

## **Wetland watering, works and measures – in miniature**

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### **Key Points**

- Small, isolated wetlands can be very important in a regional context
- Maximising environmental watering outcomes for these wetlands can be done very cost effectively given the small scale involved
- Scalable approach has been applied more broadly with further scope to do so into the future

### **Keywords**

wetlands, Wimmera, infrastructure, pipeline, environmental water

### **Introduction**

This technical note describes the process applied to enhance environmental outcomes achieved by delivering environmental water through a reticulated pipeline to a number of small off-stream wetlands dispersed throughout the north-east of the Wimmera Catchment Management Authority region in western Victoria. This involved assessing their values, determining a watering regime and undertaking infrastructure works to achieve this at a scale commensurate with and appropriate for the size of the wetland.

### **Background**

The business case for the funding of the Wimmera Mallee Pipeline (an infrastructure project involving the replacement of a distribution network of open channels and dams with pipes and tanks) included the creation of a 1000 ML entitlement to supply modified wetlands formerly connected to the channel system since the 1930's (Wimmera Mallee Pipeline Project Planning Group, 2003). The rationale was that this would provide important surface water locations for local fauna that had benefitted for decades from the large network of channel-fed dams that were filled most years in a semi-arid landscape largely devoid of creeks and rivers. Local community members were lobbied for the creation of the entitlement and there is keen continuing interest in and support for environmental water for these wetlands.

GWMWater (responsible for managing the Wimmera Mallee Pipeline Project) undertook an expression of interest process through which landholders could nominate wetlands on their property for supply that contained dams that were previously filled by the former channel system. Subsequently a shortlisting process was undertaken which considered factors such as the cost of connection, rate of delivery, hydraulic impact on nearby pipeline customers, geographic spread and a coarse assessment of environmental values. Following this assessment, 51 wetlands/dams were connected to the Wimmera Mallee Pipeline across the Mallee, North Central and Wimmera CMA regions, of which 13 are in the Wimmera CMA region. Whilst most sites are small wetlands, some are solely dams with locally significant environmental values (e.g. Growling Grass Frogs). For cost efficiency and to minimise permitting requirements, the pipeline outlet typically was installed at the edge of the property to drain into the wetland through the remains of the former channel system or was directionally bored to the edge of the dam. The wetlands are typically very small, ranging from up to 6 hectares down to small farm dams. Therefore the volumes required to inundate these wetlands range between less than 2 ML up to about 60 ML.

## Process

### Determining Values and Watering Regimes

Given their size and the uncertainty regarding their historic hydrology (being off-stream wetlands) it was not practical to undertake comprehensive environmental flows studies for each wetland, such as had previously been completed for other wetlands that can receive environmental water. Therefore comparatively brief assessments were undertaken to gain a snapshot of their environmental value as this information was non-existent at virtually every wetland. Assessments included determining the ecological vegetation classes (EVC), conducting an Index of Wetland Condition assessment, establishing vegetation monitoring quadrats and noting flora and fauna species observed during site visits (Figure 1). This information was in turn used to approximate the area of each EVC and based on this and an indication of watering regimes for various wetland EVCs (Flood, 2012), enabled an estimate of the volume required to provide an appropriate watering event (not including seepage and evaporation). Initially this was only applied to wetlands in the Wimmera CMA region, however the success of the approach meant that it was subsequently applied to the remaining wetlands across the Mallee and North Central CMA regions.

This information was invaluable for the development of Environmental Water Management Plans for these wetlands, and helped establish a long-term watering regime (subject to water availability). It was also useful in terms of prioritising environmental watering actions between the wetlands. Furthermore it highlighted the diversity of native flora and fauna they support (including a number of threatened species) despite the fact that these wetlands are small, isolated fragments of native vegetation in a largely cleared, broad-acre agricultural landscape.

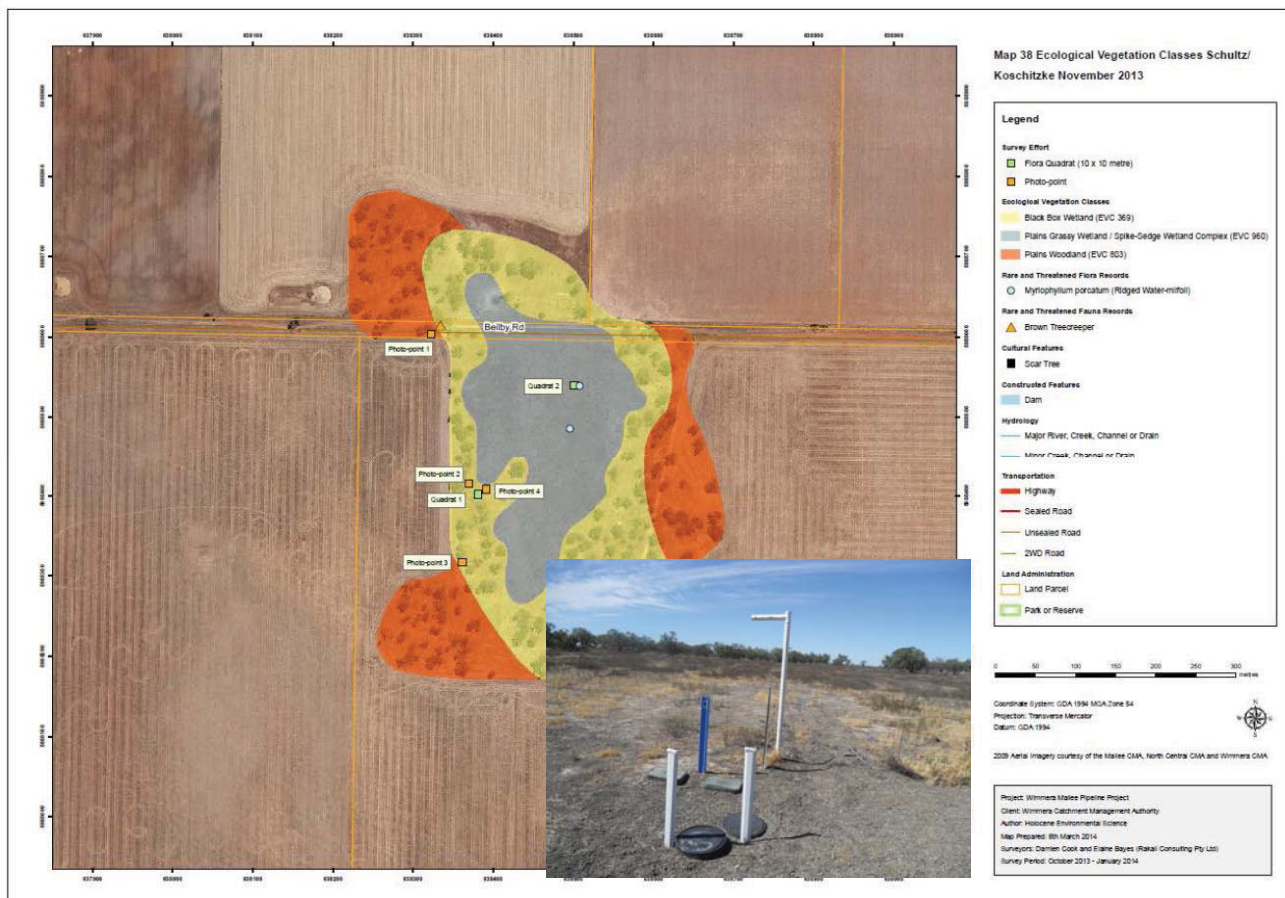


Figure 1. Ecological Vegetation Class and threatened species mapping for Schultz/Koschitzke Wetland

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**(Cook, 2014) and (inset) constructed valves to enable watering of dam (north of Beilby Road) and/or wetland (south of Beilby Road). Note the PVC pipe post represents the January 2011 flood level.**

### ***Maximising Environmental Outcomes***

Initial observations indicated that in a number of cases the dam which was the location of the pipeline outlet was physically disconnected from the adjacent wetland area(s). This constrained watering to filling the dam only. Otherwise in the process of reaching the targeted wetland area(s), water would inundate adjoining properties or non-wetland EVCs, presenting unacceptable risks.

These risks identified a need to undertake physical works to enable water to effectively inundate target wetlands and not just fill dams. Site inspections were undertaken to determine what, if any works would be required and following this, works were recommended at several sites including installing additional pipelines and outlets as well as creating low-level channels and bunds. An important part of this was consultation with land managers (Parks Victoria, in most cases) as well as the Registered Aboriginal Party (Barengi Gadjin Land Council) to ensure the works were appropriate for a parks setting and would not affect cultural heritage. The relative small-scale of the works was important in gaining approval for the works given the lower costs involved in maintaining them, for example the two inch pipes and valves used can be easily repaired by local plumbing contractors rather than requiring specialised technicians and heavy equipment.

The works were undertaken during 2015 and unfortunately dry conditions since 2011, culminating with drought from 2014 onwards have seen significantly reduced allocations and therefore limited opportunities to implement wetland watering. The current main objective is the filling of the dams associated with the wetlands. However in some cases the infrastructure has increased the efficiency of these actions, delivering water to the dam without needing to flow through the remnants of the previous channel system. Upon the return of wetter conditions, the infrastructure will be fully utilised to implement the watering regimes prescribed in the Environmental Water Management Plan for these wetlands.

### **Conclusions**

Although it does not have the scale and profile of other wetland watering actions seen throughout Australia, small wetlands supplied by the Wimmera Mallee Pipeline provide important local environmental outcomes including for threatened species. This in turn benefits the broader community of the northern Wimmera who appreciate the benefits of healthy wetlands in a semi-arid climate, long distances from the nearest river or creek. For comparatively minor levels of investment (i.e. several thousand dollars per wetland), the modest outcomes that would have otherwise occurred can be greatly enhanced through monitoring, assessment and infrastructure projects tailored to fit the smaller scales involved. Given its success to date the same approach is looking to potentially be rolled out to other wetlands supplied by the Wimmera Mallee Pipeline beyond the Wimmera CMA region.

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