Chap 1Implementation 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 s 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.

Dryland salinity –the need for change

The solution to the emerging problem of dryland salinity will entail a massive change in land use and management. Change of the magnitude suggested will only happen if the community as a whole is in agreement and wants to embrace the change.

There are two problems when engaging the interest of the community. First is the relative imp ortance of dryland salinity as a natural resource issue. Dryland salinity is one of a number of natural resource issues. It is arguable whether it is the most important environmental issues compared with climate change, sustainable energy use or population management.

The second problem is that the community also faces many more challenges than environmental ones. These include- provision of services by government or utilities and banks, employment, migration of the young people to cities and health. This diversity of interests and concerns makes it very difficult to inspire the sort of change that is necessary to manage the dryland salinity problem if it is promoted as a single issue.

Management of dryland salinity, at the scale described in this strategy, is only going to be accepted, and so made possible, if the outcomes from improved salinity management are clearly seen to improve condition of the whole community. For salinity to be dealt with at an appropriate community scale it needs to be more clearly linked to the broader success of the region and to be part of a holistic response to the issues that beset local regional communities. The actions required to combat salinity need to be aligned with objectives that are seen to better meet the needs of communities. As Peter Elyard observed in his address to a workshop on the future of communities,

> "…An action which achieves ecological sustainability … while totally wrecking the economic and social sustainability of a community … is not working towards sustainable development."

It is necessary to implement natural resource protection programs in a broader regional development context. Dryland salinity is a regional development issue. As such the focus needs to be on the protection of key assets that enhance or maintain the economic, social and environmental sustainability of the region.

At present there are no clearly identified bodies in the dryland catchment to provide the support to link natural resource management to regional development. At the same time there are a number of committees or steering groups in the catchment with the potential to catalyse a broader regional development initiative in a way that encompasses the major environmental issues. Such a forum would be needed to help facilitate institutional change in support of community inspired initiatives.

It is well accepted that development is contingent on trade-offs between different demands. Elyard (2001) wrote:

> "… there would need to be trade-offs between ecological, economic,, social and cultural goals. To allow for this most policy makers have also advocated open, consensus based planning processes to ensure that the necessary compromises required to accommodate these trade-offs did not result in any form of irreversible environmental change, and that any accommodations which were made also had broad community support."

Explicit recognition and management of the trade-offs needs to be built into the Program and the most appropriate way to achieve this is through an increased emphasis on community involvement. For the GBDSMP to be successful the community needs to draw together the supporting infrastructure that would facilitate institutional change.

Sub-Programs

The sub programs that make up the salinity program also need to reflect the challenges for the future and the way that the protection and enhancement of natural resources is to be managed and paid for.

Currently there are eleven sub programs in the GBDSMP which largely describe the activities of the program. It is proposed to reduce the number of programs to five that better capture the focus of the Program in the future. The five proposed programs are Community Engagement, Plan Support, On Farm, Commercial and Engineering.

Each program encompasses the following:

Community engagement	Local Area planning
	Local Government
	Regional development
	Landcare support
	Schools program
Plan Support	Research and Investigation
	Monitoring
	Policy and planning
	Vegetation bank
	Adaptive management
On-farm	HD trees, farm forestry, BOS
	Pastures
	Discharge management
	Living with /Saline agriculture
	Whole farm planning
Commercial	Plantation forestry
	Investment development
	Regional development
Engineering	Salt interception
	Salt disposal
	Groundwater pumping
	Regional development

Each sub program needs a clear focus and plan of action with targets and timeframes for implementation. Each sub program should have a specific leader, a person delegated to take responsibility for coordinating implementation of the sub-program and reporting on progress. Some functions, such as regional development cross sub-programs. Equally it is expected that staff function's will also cross sub–programs. This will work to ensure that the implementation of the Plan is properly integrated.

Community engagement sub program

The success of the management plan hinges on the success of engaging the entire catchment community. This in itself will require a more sophisticated model of operating than used in the past. Proper recognition will have to be given to the implications of the work of Curtis *et al* (2000) and Barr (2001) and how their conclusions influence our approaches in the future. In particular both identify that a reliance on altruism and voluntarism limits the capacity to deliver the level of works required to deal with the problem. Of equal importance is how the service agencies respond to directions set by the community. The future will require an adaptive style of management, one that is capable of responding to directions from a community with a different perspective to that which pervades natural resource agencies. To work, the ethos of adaptive management needs to be adopted at senior management levels in the key agencies, notably DNRE and the CMA.

The elements of the community engagement sub-program are:

Local Area planning
Natural resource management programs must place more emphasis on the role of Local Area Planning (LAP) as a process to identify the most suitable way forward in resource protection and regional development. The Regional Catchment Strategy describes the desired approach to natural resource management across the catchment and is limited in its influence. The development of LAP's needs to meet the needs of those charged with the responsibility of managing natural resources. They also need to provide the means to engage with the community on inter-related issues.

Local Area planning is a vehicle to support greater community participation in natural resource management. In the short term the LAP process needs to link issues identified through community forums with current priorities and resource allocations. In the medium and longer term LAP's need to encompass a wider range of issues and capture the interest of a greater part of the community. Sometimes this may mean building on LAP's, at other times it will mean incorporating outcomes and processes from the LAP's into other community initiatives.

The effectiveness of LAP's will be determined in part by the ability of decision makers in the service agencies to adapt to the demands that arise from community. At the same time unless the service agencies themselves, as members of the community, have a clear vision for the future their responses will as likely be ad hoc and increasingly reactive and ineffective.

Local Government
Local government plays a critical role in the future of resource management on two accounts. First they are the elected representatives of the community and are responsible for many issues that are of more commonplace concern than natural resource management. As such the responsiveness of local councils to environmental matters is a measure of the progress towards a more environmentally aware or concerned community. Second, through the Planning and Environment Act, they are a major influence on what is deemed appropriate land use. The use of planning overlays is critical to describing suitable development and land uses and proscribing unsuitable developments or land use. Third local government has a key role in promoting regional development initiatives. As described previously the management of the dryland salinity problem is dependent on the community pursuing a common vision for regional development, one which addresses the environmental, social and economic aspirations of the community.

It will be important to develop a three way partnership with Local Government, the Department of Infrastructure and natural resource service agencies. Due consideration needs to be given to the expected role of each organisation and the type of support required for them to participate.

Regional development support
If we are to participate in regional development then we need to provide appropriate support by providing information and analysing the implications of different initiatives. The GBCMA can play a lead role in convening and supporting a forum that enacts the vision of "double the production off half the land".

Such a forum needs to bring together relevant Government departments, industry and community interest groups to provide ideas and influence to improve the productivity and resource condition of the catchment.

Schools program
Close liaison with schools is important in forming public opinion and influencing cultural change in the community. The Saltwatch and Waterwatch programs have been highly successful in introducing natural resource management concepts into schools and the community. In the recent past this has been enhanced with the development of additional curriculum materials for schools. If such programs are to be successful and adopted by schools then their presentation also needs to be supported.

Social and economic condition
Measuring progress via the 'triple bottom line' has become a mantra for strategies and government policy in recent times, without anyone being able to clearly articulate what exactly is to be measured. It is generally true that agencies such as the CMA and DNRE do not have the breadth of skills to undertake social analysis. Economic analysis is also hamstrung because of the difficulties of analysing issues of inter-generational equity and properly defining scarcity of resources.

The catchment needs to develop a set of indicators of catchment health and well being spanning across the environmental economic and social qualities that mark progress. Although there have been a number of efforts to do this in the past at the State and National level they have all floundered on the problems of definition and compromise. A set of catchment indicators for Regional, rather than State or Basin, analysis is being developed in the North East region. This may catalyse action at a broader scale but more importantly it will provide the basis for deciding what we, as a regional community, deem important and help devise the measures of progress towards our goals.

Community support
Landcare support has been a major part of the extension and community education role of the Plan in the past 12 years. This needs to be strengthened and broadened to explicitly include a wider audience. This will entail a considerable change in the way we approach the task because we are no longer communicating to an aware and receptive audience. A different approach is required for that sector of the community that has shown scant interest in natural resource matters in the past. This emphasises the value of putting the salinity problem in a broader regional development context.

As well as providing information and assisting the devolved grant process, this part of the program needs to develop a network throughout the community that supports increased community participation in regional development.

Plan support sub program

Adaptive management

The GBDSMP needs to establish benchmarks of performance in responding and/or managing community aspirations. The mechanisms to achieve this need to be part of the normal business planning cycle.

Land stewardship

Land stewardship requires that the appropriate infrastructure be put in place to manage financial and advisory support to land managers that allows them to manage land for ecosystem services, including salinity abatement. Investment by the community in such schemes needs to be safeguarded with management and cost share arrangements that are equitable and ensure that there is a net gain for the community through the investment. The principles upon which stewardship is based are well established in the Goulburn Broken. The implementation of more sophisticated methods of land management is a natural progression and closely linked to instituting a vegetation bank.

Integration across programs

The integration of priority setting processes and planning across programs is the key to integrated catchment management. Further work is required to more closely align bioregional planning initiatives with the environmental component of the Plan. At the same time there is mutual benefit to be gained from co-ordinating works activities near streams to establish buffers against salt and nutrient flows to streams. The development of erosion risk maps will also provide the means to identify where management of erosion and recharge and discharge management coincide.

Research and Development

After twelve years there are still some significant gaps in our knowledge. The following are areas where further investigation is required:

- **Accurate identification of recharge areas across the catchment** – Currently recharge maps across the catchment are incomplete. The techniques used to map the recharge areas were not consistent and the accuracy of these maps varies. It is necessary to develop a more scientifically sound and cost-effective technique (using a combination of existing soil data, digital elevation model data, soil radiometric data and bore data) to map potential recharge areas across the catchment.

- **Movement of salt in the landscape and accession processes in priority areas.** In the past 20 years, a comprehensive network of sites for groundwater and surface water monitoring has been established. Groundwater, surface water and dryland salinity processes have been extensively studied in the Goulburn Broken Dryland Catchment. Many previous studies (Allan, 1994; SKM, 1996, 1999; Cheng, 1999) have shown that dryland salinity has caused significant degradation and is posing an increasing threat to land and streams in the catchment. However, these studies were mainly based on point data. The spatial distribution of salt and its historical change have hardly been studied due to the unavailablity of technology. Because of this, development of catchment models (conceptual and numerical) has been a very difficult task. Airborne geophysical technology, in conjunction with other datasets, offers the prospect to revolutionise the way we develop catchment models and, ultimately, the tools that we use to help manage catchment issues such as salinity, water quality and resources in general.

- **Assessment of the effectiveness of salinity management options**. Over the past ten years, many salinity control techniques have been employed to combat dryland salinity problems in the catchment, particularly in the areas where salinity is visible and there is active community involvement. These approaches include remnant vegetation retention, establishment of high-density tree plantations, lucerne, perennial pastures, break-of-slope tree plantations, and groundwater pumping. These programs need to be monitored and assessed for their impact and cost-effectiveness on watertable control. The use of the Catchment Assessment Tool to validate the assumptions that underpin the Plan will be an important task.

- **Perennial vegetation management systems.** Vegetation management systems, involving the incorporation of perennial vegetation (pastures or/and trees) into either the crop rotation, or onto the cropland itself, could be effective for salinity management. Further investigations are required to look at the potential application of these systems in the Goulburn Broken Dryland Catchment. The Program also needs to support investigations into alternative crop types for saline land and for the management of recharge in low rainfall areas.

- **Engineering options**. Engineering approaches have been widely used in irrigation regions for salinity control, but are often considered to be too expensive for dryland area. Although investigations to identify and delineate groundwater resources have been undertaken in some areas (eg. Mt. Camel Range, Dookie and Nagambie), groundwater pumping options have not been widely adopted. Investigation should be expanded to a wider area including paleao-channels on the Broken Plain. New technology (eg. airborne geophysical sensing techniques) may be needed.

- **Impact on streams.** Several studies (Earl, 1988; SKM, 1996; ANU, 2001) identified the South-West Goulburn to be the catchment's greatest contributor of salt to the Goulburn River, on a tonnes per hectare per annum basis. However, the salt release processes, including the relative significance of salt wash-off and base flow, remain unclear. To address this we need to:
  - identify high-risk salinity areas and the key processes,
  - prioritise high-risk areas for targeting implementation strategies (including on-ground works, research, capacity building) on the basis of technical, environmental, social and economic considerations,
  - develop a data acquisition program to address data deficiencies, and
  - develop a management decision support system for later use in testing different management options in the identified priority areas.
- **Risk posed by acidification of the landscape**

The success of biological solutions to dryland salinity is compromised by acidification of the landscape. The risk that such acidification poses is not well understood. More information is required to understand the processes of acidification, the areas likely to be affected and the impact on reforestation and pastures as well as terrestrial and aquatic ecosystems.

- **Discharge risk in the priority areas of the catchment.** Requirements include:
  - Location - which areas are at risk
  - Extent - what is the probable area to be affected over time
  - Rate of spread - how quickly is it likely to occur.

Geographic Information Systems Support

The use of GIS has been instrumental in the priority setting process, and support for the grants scheme, as well as for spatial analysis of impacts of reforestation on catchment yield. This needs to continue into the future with tasks including:

- Accumulation and integration of critical data sets
- Spatial analysis of responses to recharge and discharge control options
- Local Area Plan support
- Regional development support
- Asset identification and risk assessment
- Land use options
- Natural and built assets at risk

End of Valley targets and progress

An analysis by SKM (2002) confirmed the suitability of the End of Valley sites at Goulburn Weir and Casey's Weir. The analysis of trends at Goulburn Weir will be supported by results from stream salinity monitoring at Trawool. Between these two data sets there will be indicative information on responses to works carried out in the South West Goulburn. The major issue of concern is accounting for diversions at the Weir. In the Broken system, there is less need to compartmentalise the response to increased salinity. The focus of work in this region will be on managing the higher water tables rather than stream salinity for its own ends.

Surface water

Stream salinity monitoring in the catchment is adequate for the purposes of describing the overall condition of the catchment. There will be a need from time-to-time to enhance the network as our understanding of the salt accession processes improves.

Groundwater

A review of groundwater monitoring was carried out by CLPR (Cheng, 1999). The recommendations of that review have been implemented. It will be important to improve the network in the vicinity of the Plains-Upland interface to allow us to understand more clearly what is happening in this area and how the problem of dryland salinity is likely to express itself.

Discharge

Discharge monitoring has been a low priority of the GBDSMP in the past, in part a recognition of the refusal to accept the living with salt option. Any discharge monitoring has been largely carried out under the mandatory environmental monitoring.

The situation has changed enormously with the projections of the Ultimate Salt Loads study and the Murray Darling Basin Salinity Management Strategy. It is essential to establish a formal discharge monitoring program to:

- Validate or otherwise the projected increase in areas of dryland salinity.
- Provide data to support changes to the Plan in the future, according to the actual rise in groundwater and salinisation of the landscape.

A trial discharge monitoring project established in 2000 the protocol for mapping salinity areas. This should provide the framework for future discharge monitoring programs, primarily in the Riverine Plain and the Plains-Upland interface, with additional work in the South West Goulburn.

CMA/IC support

Continued support to the IC and CMA to ensure the Partnership develops and provides appropriate service levels to the community

Commercial sub program

Meeting the targets will require a substantial investment by private industry or other investors. In the short term, significant opportunities are offered by an expansion of the plantation timber industry in the catchment. The region is well suited to the growth of the plantation industry. However, development of a hardwood chip or pulp plantation base is at present hamstrung by distance to port or other markets. Development of a hardwood plantation sawlog industry is dependent on sufficient quantity and quality of resource base being established.

Government support for the establishment of timber plantations is justified where there are clear public benefits. In areas where there is a mutual public and private benefit, Government investment could allay the risk to investors arsing from extra costs, and at the same time increase the area under plantation. The principle of Government investment in plantations for salinity benefit and timber production is similar to that which justifies support for individual landholders. It is likely that the level of Government investment on behalf of the community, on an area basis, would be far less than that which is presently paid to individual landholders. Government involvement would also enable the community to set standards for plantation development that reflected the broad needs of the community. This would include such things as better biodiversity outcomes, managing perceived fire hazards, maintaining social structures, and balancing reductions in salt accessions with maintenance of catchment yield for downstream users and the environment.

No such investment should occur without full consideration of the long-term benefits to the environment, and the development of equitable cost-share arrangements. The guiding principles of any investment should be that the market knows best what it will invest in, and the community, through the Government, should only invest where the public costs are outweighed by the expected benefits.

In the longer-term, there is a range of opportunities built around better practice management within emerging industries. For example, the budding horse racing industry in the catchment could distinguish itself in the market through its commitment to the environment. Likewise, with other intensive industries that see 'being green' as a marketing opportunity rather than an external cost.

Engineering

Engineering options will become increasingly important in the implementation of the Plan for the foreseeable future.

Drainage

The increase in area affected by high water table will create a demand for the drainage of affected land across substantial areas of the Riverine plain and the Plains-upland interface. At present there is no scope to undertake works in the dryland to dispose of saline water into waterways or drainage lines. It will be critical to develop a comprehensive dryland drainage strategy before events overtake us.

Groundwater pumping

This also applies to groundwater pumping where there is a need to develop a clear set of guidelines that describe the conditions under which groundwater pumped to the surface can be allowed to flow to the waterways, and manage the impact of groundwater pumping and use on catchment yield.

As part of the broader program, it will be important to establish where groundwater pumping is most likely to:

- Provide adequate yields of suitable quality that support commercial development
- Provide a benefit by reducing the risk of salt reaching waterways or the area of salt affected land

The development of industries around groundwater use needs to be supported through the extension effort of DNRE and CMA, and as part of the regional development focus.

Salt interception

Salt interception schemes provide the most effective means to meet end of valley target level in the proposed timeframe of 15 years. After factoring in time for implementation and for land use change to be fully functioning salt interception also provides the most suitable and effective option for at least the next 30 years.

To reach the end of valley targets will require a combination of land use change coupled to salt interception works either in the catchment or outside of the catchment.

Consideration will be given to salt interception schemes where appropriate but it needs to be established whether these are best placed in the catchment, or outside of the catchment as part of a joints work program.

Dilution flows

Another option for management of stream condition is the provision of dilution flows. The Goulburn River already has low salinity levels due to the impact of releases from Eildon over the summer period. Any increase in dilution flows will come at the expense of diversions for irrigation use and so would need to provide a clear benefit either to overcome the production foregone or to protect important environmental values. Any plan to increase dilution flows has to be part of a broader consideration of water supply management and water use efficiency, particularly in the irrigation region.

On-farm program

There are six components to this sub program-pastures farm forestry, environmental planting, discharge management, saline agriculture and whole farm planning.

The central theme to the program is optimising water use on farms and entails a whole farm approach to managing the water regime of farms. Optimal water use can be achieved through a range of actions, from tree planting, pasture development, groundwater pumping for irrigation and saline aquaculture. How any one land manager achieves better water use should be left to them. The role of Government and the GBCMA is to establish clear benchmarks on the expected water use on-farm and to then support land managers in achieving an agreed level of increased water use using endorsed activities or management practices.

Linked to community engagement and adaptive management

Pastures

Pastures will remain an important part of the Plan. Whilst perennial pastures are not as effective as high-density trees, they are accepted more widely by land managers, and provide potential for improvement in recharge control across much of the landscape. They also play an important role in the stated aim of the GBCMA to 'double the production off half the land'. Increased emphasis will be placed on promoting the management of pastures, whether exotic or native, to increase water-use and salinity benefit, as well as to improve profitability, weed control and biodiversity benefits.

In recent times, there has been increasing interest in the use of native grasses for recharge management. There is no doubt that remnant native grasses have an important role in integrated catchment management, but it is difficult to see how the large-scale reintroduction of native grasses into areas where they have been lost can be promoted. There is no suitable native grass seed producing industry at present, and the costs of available seed currently make sowing of native pastures not commercially viable. The most effective option open to Government support is the promotion of pasture management practices which will encourage the spread of remnant native grasses.

Farm forestry

The options for farm forestry, at this time, are still limited by a lack of institutional support and markets. A decision to ban all collection of firewood on public land would create a demand for a firewood industry very quickly. Such an industry would be at least greenhouse gas neutral while serving to provide a high density vegetation option for recharge control in low rainfall (<650mm) areas.

Experience in the FFORNE project indicates there is an opportunity to establish between 600 and 1000ha of high density farm forestry plantings each year.

Revegetation

Environmental plantings have been the mainstay of the high density tree planting in the salinity program for the past 12 years. This part of the program is heavily dependent on the altruism of landholders for its success. Environmental plantings are best targeted to those areas where there is depleted or rare EVC's or where additional plantings can improve habitat for rare and endangered species. Historically around 200ha of high density trees have been established each year over the last 12 years. This target needs to be lifted to 400-500ha.

Additional support through land stewardship arrangements will be essential for the long term expansion of this project to break the dependence on the altruism of land owners.

In recent times there has been more interest in the use of native grasses for recharge management. There is no doubt that native grasses have an important role in integrated catchment management. Financial support for the establishment of native grasses depends on there being a seed producing industry and a substantial reduction in the price of commercially available seed. The most effective option open to the GBCMA and regional DNRE, in the short and medium term, is the promotion of better practices to encourage the spread of native grasses .

Remnant Vegetation Management

The protection and enhancement of existing remnant native vegetation, and the promotion of management practices which encourage natural regeneration are another effective approach to salinity control. A wide range of programs are directed at protecting native vegetation across the catchment, and promoting more effective management. These programs have been successfully integrated into the GBDSMP Program, through initiatives such as the Environmental Management Grants system and Whole Farm Planning. Efforts to integrate remnant vegetation and biodiversity management into the Program will be sustained.

Additional support through land stewardship arrangements will be essential for the long-term expansion of this sub-program.

Discharge management

Management of discharge sites is as important as management of recharge in many landscapes, particularly those dominated by overland flow processes. Preventing salt accession to streams, once it is mobilised, is part of the management strategy to 'buy time' so as to allow other landscape change options to take affect.

There are two components to this activity. First is the management of active discharge sites, to reduce their spread, to stabilise them against erosion by providing some groundcover, and to provide some limited production options. The second is to intercept saline overland flow before it reaches waterways. By buffering streams, the rate at which salt gets to the streams is reduced. This program will be developed in conjunction with the Waterways Program to ensure that maximum benefits are gained from works undertaken.

Saline agriculture

Saline agriculture is about the productive use of salt-affected land, about making opportunities from otherwise adverse conditions. The development of profitable options for living with salt is reactive by definition. It can only be promoted where there are existing salt outbreaks. The role of Governments in such circumstances is to undertake research and demonstration, to promote desirable approaches and provide information, and to remove impediments to innovative approaches. At the same time, service agencies need to ensure that all planning controls are adhered to and that no additional risk is posed to the environment or built infrastructure from saline agriculture.

In the regional groundwater flow systems of the Riverine Plains (GFS 6), it is likely that the most suitable long-term option is living with salt. The onset of high watertables, with subsequent salinisation, of large areas of land cannot be avoided for many areas. It will be important to develop links with programs such as OPUS and PUR$L to ensure that landholders have the opportunity to learn from the past experiences of other landholders, and to have access to the latest information.

Whole farm planning

Whole Farm Planning provides the means to encourage the widespread adoption of better management practices for sustainable farming. There are two distinct client types in the Goulburn Broken dryland: those who manage their land primarily for production, and those who own land for the lifestyle they enjoy as a result. The WFP sub-program needs to provide for the different requirements of each client group.

Where managers are concerned with deriving a substantial part of their income from the land, the problem is one of business viability, not merely enterprise or activity viability, nor even environmental viability. Better management practices should lead to more informed decision-making on:

- What to invest in
- Where and when to invest

- How to maintain debt-servicing capacity
- Risk assessment
- The link between desired lifestyle and capacity of the business to deliver it

In this case, better management practices will only lead to better natural resource management if the planning horizon is long-term. Short-term demands will often force businesses to over-utilise natural resources, because there are no appropriate market signals to suggest otherwise. This is difficult to manage, and relies on the existence of a market for the social goods that reward better management practices. The appropriate market signals may be in property values, commodity prices or lending rates from financial institutions. Whole Farm Planning can assist this process by being the starting point for accreditation under various possible Environmental Management Systems (EMS) banners.

The second client group is better served by the conventional model of Whole Farm Planning because they are less concerned with the trade-offs between productive land and amenity or service revegetation. In fact, additional environmental works will normally enhance the value of the land for this group. They are a very important group because they are starting to dominate land ownership, if not by number, then certainly by influence on land prices in the highlands and foothills where many of the environmental problems are found or arise.

The challenges in working with this group are their availability, often confined to weekends, their limited understanding of biological and agricultural systems, and the high rates of turnover of land. It is the last point that should define the way the program is delivered. There is no merit in investing resources in skilling this group in soil science, agronomy and forest science. It is sufficient they know there are differences, and necessary they know that the differences are important. This information is easily delivered nowadays using GIS overlays. There is potential to provide benefit to these landholders if they prepare a long-term Environmental Farm Plan, and show progress in its implementation, by way of rate rebates or other benefits that can be transferred from one owner to the next.

Community Links Officers

The Community Links Officers approach to program extension has proved to be a cost-effective way to deliver services to the community, and it will be important to expand this approach in priority areas. In addition to the current activities of Links Officers, there is a need to provide greater assistance with the coordination and implementation of works, particularly for landholders where time is a major constraint on their participation in environmental programs.

Table 1 Priority tasks and implementation framework for GBDSMP 2001-2015

	Annual cost	Task	Target and Time
Community engagement			
Local Area Planning	$40,000	Adopt as a vehicle for business plan development	Complete natural resource component o procedure to engage with community at programs as needed- 2 years
Support annual priority setting process	$45,000	Annual priority setting process-input from key program leaders	Extend priority setting process to local c stakeholders as part of developing Regio
	$85,000	Liase with community	Establish and maintain community netw for information exchange, priority settin going
			Integrate LAP's with other community ir
	$12,000	Adaptation of LAP triennially	Review status and progress with LAP- C
Schools program	$60,000	Implement schools program , support curriculum presentation	Support Salt watch and Waterwatch pro develop and assist the delivery of CSF m
Community support	$50,000	Information provision to key stakeholders and priority setting with community groups and landholders	On -going.Annual priority setting proce
		Assist groups with devolved grants	Provide direction and advice to groups o

Local Government	$50,000	Assist local government to deliver improved environmental management controls throughplanning scheme	Establish relationship with each Local G data and information requirements to su
			Enhance planning overlays, with empha planning permits in co-operation with D
Regional Development	$30,000	(Initiate and) support regional development forum.Includes planning and administrative support	2 years to develop appropriate forum an support subject to negotiation with partic
			Develop common vision for sustainable natural assets within 12 months
Social and economic condition	$80,000	Develop benchmark indicators for condition and change in condition of key social and economic indicators	In co-operation with evaluation section develop set of indicators to measure cha and economic performance of the drylan
sub TOTAL	$ 452,000		

Plan support

Adaptive management	Not costed	Co-ordinate response to community input to business planning cycle and incorporate new information into implementation program	2 years to develop benchmarks and insti community and Government aspirations
Technical support	$35,000	DST support to community groups	On-going provision of technical support interest groups
Research and Investigation	$45,000	Identify salinity risk areas in high priority zones	Extend SWGinvestigation to other high catchment 3 years
	$72,000	Assess risk posed to salinty and biodiveristiy	from acidification of landscape in high p
	$ 150,000	Develop model of response time and processes for salt accession to land and streams	Complete SWG investigations on acces function 18 months
	$ 100,000	Further develop priority setting process for plan management	Develop priority setting process to enco particularly built infrastructure and signi 18 months
	$5,000	Support for CRCCH, CRCPBS and other research initiatives	Continued support for national and state
Monitoring	$45,000	Monitor spread of discharge in key areas of Riverine plain and Plains-Upland interface	Contribute to enhanced statewide discha andmonitoring of active sitesand assess discharge area -On-going
	$34,000	Continue to monitor groundwater program and enhance network in key areas of South West Goulburn and Plains-Upland interface	Maintain and log 430 bores of monitori community on changes On-going
	$40,000	Surface water(including new sites required for WIV monitoring)	Establish 2 new sites for WIV monitorin Weir and support maintenance of existin
Nature Conservation Co-ordinator	$80,000	Provide technical advice on integration of biodiversity principles into all work programs	Establish biodiversity risk management
		Implement strategic and tactical environmental planning into work programs	Priority settign in salinity enhanced with improvement of ecosystem function

Plan co-ordination	$85,000	Promote ICM through improved decision making and data assessment capability	Integrate CAT along with other DSS too management and management of social, tradeoffs
		Quarterly reporting planning assistance and technical advice	Specialist advice to community IC's on I needsOn-going
GIS support	$85,000	Support planning, reporting and priority setting activities of the plan	Provide spatial analysis, mapping suppo support for on-farm, commercial progra supportOn-going
sub TOTAL	*$776,000*		
Commercial			
Vegetation bank	$33,000	Establishment and management of vegetation bank	Establish principles and operating agree partnership with funders and fund manag projects
Plantation forestry	$40,000	Develop investment portfolio for investment partners, detailing the conditions and extent of investment for natural resource benefits	In partnership with Regional Developme develop investment portfolio
	$16,000	Construct likelihood maps for investment opportunities	Analysis of suitability of land for plantat and moderate priority areas 6 months
Fund manager	$80,000	Develop fund portfolio from private industry and philanthropic trusts	3 years to establish $1 million of non g catchment management and then on-goi supporting at 10% of funds captured
		Establish management and cost share arrangements for stewardship program	Develop management arrangement for la engagement programs
			Link to fund manager to develop capital of high priority land, at an annuity equal under stewardship
	$ 240,000	Develop investment fund to support sustainable development in plantation industry	Assist the establishment of 1200 ha, long forestry in high and moderate priority zo basis -on-going
sub TOTAL	*$409,000*		
Engineering			
Plan support	$15,000	Provide policy and technical advice to Plan co-ordinator and IC	On-going
Dryland drainage	$30,000	Complete dryland drainage strategy	Provide clear direction to GBCMA and I guidelines for management of drainage a the surface-12 months
Irrigation options	$40,000	Integrate into extension program and regional development plans	Develop dryland irrigation management requirement and disposal. 3 years
Salt interception	$35,000	Planning	Analysis of suitability of areas in GBC f large scale salt mitigation works 18 mon
	$ 120,000	Farm exploratory drilling program	Continue farm drilling program in high a co-operation with On-farm program. On-
sub TOTAL	*$240,000*		
On farm			
Pastures	$ 195,000	Integrate pasture planting in low rainfall area into tree planting and land stewardship programs	In co-operation with WFP project develo with land managers On-going

			Assist the establishment of 500 ha/yr of area, including sub-divisional fencing
Farm forestry	$ 980,000	Develop farm forestry industry in low rainfall zone to compliment regional development initiatives to expand market for farm forestry products	Plant 800 ha/yr to low rainfall farm fores priority areas -on-going
Environmental	$1,280,000	Maintain integration of protection and enhancement of native vegetation with salinity recharge and discharge plantings	Establish 500 ha/yr of environmental pla priority areas including protection of exi
Discharge	$ 120,000	Protect high risk areas by reducing salt export and, in partnership with waterways program undertake stream buffering program in critical areas	Protect 80 ha active discharge sites annu priority areas posing high risk to streams
Saline agriculture	$75,000	Support the implementation of OPUS and PUR$L programs into the riverine plains of GB dryland	Establish and maintain 4 PUR$L sites in community
Whole farm planning	$75,000	Develop a system for wide scale adoption of whole farm planning and link to grants s	
	$45,000	Complete preliminary Farm planning course with 60 landholders and evaluate against participation in remediation work and efficiency of grant servicing12 months.In co-operation with education providers promote on farm service to assess business viability as part of regional development strategy*	Provide training and consultingopportun
sub TOTAL	*$ 2,770,000*		
Overall TOTAL	***$ 4,647,000***		