

Executive summary

Introduction

This document is part of the review of the Goulburn Broken Regional Catchment Strategy. The risk posed by dryland salinity has been revealed to be much larger than previously thought. It will not be possible to protect large areas of the catchment from degradation and so it is important the Goulburn Broken Dryland Salinity Management Plan focuses on the identification and protection of key assets. The protection of these assets will require a radical shift in the way works are delivered and in the community's participation in identifying and working towards the appropriate natural resource management outcomes.

The salinity plan is built on the interim end of valley targets set by the Murray Darling Basin Commission. These targets are for stream salinity to be kept at current levels in the Goulburn River at Goulburn Weir and for the increase in the Broken River at Casey's Weir to be kept to 36% of the present levels. To go any way to meeting these targets will require massive landscape change, at scale not seen since the 1840's.

This document deals with the issue of dryland salinity, there are other natural resource issues in the dryland that need to be managed. The protection of assets will be used to develop a more integrated approach to catchment management over the next three years.

The issues

The three key issues in the Goulburn Broken dryland are:

- area of land affected by high water tables,*
- stream salt loads, and*
- stream salinities.*

High water tables will affect large areas of the Goulburn and Broken plain, with the Broken plain worst affected. Across the dryland, over the next 100 years, up to 135,000 hectares of land will be affected by dryland salinity. It is expected that the greater part of this will remain in the landscape.

High stream salinities are an ephemeral problem in the catchment, with a few streams of high EC, usually late in summer.

A major task in the next three years is to identify the natural and built assets at risk from the threatening process of dryland salinity and the probable impact on asset values given the projected increases in dryland salinity and the resilience of the assets.

In the Goulburn system mean EC is expected to increase by 24 EC units if nothing is done to manage the problem. In the Broken the expected increase is 133 EC, a doubling of current levels. There is limited capacity to manage these EC levels using dilution flows. The primary task, then, is to prevent the salt reaching the streams, either by lowering recharge rates or intercepting salt before it reaches the streams.

The dominance of regional groundwater flow systems in the Broken Plain means it will be very difficult to counter the expected increases in dryland salinity and stream salt loads in this area. Managing salt in the landscape will become an important part of land management in the future in this area.

Most gains in reducing salt loads will be made in areas such as the south west Goulburn and Broken Highlands where there is a predominance of local and intermediate groundwater flow systems.

The management of dryland salinity influences and is influenced by other key natural resource issues. These include water quality, soil acidity, water supply, native vegetation and biodiversity, and pest plants and animals. The integration of planning and work activities will be improved over the next three years to ensure that multiple benefits are realised and key assets across the catchment are protected and, where possible, improved.

Achievements

Perennial pastures (exotic grasses and lucerne) have been the mainstay of the program, accounting for over 70% of all works completed. Around 200 ha/yr of high density tree plantings, as revegetation, break of slope or protection of discharge areas, have been completed since 1996.

Trends in area planted annually are very responsive to seasonal influences, more so because of the high proportion of pastures that make up the works activities.

It is now understood that the targets set in 1989 and modified in 1995 were inadequate for dealing with dryland salinity. It will require at least a twenty-fold increase in on-ground work activities to meet the end of valley targets.

Much of the extension and education activities of the Plan have focussed on the traditional landholder base. There is a need to adapt the plan to a changing community structure across the catchment.

The importance of pastures has already been emphasised. Perennial pastures are no longer promoted for recharge management, in areas where the annual rainfall is over 650 mm. Where they abut onto remnants landholders are also required to keep a 20m buffer between the pastures and the remnant.

In the past five years closer links with farm forestry and plantation ventures have been developed. This has culminated in the development of decision aids to allow investors, processors and growers to evaluate the opportunities for commercial tree growing activities in the catchment.

The cropping program is no longer supported by the salinity program. This is due to increasing costs of program support and the recognition that improved cropping practices offer only small gains in control of recharge when compared with other perennial vegetation options.

A number of studies have been carried out since 1995. Some of the more important were the Goulburn Broken salt and water balance study (SKM 1996, ANU 2001, Australian groundwater flow systems contributing to dryland salinity (Coram et al 2000) and Catchment priorities study (CLPR, 1999 and SKM 1999).

After 12 years there are still many questions that need to be answered. High on the list is the processes by which salt reaches the streams or is discharged to the landscape; this is important information for effective targeting of works. Other notable issues include identifying assets, beyond water quality, and the threats posed to those assets.

Local Area Planning has been heavily promoted in the last three years as one way to involve the community more in the processes of natural resource management. Local area plans in their simplest form have been developed for the whole of the dryland catchment.

Making sure that costs of natural resource management are shared equitably has been an important plank of the GBDSMP to date. The cost share arrangements have undergone constant revision as the need to capture multiple benefits has grown. The principles that sustain cost share arrangements in the Goulburn Broken are:

Duty of care – natural resource managers have a duty ensure they do not damage the natural resource base.

Beneficiary pays – when it is not possible to attribute damage, then primary beneficiaries should pay.

Government contributions for public benefit – Governments may also contribute to land and water management activities that have a private benefit, where the activities provide significant public benefit and government support is required to facilitate this uptake.

In 2000 a new grant system was developed-the Environmental Management Grants. These combined salinity, biodiversity and soil management outcomes in assessing the value of government contributions to grants. The purpose was to maintain equitable cost sharing arrangements while at the same time ensuring that works were properly targeted and reflected the priorities of funding agencies. The new grants systems has been highly effective in increasing the uptake of grants, with targets being easily reached two years after their introduction

The Second Generation Strategy

The objectives of the revised salinity management plan are:

- deliver an integrated program to protect and enhance natural resources within the catchment
- develop a high level of community responsibility and accountability.
- control land degradation and protect important terrestrial and aquatic assets.
- maintain water quality for all beneficial uses, including agricultural, environmental, urban, industrial and recreational.

The end of valley targets, as proposed by the MDBC and agreed to in principle by the State Government are only the start of the target setting process. Ultimately it will be the community that decides how much degradation they are prepared to accept and how much on-ground works they are willing to do. Any targets set at the catchment level will have to:

- reflect community attitudes
- be technically feasible and economically efficient
- be equitable across different sectors of the community

It is necessary to put the targets in a way that is more readily understood if the community is to participate in negotiating outcomes. To this end estimates are made of the area of land that needs to be treated in order to achieve the desired reduction in salt reaching the streams. These then become the targets for annual works programs as well as a measure of the overall area that needs to be treated.

On currently available information around 300,000 ha of land would need to be planted to high density trees (more than 500 stems to the hectare), or its equivalent, to meet the proposed end of valley targets. Both the Upper Goulburn Implementation Committee and the Mid Goulburn Broken Implementation Committee recognise that this is an unacceptable burden on the community and have instead opted for an overall target of 150,000 ha to be treated. A consequence of reducing the area to be treated is that the amount of salt entering the streams will be higher than is desired under the end of valley targets. The Goulburn Broken Catchment Management Authority will work with the Department of Natural Resources and Environment, the State and Federal Governments and the Murray Darling Basin Commission to identify how else the stream salt loads can be managed using silt interception works or other engineering options.

The areas to be targeted are firstly those sub catchments that contribute high salt loads into the Goulburn and Broken rivers. Within these sub catchments some areas contribute more salt than other or are more responsive to treatment. These areas have been identified according to the groundwater flow systems within the sub catchments. The highest priority areas are those:

- with high salt stores at risk of being mobilised
- with high groundwater salinities and zones of high recharge
- that are likely to respond to treatment options
- where the time it takes for the effect of treatments to be expressed are reasonable

The actions taken to reduce dryland salinity and salt reaching the streams will depend on the suitability of different areas for those treatments. In the Goulburn and Broken plains, lucerne pasture in combination with high density trees offers some scope for slowing rising groundwaters. Over time more consideration will be given to living with salt options, as areas become salinised. In the higher rainfall areas high density trees will be promoted, particularly where there are likely to be commercial returns or where multiple benefits are most likely. Groundwater pumping is well suited to some areas of the catchment and will be used where it can be shown to provide a clear salinity benefit and where current or proposed land use is complemented by the availability of groundwater.

Catchment Standard practice

It is very important that the RCS and the plans that support it adhere to recognised operating procedures and management principles.

Chief among these is the need to help the community to build their capacity to adapt to changed circumstances and to influence the direction that change takes. Catchment standards are built on:

- developing relationships between communities and organisations,
- establishing financial arrangements which are fair between communities and over time and
- providing for the security of all stakeholders in a changed working environment

The environment in which these plans will be implemented is subject to significant change in objectives and resources over time. Recognising and valuing the assets in the catchment, analysing the risks posed to those assets and developing contingency plans is central to preserving the impetus that the plan(s) aim to create. If the RCS is to be implemented and the supporting plans are to be successful then management will have to become more adaptive.

Measuring and evaluating progress is essential for adaptive management. It includes monitoring of changes in the biophysical condition of the catchment as well as evaluating the effectiveness of management arrangements and processes that drive implementation.

Investment Analysis

The annual costs of works is up to \$7m. For the preferred option, which aims to achieve 50% of the proposed end of valley targets it is \$3.5m. It is likely that the costs to the public can be reduced substantially by enabling more private investment and aiming for work sites to be on a larger scale (more than 10 ha). If we do nothing then the disbenefits to the community will exceed \$10m annually or an NPV of around \$250m. However we cannot prevent all disbenefits occurring. Even if we reach 100% of end of valley targets the community will still suffer disbenefits of around \$3.5m a year. At 50% of end of valley target the disbenefits incurred are over \$6.5m. At the same time the benefits of implementing the plan are \$3.8m annually. The additional benefits that accrue from carbon sequestration, reduced phosphorous inflow into streams, soil stabilisation, aquatic and terrestrial ecosystem services and multiplier benefits of investment in the region by government and private industry have not been included. These additional benefits, coupled to reductions in public costs with increased private industry participation will ensure that the benefits of implementing the plan exceed the costs.

Cost share arrangement with those doing the works will be governed, at least in the short term, by the principle of beneficiary pays. While it is usually preferable to make the polluter pay there are problems in instances such as dryland salinity identifying the polluter. There are also issues of equity in that the cause of dryland salinity and salinisation of streams, clearing of native vegetation, were often the result of government inspired programs.

Cost share arrangements have to be built on a proper estimate of the costs incurred by each party. Traditionally many of the costs incurred by landholders have either not been recognised or if they were recognised have not been properly valued. Estimates of costs to landholders from depreciation costs, site maintenance costs and lost opportunity costs are between 24% and 53% of the up front costs of site establishment. It is also recognised that if the community is to enter into cost share arrangements that take into account the additional costs to landholders then there needs to be some form of guarantee that the works will remain in place or that sites will be maintained to an agreed standard.

There is a pressing need to enhance financial investment analysis, built on biophysical inputs and outputs, with a more comprehensive social and political analysis. The debate on the natural resource management is in fact a debate on the well being of communities. Such debates cannot be held and the appropriate trade-offs identified if the information is not available.

Historically Governments and landholders have borne the costs of natural resource management programs. The task of combating the rise in dryland salinity will outstrip the capacity of both these groups very quickly. There is both a need and an opportunity to involve private industry and the investment markets in natural resource management. If done properly, this will provide the resources for land stewardship payments and large scale investment in plantation and farm forestry and regional development. The need and opportunity should be a catalyst for the reform of institutional arrangements that support regulation of land use, the roles of the market in public good projects and the role of government in monitoring land use and instigating and monitoring the activities of the market in public good projects.

Implementation details

Implementation needs to focus more on large-scale landscape change. The challenge in such change is to get broad community understanding of the issues and a clear idea about what level of change they are prepared to accept. This can only be achieved by creating better opportunities for community participation in the management of the problem. It is important to recognise that the salinity problem can act as a catalyst for community involvement in the wider issue of regional development. As an

issue in its own right salinity, and any other single natural resource management issue, will not galvanise the community to action. The emphasis will shift to regional development and the greater involvement of private markets in overcoming the problems of degradation of natural assets. The salinity program will deliver this via five sub programs: community engagement, plan support, on-farm, commercial and engineering. Each sub program will have its own targets and timeframes for implementation.

Improved community engagement is essential for the success of the plan. There needs to be better identification of 'the market' and a move away from sole reliance on landcare to bring about the change required. Recent work has underscored the need to better understand the process of change and the attitudes of the community to change and to use this to change the way the program is delivered. Plan support will focus on filling information gaps, integrating activities across different programs and adapting the program to the changed circumstances. The commercial sub program will develop partnerships between government, industry and investors. The aim is to ensure that the communities resources are used effectively to protect and enhance natural assets while creating opportunities for the economic growth of the region and the improvement service delivery to local communities. Engineering options, within or outside the catchment, are the surest means to manage salt loads in stream in the shortest time. The key question is to what extent the community wishes to invest in engineering works to protect important assets in the near future. Engineering will also provide opportunities to promote regional development and at the same time reduce salt loads entering streams in some areas of the catchment. The on-farm sub program will focus on maximising water use on farm, combining production and protection at the whole of farm scale. Landholders can select from a number of options to manage water use on their farm with a view to reaching as yet to be defined benchmarks to attract support to establish more sustainable farming systems.

The implementation of the SMP will require an annual investment of around \$4.6m annually. Such a level of investment needs to combine government and private market support; this is the significant challenge for natural resource management in the future.