Community wetland monitoring in the South Australian Murray-Darling Basin

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Abstract

Community groups manage the majority of wetlands along the River Murray in South Australia. The SAMDBNRMB runs a successful community wetland monitoring program that assists these groups to undertake monitoring to guide the management of their wetlands. Wetland Officers from the NRM Board provide equipment, training and technical advice, with approximately 27 groups currently receiving ongoing support. These dedicated groups hold regular scheduled monitoring days but also undertake more intensive event-based monitoring to determine the effects of specific management actions. Parameters monitored include surface water, groundwater, vegetation, photopoints, tree health, fish, frogs and birds. A recent survey revealed that community members were able to confidently monitor photopoints, surface water and groundwater without supervision, but needed assistance with fish and vegetation monitoring. Even though community members are not scientists, the data collected is extremely valuable, and has been used to successfully inform future management decisions. The monitoring program is now in its fourth year of operation, with more and more wetland groups getting involved each year.

Keywords

Adaptive management, capacity building, salinity

Introduction

There is a strong history of wetland rehabilitation programs along the River Murray in South Australia, largely driven by community organizations. For many such organizations the success of any program is best proven through achieving on-ground works such as the installation of flow regulation structures, which then leaves them with the responsibility of making complex management decisions into the future. As a result, the SAMDBNRM (South Australian Murray-Darling Basin Natural Resource Management) Board identified a need to support community organizations to develop and implement wetland rehabilitation programs, particularly the collection of baseline data and ongoing monitoring in order to make ecologically sound management decisions.

The Board's Community Wetland Monitoring Program commenced in June 2002 when a Wetland Management Project Officer (WMPO) was employed by the then River Murray Catchment Water Management Board (now SAMDBNRM Board). In the first year, technical support was primarily given to approximately five groups in the upper reaches of the SA River Murray (between the border and Blanchetown). A year later, after the success of the program became evident and more groups expressed a desire to get involved, a second WMPO was employed to assist groups in the lower reaches (between Blanchetown and the mouth). The program has grown considerably since, with approximately 27 groups receiving on-going support through the Board's wetland program (Fig. 1).

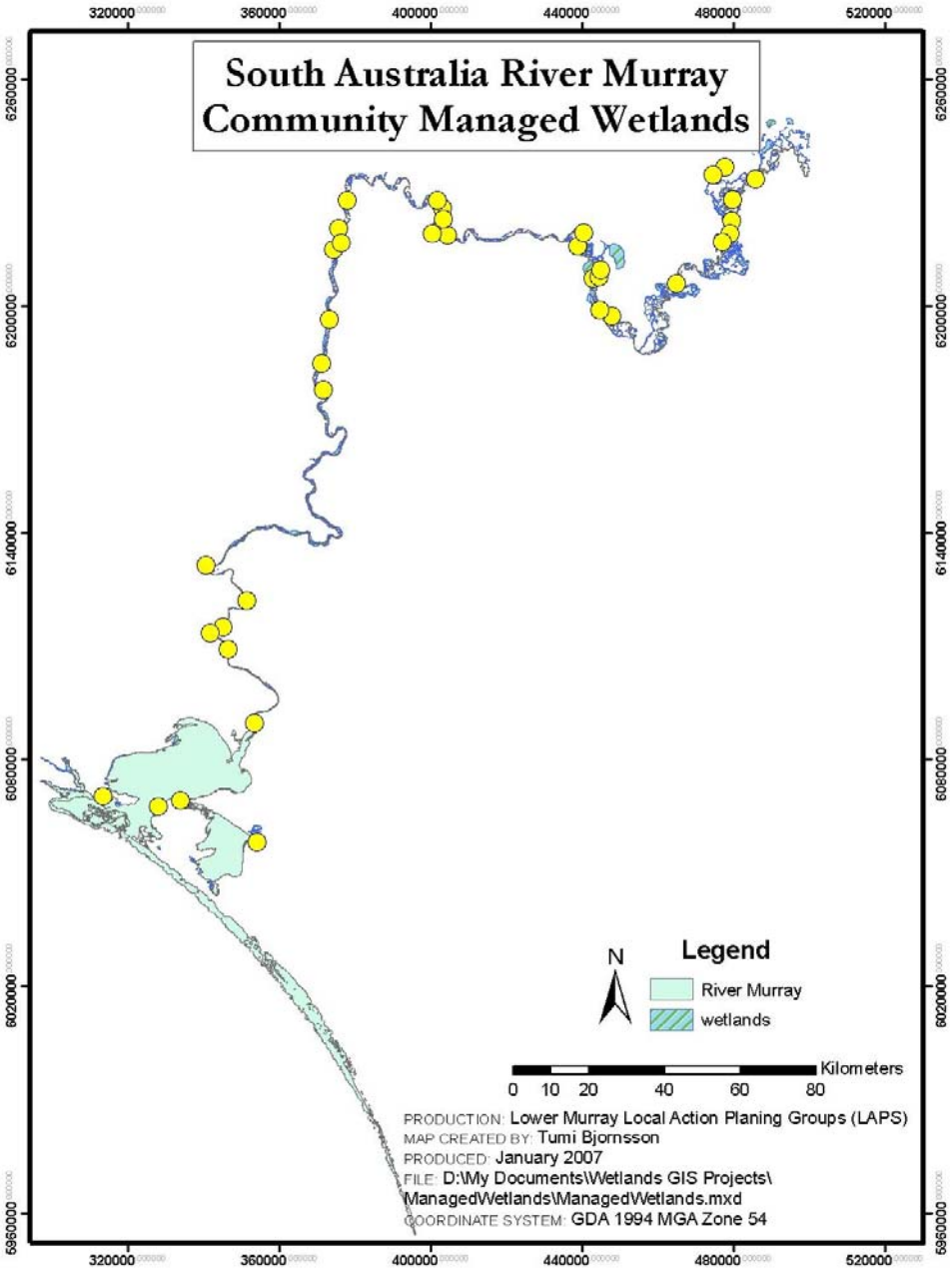

Figure 1. Distribution of all community groups involved in wetland rehabilitation in the SAMDB (map developed by Tumi Bjornsson, Lower Murray LAPs).

A successful system is now in place by which River Murray wetlands are managed and monitored by community groups with support and funding provided through the SAMDBNRM Board in association with the riverine Local Action Planning Associations.

Developing and implementing a wetland rehabilitation program

The first stage in the wetland management process is for the community to identify a wetland as being in need of rehabilitation or protection. The next step is to undertake a wetland baseline survey at the wetland, to establish the condition of the wetland prior to any management actions taking place. A baseline survey is a once-off, year-long survey that gathers data on surface and groundwater quality, birds, fish, frogs, macroinvertebrates, vegetation (including tree health), basin topography and wetland volume. To date, around 75 wetlands along the River Murray and Lower Lakes in South Australia have been surveyed. In most cases, the baseline survey has been undertaken as a consultancy, not by community members.

After the baseline survey has been completed, a Wetland Management Plan (WMP) is written for the wetland, usually by an employed Wetland Planning Officer. The plan must adhere to specific guidelines (DWLBC, 2003) and is developed in close consultation with the community group. A WMP utilizes the information gathered in the baseline survey to develop a list of threats, objectives and management actions for the wetland, as well as timetables for on-ground works and on-going monitoring. A WMP may also allow a wetland to receive an environmental water allocation, especially if the wetland's hydrology can be managed at normal pool level.

Depending on the recommendations of the WMP, on-ground works such as the installation of flow control structures, weed removal and clearing out of flow paths may occur, in accordance with state government guidelines (SAMDBNRMB, 2007).

The final and on-going stage is a monitoring and evaluation process in order to gauge the effectiveness of management actions and determine future activities (Fig. 2). The SAMDBNRM Board provides support and input throughout the process but the WMPOs work is focused on this final stage.

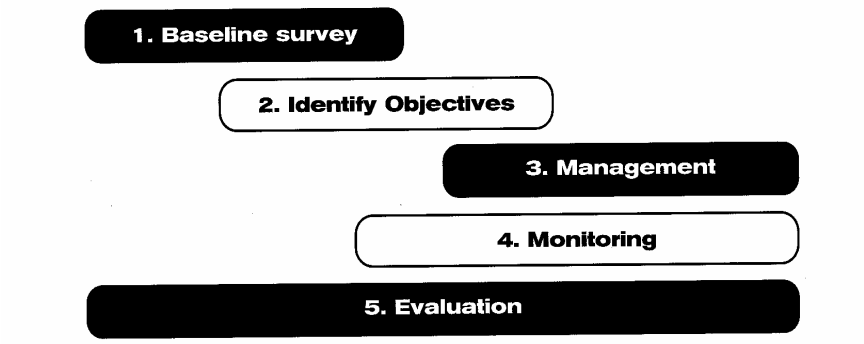

Figure 2. Wetland management and monitoring process (Tucker, 2003).

The WMPOs provide equipment, training and technical advice to wetland managers and community members. Monitoring techniques are taken from Tucker (2003) to ensure consistent techniques are used at each wetland involved in the program, although minor modifications may be required due to the unique characteristics of individual sites. Parameters such as groundwater, surface water and photopoints are generally monitored on a quarterly basis, while more complex parameters such as fish, birds and frogs are monitored bi-annually. The monitoring intensity may also be altered in response to specific management events, such as the drying of a wetland.

The data is then analyzed and interpreted by the WMPOs, and used in the decision making process. A key step in engaging the community is to ensure that they are provided with regular and timely updates on the data they have gathered. It is critical that the results are placed in context and related to management actions, which demonstrates that their data is useful and they are not just monitoring for monitoring's sake.

Community wetland monitoring review

In late 2004, due to the ever-growing interest in the program and a subsequent need to prioritise resourcing, the Board's WMPOs undertook a review of the Community Wetland Monitoring Program (Steggles and Frears, 2004). The aims of the review were to:

- Determine the level of monitoring that community groups were realistically capable of completing
- Identify additional monitoring that would require alternative options in order to be completed
- Determine the number of wetlands that required monitoring
- Identify the key parameters to be monitored to enable ecologically sound wetland management

As part of this review, members of the wetland community groups were asked to complete a questionnaire to determine to what extent they had been involved in wetland monitoring, gauge their confidence in applying

the various techniques, seek input on changes they would like to see in the future and determine their overall understanding of the need for monitoring. Of the 45 questionnaires that were sent to community members involved in the board's wetland monitoring program, a total of 18 responses were received. The results of the questionnaire were collated and used to refine the program. A summary of the results is presented below.

Photopoints, surface water and groundwater
Photopoints, Surface Water and Groundwater were the parameters that community members were most commonly already undertaking and were keen to continue in the future. Most individuals felt confident in their ability to monitor photopoints independently, which indicated that this technique had been successfully demonstrated and was relatively easy to implement.

Fish and vegetation
The parameters that community groups were involved in monitoring but thought they needed assistance with were Fish and Vegetation. This was indicated by the relatively high number of individuals already involved with these parameters, but only a small percentage thought they could complete this monitoring without assistance. These results indicate that even though WMPOs had demonstrated these techniques and involved community members in surveys, individuals did not always feel confident in their ability to undertake these surveys. Supervision from either WMPOs or other suitably experienced/qualified professionals is therefore required when monitoring these parameters.

Birds and frogs
The parameters that community members had not been involved with previously but were keen to take up in the future were Birds and Frogs. This may be a consequence of birds and frogs not being considered essential parameters for making decisions about wetland management, so they had not been given priority when monitoring.

Tree health and management log
Tree Health and the Management Log showed variable results. Whilst these parameters were generally surveyed for upper Murray sites, lower Murray wetlands characteristically lack fringing trees and therefore groups in these areas are not required to complete tree health monitoring. Also, very few wetlands in the lower Murray had begun managing the hydrology of their wetland and so they had not yet established a management log. Overall a low number of individuals indicated that they had already been involved and therefore the WMPOs needed to increase training in these parameters in the future.

For all parameters listed, there were more individuals keen to be involved in the future than were already involved, which was a positive indication of the success of the community wetland monitoring program.
A significant outcome of the review was the feedback on the way in which monitoring was conducted. Prior to the review, community members had been asked to nominate the parameter(s) in which they were interested and then been involved in monitoring these individually on an as needs basis. Overwhelmingly, respondents indicated that they would prefer to complete the monitoring as a group during regular monitoring days. This change was implemented almost immediately and has proven to be highly effective. Logistically, this also has proven to be a much simpler way for the WMPOs to facilitate the community monitoring. With dates set well in advance it allows greater forward planner for staff resource and equipment requirements.

Most wetland groups now hold quarterly monitoring days, at which all parameters due under the monitoring schedule are completed. Community members split up into 'teams' to complete each parameter then re-group at the end of the day to collate data sheets and discuss results. To be successful, the WMPOs must ensure that each team contains at least one member who is familiar with the monitoring site locations and can confidently apply the technique. During data entry, the WMPOs also need to peruse the data to ensure it is of satisfactory quality and appears accurate. Once or twice a year the WMPOs accompany each team to ensure they are completing the monitoring correctly and to provide refresher training. Once implemented, this system allows a significant amount of data to be collected in a relatively short space of time, which would otherwise take one or two employed staff several days to collect. Monitoring days also provide a social atmosphere for community members, which ensures the day is enjoyable and members continue to attend in the future.

Case Study

The Overland Corner Wetland Group (Fig. 3) holds quarterly monitoring days, which always start with tea and scones on the banks of the wetland and is generally followed by a barbeque lunch. This wetland is a temporary wetland, which means it is dry more often than it is inundated. A flow control structure has been installed to increase the duration of flooding, however the site has not seen a natural flood for over 10 years. The monitoring days generally focus on collecting photopoint, groundwater and tree health data.

In July 2004 the group was able to source water to artificially flood the wetland using a landholder's pump. The allocation of water was supported by the tree health and photopoint data that had been gathered by the group and showed that the health of surrounding mature red gums was in decline and the bed of the lagoon was salt-affected. The main aims of the flooding were to improve the health of the surrounding mature red gums, and promote the germination and growth of native vegetation in and around the wetland.

The Group was involved in a more intensive monitoring program to record the outcomes of this artificial flooding, which included their regular monitoring as well as quantitative vegetation surveys and surface water quality readings.

The data gathered showed that the artificial watering had benefits for the understorey vegetation as well as riparian trees. Comparison of 'before' and 'after' tree health data showed an increase in the mean health score indicating that the trees around the wetland had responded to the filling event. Vegetation surveys had been undertaken twice prior to filling (May 2003 and October 2003) as well as once after filling (January 2005), and this data was analysed by staff from SARDI using multivariate statistics with the PC-Ord and Primer packages. This analysis showed that there was a shift from terrestrial to floodplain species in quadrats at the highest elevation inundated. At the lowest elevation, there was a shift from a community dominated by extremely salt tolerant species (samphire) to species tolerant of fresher conditions (saltbush).

Figure 3. Overland Corner Wetland Group

Thanks to the data gathered by the community group they were able to clearly demonstrate the positive effect that the flooding had on the wetland and because of this the site was included in the 2005-06 River Redgum Rescue Project. This meant the wetland received a second watering in mid-2006 and of course more monitoring for the group.

Conclusion

The SAMDBNRM Board's Community Wetland Monitoring Program has proven to be an effective way of collecting large amounts of meaningful data and involving the community in wetland rehabilitation programs. Feedback from the community group members indicates that they are not only confident in monitoring some key parameters but are also keen to learn more techniques. With the appropriate level of support wetland community groups are capable of collecting quality data essential for determining the

outcomes and future directions of wetland management activities. The monitoring program provides an opportunity to educate the community about wetland ecology in a fun and friendly social atmosphere, which helps to keep people involved in wetland rehabilitation.

Acknowledgements

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