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ROBERT WEBB - “DAPPO”

Where	Narromine, 40km west of Dubbo, NSW
Enterprise	Grazing (sheep)
Size	600 hectares
Wetland area	25 hectares

What they did

- Reinstated a near-natural flow regime to the wetland after past drainage works by constructing a flow control structure (licensed small concrete weir)
- Undertaken earthworks to create habitat e.g. installing islands
- Carried out an extensive re-vegetation program
- Fenced out the wetland to enable the control of stock access
- Planted old man saltbush (*Atriplex nummularia*) along one boundary (outside the fence).

Why they did it

- To improve the health of the wetland that had clearly been adversely affected by past drainage works, e.g. there was no natural regeneration of wetland vegetation.
- To encourage bird life back to both the wetland and the property in general
- In the hope that the re-planted wetland would act as a windbreak (stock shelter and wildlife habitat).

Cost

- Approximately \$50,000 spread over thirteen years with government funding assistance totalling about \$12,000.

Assistance

- Initial funding support for re-vegetation works came from the former Department of Water Resource’s “Green River Banks” scheme
- Later assistance for the construction of the flow control structure came from the former Catchment Management Committee.

Benefits

- The overall effect has been to produce an extremely attractive wetland that provides considerable aesthetic enhancement to the property
- There has been a noticeable increase in the birdlife in and around the wetland, including regular breeding of black swans and broilgas. The owners feel that the value of the property has increased as a result of the successful rehabilitation of the wetland.
- Integrated the wetland into their primary production with opportunistic grazing.

Monitoring & evaluation

- Long term photo points have been established that clearly record the improved condition of the wetland vegetation.

Their story

The wetland at the property 'Dappo' forms part of a water body locally known as the Backwater Cowal. A 'Cowal' is defined as 'a small lake or dam' by the Geographical Names Board of NSW. This occasional watercourse flows only after local heavy rain and is characterised by a series of wetlands connected by a wide, low-relief channel.

Originally a natural levee held water in the wetland but in 1957, after a series of wet years, a drain was cut to remove the impounded water. Over the years that followed the drainage works led to a gradual, but relentless decline in the health of the wetland. A reduction in wetland vegetation was the most obvious indicator of this malaise, with little regeneration of the surrounding river red gums (*Eucalyptus camaldulensis*) and the disappearance of the native sedges and other specialist wetland plants.



Image 23: Aerial view of the wetland on Backwater Cowal at the property Dappo (view looking north-east with the Macquarie River in the background). The revegetation works commenced in 1993 are obvious at the upstream (eastern) end of the wetland. The road in this area, which connects the two halves of the property, was moved to its present location in 1995. A flow control structure (levee and small weir) was constructed in 1999 and is located at the western end of the wetland (left hand side of the photo).

In the early 1990s Rob decided that it was time to do something about his ailing wetland. What followed was a series of projects that culminated in the weir and levee construction. Initially, Rob remembers, *'we just wanted to get some trees back and create a bit of a wind break'*. The first re-vegetation works were commenced in 1993. Two years later the road at the upstream end of the wetland, which connects the two halves of the property, was upgraded and re-aligned. At about this time earthworks within the wetland saw the creation of some islands to provide improved bird breeding habitat.

However, Rob realised that this was not enough – to really reinvigorate the wetland it needed water. *'We needed a greater degree of permanence of water'* Rob recalls, *'to get swans to nest you need at least three months of water and our wetland just drained away'*. This realisation led to the construction of a small concrete weir (licensed) in 1999 which, through a process of trial and error, has been progressively modified and updated to the present time.



Image 24: Rob Webb with his rehabilitated wetland on Backwater Cowal near Narromine. Rob has been working on his wetland for over thirteen years and is very happy with what he has finally achieved. 'We have turned it around' is Rob's summary of the work, not only is it now a very attractive part of the landscape but Rob feels it has definitely increased the value of his property.

1. Re-vegetation works

The initial revegetation work (1993 – '94) was carried out at the eastern end of the wetland. A grader was used to clear the site and create linear, raised planting beds (see photos on page 69). A range of native trees were planted, the majority of which established well. As was often the case in the early 1990s, this revegetation project included some species that probably would not have occurred in this location originally.

Hindsight is a marvellous thing and as Rob looks back now there are, of course, some things he would have done differently. *'The river red gums we planted grew well, but by the time we fenced the wetland and got the water levels right they just came back by themselves. I'd let natural regeneration do the work if I were starting again.'* However, one advantage of the natural regeneration has been to break up the straight lines created by those first planted trees.

This is another aspect of the revegetation design that Rob would now do differently. Rob also remembers that some plants that were put in didn't survive the later changes in water level created when the weir was built. *'The saltbush didn't like getting so wet. I think we lost almost all of it.'*

Perhaps just as rewarding as the success of the revegetation works was the almost miraculous reappearance of a wide range of native wetland sedges and other aquatic plants after the weir was installed. Whether from seeds dormant in the soil or from those washed in from upstream, this natural regeneration has been most welcome as trying to replant the whole wetland with these species would have been a very expensive and time consuming exercise. The key lesson learnt has been that if you create the right conditions, natural regeneration may well do most of the revegetation work for you free of charge!



Image 25: Before-and-after photos of the revegetation works carried out at Dappo – the red arrows mark the same spot (above - 1994, below - 2007). Trees were planted into raised beds but the natural regeneration of River Red Gums in particular has now broken up these straight lines somewhat. Once the weir was constructed in 1999, the natural regeneration of wetland plants soon followed (see foreground of lower photo).

2. Earthworks – habitat creation

For ground-nesting waterbirds the taking of eggs and flightless chicks by predators, especially the introduced fox, is a major problem that has been identified as threatening the long-term survival of many species. Islands, and those surrounded by deep water in particular, provide important refuge. A small 'Cato' bulldozer was used to create these nesting islands, but in retrospect an excavator would have done a neater, quicker job.



Image 26: Constructed islands such as this one provide valuable nesting sites and reduce the risk of eggs and chicks being taken by foxes.

3. Flow regime – building the flow control structures

Using the wetland classification scheme developed by Corrick and Norman (1980) the wetland at Dappo is an example of a red gum dominated Deep Freshwater Marsh. These types of wetland usually have an average water depth of less than 0.5m and typically hold water for no more than eight months a year. These wetland vital statistics, usually referred to as the 'flow regime' or 'wetland hydrology', are one of the most important, if not the most important thing, that has to be addressed when rehabilitating a wetland. The pulse of life that water brings provides the heartbeat of the wetland, and the timing, duration and depth of the water is critical for plants and animals alike to complete their life cycles. In recognition of this fact, and after some consultation and gaining the necessary permits, a levee and associated small concrete weir structure was installed in 1999.

The weir at Dappo has had an evolving design. Initially, problems were encountered when water falling over the weir wall started to undercut the structure. Added to this, yabbies burrowing under and around the weir were causing leaks. The addition of concrete 'aprons' to the front and back of the weir wall solved these problems. Finally, the inclusion of 'drop boards' (a removable section at the crest of the weir) now enables some manipulation of water levels.

4. A new grazing regime

In common with many wetlands that are managed for their environmental values stock are excluded during wet phases and only allowed access during the periods when the wetland dries out.

5. Monitoring & evaluation

A number of photo points were established when Rob first started his project and these now provide an invaluable visual record spanning the thirteen years of activity (see photos on following pages).

For Rob the process of monitoring and evaluation is not so much a formal assessment process, but rather it involves taking the time to regularly observe what is happening within his wetland, e.g. he is in no doubt that both the number and diversity of birds using the wetland has increased over time.



Image 27: Drained in the 1950s, the flow of water in and out of the wetland at Dappo is now controlled by a levee bank and this small weir constructed in 1999.

Challenges

Finding the time and money to undertake a project of this nature is always a challenge, but by completing the work in small stages over a number of years Rob has been able to 'spread the pain' somewhat. Occasional financial assistance for certain parts of the project has also helped.

Fox, pig and weed control are also ongoing issues and baiting for the former has been required at various times.

'we got absolutely what we wanted, in full measure' is how, with great satisfaction, Rob summarises thirteen years of wetland rehabilitation effort

Summary

Rob's project is an example of persistence paying off. The work was carried out in stages over many years with careful observation of the results achieved from preceding works being used to guide the next efforts. Re-establishing a wetland flow regime that closely mimics the original was probably the key to overall success, as this has triggered the widespread natural regeneration of native wetland vegetation and provided the right conditions for waterbirds. Rob set out to try and make '*...a small part of the Backwater Cowal system live again*'. Today he feels that this has been achieved '*we got absolutely what we wanted, in full measure*' is how, with great satisfaction, he summarises thirteen years of wetland rehabilitation effort.

Reference

Corrick, A.H. & Norman, F.I. (1980) Wetlands of Victoria 1. *Wetlands and waterbirds of the Snowy River and Gippsland Lakes catchment*. Proceedings of the Royal Society of Victoria. 91: 1-15.



Image 28: Photo point 1. Left 1994, right 2007



Image 29: Photo point 2. Left 1995, right 2007



Image 30: Photo point 3. Left 1994, right 2007



Image 31: Photo point 4. Left 1994, right 2007



Image 32: Photo point 5. Left 1995, right 2007