

# Protecting Wetlands with Redundant Drainage Infrastructure

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## Key Points

- The Victorian Government is developing the Victorian Rural Drainage Strategy to help landholders make choices about how they manage water logging on agricultural land.
- The release of a draft Strategy in November 2017 was a key milestone, delivering on the Government's commitment in *Water for Victoria*, to develop a rural drainage Strategy for Victoria through an open and consultative process.
- Feedback on the draft Strategy showed that the challenges and opportunities for drainage management are different across the state.
- To support the movement to the new arrangements, the Government is investing in pilot projects across Victoria to understand what is needed for the new arrangements to work.
- The pilot projects will help develop fit-for purpose tools and guidelines that can be adapted for the local context that landholders can use to make choices about how they will manage rural drainage.
- The pilot projects are considering opportunities to balance the economic, cultural and environmental values of rural drainage.

## Abstract

Rural drainage has significantly impacted inland aquatic systems throughout Victoria. Up to one third of the state's wetlands and 75 percent of the shallow freshwater wetlands of southwest Victoria have been lost, or severely modified by drainage works. Dryland rural drainage is the last sector of water management in Victoria to be reviewed.

The 2016 *Water for Victoria* plan, committed to developing a rural drainage strategy through an open and consultative process. In delivering the strategy the Victorian State Government is working with catchment management authorities to establish modern arrangements for rural drainage. Government and catchment management authorities are using innovative approaches to increase local climate change resilience and protect environmental values while landholders maintain appropriate drainage services to maximise agricultural productivity.

The Corangamite Catchment Management Authority (CMA) has responsibility for two drainage schemes in its region. These drainage schemes can impact two Ramsar sites (Lake Corangamite, part of the Western Districts Lakes Ramsar Site and the Lower Barwon Wetlands complex, part of the Port Phillip Bay [Western Shoreline] and Bellarine Peninsula Ramsar Site). In recent years, diminished natural inflows, exacerbated by the diversion scheme have seen significantly reduced water levels in Lake Corangamite, leading to a potential change in its ecological character. The future management of these drainage areas are the subject of a pilot project managed by the CMA.

The management framework outlined in the draft Strategy empowers landholders and community partners to work together to improve rural drainage management, while driving the agricultural sector's contribution to the Victorian economy and supporting positive cultural and environmental outcomes.

## Keywords

Dryland rural drainage, wetlands, Ramsar

## Introduction

Drainage of rural land in Victoria began in the mid- 1800s. It expanded significantly at the start of the 20<sup>th</sup> century, and again after World War II. Historically, large-scale drainage systems were established to bring into agricultural production land that was previously unable to be farmed due to it being under water for some or all of the year.

At its peak, Victoria had formally gazetted about 130 dryland rural drainage areas, draining approximately 1.5 million hectares of agricultural land and servicing about 5000 landholders. They vary markedly in their complexity and size and were usually managed by local government, in partnership with landholders. A handful were managed by river improvement or drainage trusts. The number and extent of informal drainage systems is unknown (Department of Environment, Land Water and Planning, 2017).

At the turn of the 20<sup>th</sup> century, extended drought in Victoria had reduced the need for dryland drainage. This, combined with significant changes to legislative and management arrangements around drainage and water led to a lack of maintenance on drainage infrastructure. Significant floods in 2010 to 2012 led to prolonged waterlogging in agricultural areas and highlighted inadequacies in maintenance and confusion around management amongst stakeholders (Natural Resources and Environment Committee, 2013).

To address these issues, the Victorian Government is developing the Victorian Rural Drainage Strategy. This will help landholders manage water logging on agricultural land by clarifying management arrangements and by providing information and tools to help them make informed choices about how they will manage rural drainage. The strategy is considering opportunities to balance the economic, cultural and environmental values of rural drainage.

A draft Strategy for public consultation was released on 25 October 2017, delivering on a significant milestone for the Government's commitment in *Water for Victoria*, to develop a rural drainage Strategy for Victoria through an open and consultative process.

Feedback on the draft Strategy showed that the challenges and opportunities for drainage management are different across the state. To support the movement to the new modern arrangements, the Government is investing \$1.9 million in seven pilot projects across Victoria to understand what is needed for the new arrangements to work. The pilot projects will help develop fit-for purpose tools and guidelines that can be adapted for the local context. The projects will foster partnerships between all stakeholders (community and government agencies) and support landholders to make choices about how they will manage rural drainage.

This paper focuses on works being undertaken to apply modern arrangements in the Woody Yaloak Diversion Scheme, near Colac in western Victoria.

## Woody Yaloak Diversion Scheme

### Overview

The Woody Yaloak Diversion Scheme (WYDS) was built in the late 1950's in response to major floods, which resulted in prolonged periods of inundation of agricultural land around Lake Corangamite making the land unsuitable for agriculture. The scheme also provides drainage services to landholders along the diversion channel, downstream from Lake Corangamite, increasing their area of viable land by reducing waterlogging.

The scheme consists of a series of barrages at the inlet and outlet of Cundare Pool and a man-made diversion channel with various syphons and crossings (see figure 1). The barrages regulate flow from the Woody Yaloak River into lake Corangamite and redirects water through a diversion channel, then into a tributary of the Barwon River which flows out to sea through the Lower Barwon wetlands near Geelong. Water can still reach Lake Corangamite from the Woody Yaloak, but it must flow through Cundare Pool. Approximately half of the of flood prone freehold land around Lake Corangamite was voluntarily acquired by the State Government at the establishment of the scheme and is now leased back to land holders (GHD 2004).

Under natural conditions, Lake Corangamite rarely spilled overland other than in extreme floods. The lake's levels and salinities fluctuated naturally with very high salinity occurring when levels fell as a result of low inflows and high evaporation losses. While the scheme has been effective in reducing water levels and protected large areas of adjoining freehold grazing land from flooding, it has also increased the frequency of low water levels and high salinity levels in lake Corangamite (GHD 2004).

Under its statement of obligations, the Corangamite CMA deliver statutory waterway, floodplain and drainage management functions in its region. In 1998 the CMA assumed responsibility for the management of the WYDS. The schemes are managed in accordance with the provisions of the *Water Act 1989*, which includes both ongoing maintenance of the schemes and operation of the schemes in accordance with agreed operational rules. The main purpose of the operating rules is to control salinity limits in the Barwon River, and ultimately, the Lower Barwon Wetlands (GHD 2004).



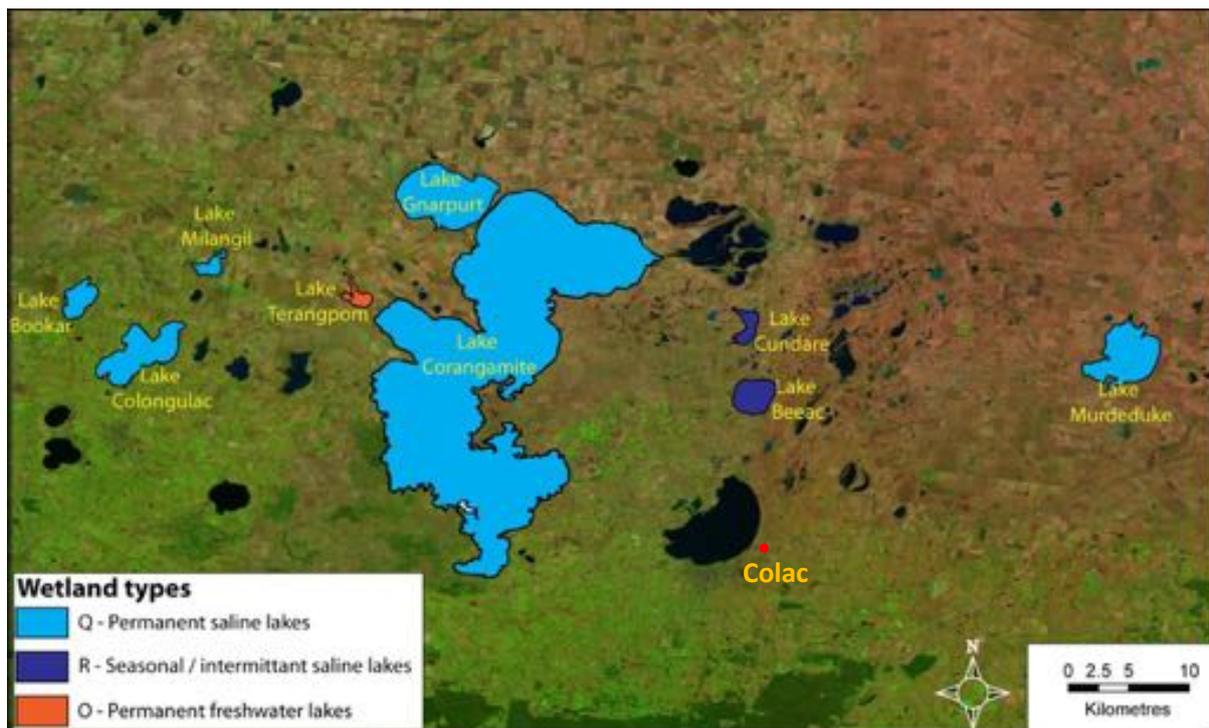
## **Current Status**

Historically, funding for the WYDS has not met the needs to maintain it to original design standards. While the scheme is still capable of being operated, significant maintenance is required to ensure it is viable into the future and is compliant with current OH&S regulations. Various components are at, or near, the end of their economic and operational life with the majority being over 50 years old (Tim Cummins & Associates, 2016). The Victorian Government has funded the Corangamite CMA to address potential risks from aging infrastructure, which are being addressed on a priority basis. The project is considering opportunities to support landholders that continue to benefit from reduced water logging from drainage services provided by the WYDS. It is doing this through providing options to transfer the ownership and ongoing management of assets to those that see a benefit.

## **Lake Corangamite and the Western District Lakes Ramsar Site**

The WYDS is within a region widely recognised as having significant ecological value and has the potential to impact the environment of both the local area around the scheme as well as the ecological functioning of a wider geographic area. Of particular importance is the Western District Lakes Ramsar site (see figure 2). This comprises nine separate lakes (including Lake Corangamite, the largest), which lie to the west, north and east of the town of Colac. Lakes dominate surface water in the catchment with the Woody Yaloack being the only significant river. The Western District Lakes Ramsar site was listed in 1982 (Hale and Butcher, 2011).

The millennium drought, along with decreasing runoff attributed to climate change has seen significant negative impacts on the level and quality of water in Lake Corangamite. During the millennium drought, falling water levels (and the associated shift from moderately saline lake to highly saline) significantly impacted on the composition of the lakes biota. Some species (amphipods, snails, Common jollytail and *Ruppia*) almost disappeared. The loss of these species and reduced water levels has greatly decreased the value of the lake to waterbirds, with reduced numbers recorded at the lake over recent years, and had the potential to impact the ecological character of the lake as set out in the ecological character description for the Western District Lakes Ramsar Site' (Corangamite CMA 2014; Hale and Butcher, 2011).



**Figure 2:** General location of dominant wetland types in the Western District Lakes Ramsar site (note that types with extents of less than 15 hectares are too small to show on the map, but the areas of seasonal/intermittent freshwater marsh are in the south west corner of Lake Corangamite) (Hale and Butcher, 2011).

### Future Management and Enhancing Environmental Values

As part of the pilot program, the CMA recently undertook an investigation to explore sustainable funding models and institutional arrangements for the future management of the scheme. The CMA is conscious that a continuation of the current management arrangements is unlikely to be financially sustainable into the future. Nonetheless, it is also conscious that a decision to decommission the scheme is unlikely to be acceptable to the benefiting communities. These communities see the drainage systems as providing valuable services into the future to prevent potential waterlogging. Further to this, the WYDS is unique among rural drainage systems in Victoria as it also provides landholders around Lake Corangamite with protection from flood events. The investigation concluded that the only sustainable option would be to mothball the scheme by maintaining the drainage assets at a low operational level, enabling them to be easily brought back to full operation if required during wet years (Tim Cummins & Associates, 2016). Funded through the pilot project, the CMA is addressing the associated risks on a prioritised basis, and where appropriate transferring ownership and management to the stakeholder (landholder or agency) who receives a benefit from the asset. Further options are being considered by the CMA for the management responsibility of future drainage to sit with the landholders who benefit from the WYDS. At this stage of the project, arrangements are yet to be finalised.

As Lake Corangamite is within a Ramsar area, the CMA are obligated to undertake actions to enhance the values which support migratory waterbird populations upon which the Ramsar nomination is based. In recent years the CMA has undertaken works to enlarge the Cundare Barrage Outlet to allow greater flexibility to manage flows into Cundare Pool and Lake Corangamite. The CMA is considering opportunities to amend the operating rules for the drainage scheme based on environmental flow investigations aimed at maximising the ecological benefits of Lake Corangamite and the adjoining Cundare Pool and Lake Martin.

As decommissioning the WYDS or returning it to original design specifications are not viable options, mothballing the system would allow continued operation of the regulators to manage the environmental values of Lake Corangamite, the Cundare Pool and Lake Martin. Under these arrangements, the system can be managed primarily for environmental purposes, helping to address impacts from the establishment of the scheme and manage for predicted climate change. The CMA may consider reviewed operation rules for flows into Lake Corangamite improve habitat for biota the lake supports as per the ecological character description for the Ramsar Site', that will take into account any increased risk of flooding. Even if management rules are changed, returning Lake Corangamite to historic levels may not be possible due to the significant volume of water required and lower inflows. The Cundare Pool is however less restricted in its management rules and also has high environmental values similar to Lake Corangamite. The CMA is exploring ways that these values could be better protected into the future (Corangamite CMA, 2014).

## **Conclusions**

The recent history of prolonged drought punctuated by heavy flooding in the Corangamite CMA region highlights the need for flexible water management which can address the impacts climate change. Upgrade to the Blackpool Regulator and Cundare Barrage that allows more adaptable management of flows to Lake Corangamite will allow the CMA to respond to a range of conditions and risks. While the WYDS has had significant environmental impacts over the last 50 years, decommissioning the system could lead to worse outcomes in the future. Developing a sustainable management plan through the pilot project will enable the system to continue to be managed to meet ecological objectives in the Cundare Pool, Lake Martin and Lake Corangamite. It will also provide opportunities for landholders to continue to manage drainage services by taking on the ongoing management responsibility of infrastructure that provides a drainage service into the future.

## **Acknowledgments**

The authors would like to thank Denis Lovric from the Corangamite Catchment Management Authority and Andrea White and Janet Holmes from DELWP Waterway Health for their assistance in drafting this paper.

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