Wetlands in the Herbert catchment: Better for farming, better for the environment

Turning non-productive land into both a viable farming opportunity and a refuge for wildlife might seem counter intuitive. However, for Ingham cane farmer, Ian Kemp it has been a 25-year project in the making.

Thinking differently

Rather than rolling the dice year in, year out on whether he would be able to harvest a viable crop off the low-lying areas on his farm, Ian decided to strategically cut and fill the top soil from some parts of his farm to raise the height of adjacent paddocks. This provided more reliable cane production as well as new habitat for countless wildlife.

Figure 1: The wetlands resulting from cut and fill on Ian's farm.

Since trialling the original concept, Ian has continued to learn and adapt his farming approach to work with nature, and now boasts above district average production and profitability on what was previously considered unviable land.

"I am proud of what I have been able to achieve and can see a positive return on the investment over the longer term" Ian said. This is even in the face of increasing production costs, dwindling sugar prices and environmental concerns.

Wetland design

Good wetland design is largely dictated by the topography and position in the landscape; the amount of space available; the primary purpose of the wetland; and the type and amount of water to be treated.

Wetlands designed for biodiversity outcomes often have a mix of deep-water sections to provide refugia for aquatic species such as birds, reptiles and amphibians and shallower areas for plants and insects to thrive, providing food.

Wetlands primarily designed for treating pollutants such as sediments, nutrients and/or pesticides (treatment wetlands) will often have a deep pool at the inlet to trap sediment and prevent these from clogging up treatment area. However, the bulk of the available space is generally shallow to facilitate the growth of aquatic plants, which facilitate many of the chemical process required to remove pollutants from the water.

Figure 2: Ian's wetland is a combination of open water and vegetation aimed at providing wildlife habitat.

With adequate space and good design, it is possible to deliver on both water quality and biodiversity objectives. However, in practice, and often due to limitations in size, cost and treatment capacity, there are often trade-offs between habitat and treatment outcomes and what's more important is likely to be very site specific.

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Planning a wetland

There are numerous factors to consider before constructing a wetland:

- The soil type and water holding capacity.
- The absence of potential Acid Sulphate Soils (common in the Herbert Valley and low-lying coastal areas) is important as it will determine what, how much and where excavation can occur without causing adverse environmental problems.
- The use of wetlands is more appropriate in some parts of the catchment than others. The soil type, water regime, topography and source of run-off (i.e. land use) are all factors to consider when assessing suitable locations and designs for wetlands.
- Shallow wetlands that can sustain vegetation all year are most effective at capturing and processing fine sediments, nutrients and residual pesticides associated with intensive farming.

Low lying areas, like the ones on Ian's farm, are often the least productive from an agricultural perspective. However, they can be used to improve habitat or run-off water quality by capturing and treating run-off before it enters waterways.

Many of the wetlands on Ian's property are deeper and hold water all year round, which is great for habitat and biodiversity. Their proximity and hydrological connectivity to remnant ecosystems downstream, contributes to the plethora of aquatic fauna and flora using the wetland.

As far as reducing nutrients and pesticides in farm run-off, Ian's wetlands may not be as efficient as they could be. Ian has now teamed up with researchers to help him better understand what's happening to the water in his wetlands and quantify the water quality benefits and ecosystems services his wetlands provide.

Installing a shallow, vegetated area upstream of the lagoons would improve the treatment capacity of his wetlands with minimal disturbance and cost. Improving the water quality entering the lagoons would likely further improve the habitat values of the deep-water sections.

Maintaining a healthy wetland

Aquatic weed infestations are a common problem in wetlands, therefore understanding what weeds are likely to occur and how these will be managed into the future is a key design and ongoing maintenance consideration.

Figure 3: Control of aquatic weeds (Hymenachne) are an important design and maintenance consideration to the success of wetlands in the Herbert Catchment.

It is also important to check whether there are any relevant legislative constraints associated with building a wetland. Details concerning possible permits and relevant legislation, as well as information on rehabilitating wetlands, treatment wetlands and other types of treatment systems is on Wetland*Info:* wetlandinfo.des.qld.gov.au. Wetlands are only one option to improve water quality. There are other treatment systems, such as vegetated buffers, sediment basins or bioreactors, that can be used instead of, or in combination with wetlands.

If you would like to learn more about whether a wetland or treatment system might be advantageous to your farming enterprise, please contact HCPSL, DAF or the Herbert River Catchment and Landcare Group to find out more about the latest funding opportunities.

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