

Diversity in a piped system

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Take Home Messages

- The completion of the Wimmera Mallee Pipeline will introduce long term changes to wildlife populations on farms across the region.
- Surveys undertaken by BCG have shown that the wildlife values on farms are higher where there is open water available and where native vegetation is present.
- Installing a wildlife water point on a farm can be an efficient and cost-effective way of enhancing wildlife values in the Wimmera and Mallee within a piped water delivery system.

Background

The completion of the Wimmera Mallee Pipeline will cause significant and long-term changes to regional biodiversity as a result of the change from an open water supply system of channels and dams to a closed system of pipes and stock troughs. Understanding the current biodiversity values of existing on-farm water points (dams, channels and stock troughs) is crucial in identifying actions to manage any impacts that the change may have on wildlife, the environment and the well-being of rural communities.

Aims

The main objectives of the Diversity in a Piped System project were to:

- assess the biodiversity values of stock water points in the Wimmera Mallee Channel/Dam region and the Northern Mallee Pipeline region,
- determine whether biodiversity and the environmental values of open water can be maintained in a farming landscape through the use of purpose-built water points for wildlife, and
- develop guidelines for farmers and industry on the use of water points for best management of wildlife within a piped water delivery system.

Results

The project began in October 2004 and ran for two years. Thirty-six sites were established in the Wimmera and Mallee to assess the biodiversity values of the different farm water points (dams, channels and stock troughs). These are shown in Figure 1. Data was collected on birds, mammals, reptiles and frogs at each of the study sites. Birds provided the best indicators of the relative biodiversity values of the different sites. An integral part of the project was trialling an experimental water point, designed to provide an open water source for wildlife (Photo 1). These were concrete troughs, cast in-ground and planted with aquatic vegetation to provide habitat for aquatic fauna.

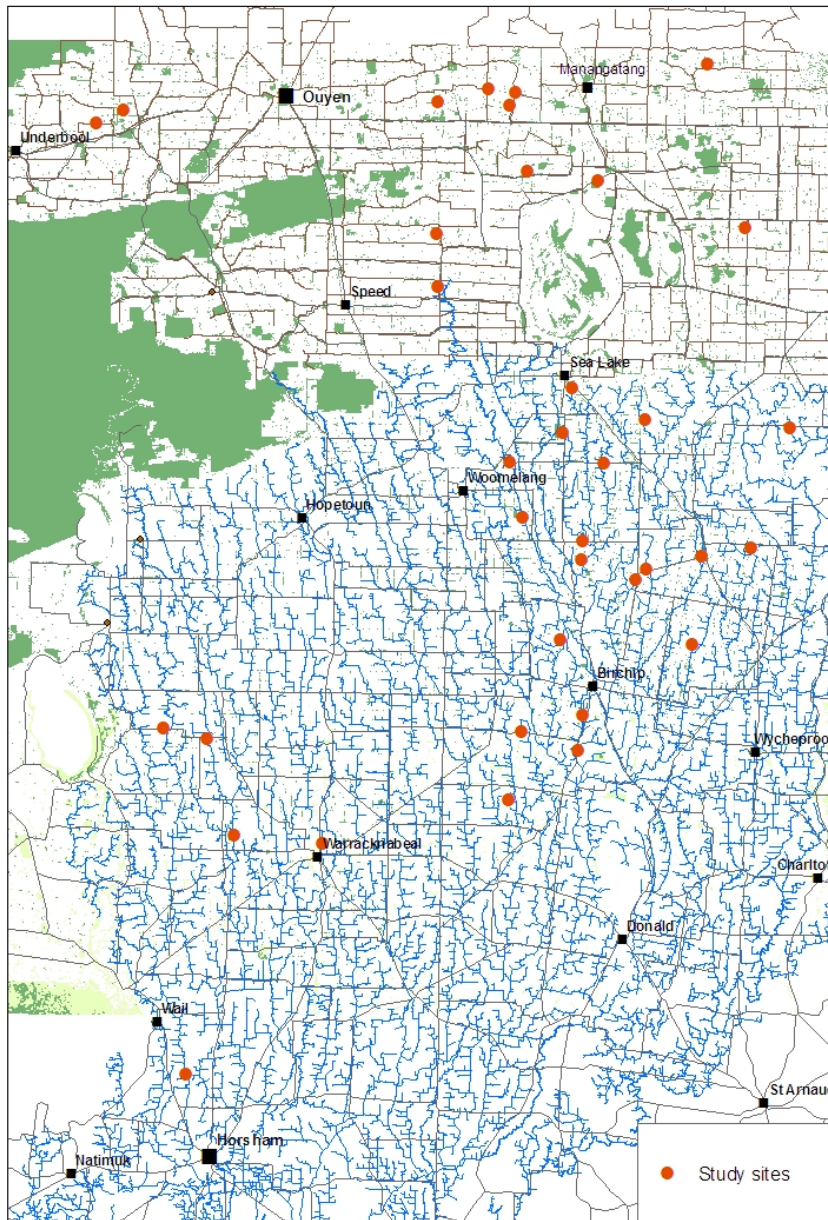


Figure 1: Map of the study area showing towns, the Wimmera and southern Mallee channel system, the Northern Mallee Pipeline, areas of native vegetation and the DIPS study sites.

Biodiversity levels on farms were highest at sites with open water (dams) and at sites in woodlands.

Survey results showed that levels of bird abundance (number of birds) and bird diversity (number of species) were significantly higher at open paddock sites with a farm dam. (significance refers to 95% confidence that the findings were due to actual differences between samples and not random variation)] compared to open paddock sites with a stock trough (Figure 2). Similarly, significantly higher levels of bird abundance and diversity were recorded in woodlands with farm dams compared to woodland sites without water. Woodland sites also supported higher bird abundance and diversity than sites in open paddocks.

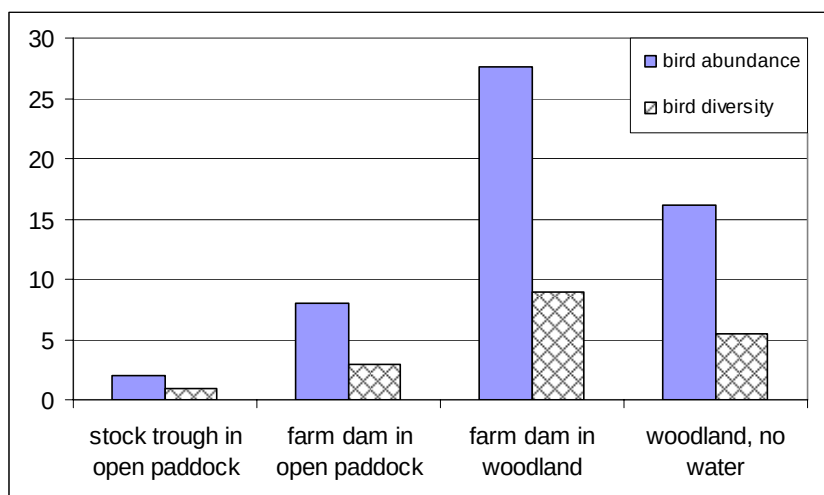


Figure 2: Average bird abundance and average bird diversity recorded at sites both with and without open water, in open paddocks and woodlands.

The results illustrate the difference that the presence of an open water source such as a farm dam can make to biodiversity. The presence of native vegetation is also important. A similar result was found for reptiles and bats, which showed significantly higher populations in woodland sites compared with open paddock sites. Bats were also found to be more abundant at sites with open water compared to sites without.



Photo 1: Wildlife water point in the Northern Mallee Pipeline region planted with aquatic vegetation to provide habitat for fauna.

Wildlife water points can increase the biodiversity value of a woodland patch.

The installation of a wildlife water point in a woodland resulted in an increase in bird populations. Significantly higher levels of both bird abundance and bird diversity were recorded at woodland sites with a wildlife water point compared to woodlands where there was no water (Figure 3), illustrating how the addition of water through the use of a wildlife water point can increase biodiversity levels (as measured by birds). The wildlife water points were used by many species of birds for drinking and bathing (Photo 2).

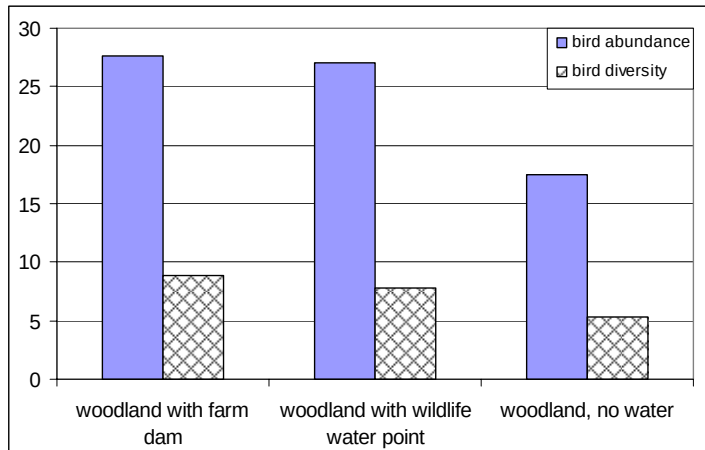


Figure 3: Average bird abundance and average bird diversity recorded at woodlands with a farm dam, woodlands with a wildlife water point and woodlands with no water.

Woodland sites with wildlife water points and woodland sites with farm dams showed no significant difference in their bird populations, demonstrating that wildlife water points can maintain biodiversity values at levels comparable to farm dams.



Photo 2: Red-rumped Parrots coming to drink at a wildlife water point.

Frogs and turtles are likely to be seriously affected by the loss of open water.

Frogs are almost entirely dependent on open water as habitat, and the absence of frogs on farms reflects the absence of open water sources. Frogs breed in water and spend much of their adult stage in or near water (photo 3). Similarly, the Common Long-necked Turtle is dependent on water for much of its lifecycle. In the Wimmera Mallee Channel/Dam region, frogs and turtles were only found at sites with farm dams and sites with channels (when flowing). No frogs or turtles were found at any of the sites in the Northern Mallee Pipeline region, where these water sources were absent.



Photo 3: A Spotted Marsh Frog at the edge of a farm dam.

No frogs or turtles were found using the wildlife water points. This may be due to the sites chosen for the wildlife water points being too far from existing frog populations. Also, there was no channel run and dam fill from the Grampians system in 2006, which meant less open water available, less frog spawning and greatly reduced levels of frog dispersal.

During periods of drought, frogs seek refuge either by burrowing into the soil or by hiding under objects such as logs where there is still moisture. In a natural system, the wetlands inhabited by frogs would eventually receive water following rainfall and stream flow. The majority of frogs now depend on water from the channel and dam system. After the decommissioning of the channel/dam system, frogs hibernating in and around dry dams may never get water again and will eventually die.

Installing a wildlife water point on your farm.

The installation of a wildlife water point is an effective way to improve the biodiversity values on a farm. An ideal wildlife water point, or wildlife pond, is shallow-sided, to allow easy access and exit for animals, about one metre deep at its deepest, and planted with aquatic vegetation to provide habitat for water dependent animals. A wildlife pond can be installed in a variety of different settings but will provide greatest benefit to wildlife if installed in a patch of native vegetation with no stock access. Many of the wildlife values that dams supported can be maintained by installing a wildlife pond at a dam site. The cost of materials for constructing a wildlife pond is minimal, approximately \$200. A farmer's guide to installing a wildlife pond is being developed to assist farmers adopt these findings. This guide will be available from BCG in the near future.

Conclusion

The provision of water for wildlife in a farming landscape will increase the biodiversity levels (as measured by birds) in the Northern Mallee Pipeline region, and maintain existing biodiversity values in the Wimmera Mallee Channel/Dam region. Frogs and turtles are likely to be disadvantaged by the loss of open water following decommissioning of channels and dams. A more strategic application of water for wildlife can provide suitable habitat for frogs as well as maintain the biodiversity benefits that wildlife water points provide.

Acknowledgements

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