Wetlands and agriculture

Wetlands have been used for agriculture for thousands of years. They provide a range of valuable ecosystem services, such as the provision of food and clean water, the retention of soil and the cycling of nutrients.

However, the value of these services is sometimes underestimated. In some areas, the drainage and reclamation of wetlands for agriculture has been widespread, but there is increasing recognition of the critical interdependencies between agriculture and healthy wetlands.

Australia is a signatory to the Ramsar Convention on Wetlands, which promotes the conservation and wise use of wetlands and their resources.

The Ramsar Convention uses a broad definition of wetlands, which includes lakes, rivers, swamps, peatlands, estuaries, rice paddies, coral reefs, mudflats, water reservoirs and constructed wetlands. Wetlands do not need to be permanently inundated. In Australia, many wetlands are ephemeral and remain dry for years at a time. Importantly, wetlands contain species that are specially adapted to this variability.

How wetlands benefit agriculture

There are many different ecosystem services provided by wetlands that can benefit agriculture and contribute to human wellbeing. Wetlands can:

- support fertile soils, reduce erosion and retain sediments and nutrients as well as reduce the potential for salinity and acid sulphate soils
- support aquaculture or grazing
- provide habitat for harvestable plant and animal species
- provide drinking water for stock
- provide shade, wind buffering, protection from floods and habitat for birds
- provide a range of raw products such as timber, stock fodder, salt, peat and firewood
- act as natural filters in waste water treatment
- assist in drought resilience, a key challenge for farmers throughout most of Australia.

A well-managed wetland may also provide cultural services, such as aesthetic and spiritual values, education and recreation. While these benefits are not directly relevant to agriculture, they constitute an important contribution a landowner can make to the wider community and future generations.

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Pressures on wetlands

Within Australian there are approximately 136 000 agricultural businesses, managing around 52 per cent of the total land area. In 2011–12, the agriculture industry consumed over 9000 GL of water, which was 59 per cent of Australia's total water consumption.

Some agricultural practices can lead to increased levels of nutrients and pollutant loads (in the form of pesticides, fertilisers and animal faeces), resulting in increased phytoplankton and aquatic plant growth leading to algal bloom. The regulation of rivers and streams can change the frequency, duration and extent of flows, affecting critical life stages of water dependent species including fish and waterbirds. This can affect the health of wetlands and their roles in the formation and replenishment of soils and in maintaining water quality. Some of the largest impacts are through the drainage or conversion of wetlands to cultivated land and the disturbance of ecosystem functions due to heavy machinery use or livestock presence.

Australian wetland ecosystems under most pressure from agriculture include the Murray-Darling Basin, where action is being undertaken to rebalance use and environmental flows through the Basin Plan, and the inland wetland systems of south-west Australia which are in poor condition as a result of salinisation, agricultural run-off, water diversion and drought. Under less pressure are some of the wetlands in northern and central Australia which largely retain their original character despite some impact from pests, weeds and fire.

Photo credit: Farmer holding a rice plant at the panicle stage near Yanco, NSW © Department of the Environment and Arthur Mostead.

Current initiatives

The agricultural sector, supported by governments, has moved to embrace sustainable agricultural practices that promote productivity while maintaining ecosystem services. These practices recognise the interdependencies between agriculture and healthy wetlands and the potential for mutually beneficial outcomes.

Increasingly, the agricultural sector is investing in practices that use wetlands more wisely for sustainable production while at the same time enhancing the natural resource base. For example:

- Integrated pest management solutions reduce the need for pesticides, while practices such as conservation tillage and organic farming can reduce pollutant loads entering waterways. Combined production systems use livestock manure for aquaculture and to fertilise crops. Strategies like these can be particularly effective in small, intensive operations and on family farms.
- The control of pests such as rabbits, foxes, pigs and weeds has benefits for both agricultural productivity and the environment.
- Parts of a wetland or waterway can be fenced off to prevent access by livestock, either permanently or at certain times of the year. Alternative stock watering points (for example, troughs) may be provided. These actions preserve areas of sensitive vegetation and provide refuge for animals living in the wetland, enabling them to continue to live in the area. Benefits to landholders include reduced soil erosion and improved water quality, both within the wetland and downstream.
- Many current agricultural practices are reducing the need to use water from wetlands. Examples include the planting of drought resistant crop varieties, reusing water including wastewater and implementing more efficient irrigation.
- Healthy wetlands can present opportunities for new or diversified economic enterprises. Banrock Station, a successful vineyard and wine centre in South Australia, also attracts visitors to its Ramsar-listed wetlands, encouraging first-hand learning about wetland conservation and the importance of biodiversity in promoting sustainable land use practices.

Photo credit: Bird habitat behind recently ploughed cropland near Sisters Creek, Tasmania © Department of the Environment and Rob Blakers.

Targeted wetland conservation can also have indirect benefits for landholders. For instance, improved water quality will ultimately benefit the wider community and downstream users, and may improve the aesthetics and value of a property. Conservation activities on farms include planting trees, installing nest boxes, fencing off sensitive areas, allowing wetlands to undergo natural wet and dry cycles, and reducing disturbance of the land.

Opportunities

There is significant potential advantage to be gained if future agricultural developments consider the role played by wetlands in maintaining and enhancing agricultural productivity.

One of the most significant challenges in managing wetlands in agricultural areas is that most wetlands occur on privately owned land but require cooperative efforts between catchment management authorities and governments and, at times, adjacent land owners.

A whole-of-catchment approach is critical for preventing or managing changes to water regimes, salinity, excess nutrient runoff, sedimentation and rising water tables that may result from catchment-wide practices such as land clearing, irrigation, stock management and use of fertilisers.

Cooperative approaches to building landowner capacity and supporting sustainable environmental flows are critical to maintaining the dual role wetlands play in providing support for agriculture while sustaining a wide range of ecosystem services. Agricultural production benefits when the environmental functions and economic values of wetlands are incorporated into planning.

More information

- Wetlands fact sheets
- Ramsar Convention handbooks on the wise use of wetlands