetlands management lies with state and territory governments, which manage water supply and quality with the support of jurisdiction-specific guidelines, regulations, policies, processes and standards. The Australian Government works with the states and territories to develop the best available information and tools to manage water quality through the National Water Quality Management Strategy.

Current approaches to maintaining/improving the water quality of wetlands include:

- regulation, where wetlands identified as having a high value are protected through environmental assessment, legislation and processes to review potential developments that may impact on them
- monitoring and assessment to determine whether the condition of wetlands is improving, neutral or declining
- catchment management such as on-farm nutrient management and salinity management, aimed at reducing water quality pressures
- rehabilitation and restoration of wetlands
- constructing artificial wetlands to provide nutrient, pollutant and sediment capture, reduce peak stormwater flow, invigorate biodiversity and/or augment storm water and sewage treatment processes
- providing environmental water to increase the resilience of wetlands.

Opportunities

Our knowledge about the water quality services that wetlands provide across Australia continues to increase. With appropriate monitoring and assessment of those services, there are many opportunities for identifying, prioritising and developing projects to repair, restore or establish wetland ecosystems for the purpose of improving water quality. These in turn will lead to associated opportunities and benefits in fisheries productivity, catchment hydrology, coastal biodiversity, flood control, carbon sequestration and foreshore buffering.

More information

- Wetlands fact sheets
- National Water Quality Management Strategy
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality

Photo credit: Grange Burn wetland restoration © the Department of the Environment and John Baker.