JOINT SUBMISSION TO THE

SENATE ENVIRONMENT, COMMUNICATIONS, INFORMATION AND TECHNOLOGY AND THE ARTS REFERENCE COMMITTEE INQUIRY INTO:

THE EXTENT AND ECONOMIC IMPACT OF SALINITY IN THE AUSTRALIAN ENVIRONMENT

DEPARTMENT OF AGRICULTURE FISHERIES AND FORESTRY

DEPARTMENT OF ENVIRONMENT AND HERITAGE

SUMMARY

Salinity is a critical problem threatening the Australian natural environment and the sustainability of productive agriculture areas. The Australian Government has taken a leadership role in addressing salinity and finding practical solutions to this pervasive problem. Australian Government leadership has established salinity as a national issue, built working partnerships with State governments and the community in developing innovative and flexible approaches that are delivering positive outcomes on the ground.

The 2000 Australian Government paper "Our Vital Resources: A National Action Plan for Salinity and Water Quality" provided an estimate of the cost of land and water degradation alone to be $3.5 billion per annum in economic terms. This paper also identified that at least 2.5 million hectares (5% of cultivated land) is currently affected by dryland salinity and this could rise to 12 million hectares (22% of cultivated land) at the current rate of increase.

The Australian Government is dealing with salinity through a wide range of initiatives. These include the Murray Darling Basin Initiative, Land and Water Australia, the National Action Plan for Salinity and Water Quality (NAP), the Natural Heritage Trust (the Trust) and the National Landcare Program together with research and development initiatives such as the National Dryland Salinity Program. The range of measures the Australian Government is applying to the salinity problems includes research and development, making direct on ground interventions, developing timely information on salinity and building capacity.

The diversity of instruments to address salinity problems in the landscape includes aerial salinity mapping, engineering works to construct salinity mitigation schemes, targeted grants program together with market based instruments and associated biodiversity arrangements. The body of the submission provides as an example detail of the work being done in the Upper South East region of South Australia where a biodiversity offset arrangement has been put in place to assist landholders meet their cash levy obligation towards constructing a comprehensive drainage system. This arrangement enables landholders to offset the levy in full or part by conserving biodiversity values, including remnant vegetation on landholder properties.

Aerial salinity mapping is another effective instrument that is being used to tackle salinity in the Australian landscape. This mapping has shown that the salt causing detrimental impacts is often localised in the landscape. This has meant that remediation activities to minimise this impact can be highly targeted and provide high benefit for public expenditure.

The key national programs initiated by the Commonwealth to tackle salinity and other natural resource management issues are the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust and the National Landcare programs. The NAP is specifically directed at improving salinity and water quality conditions in the Australian environment whilst the Trust is focused on the protection and sustainable use of

Australia's land, water and marine resources. The National Landcare program's focus is on ensuring sustainable agriculture practices and providing support to landholders at the local level. The principles underlying these three national programs are that they are community based, provide the necessary capacity building for groups to deliver on ground works and use the whole or part elements of a regional delivery approach and integrated regional management plans with embedded targets.

These programs allow salinity problems to be addressed at various levels of intervention. For example, the NAP and the Trust provide investments at the regional scale characterised by relatively large level investments within the priority regional areas. The National Landcare program can provide support to landholders at the local level to undertake salinity mitigation work consistent with the priorities in the regional plan.

The goals of the national programs are long term. The resource condition changes to the Australian landscape will be delivered beyond the funding timelines of the programs. This is as a result of the slowly responding natural systems and the high climate variability of the Australian continent. The Australian National Audit Office Report Number 17 2004-05 on the NAP recognised the long lead times inherent in addressing resource condition changes in the Australian landscape. This report stated that the NAP monitoring and reporting framework is sound and provides the basis to measure progress against long term outcomes.

The 2003-04 Regional Programs Summary Report released by the Natural Resource Management Ministerial Council provides an analysis of activities being supported to achieve successful natural resource outcomes. The summary report provides examples of resource condition targets identified in accredited regional plans and the range of projects contributing to achieving these targets. A copy of this report including the accompanying CD is included with the submission. The CD provides the comprehensive main report, which details the targets, investments, expenditure and outputs by region.

The Australian Government has provided strong support for natural resource management research and development. Improved natural resource management knowledge allows more effective regional planning, priority setting and monitoring and evaluation frameworks to be established. For example, the Australian Government's investment in the National Land and Water Resources Audit has provided a baseline of information to assess the effectiveness of land and water policies together with related programs. This information has improved decision making on natural resource management at the Commonwealth, State and local levels. The Australian Government's investment in the National Dryland Salinity Program, co-ordinated by Land and Water Australia, has provided both increased knowledge on salinity and provided a wide range of practical approaches to managing salinity in the landscape.

The Natural Resource Management Ministerial Council at its meeting in April 2004 appointed a regional implementation working group to assess the effectiveness of the regional natural resource management model. The March 2005 report from this group identified significant attitudinal and social changes that had occurred through the regional

delivery process. A key message from regional communities was to continue with this approach as it provided the best means to deal with catchment wide natural resource management problems. The body of the submission provides further details on the key messages from the March 2005 report.

Regional bodies play a fundamental role in achieving successful natural resource outcomes at a catchment scale by mobilising community involvement in developing and implementing natural resource management plans. These plans identify catchment natural resource management priorities and detail targets to be achieved. The National Action Plan for Salinity and Water Quality and the Trust have a common element of using the regional delivery approach to identify regional NRM priorities and target investments to deliver results. The community support component of the National Landcare program targets actions at the local level with investments consistent with priorities in the accredited regional plans. The national component of this program targets broad scale priorities rather than regional or local outcomes. The key role of regional bodies involves undertaking regional natural resource management planning, prioritising regional level investments, co-ordinating actions at the landscape scale, getting community ownership in decision making and reporting on progress.

The financial support from governments through foundation funding to assist regional groups have the capacity to carry out their responsibilities under the NRM delivery model has been significant. The total level of foundation funding provided by Commonwealth and State Governments as at 30 June 2004 is $44 million. This support has been provided through the Australian Government and State governments by both NAP and Trust foundation funding. The range of activities supported by foundation funding includes support for regional bodies to undertake target setting processes, develop evidence based investment tools and activities to support and improve community engagement.

Foundation funding provided the essential support to assist in the development of regional plans but the very substantial on ground investments have been delivered through priority action and regional investment funding. Whilst regional communities were undertaking their planning and investment processes governments recognised that obvious interventions in combating salinity needed to get underway. Priority action funding was provided for these purposes. Regional investments based on accredited regional plans and the resulting investment strategies are the primary mechanism for achieving resource condition changes. The 2003-04 Regional Programs Summary Report indicated a major shift during 2003-04 in the nature of investments from building the capacity of regional bodies, plan preparation and priority projects to investment directly addressing resource condition targets through investment strategies, has included:

- foundation funding approvals reducing from $37.8m in 2002-03 to $4.3m in 2003-04;
- priority actions to address urgent resource condition issues continued where regions were still to finalise the accreditation of their regional plans, however, this

funding has decreased to $78.6m in approvals 2003-04 from $199.1m in 2002-03; and

- approvals of $128.2m for regional investment strategies based on accredited regional plans is a significant increase from the $3.0m in 2002-03.

A total of $629 million NAP and Trust funds have been provided or committed to the NAP and NHT regions across Australia for the years 2000-01 to 2006-07. This includes foundation and priority action funding together with funding provided through regional investment plans.

The House of Representatives Standing Committee Report "Science Overcoming Salinity" provides a comprehensive summary of salinity science and research up to the time of its release. The Report concludes that salinity research must be better coordinated and communicated. The recommendations made in the report were aimed at improving the coordination of salinity science from the research level through to its application on the ground.

The Australian Government response to the recommendations in the House of Representatives Report is currently being finalised. The submission highlights actions and initiatives where the Australian Government continues to improve the management of salinity by ensuring current salinity science, research and management options are available to resource managers at all levels.

BACKGROUND

The economic and social impacts of salinity on the Australian environment is a major national problem. To bring about positive changes in land and water resource conditions from salinity damage requires all levels of government working in partnership with the community. The economic and social impacts on the Australian environment are large. The 2000 Australian Government paper "Our Vital Resources: A National Action Plan for Salinity and Water Quality" provided an estimate of the cost of land and water degradation alone to be $3.5 billion per annum in economic terms.

Salinity occurs naturally in the Australian landscape. In areas where rainfall is low, less than 800mm, significant amounts of salt has accumulated, primarily in areas where the topography is flat. In some of these areas vegetation change, often due to agricultural practices, has allowed rain to percolate deep into the ground and mobilise this salt. This has resulted in saline groundwater entering rivers and streams or being expressed on the land surface. This process is known as secondary, or human induced salinisation. However recent salinity mapping projects, primarily funded under the National Action Plan for Salinity and Water Quality, has shown that the salt causing these impacts are localised in the landscape. This means that remediation activities to minimise this impact can be highly targeted and provide maximum benefit for public expenditure. The problems generated by secondary salinisation have been well documented over the last twenty years.

Key reports that helped inform the Australian Government's response to addressing the salinity problem included the Prime Minister's Science, Engineering and Innovation Council, (PMSEIC) Occasional Paper number 1 (1999); the NHT (phase1) mid term review; the 1999 Murray Darling Basin Commission Salinity Audit; the 2000 National Land and Water Resources Audit (NLWRA, 2000) and in 2000 the Australian Government paper "Our Vital Resources – A National Action Plan for Salinity and Water Quality". The reports highlighted that the economic impact of salinity would increase to the detriment of both the environment and local communities, in both rural and urban settings. A number of State salinity reports were produced at the same time in Western Australia and in New South Wales.

RESPONSES TO THE TERMS OF REFERENCE

WHETHER THE GOALS OF NATIONAL PROGRAMS TO ADDRESS SALINITY HAVE BEEN ATTAINED, INCLUDING THOSE STATED IN THE NATIONAL ACTION PLAN FOR SALINITY AND WATER QUALITY, NATIONAL HERITAGE TRUST, AND THE NATIONAL LANDCARE PROGRAMS

The Australian Government is taking a leadership role in combating the salinity problem at the national, regional and local levels. The Commonwealth provides significant investments in key initiatives through the NAP, the Trust and the NLP. In addition support is provided through Land and Water Australia, the Murray Darling Basin Initiative, the National Dryland Salinity Program co-ordinated by Land and Water Australia together with the National Land and Water Resources Audit. A brief outline on these initiatives is provided at **Attachment A.**

The Australian Government has taken a strategic approach in utilising a wide range of measures to address the impact of salinity on the Australian landscape. These measures include research and development; developing timely and useful information on salinity to inform policy makers, landholders and the broader public on salinity developments; undertaking capacity building at the regional level; working closely with both industry and environmental groups and making direct interventions to reverse and mitigate salinity impacts.

The National Action Plan for Salinity and Water Quality (NAP), the National Heritage Trust (NHT), and the National Landcare programs (NLP) are the key suite of national programs supporting on ground action to improve natural resource management. The NAP is the only program that specifically has a stated goal to combat salinity and water quality degradation problems across the nation. The Trust and the NLP contribute to dealing with salinity problems because salinity is a natural resource management issue that can effectively be dealt with by measures that may also be addressing other natural resource management issues. The goals of the NAP are to:

- Motivate and engage regional communities to use coordinated and targeted action.

- Prevent, stabilize and reverse trends in dryland salinity affecting the sustainability of production, the conservation of biological diversity and the viability of infrastructure.
- Improve water quality and secure reliable allocations for human uses, industry and the environment.

The NAP is specifically directed at improving salinity and water quality conditions in the Australian environment. The investments are at the regional scale and are characterised by relatively large level investments within the priority regional areas.

The Trust is focused on the protection and sustainable use of Australia's land, water and marine resources. The objectives of the NHT are increasing:

- Biodiversity conservation through the protection and restoration of terrestrial, freshwater, estuarine and marine ecosystems and habitat for native plants and animals.
- The sustainable use of natural resources by managing Australia's land, water and marine resources so as to improve the productivity and profitability of resource based industries.
- Community capacity building and institutional change through support for individuals, landholders, industry and communities with skills, knowledge, information and institutional frameworks to promote biodiversity conservation and sustainable resource use and management.

The investments under the Trust provide a broader coverage of land and water issues than the NAP by also addressing biodiversity and the sustainable use of natural resources. The Trust utilises the regional delivery framework of the NAP to provide targeted investments to meet its goals. In addition the NHT also provides investments in activities that have a broadscale, rather than a regional or local outcome to address natural resource problems occurring at a state-wide and national level. For example, the funding of the National Land and Water Resources Audit to provide a baseline of information to assess the effectiveness of land and water policies together with related programs.

The National Landcare program's focus is on ensuring sustainable agriculture practices and providing support to landholders at the local level. The investments under the National Landcare program are consistent with the priorities identified in the accredited regional plans and investment strategies. The goals of the program are to assist in:

- Developing community, industry and governmental partnerships in the management of natural resources in Australia.
- Establishing institutional arrangements to develop and implement policies, programs and practices that will encourage sustainable use of natural resources in Australia.
- Enhancing the long term productivity of natural resources in Australia.
- Developing approaches to help resolve conflicts over access to natural resources in Australia.

These programs provide the flexibility to respond to salinity problems in the Australian landscape at varying levels of intervention and by taking a targeted investment approach. The principles underlying the three programs are that they are community based, provide the necessary capacity building for groups to deliver on ground works, utilise a regional delivery approach having integrated regional management plans with embedded targets to be achieved. The programs also allow for interventions at local, state and national levels and all have governance frameworks to secure the Commonwealth-State/Territory investments and community action in the long term.

The National Action Plan for Salinity and Water Quality and the Trust have a common element of using the regional delivery approach to identify regional NRM priorities and target investments to deliver results. The community support component of the National Landcare program targets actions at the local level with investments consistent with priorities in the accredited regional plans. The national component of this program targets broad scale priorities rather than regional or local outcomes.

The regional model provides for improved priority setting and targeting of investment to achieve real systemic change both institutionally and in resource condition changes in the Australian landscape. The Trust also has a national component to its funding and a local Envirofund component. While these are not directly targeted at salinity some successful Envirofund projects have been directed towards local salinity problems and national projects such as the agriculture environmental management systems have salinity benefits.

Attachment B provides further details on the National Action Plan for Salinity and Water Quality (NAP), the National Heritage Trust (NHT), and the National Landcare programs.

The goals of the three programs are long term. The resource condition changes to the Australian landscape will be delivered beyond the funding timelines of the programs. This is a result of the slowly responding natural systems and the high climate variability of the Australian continent. For example, actions taken to reduce saline flows from large groundwater systems into rivers may take thirty years or more to occur.

Notwithstanding that changes to resource conditions in the Australian landscape take many years to occur and require a long term commitment, major achievements in addressing salinity problems have already been achieved. These include the extensive and co-ordinated works in addressing salinity in the Upper South East Region of South Australia and in the Goulbourn Broken Catchment in Victoria. These examples illustrate how the Australian Government is utilising research and development, making timely on ground interventions and building capacity of regional communities to effectively combat salinity problems in the Australian landscape. See boxes below.

COMBATING SALINITY IN THE UPPER SOUTH EAST REGION OF SOUTH AUSTRALIA

The Australian and South Australian Governments are each contributing $19.15 million under the National Action Plan for Salinity and Water Quality to the implementation of the Upper South East Program. This builds on previous joint Government investment of $18 million. The Upper South East region of South Australia is one of the most significant areas of dryland salinity in South Australia, and Australia more generally. The governments' substantial contribution to the Upper South East Program is a reflection of the scale of the problem being addressed.

Dryland salinity has had a significant impact on agricultural production in the Upper South East region. The region has large-scale sheep and beef cattle properties, cereal crop and pasture seed production. The wetland habitats support a range of freshwater vertebrate and invertebrate species and flora which are threatened by wetland degradation through changing salinity levels, permanent inundation and the presence of stock.

The Program is an integrated solution to the dryland salinity, water management and biodiversity issues of the region. This phase of the Program is completing the drainage system, establishing an environmental management system for the drains and wetlands, and implementing an environmental enhancement and sustainable production program. Dryland salinity in the Upper South East is the result of a combination of events: large-scale native vegetation clearance in the 1950s; destruction of lucerne crops by aphids in the 1970s, and massive flooding in 1981 that caused a rapid rise in the underlying saline water table.

The effects of Dryland salinity in this region are compounded by surface flooding and waterlogging resulting from poor surface drainage. The natural drainage in the area is sluggish due to the very slight gradient (1:1500) of the groundwater system and the slight gradient (1:1600) for surface water.

These factors contributed to the development and acceptance by the community of drainage and vegetation management as integral components of the solution to flooding and dryland salinity. Hydrological investigations, biological assessments, including an environmental impact assessment, and cost-benefit analyses were undertaken to investigate effective solutions to the problems of dryland salinity and flooding in the Upper South East. The current Program is the result of considerable consultation with landholders and extensive work on drain design and environmental assessment.

Progress on the implementation of the final phase of the Upper South East Dryland Salinity and Flood Management Program has been substantial. Investment in the Upper South East Dryland Salinity and Flood Management Program is contributing significantly to the goals of the National Action Plan as it provides incentives to encourage significant changes in land use and management practices. Total length of the engineering works in the Upper South East will be approximately 650km of which 306km is substantially completed

A Biodiversity Offset Scheme is being implemented as part of the environmental enhancement package. A high level of landholder interest has been demonstrated in the scheme that has been developed to assist landholders meet their cash levy obligation to the Program (total landholder contribution $11million). The levy can be offset fully or in part by conserving biodiversity values, including remnant native vegetation on landholder properties.

It is anticipated that the major components of the Upper South East Dryland Salinity and Flood Management Program will be completed by 2008.

COMBATING IRRIGATION SALINITY IN THE SHEPPARTON IRRIGATION REGION

An extensive co-ordinated program of works in the Goulburn Broken catchment to protect the Shepparton Irrigation Region from salinity and rising groundwater levels and also to reduce downstream impacts is an example of the integrated approach being pursed to salinity mitigation under the National Action Plan for Salinity and Water Quality. The Australian Government's investments over a number of years in this program has delivered significant falls in water table levels across the irrigation region and considerably reduced accessions of irrigation run off to the Murray system.

The integrated and co-ordinated surface and sub surface irrigation drainage strategy in the Shepparton region commenced in 1990 in predecessor programs to the National Action Plan. It is now approximately half way through a strategic and targeted program of works to protect the sustainability of agricultural production in the Shepparton Irrigation Region and also protect environmental assets from salinity and rising groundwater.

Australian Government funding was initially targeted at the development of the program in the region which required intensive community involvement and support. The Goulburn Broken Catchment Management Authority successfully raised awareness of the threats posed by rising watertables to agricultural production and the environment. Under a comprehensive community driven process, the community itself considered and developed solutions to the threats identified.

Having harnessed the support of the community and relevant stakeholders, the next step was to develop the actual program to address the problems of salinity, water quality and rising water tables. A prioritised and integrated program of works was developed with detailed cost sharing arrangements and designated areas of responsibility. . Both the scale of regional funding under the National Action Plan as well as its continuity over a 6 year timeframe has been well suited to accelerate implementation of the large scale program of works under the salinity program. Building on past experience delivery of works has been improved. For example, drains are constructed within their natural catchments and the total catchment is considered in their design. There is carefulco-ordination with local government planning authorities.

Since 2001, some $16m has been provided to the Shepparton Irrigation Region under the National Action Plan to progress the drainage, irrigation and river health programs in the sub catchment. Since the program commenced, major works have included the construction of over 160 kms of primary surface drains, over 430 km of community surface drains, and over 250 groundwater pumps. In addition, over 65 per cent of the region is now covered by Whole Farm Plans through which landholder incentives are delivered to encourage more efficient irrigation practices such as water re-use systems and automated irrigation.

In 1995 almost half of the area monitored in the region had a watertable less than two metres below the surface, posing real risks to both agricultural and environmental assets. As a result of the salinity program works the area affected in the region has now fallen to a quarter (It should be noted that incidence of a number of dry seasons has also contributed to this outcome). Further improvements are expected with the on-going implementation of the salinity program in the region.

The Australian Government through the Market Based Instruments (MBI) and Environmental Management Systems (EMS) initiatives has provided innovative tools to encourage beneficial land use changes. Market Based Instruments are tools that use a range of market like approaches to positively influence the behaviour of people to improve landuse management. They are able to achieve landuse management change by altering market prices, setting a cap or altering quantities of a particular good and improving the way a market works. EMS provides an integrated business management tool to improve environmental, business and marketing performance so as to contribute to

sustainable farming practices. **Attachment C** provides further information on these initiatives.

The way in which assurance is provided that the goals of the three programs will occur is through the monitoring and evaluation strategy that has been approved by the Natural Resource Management Ministerial Council.

The Australian National Audit Office Report Number 17 2004-05 (ANAO report) on the NAP recognised the long lead times inherent in addressing resource condition changes in the Australian landscape. This report stated that the NAP monitoring and reporting framework is sound and provides the basis to measure progress against long term outcomes.

The National Action Plan for Salinity and Water Quality (NAP), the Trust and the community support element of the National Landcare programs provide for investments to be made in a strategic context through accredited regional management plans, which identify immediate and longer term resource condition targets. Investments are then directed towards these targets. The Monitoring and Evaluation framework ensures the comprehensive assessment of progress of all investments against nationally agreed categories of outputs and nationally agreed indicators.

Given the long term nature of salinity changes occurring in the Australian landscape progress against intermediate targets provide assurances of achieving long term program goals and provides opportunities to modify strategies when required. The monitoring and evaluation strategy is underpinned by credible science and processes to provide government and communities with confidence that the investments in NRM targeted works will achieve the anticipated results. **Attachment D** provides details of the rigour underlining the monitoring and evaluation framework.

The Funding Principles for Monitoring, Evaluating and Reporting Activities under the NAP and the Trust under the National M&E Framework are detailed in the box below.

Funding Principles for Monitoring, Evaluation and Reporting Activities under the NAP and NHT

- Investment proposals which address resource condition targets must include a monitoring, evaluation and reporting component.
- The monitoring and reporting component must utilise existing monitoring wherever possible. Investment by the program could support new and additional monitoring requirements which, following consideration of an appropriate cost/benefit analysis, would be fully funded as part of the investment proposal.
- Monitoring and reporting components of investment proposals must be consistent with the State/Territory requirements for the relevant core indicator.
- Each State/Territory would aim to have a medium to long term strategy for the maintenance and development of the indicators in the core set.
- In the development or review of its strategy for the maintenance and development of the indicators in the core set, each State/Territory would consult with the NLWRA and make best endeavours to ensure that the proposed plan or strategy is consistent with the data requirements for reporting on the core set of natural resource management indicators.

The agreed principles require regions to establish targets using existing State/Territory datasets or, where these do not exist, to develop monitoring programs ensuring that these are suitable to State/Territory datasets. While regions are responsible for identifying monitoring processes and ensuring ongoing reporting of progress, regions are not directly accountable for changes in resource condition where there is a lack of major scientific certainty or there are significant external factors over which the participants have little or no control. For example, regions do not control water allocations. Decisions on water allocations are made by State Governments. However, regions are accountable for the implementation and delivery of programs for which funding has been provided and are required to report progress against management action targets with continued investment linked to the achievement of these targets. The collective effect of meeting targets for management action should contribute to resource condition change.

The funding principles for monitoring, evaluation and reporting activities under NAP and the Trust place significant emphasis on existing State/Territory monitoring systems as the primary source of data and advice for regions. To support this, the principles also require each State/Territory to have a medium to long-term strategy for the maintenance and development of the indicators in the core data set, and that in developing or reviewing the strategy they would consult with NLWRA to ensure the strategy is consistent with national data requirements.

At **Attachment E** is a copy of the 2003-04 regional programs summary report on the National Action Plan for Water Quality and the Trust. This report details the key elements of the Monitoring and Evaluation framework and progress against set targets.

THE ROLE THAT CATCHMENT MANAGEMENT AUTHORITIES ARE REQUIRED TO PLAY IN MANAGEMENT OF SALINITY AFFECTED AREAS, AND THE LEGISLATIVE AND FINANCIAL SUPPORT AVAILABLE TO ASSIST THEM IN ACHIEVING NATIONAL GOALS.

Regional NRM organisations have been established in all states and territories to be the conduit for the planning and delivery of NRM priorities and on ground investments. The legislative support for regional groups varies across the States and Territories. In New South Wales, Victoria, Tasmania and South Australia the regional groups are underpinned by legislation. In the other States and Territories the regional bodies are not founded on a legislative basis. The regional bodies in Queensland and the ACT were created following the identification of the NAP regional areas. In Western Australia the regional bodies are based on existing advisory committees and in the Northern Territory the Landcare Council of the Northern Territory was made the regional body.

The National Action Plan for Salinity and Water Quality (NAP), the Trust and the community support element of the National Landcare program all have a common element of using the regional delivery approach to identify regional NRM priorities and target investments to deliver on ground results. Accordingly the regional catchment authorities are fundamental to the successful implementation of the programs in achieving their goals.

The regional model comprises the formation of a representative and informed regional group who develop an integrated NRM plan which identifies priorities and details targets to achieve. The plan provides the basis for an investment strategy so that government and community NRM investments to address landscape degradation are well targeted. To date forty five plans have been accreditated by both Commonwealth and relevant State / Territory Ministers and forty investment strategies agreed. It is expected that all of the continent will be covered by strategic Natural Resource Management Plans and targeted investments early in 2005-06.

The regional delivery model requires a comprehensive monitoring and evaluation framework. The establishment of community owned and government recognised resource condition targets is a fundamental aspect of the regional delivery model. It is important to note that the targets identified in the regional plans are not intended as a basis of regulatory requirements but as a focus for joint community and government action.

The key roles of the regional groups include:

- mobilising community involvement and contributions to achieving positive NRM outcomes at a regional level;

- undertaking comprehensive consultation with the broad community and segments of the community with interests in natural resource management;

- developing integrated NRM plans that would form the basis for strategic investment by governments, the community and other stakeholders in action to improve management of natural resource and the environment;

- developing management, resource condition and aspirational targets as agreed by governments and communities in partnership as part of building the integrated INRM plans;

- developing investment strategies as a basis for undertaking targeted investment by governments and community to provide on ground NRM improvements;

- facilitating the delivery of education and information to the broad community and segments of the community with interests in natural resource management;

- providing advice on priorities for investment of grants and other related funding;

- monitoring and evaluating progress and reporting against targets at the regional scale;

- ensuring effective governance arrangements are in place in both establishing priority setting processes and in accounting and administering government and community funds; and

- representing regional community NRM interests to State and Australian Government governments

The concept of regional delivery is dynamic and as relationships mature it is likely to change over time. **Attachment F** provides a summary of the way in which each of the States and Territories has provided the necessary framework to support their regional bodies perform their role in delivering NRM outcomes. **Attachment G** provides a map of the regional NRM organisations across Australia.

At the regional level NRM planning and implementation requires the development of a shared agenda and agreed roles and responsibilities across a broad range of stakeholders. This is particularly important given the key responsibilities of regional bodies to plan, prioritise, identify where tradeoffs are necessary given limited funding and report on progress. A challenge for regional organisations is to apply effective systems for planning and delivery partnerships with key stakeholders and the broader regional community. The two case studies below show how a number of regions have achieved this.

The South Australia Eyre Peninsula NRM region is utilising the local knowledge of Local Government to deliver good NRM outcomes at the regional level.

Local Government engaged on the Eyre Peninsula

Local governments have key roles in land use decisions, planning and managing land under their control. Without their involvement a key player is missing from regional delivery of NRM.

Strong links with Local Government have ensured its active involvement in planning, decision-making and in activities on the Eyre Peninsula of South Australia. There are ten local government bodies that fall entirely within the Eyre Peninsula NRM Region that have been engaged at various levels including regular updates at Eyre Peninsula Local Government Association meetings, membership on the NRM Group, membership in the four sub-regional community groups and membership of eight coastal councils on the Eyre Peninsula Coastal Council Group.

As part of its integrated approach to delivering NRM the Eyre Peninsula Group has established four sub-regions that align with one or more local government boundaries, and incorporated within those boundaries are Animal and Plant Control Boards and Soil Conservation Boards. This has fostered good working relationships between local government, the local community and the NRM Group. Each of these sub-regions and the Eyre Peninsula Coastal Council Group is responsible for determining where the highest priority and most cost effective on-ground works can be undertaken, to yield the best return on investment under NRM programs consistent with the Eyre Peninsula NRM Plan and Investment Strategy.

Critical to the effective engagement of local government is the direct relevance of the NRM issue to councils and an understanding of the benefits - such as clarity/certainty on planning and land use decisions - as well as the recognised benefits to their local communities of on-ground activities as a result of their involvement.

In the Northern Agricultural Region of Western Australia for example Facilitators have trialled measures to increase general awareness and understanding of NRM.

Northern Agricultural Region in Western Australia

The Northern Agricultural Region in Western Australia has developed and implemented an innovative community engagement plan.

The region employed a Strategy Facilitator to guide the community engagement process. The Strategy Facilitator trained the local level Facilitators through a series of skill-building activities. These included mock interview processes and the development of a manual in relation to the strategy development process so that everyone had the same information. The local Facilitators were then able to go into the community with confidence in conducting activities such as:

Photo language project - local Facilitators provided regional groups with disposable cameras to take photos of natural resources that are significant to the community. Groups then came together to talk about the photos and what they value in their region. This activity assisted those who took a more visual approach to, and encouraged people to listen to each other.

Bus trip series –bus trips helped people out of their own sub-regions and to see NRM issues in different environments in the region. They also encouraged people to share perspectives on 'whole of region' issues and opportunities.

Compass series –self-guided workshops were held to get people to explore the links between some of the issues impacting on sustainability in the region. The first half of the workshop explored themes and the second developed ideas to address issues identified in the first.

You DECIDE Workshops - held in each sub-region. People were asked to consider targets in order of importance to them. The results helped indicate where funding should be allocated in the investment phase.

This strategy demonstrates the value of providing a range of activities to pique the interest of different community members. The approach has value in raising the awareness of those with limited or no commitment to NRM but whose views are important in encouraging attitudinal change.

The National Action Plan for Salinity and Water Quality, the Trust and the National Landcare programs provide for capacity building as a key element in ensuring the programs are able to deliver against their objectives. The National Capacity Building Framework identifies four key areas for capacity building priorities and target setting:

- Awareness
- Information and Knowledge
- Skills and training
- Facilitation and support

The Framework identifies participants in capacity building activities as including, amongst others, regional NRM groups, landholders, and regional and local community based groups. The financial support from governments to assist regional groups has been significant. Capacity building funding for regional bodies was identified as a critical factor in ensuring success. Whilst regional communities are undertaking their planning and investment processes governments recognised that obvious interventions in combating salinity needed to get underway. Priority action funding was provided for these purposes.

A critical initial element of the NAP was foundation funding. The purpose of this funding was to enable the regional groups to have the necessary capacity to carry out their responsibilities under the NRM regional delivery model. A key component of

foundation funding was to provide funding for viable regional bodies who would be able to perform their designated roles. The range of activities supported by foundation funding includes support for target setting processes, developing evidence based investment tools and activities to support and improve community engagement.

The total level of foundation funding provided by Commonwealth and State Governments as at 30 June 2004 is $44 million. Foundation funding provided the essential support to assist in the development of regional plans but the very substantial on ground investments have been delivered through priority action and regional investment funding. Whilst regional communities were undertaking their planning and investment processes governments recognised that obvious interventions in combating salinity needed to get underway. Priority action funding was provided for these purposes. Regional investments based on accredited regional plans and the resulting investment strategies are the primary mechanism for achieving resource condition changes.

The Regional Programs Summary Report on the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust to the Natural Resource Management Ministerial Council indicates that there has been a major shift during 2003-04 in the nature of investments from building the capacity of regional bodies, plan preparation and priority projects to investment directly addressing resource condition targets through investment strategies, has included:

- foundation funding approvals have reduced from $37.8m in 2002-03 to $4.3m in 2003-04;
- priority actions to address urgent resource condition issues continue where regions are still to finalise the accreditation of their regional plans, however, this funding has decreased to $78.6m in approvals 2003-04 from $199.1m in 2002-03; and
- approvals of $128.2m for regional investment strategies based on accredited regional plans is a significant increase from the $3.0m in 2002-03.

A total of $629 million NAP and Trust funds have been provided or committed to the NAP and NHT regions across Australia for the years 2000-01 to 2006-07. This includes foundation and priority action funding together with funding provided through regional investment plans.

Attachment H shows the breakup of this funding on a State and Territory basis.

Government and the community continue to work together to improve and assess the regional delivery arrangements. The Natural Resource Management Ministerial Council at its meeting in April 2004 in response to issues raised by the NRM Community Forum in Adelaide appointed a Regional Implementation Working Group to assess the effectiveness of the regional delivery model. The Regional Implementation Working Group was comprised of chairs of the Joint NRM Steering Committees for each jurisdiction, a regional chair from each jurisdiction and a representative from the Australian Local Government Association.

The March 2005 report from this group identified significant attitudinal and social changes that had occurred through the regional delivery process. These included the acceptance of the need for catchment-wide NRM solutions, target setting and the need to systematically evaluate progress. A copy of the report is at **Attachment I**. There is now a greater focus to ensure projects contribute to overall resource condition and an increased local leadership and community commitment to NRM.

In particular the Regional Implementation Working Group report stated that the regional delivery model has contributed to institutional, social and attitudinal changes including:

- development of landscape-wide solutions;
- integration of NRM activities through plans and investment strategies;
- formation of institutions and frameworks for delivering consistency across programs;
- a consistent national NRM system for prioritising actions, setting targets and for assessing progress, whilst still allowing for jurisdictional and regional differences;
- cultural change in acceptance of the need for catchment-wide solutions;
- target-setting and acceptance of the need to evaluate progress;
- an outcomes focus on the need for projects to contribute to overall improvements; and
- the development of local leadership and community commitment.

WHAT ACTION HAS BEEN TAKEN AS A RESULT OF RECOMMENDATIONS MADE BY THE HOUSE OF REPRESENTATIVES' SCIENCE AND INNOVATION COMMITTEE'S INQUIRY "SCIENCE OVERCOMING SALINITY: CO-ORDINATING AND EXTENDING THE SCIENCE TO ADDRESS THE NATION'S SALINITY PROBLEM; AND HOW THOSE RECOMMENDATIONS MAY BE FURTHERED TO ASSIST LANDHOLDERS, REGIONAL MANAGERS AND AFFECTED COMMUNITIES TO ADDRESS AND REDUCE THE PROBLEMS PRESENTED BY SALINITY?

The House of Representatives Standing Committee Report provides a comprehensive summary of salinity science and research up to the time of its release. It highlights the commitment by the Australian and state and territory governments to addressing salinity and provides twenty four recommendations to further the Commonwealth's role in managing and coordinating the application of best science in relation to Australia's salinity problems.

The Report concludes that salinity research must be better coordinated and communicated, stating it is vital that viable salinity management options are developed

and communicated to catchment management organisations and land managers. The recommendations made in the report were aimed at improving the coordination of salinity science from the research level through to its application on the ground.

The Australian Government response to the recommendations in the House of Representatives Report is currently being finalised. Nevertheless, since the Report was released a number of salinity science developments have occurred which have relevance for landholders, regional managers and affected communities. The Australian Government actions and initiatives described below continue to improve the management of salinity by ensuring current salinity science, research and management options are available to resource managers at all levels.

Salinity research

The Australian Government invests in a variety of research about land use and management to address salinity and this includes initiatives and projects of the rural industry research and development corporations, the Cooperative Research Centre for Plant-based Management of Salinity, Cooperative Research Centre for Landscape Environments and Mining Exploration and CSIRO. Examples of recent salinity research relevant to landholders, regional managers and communities are described below. An important principle is conducting research which is the right scale and relevant to the science users.

The Cooperative Research Centre for Plant-based Management of Dryland Salinity is working in partnership with AWB Landmark in the "Promoting Salinity Solutions Through Agribusiness" project to make the latest information on the establishment and management of perennial pasture plants, as part of profitable whole-farm systems, available to farmers through a national network of local agribusiness agents. The partnership includes a nationally accredited salinity training program to develop national competency standards in salinity. To date six hundred and eighty agricultural advisers across NSW, Victoria, South Australia, Queensland and Western Australia have taken part in the salinity management workshops. These advisors will have a significant coordination and facilitation role addressing on-ground natural resource management issues with landholders.

The Cooperative Research Centre for Plant-based Management of Salinity is also partnering with Meat and Livestock Australia and three catchment management authorities in the 'Profitable Animal Production from Perennials' pilot project. The project designs, tests and implements innovative animal production farming systems with perennial pastures that are more profitable than alternative land use systems, while at the same time markedly reducing recharge and salinity. The project uses bio-economic and hydrological modelling together with a series of farmer workshops to determine on-ground experimentation and demonstration. The new animal production systems are currently being tested by landholders in south west Victoria, the south coast of Western Australia and the Murrumbidgee catchment in New South Wales.

The Cooperative Research Centre for Landscape Environments and Mineral Exploration project, 'WA paleochannels for salinity mitigation', is demonstrating the use, cost effectiveness and practicality of geophysical methods to define the location and geometry of buried valleys, referred to as paleochannels. Paleochannels are important for siting production bores designed to lower the saline watertable below valuable agricultural land, providing an opportunity to improve soil health and productivity. The next stage of the project is to pump test and evaluate prospects for groundwater pumping and disposal.

The Cooperative Research Centre for Landscape Environments and Mineral Exploration and CSIRO are involved in the "Rural Towns – Liquid Assets" project in Western Australia, a progression from the "WA Rural Towns" project, which is partially funded by the National Action Plan for Salinity and Water Quality. The Rural Towns – Liquid Assets project moves beyond salinity management to assessing new water resources and industry development in 16 towns affected by townsite salinity in Western Australia. The project focuses on developing new water supplies that will provide a resource for water-based industries and employment, using potential economic benefit as a motivator to control the salinity problem. Water management plans for each community will take them to the threshold of implementation, including salinity and waterlogging control measures; economic analysis of groundwater treatment and disposal options; and evaluation of water use options.

The Australian Government is encouraging rural research and development corporations to work cooperatively to develop new sustainable land use systems and new salinity technologies, including projects that forge links across commodities in farming systems. The "Grain & Graze" and "Land, Water Wool" projects in particular are encouraging uptake of economically-viable management techniques by landholders across Australia.

"Grain & Graze" is a joint research and development program of the Grains RDC, Meat & Livestock Australia and Land and Water Australia. The Program is developing new tools for farmers to improve productivity across mixed farming systems while maintaining or enhancing biodiversity and catchment resources. Through Grain & Graze landholders are participating with researchers and catchment planners to design and implement on-farm trial and demonstration sites, as well as training and communication activities.

"Land, Water & Wool", a joint program of Australian Wool Innovation, Meat and Livestock Australia and Land and Water Australia, is geared towards practical application and tapping into a decade of natural resource management research and development and building on the wool industry's own research base. The program is providing research and practical tools to assist wool producers to better manage their productivity, natural resources, forecasting and risk management.

The "Land, Water & Wool" research subprogram, "Sustainable Grazing of Saline Lands" undertaken by the Cooperative Research Centre for Plant-based Management of Dryland Salinity, has particular relevance to salinity. The subprogram is developing, testing and demonstrating land use systems for salt-affected landscapes that are sustainable,

profitable and have positive on- and off-site impacts. The research also aims to quantify environmental benefits stemming from the more efficient use of water and hence reduced leakage to groundwater under grazing management.

Incentives for private sector investment in research

The Australian Government provides a broad range of incentives to encourage private sector investment in salinity and natural resource management research and development through levies, the R&D tax concession and landcare operations tax concession. As of 1 July 2004 financial support for salinity management works by landholders under the landcare operations tax concession was extended to cover structures to manage drainage, including salinity.

Data management

Coordination of salinity and salinity management information is crucial to ensure consistent and up-to-date information reaches landholders, regional managers and communities.

The Australian Government, with the states and territories through the Natural Resource Management Ministerial Council, has recently established an Executive Steering Committee on Australian Salinity Information to coordinate salinity information. The Steering Committee will:

- provide a forum for national leadership and coordination of salinity and salinity management information;
- work towards improvements in data collection, management and sharing for the next national assessment of salinity;
- facilitate collaboration and partnerships between data providers, coordinators and users; and
- develop and implement a strategy for 2004-05 to 2005-06 to achieve the outcomes and objectives of the National Dryland Salinity Data Infrastructure Project (a project of the Australian Government's Natural Heritage Trust), including but not limited to:

  - developing agreed data protocols, guidelines and standards to enable Australia-wide, State/Territory and regional data to be assessed in a comparable way;

  - facilitating provision of up-to-date regional/catchment scale data that will allow for data to be manipulated in a format that can be collated up to the national level; and

  - identifying significant gaps in existing data and information, with a focus on priority regions.

The Australian Government facilitates best practice data collection, management and retrieval through the National Land and Water Resources Audit which provides data, information and nationwide assessments of Australia's natural resources. The Audit's

"Natural Resources Information Management Toolkit" and "National Knowledge Brokering for Regional Natural Resource Management" projects assist information sharing between researchers, government agencies, regional managers, landholders and the community.

In 2003, a "Natural Resources Information Management Toolkit" project was implemented by the Spatial Information Provider, ANZLIC and the National Land and Water Resources Audit. The Toolkit provides resource materials to build the capacity at regional and local levels to manage, utilise and share natural resources data and information more effectively. It supports the development of community networks through open and efficient sharing of information resources and knowledge, and assists the establishment of information loops between regional, state and national levels.

The Australian Government is also providing $900,000 over two years for a project to build stronger links between scientists, information providers and regional communities. The project, "National Knowledge Brokering for Regional Natural Resource Management", is being funded under the Natural Heritage Trust and is managed by Land and Water Australia. The project aims to ensure regions have the ability to access the information they need to plan, implement and evaluate their natural resource management investments and help improve the flow of knowledge to and from regions and local communities.

Extending the science

In June 2004 the National Dryland Salinity Program, through Land and Water Australia, released three products to conclude its operation in an "Enhanced Communication Year". The products were:

1. "Dryland Salinity - On-Farm Decisions and Catchment Outcomes — a Guide for Leading Producers and Advisors";
2. "Dryland Salinity and Catchment Management – a Resource Guide and Action Manual for Catchment Managers"; and
3. "Breaking Ground – Key Findings from 10 Years of Australia's National Dryland Salinity Program" provide a valuable collation of scientific information as requested by this recommendation.

The publications provide a self-help system enabling government, landholders, regional managers and communities access to a complete synthesis of ten years of salinity research that can be incorporated into regional plans, investment strategies and on-ground works. The three manuals are available free-of-charge in hardcopy and on CD-ROM. The CD-ROM provides an interactive system for access to nearly 200 research reports, "TechNotes" fact sheets and numerous links to on-line resources, organisations and groups skilled in salinity management.

In 2003 a draft "Technical Report on Salinity Mapping Methods in the Australian Context" was released on the National Dryland Salinity Program website to address the need identified by catchment managers for advice on the range of salinity mapping

methods on offer. The report is a culmination of submissions and workshops involving 36 organisations and individuals, which was reviewed by the Australian Academy of Science and Australian Academy of Technological Sciences and Engineering. The final full-colour "Salinity Mapping Methods in the Australian Context" book, user guide and CD-ROM will be published shortly to be available free-of-charge in mid 2005. The publications contain descriptions of each method and are designed to help the potential user determine how their salinity mapping needs can be nest met. The user guide provides summary descriptions to enable quick reference for landholders, regional managers and the community.

Utilisation of the abovementioned tools, combined with existing resources available on the internet and face-to-face advice and information from natural resource management facilitators and coordinators, ensure relevant and up-to-date salinity management information can be considered by landholders and regional managers in property management planning and regional natural resource management planning processes respectively.

REFERENCES

2000 Australian Government paper "Our Vital Resources: A National Action Plan for Salinity and Water Quality"

Prime Minister's Science, Engineering and Innovation Council, (PMSEIC) Occasional Paper number 1 (1999)

1999 Murray Darling Basin Commission Salinity Audit Report

2000 National Land and Water Resources Audit (NLWRA, 2000)

ATTACHMENTS

Attachment A: Information on work being done by the Murray Darling Basin Initiative, National Dryland Salinity Program and the National Land and Water Audit in addressing salinity in the Australian landscape

Attachment B: Goals, funding levels and design features of the National Action Plan for Salinity and Water Quality, the Natural Heritage Trust and the National Landcare programs.

Attachment C: Information on the National Market Based Instruments and the Environmental Management Systems initiatives

Attachment D: The program logic of the Monitoring and Evaluation framework

Attachment E: The 2003-04 Regional Programs Summary Report on the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust

Attachment F: The State and Territory legislative framework underpinning the regional catchment management bodies

Attachment G: Map of the regional NRM organisations across Australia.

Attachment H: Commonwealth NAP and NHT funds provided or committed to regions under foundation funding, priority action and investment strategies from 2000-01 to 2006-07

Attachment I: Copy of the report of the Regional Implementation Working Group assessing the effectiveness of the regional model for delivering natural resource management programs