

A Community Developed Framework for Stream Rehabilitation in the Murrumbidgee River Catchment.

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SUMMARY: The Murrumbidgee Catchment Action Plan for Integrated Natural Resources Management (MCAP) provides a catchment wide framework to guide natural resource management. The plan is being developed at a time when communities are re defining relationships with the environment and natural resource base. The institutional context of MCAP starts internationally with calls by UNESCO taken on by the Federal Government in an Ecologically Sustainable Development (ESD) Strategy for Australia (1992). ESD is being put into practice through the Council of Australian Government agreements and other initiatives such as the Natural Heritage Trust. In New South Wales, action on international and national agreements is occurring through the State natural resource reform agenda. It is within this context that the MCAP has evolved, as the community comes to terms with putting government policies and funding into on-ground action for stream rehabilitation.

Community concerns have been turned into action through a process which has allowed communities to identify the stream rehabilitation issues and major stake-holders responsible for action. Streambank erosion, riparian zone management, extractive industry management, surface water quality management and surface water flows have been identified as issues for stream rehabilitation. Links between the MCAP and community group or land holder action occur through funding, where the MCAP guides project preparation and subsequent assessment for funding. The process has provided community ownership of the plan and confidence in its recommended actions.

THE MAIN POINTS OF THIS PAPER

- Planning at the catchment scale co-ordinates local stream rehabilitation plans and activities
- Planning at the catchment scale ensures that all issues relating to stream rehabilitation are considered in an integrated manner
- Community involvement in planning is needed to secure ownership and implementation

1. INTRODUCTION

1.1 Background

Development of the Murrumbidgee Catchment Action Plan for Integrated Natural Resource Management (MCAP) arose directly from requests by the community for catchment-wide guidance for planning and actions. There are many action plans being developed at various scales, including Land and Water Management Plans (LWMP's) and sub-catchment plans. The community requested the Murrumbidgee Catchment Management Committee (MCMC), as a community-based co-ordinating body, to ensure that these plans are co-ordinated within a wider framework so that they address agreed priorities and that the benefits of implementation extend outside their local area.

A catchment based approach to natural resource management has occurred since 1973 in the St. Johns River Water Management District, Florida, USA (SJRWMD). The St. Johns River District mission is to manage water and related resources to ensure the continued availability of water with maximum environmental and economic benefits (SJRWMD, 1995). The mission is achieved through a management plan, completed in 1995, which has a twenty year time frame. The plan is focused on the implementation of

actions by the entire catchment community to achieve water management goals for the catchment. This catchment based approach to planning, management and sustainable development provides a benchmark for action planning in the Murrumbidgee Catchment.

The MCAP is the institutional framework for community involvement in stream rehabilitation in the Murrumbidgee Catchment. It achieves this by providing an opportunity for all members of the catchment community to identify issues and actions required to achieve stream rehabilitation. The MCAP (Murrumbidgee Catchment Management Committee, 1998a) aims to:

- promote ecologically sustainable development,
- provide detailed information about priority natural resource management and planning issues,
- provide co-ordinated strategic direction which focuses resources towards effective and sustainable management,
- provide for catchment action plans which in turn lead to extensive on ground works.

The MCAP integrates international, national and state/territory concerns for the environment and natural

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resource use with stream rehabilitation issues identified by the Murrumbidgee catchment community. The catchment community referred to in MCAP includes land managers, the general community, community groups, local government, NSW state government agencies, ACT government agencies, commonwealth government, environmental groups, industry groups, educational institutions, research institutions, utilities, business groups and professional associations (Murrumbidgee Catchment Management Committee, 1998a).

Rutherford *et al.* (1998, p17), refer to stream rehabilitation as being “part of total catchment management”. This reinforces the MCAP approach to planning for stream rehabilitation, which focuses on addressing issues of concern across the catchment for improved health of streams. Rutherford *et al.* (1998) have also identified a lack of clear goals as a major obstacle to effective stream rehabilitation. It is for this purpose that the MCAP has been established by the Murrumbidgee Catchment Management Committee, to identify the interests and expectations of the catchment community and develop a common focus for stream rehabilitation through co-ordinated catchment management.

An issue has been defined in the MCAP as “a common concern identified by the catchment community which impacts on the current condition and future sustainability of the catchment” (Murrumbidgee Catchment Management Committee, 1998a, p78).

Issues identified in MCAP that relate to stream rehabilitation are streambank erosion, riparian zone management, extractive industry management, surface water flow and availability and surface water quality management. These issues have been prioritised for the upper, mid and lower catchment areas, which coincide with distinct geomorphologic reaches of the Murrumbidgee River.

1.2 Global to Local Context

In 1987, the World Commission on Environment and Development presented “Our Common Future” (Brundtland, 1987). This report recognised that ecologically sustainable development means the adoption of lifestyles within the planet's ecological means.

The Australian approach to ESD aims to use, conserve and enhance the community's resources so that the ecological processes, on which life depends, are maintained and the total quality of life can be increased (Commonwealth Government, 1992). ESD has been put into action through many initiatives including Council of Australian Government (COAG) agreements on an efficient and sustainable water industry, implemented as the Water Reforms in NSW.

The water reforms include an approach to streams which involves the community in planning for effective action on the ground. A feature of the MCAP that is vital for the water reform process is the strong Murrumbidgee Catchment focus, which is complementary to the management plans being developed under the reforms.

National and state policies on the environment and natural resource use are linked to funding programmes like Natural Heritage Trust (NHT) and Rivercare. The MCAP has a dual role with funding. It provides a strategy for effective and efficient Commonwealth investment through NHT as well as being a tool for the catchment community to target actions that attract funding for stream rehabilitation.

1.3 Catchment details

The Murrumbidgee Catchment is in southern New South Wales bounded to the east by the Great Dividing Range and lying between the Lachlan River Catchment to the north and the Murray River Catchment to the south. The Catchment covers an area of 73 400 square kilometres (Murrumbidgee Catchment Management Committee, 1998a).

The Upper Murrumbidgee is the section upstream of Burrinjuck Dam, including the Australian Capital Territory and Lake George. The Mid Murrumbidgee extends from below Burrinjuck Dam to downstream of Wagga Wagga, near the towns of Narrandera and Leeton. Major land-uses are dryland agriculture and plantation forestry. The Lower Murrumbidgee is on the riverine plain, and runs to the junction with the Murray River, downstream of Balranald. This section includes major irrigation areas and wide expanses of pastoral enterprises.

2. MCAP DEVELOPMENT

2.1 Consultation

The need for development of the MCAP emerged during ongoing communication between the MCMC and the community, and through specific consultation. Many community members expressed a desire for guidance at a catchment scale, to ensure that local actions are targeted at agreed priorities, to promote strategic investment and to achieve benefits at the catchment scale. Major consultation activities conducted by subcommittees of the MCMC were; four community forums on water quality issues, conducted in 1994 (Buchan and Diacono, 1994), and five Upper Murrumbidgee Catchment community issues workshops conducted in 1995 and 1996 (Upper Murrumbidgee Catchment Co-ordinating Committee, 1997).

These forums were attended by a wide cross-section of the community. Many issues were raised, and recommendations for action were made.

Development of the MCAP commenced in 1997. The first step was a review of outcomes of the earlier consultation. Other work on identification of catchment issues had been done by the Soil Conservation Service of NSW, in a state-wide project undertaken from 1989 to 1991, and by the MCMC, through its *Natural Resource Management Strategy for the Murrumbidgee Catchment* (1994). The findings of these were compared and a preliminary issues list was developed.

2.2 Prioritisation

The next step was revision of issues using current information, and prioritisation of this revised list. The purpose was to set agreed directions for action. Four meetings were conducted, with invited participants representing many stakeholders. At each meeting a recommended list of current issues was produced.

Each person then prioritised the issues, considering their importance to the catchment. Priorities assigned to issues by individuals vary according to their perceptions, interests and knowledge. To promote objective and consistent decision-making, individuals were given twelve criteria to consider, and were asked to provide a value of between 1 and 10 for each criterion, for each issue. This allowed direct comparison and ranking of results.

The criteria were:

1. Extent of damage caused by the issue;
2. Synergistic nature of the issue;
3. Scale of effect of the issue;
4. Level of community support and motivation for addressing the issue;
5. Level of community conflict over the issue;
6. Political exposure given to this issue;
7. Urgency of action to address the issue;
8. Investment value of addressing the issue;
9. Level of existing management of the issue;
10. Effectiveness of existing management;
11. Availability of solutions;
12. Education and demonstration value of addressing the issue.

As a checking mechanism, all MCMC members then undertook a similar process. The results were consistent with those from the community, indicating that the outcomes of the process could be considered to reflect the priorities of the wider community.

While the outcomes of the prioritisation process still reflect assumptions of the community about the relative importance of issues to some degree, they also show movement towards well informed 'big picture' assessment. This was indicated by a reasonable level of consistency between scores given by people with varying backgrounds and interests. An example is the allocation of only a medium high priority to the issue of surface water flows and availability, despite the assessment being done during drought and at a time of anxiety about the effects of water reforms on irrigation

water allocations. The process was an improvement on assessments done on a purely subjective basis.

The priorities are expected to change over time. They will be a significant factor guiding allocation of Natural Resource and Environment Management program funds. Industry organisations and agencies of all levels of government are being encouraged to incorporate these priorities in their programs.

The identified issues are treated separately for the Upper, Mid and Lower Murrumbidgee Catchment areas, to allow catchment managers to easily relate the issues and actions to their local situation. As expected, varying priorities emerged for the three areas.

2.3 Actions

Following prioritisation, actions for addressing each issue were developed by the MCMC, with assistance from a significant number of individuals and organisations. Most actions are at the broad strategic level, aiming to incorporate actions that are already occurring in some locations and to guide development of detailed local actions. For each issue, actions cover research, survey, education, planning, on-ground works and monitoring and evaluation.

Performance indicators, monitoring arrangements and responsibilities for implementation are included for each action. This highlights the opportunities for increased participation by a wide range of stakeholders in a catchment region that has large urban populations and several government jurisdictions.

Assessment of socio-economic aspects of management of the issues was undertaken. This included benefit cost analysis and assessment of the ability of the community to invest in actions. In most cases, the broad nature of the actions, the size of the catchment and the lack of baseline data meant that only indicative information could be provided.

The draft MCAP, including recommended actions, was widely circulated. Thirty-one community forums were conducted to allow explanation of the plan and to obtain feedback. Extensive comments were received. As a result, new actions were added and some existing actions were amended. The MCMC is confident that its efforts to involve the community have produced a plan that has the ownership necessary to achieve implementation.

2.4 Evaluation

The success of the MCAP will be evaluated by the MCMC in terms of stakeholder support and adoption, and catchment outcomes. The MCAP allows users to assess the plan and report on their implementation through specific reporting of actions and outcomes, as well as general feedback to help update the plan and improve its usefulness. Emphasis has been placed on keeping reporting requirements simple and on adapting

existing monitoring and reporting, such as annual reports, State of the Environment reports and project reports. Key agencies and community/Landcare support staff will be expected to take some responsibility for ensuring reporting takes place. The entire plan is an evolving process. Change will be made over time, and will be driven by the community.

2.5 Catchment Investment Strategy

The Murrumbidgee Catchment Regional Strategy 1999/2002: A strategy for natural resource and environment management (Catchment Strategy) has been developed in parallel with the MCAP, by the MCMC (Murrumbidgee Catchment Management Committee, 1998b).

The Catchment Strategy draws the issues identified by the MCAP together into investment objectives, to focus investment by public and private investors. It analyses the current investment in managing these issues, and sets targets for investment in future years. The investment refers to cash and in kind contributions by public and private investors in projects under Commonwealth, NSW and ACT natural resource and environment management programmes. It is expected that the MCAP will attract increased funding allocations to the catchment, by demonstrating an integrated approach that will give better returns on investment.

The total investment within the catchment in 1998/1999 exceeds \$20 million, and there are targets for annual increases from 1999/2000. The Catchment Strategy is to be updated annually. It will monitor and evaluate results of investment, and will set new targets for investment accordingly.

3. STREAM REHABILITATION ISSUES.

Stream rehabilitation issues have targets with performance indicators, monitoring details, time frame for action and responsibility for action detailed in the MCAP. This ensures a co-ordinated approach to stream rehabilitation. Specific stream rehabilitation issues for the Upper, Mid and Lower Murrumbidgee are:

3.1 Streambank Erosion

River regulation, stock access and unsuitable riparian vegetation management have modified the natural erosion processes of the Murrumbidgee River and tributaries. This has increased stream turbidity and sediment loads causing loss of agricultural land and structures, loss of flora and fauna habitat and diminished recreational and aesthetic values (Murrumbidgee Catchment Management Committee, 1998). Streambank erosion is a major contributor of nutrients to the Murrumbidgee (Wasson *et al.* 1997 draft).

Wasson *et al.* (1995) have shown that sediment erosion from gullies and creek channels dominate sediment flux in the Upper Murrumbidgee, contributing 95% of the

total sediment flux from the catchment. Olley (1995) has shown a similar situation for the Mid Murrumbidgee where tributary streams are the dominant source of sediment transported by the Murrumbidgee River to the Lower Murrumbidgee catchment.

An approach to management of erosion in Murrumbidgee River tributaries involves community developed management plans with site specific actions. An example of this type of plan is the Tarcutta Creek Catchment Riverine Corridor Management and Works Manual (Smith *et al.* 1996).

3.2 Riparian Zone Management

Vegetation in the riparian zone has a significant role in stabilising the riverbank and providing a filter zone for overland flow. Riparian vegetation combines with the stream channel form and stream flow to determine the condition of the riparian zone (Raine and Gardiner, 1995). Many riparian areas are not protected and suffer from poor land management practices. Recreational pressures can also add to the degradation of riparian zones (Murrumbidgee Catchment Management Committee, 1998).

A particular issue in riparian zone management for the Upper and Mid Murrumbidgee is willows. Willows have been used as a tool to protect the riparian zone from erosion. The introduction of more willow species has allowed the willow to spread rapidly along streams, causing problems in parts of the Upper and Mid Murrumbidgee. The potential willow problem is reinforced by Cremer (1995), who identified that willows have successfully dominated only a small proportion of their potential habitat along streams.

The Upper Murrumbidgee Willow Management Strategy (1998) has been developed as a response to the issue of willows in streams and riparian zones. The strategy identifies the values and adverse impacts of willows, key areas for management and on ground management actions. The Willow Strategy is an issue-specific strategy that complements the MCAP.

3.3 Extractive Industry Management

Extractive Industries are an issue in the Upper and Mid Murrumbidgee. Extraction occurs within stream channels and on adjacent floodplain areas. Extraction often compromises bed and/or bank stability as well as impacting on water flow, water quality and riparian vegetation. Management of the site during extraction and for rehabilitation are concerns to the community with specific reference to stability of the site during floods. There are sites where extraction is used to benefit the stream management (Murrumbidgee Catchment Management Committee, 1998).

3.4 Surface Water Quality Management

Water quality issues have been identified as salinity, temperature, turbidity, algae blooms, pH and oxygenation. Maintaining adequate water quality is necessary for the varied uses of water in the catchment (Murrumbidgee Catchment Management Committee, 1998).

Turbidity and algal blooms are being dealt with through the Murrumbidgee Nutrient Management Plan (DLWC, 1998 draft). This is an issue specific plan that aims to prevent excessive amounts of nutrient from entering streams and groundwater. The plan proposes best management practices for reducing the sources of nutrients in Murrumbidgee Catchment waterways.

3.5 Surface Water Flows and Availability

Irrigation, town and domestic supplies, industry, power generation, recreation and the environment are all users of water in the catchment. Often some of these uses have been compromised by other uses and there is a need to establish balanced water use. The main question is who gets what, when, how much and why? (Murrumbidgee Catchment Management Committee, 1998).

4. LESSONS LEARNED

The MCAP covers management of all major natural resource issues on a catchment basis, and stream rehabilitation is one of the major aspects of management that draws these issues together. Stream condition indicates how well many of the other issues are being managed, and it is an indicator that is widely recognised. Stream rehabilitation itself also obviously relates directly to water quality, bio-diversity and many other issues. By describing issues separately and by pointing out the many linkages, there has been some success in demonstrating the importance of integrated management.

There is widespread cynicism about any activity that includes the word "planning"; it is seen as adding another level of bureaucracy and producing more weighty documents at the expense of actual improvements on the ground. In some cases this view is justified. However the high level of community concern, the large numbers of stakeholders involved and the severely limited resources available reinforce the need for thorough planning. Implementation of a catchment wide plan through local plans will encourage each local group to think about the downstream impacts of their plans, and also to look at upstream influences. It is essential that plans are implemented, and seen to be implemented, to show how they can produce tangible outcomes

Cynicism extends to the relationship between community-based actions and the government natural resource reforms. In some cases TCM activities are being seen as government-driven, and this restricts support and adoption, particularly where reforms are

seen as affecting the livelihoods of those managing the natural resources. Given the pace and extent of reforms in NSW, information overload has contributed to this resentment.

The process of developing the MCAP has brought existing cynicism to the surface, and it may have led to further cynicism. However, the plan is already providing benefits, through better understanding of natural resources within the catchment, and through initiation of integrated, planned actions. Only some of the cynics will recognise the role of MCAP in these advances. This shows the need for further community awareness and participation in planning activities, but it also suggests that the MCAP will help in achieving results on ground, regardless of whether it is recognised.

Community based catchment planning is a relatively recent concept. In the Murrumbidgee Catchment there are several examples of plans, such as Rivercare plans and LWMP's, which are at a scale that people are familiar with and can relate to. Few people are well-acquainted with the entire catchment. In some cases the MCAP, with its overarching priorities and actions, is seen as a potential threat that will take over or undermine the hard work already put into local plans and action. There is also an "us and them" mentality, where some communities see the whole catchment as being managed to supply water for irrigation, and others perceive all water quality problems as being due to a particular upstream influence. Urban and rural communities blame each other for declining water quality. The MCMC is working to overcome these perceptions by showing how all characteristics of the catchment are interrelated, and how the MCAP can help to increase action and improve results.

While most people perceive water quality as declining, and many have observed the decline of native fish populations, some related issues are not widely known or understood. Many rural landholders do not acknowledge the links between livestock management, streambank erosion and water quality, and are not aware of the options for reducing detrimental impacts. In urban and rural communities, there is a lack of awareness of what the major sources of nutrients in watercourses are. These and other information needs must be addressed if co-ordinated and co-operative management of streams is to be achieved. Continued education, particularly through demonstration, is an essential part of community-based plans. There is also a need to continually show the links between planning and on-ground outcomes, if increased stakeholder commitment is to be secured.

Successful implementation of the MCAP and similar plans depends on increased activity by all stakeholders, and by sharing of costs. Community members see agency resources being duplicated and being spent on administration rather than on meeting their

responsibilities on the ground. Communities also see what were once government responsibilities being shifted to land managers. Many rural land managers consider that they have no capacity to invest in any form of protection or rehabilitation work. All stakeholders need an appreciation of the constraints operating on others. One of the actions needed before this can be clearly demonstrated is thorough socio-economic analysis. Realistic sources and levels of investment, and returns on this investment, need to be identified so that informed decisions can be made.

Consultation with all interest groups through community workshops developed stronger ownership of the plan to strengthen its position as a framework document for natural resource management issues and priority actions for stream rehabilitation

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