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Victorian Landcare & Catchment Management

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Salinity feature

Spotlight on local government

Managing dryland salinity

New research results

Salinity and the environment

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Cover photograph:
Salinity in northern Victoria
by Andrew Chapman

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Four sites in the Central Hopkins

Research Results

By Kate Calvert and Lee-anne Mintern

The integrated subcatchment management project focuses on soils, salinity and sodicity management in the Central Hopkins region of south-west Victoria. The project was funded by the NHT for two years in March 1999.

The Lower Mustons Landcare Group, Blind Creek Landcare Group, Hopkins Landcare Group and the Central Hopkins Land Protection Association are involved in the project.

Four demonstration sites were chosen on representative soil types (basalt and sedimentary soils) in the Mortlake and Caramut area. Each site has saline characteristics, potential for waterlogging, several land classes and enthusiastic landholders.

Eight to nine soil pits were dug down the slope at each site to enable soil analysis and profile descriptions to be developed. Using the soil information gathered, nests of piezometers were then installed at each site to monitor subsurface water flow and salinity levels. The piezometers are monitored monthly. Aerial photographs were taken of each site to help with farm planning.

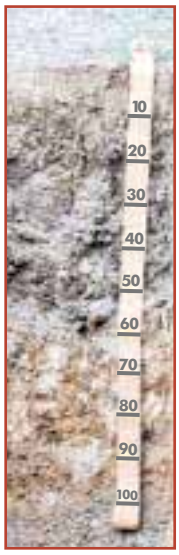
EM31 (electromagnetic induction) technology was then used at each site to investigate and map the apparent EC (electrical conductivity mS/m) levels at the sites to a depth of five metres.

The EM31 survey system consists of a four-wheel-drive motorbike with the EM31 mounted on the side, a GPS (global positioning system) antennae on the rear, and a recording unit on the front.

EM31 values are then downloaded and plotted to map the distribution and apparent conductivity levels in the landscape. Although the EM31 will map salinity hazard 'hot spots' at each site, the readings are not true salinity values. EM31 maps must be calibrated with EC soil and piezometer measurements.

With information from the soil profile analysis, EC subsurface monitoring and EM31 mapping, the landholders were then involved in putting together a whole farm plan for each site. A seminar series was held to give local Landcarers and landholders a better understanding of landscape processes and to discuss plans for proposed on-ground works.

From the outcomes of the seminar series and discussions with landholders, a works plan for each site was developed. Each program is different due to the different landscape processes, degree of dryland salinity and funding availability for each site.



The data collected from the EM31 must be ground-truthed with soil measurements and piezometer readings.

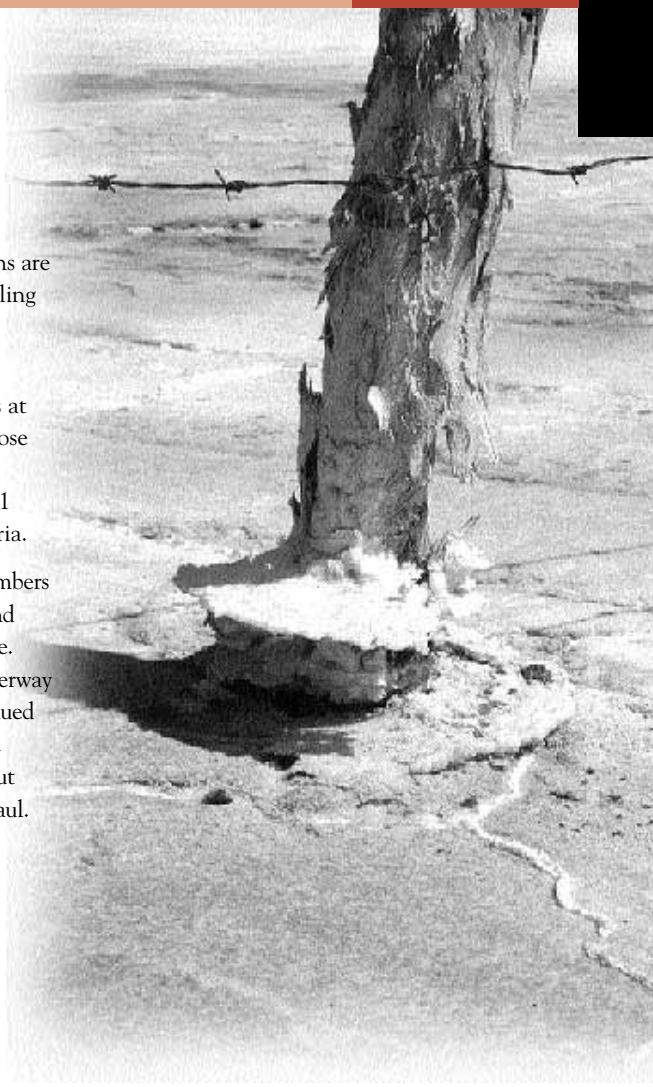
The works programs include land class fencing, saline agronomy establishment and native vegetation establishment, including both cells and direct seeding methods. More funding has been sought to continue the work at each of the demonstration sites.

By the end of spring 2000, it is anticipated that stage one of the works program at the four sites will be completed. University groups, other Landcare groups and whole farm planning groups have used the sites. Mortlake P-12 Secondary College is using one of the sites as part of its Waterwatch program this year. A catchment bus tour is planned for later in the year to visit the newly completed sites.

For further information or Landcare groups interested in touring the sites contact Kate Calvert on (03) 5597 9239.

Lee-anne Mintern operates the EM31 4WD bike used to map salinity hazard sites in the Central Hopkins region.

From the editors



In the last issue we called for stories about salinity – both successes and failures. The response has been overwhelming. We were unable to run all of your salinity stories in this issue due to lack of space, but look out for them later in the year.

Salinity is without a doubt one of the major issues facing Landcare groups today. While predictions on the increasing extent of dryland salinity are dire, the stories in this issue show that there is a great deal of salinity activity underway across the State.

Dr John Angus, a CSIRO plant industry scientist, says there is good evidence for solutions to salinity that are both profitable and sustainable. According to Dr Angus the solutions are not just about tree planting but an integrated plan including perennial pastures, high-yielding crops, retiring unproductive land to perennial pastures and strategic tree planting.

Salinity is not just an issue for farmers. Our feature on salinity and local government demonstrates the severe impact salinity is having on many Australian towns. Building foundations are cracking, roads and pavements crumbling and sports fields are under threat.

It's interesting to note that the local governments having the most success at managing the salinity problem are those who have prepared detailed salinity management plans – much like the 21 plans we have operating across Victoria.

A great deal of credit is due to the members of salinity management plan forums and implementation groups across the State. Some of the plans have now been underway for over ten years and will need continued work and commitment for many more. The one issue we can't argue with about salinity is that it's going to be a long haul.

Please keep your stories and letters coming. We are always interested in hearing from our readers.

Lyall Grey, Jo Safstrom,
Gabrielle Sheehan, Carrie Tiffany

Vale Gyn Jones

By John Quinlan

It was with deep regret that we learned of the passing of Gyn Jones. For those like me who always wondered, Gyn was short for Gynlais (Welsh) and was pronounced 'Gun'.

Gyn died on 19 June 2000 and his funeral was held in Kerang. He was 67 years of age.

With his familiar 'mutton-chops', Gyn was one of the real characters of the old Department of Agriculture. He was officer-in-charge of the Kerang office for many years, giving says former workmate Howard Pascoe (NRE Echuca), "stability and leadership to the office and its staff".

According to Howard, Gyn had a deep knowledge of the geology and past history of the Tragowel Plains. He was very aware of the problems facing farmers in the area and dedicated much of his life to improving the productivity and profitability of farms in the Kerang district.

Gyn wrote his well-known newspaper column *Gunshots* for many years and, says Howard, "wrote without fear or favour".

Howard also recalls that Gyn had a small property on the outskirts of Kerang and "was a farmer until the day he died".

Gynlais Oughton Jones will be sadly missed by his family, friends and colleagues.

Letters Letters

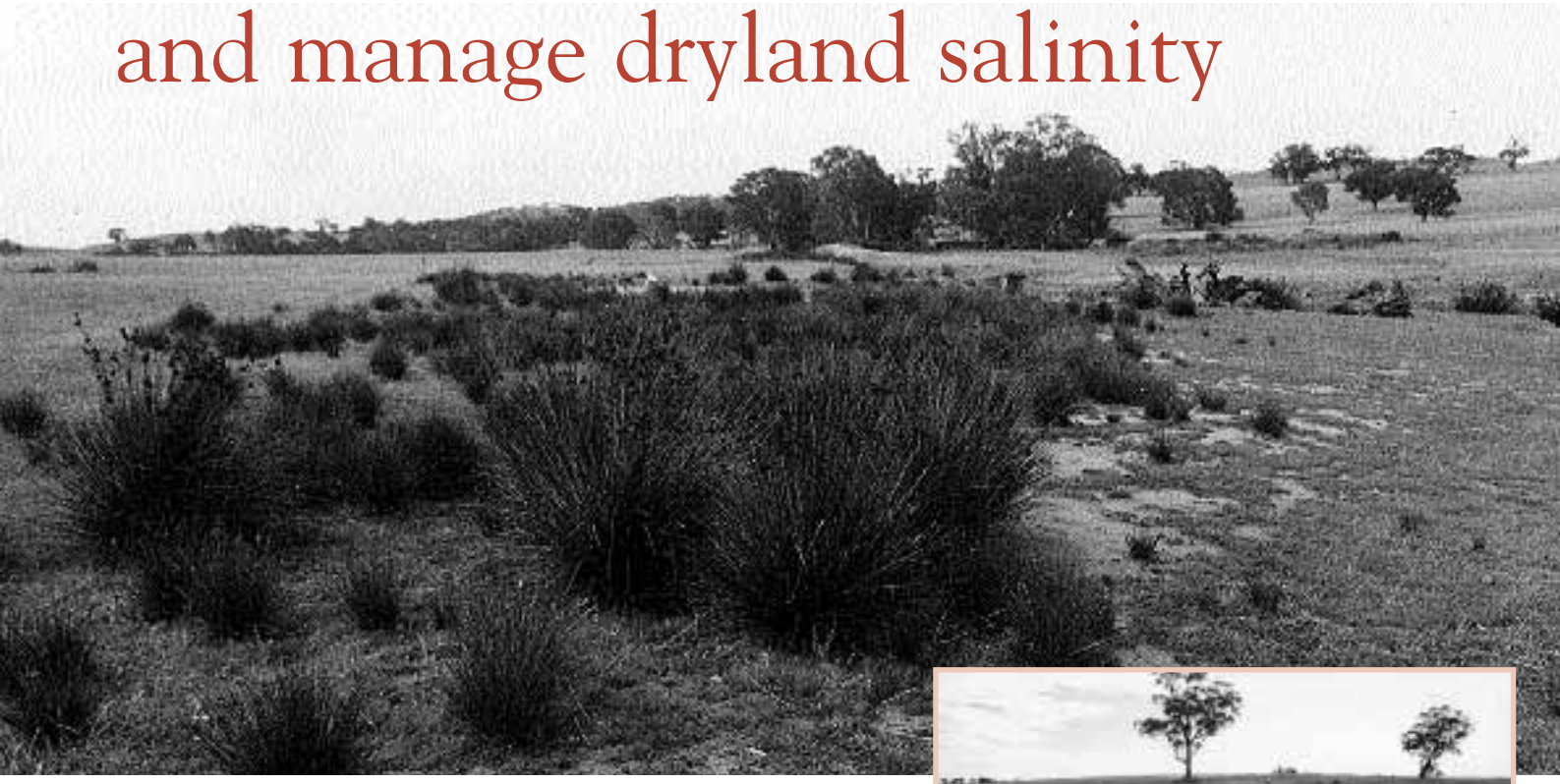
Dear Editors,

I read the Winter 2000 *Landcare and Catchment Management Magazine* recently and was really interested in the reports back from the International Landcare 2000 Conference. I have seen a number of short reports elsewhere, but not a comprehensive look from a number of different perspectives. Well done for giving a good overview of the event.

I also read with interest a number of the other articles. All up – an excellent edition.

John Squires

Researchers train groups to map and manage dryland salinity



Typical salt-affected land in the Mid-Loddon subcatchment.

Four Landcare groups in the Mid-Loddon subcatchment are undertaking a salinity reduction project in partnership with researchers from NRE's Centre for Land Protection Research at Epsom. The Upper Spring Creek, Ravenswood Valley, West Marong and Nuggety Landcare Groups are working on this NHT-funded project where skills, expertise and labour are traded for free.

The project objective is to arrest the spread of dryland salinity across the Mid-Loddon subcatchment and reduce the salt load draining into local creeks and the Loddon River by lowering watertables across the project area.

To achieve this goal, a project manager has been employed to raise public awareness about salinity and assist landholders to fence and protect remnant vegetation and establish deep-rooted native vegetation on identified recharge areas. These measures are aimed at maximising the use of rain where it falls. Streamsides are also being targeted to link remnants and increase biodiversity.

The first step in this process was to map all discharge sites across the project area. This data provided the basis for planning the salinity control measures across the project area and set a benchmark so that the effectiveness of the control measures can be assessed by remapping in the future. This information was also essential for constructing a groundwater bore network that will allow the Landcare groups to further evaluate the success of the revegetation in controlling salinity across the subcatchment.

Free mapping training for groups

NRE has developed a standard method for identifying and recording the extent and severity of soil salinity. A salinity officer from CLPR trained two Landcare members to identify saline areas and accurately map these sites. Once the soil salinity was mapped across the Mid-Loddon subcatchment the information was digitised and entered on to the NRE Geographic Information System (GIS).

Clearing the hills and ridges produces rising watertables and is often followed by increasing salinity and erosion.

The GIS system allows maps to be produced easily and efficiently so they can be distributed to a whole range of participants in the project, from landholders and Landcare groups through to NRE hydrogeologists, extension staff and regional planners.

If you are planning a salinity-related project that requires soil salinity to be mapped, CLPR has some funding to train Landcare groups and their members to identify and record soil salinity across Victoria and digitise the data so that it can be added to the NRE database. These services are provided free of charge.

For further information contact Rob Clark at CLPR on (03) 5430 4355.

IN BRIEF

Irrigation farm dams

Earlier this year the Government released a discussion paper concerning sustainable water resources management and farm dams. Farm dams that are not built on waterways are not subject to regulatory control. The ever-increasing construction of these dams has the potential to diminish the security of existing irrigation development, affect domestic stock supplies and have adverse environmental consequences.

The Victorian Farm Dams (Irrigation) Committee is considering submissions on this issue and will make recommendations to Government. It has produced a series of fact sheets, providing information on the community participation process and some of the technical and management issues.

Public submissions are invited up until 30 September 2000. Copies of the Sustainable Water Resources and Farm Dams discussion paper and the fact sheets are available through the NRE Customer Service Centre on 136 186 or the NRE website at www.nre.vic.gov.au

Old Salts network

'Old Salts' is an informal network of people across Victoria interested in getting together a couple of times a year to talk about communication and dryland salinity. The group meets in an informal setting to share ideas, update activities and outcomes, and generally help to keep information moving about.

New members are always welcome. For further information contact Jo Curkpatrick, Communication Co-ordinator for the National Dryland Salinity Program in Victoria, on (03) 9328 5301.

National Water Week 2000

This year National Water Week will run from 15-21 October 2000. The theme is 'Water for Life'.

NRE is hosting Victoria's National Water Week website. The site has application forms for the poster competition, a media kit, contact details for the co-ordinator and all the necessary links. Go to: http://www.nre.vic.gov.au click on What's New, then click on National Water Week.

For further information about National Water Week, including the Stockholm Junior Water Prize and the Wise Waterways Conference, contact the National Water Week Co-ordinator at Scarlet Consulting Australasia on (03) 5442 5355.

Earth Alive!

September is Biodiversity Month – a national celebration of Australia's rich diversity of life and what all Australians can do to help conserve wildlife habitat. The month is co-ordinated by the Community Biodiversity Network.

For an Earth Alive! information kit that contains free educational and community awareness materials contact the Community Biodiversity Network on (02) 9380 7629.

Water quality on the web

Information on Victoria's water quality and streams can now be found on the Internet through the Victorian Water Resources Monitoring Network. Users can enter simple or complex questions on water quality and quantity, and groundwater. The site enables better decision-making in the management of Victoria's water resources.

The site has information on groundwater, environmental water quality for 170 sites, quantity of water flow for 120 sites and trend analysis for nutrients, pH, turbidity and salinity. Go to: http://www.nre.vic.gov.au/vwrmn

Singing Landcare!

The 'Soil Ain't Dirt' collection has become something of a classic in Landcare and environmental education across Australia. Singer/songwriter Fay White has just released a new CD – *Singing Landcare*! including the whole 'Soil Ain't Dirt' collection and six extra Landcare songs. These are whimsical and inspiring songs about how and why to care for the earth.

Faye White's songs are fun, easy to sing and packed with accurate and up-to-date information – there's even a song about direct seeding! A great tool for teachers, parents and Landcare enthusiasts. *Singing Landcare*! is $20 plus postage from Grapevine Music on (03) 5461 5471.

Submissions invited on vegetation plans

The Minister for Environment and Conservation has launched Victoria's draft Native Vegetation Management Framework and the ten regional draft Native Vegetation Plans for public consultation. Submissions are invited up until 6 December 2000.

Copies of the framework and plans are available from the Catchment Management Authorities or by calling the NRE Customer Service Centre on 136 186.

National DRYLAND SALINITY Program

Environmental spotlight on salinity

The environmental impacts of dryland salinity are to be put under the spotlight in several new NDSP projects.

The new projects will investigate the potential loss of aquatic biodiversity, the influence of catchment management programs and the effects of increasing salinity on the structure and future use of soils for productive purposes.

"For the first time, we are expanding our focus and taking a good look at the environmental impacts of dryland salinity as distinct from just its impacts on productivity in the agricultural sector," said NDSP Program Manager Richard Price.

A system for predicting impacts on biodiversity in our waterways and wetlands is the focus of a project being run by Ben Kefford of NRE.

Dr Lu Zhang of CSIRO Land and Water is leading a project which will investigate the environmental impacts of catchment management regimes on dryland salinity.

Dr Hamish Cresswell, also from CSIRO Land and Water, will investigate the generation and delivery of salt and water to streams.

Dr Rob Fitzpatrick from CSIRO Land and Water in Perth will examine biogeochemical and physical processes in saline soils and potential reversibility.

The National Dryland Salinity Program now has over 40 projects across Australia seeking information about a wide range of biophysical, hydrogeological, institutional, agronomical and economic issues about salinity and its implications for Australia's natural resource base.

Bugs in streams give clues on rising salinity

A new Victorian research project commissioned under the National Dryland Salinity Program (NDSP) will use bugs in streams to help predict the effects of rising salinity on aquatic biodiversity.

Based at NRE's Arthur Rylah Institute for Environmental Research, the project will evaluate the response of common stream-dwelling macroinvertebrates, such as mayflies, to varying levels of salinity.

The researchers will carry out laboratory trials and on-site experiments in the Barwon River catchment south-west of Melbourne.

Joint project leaders, Phil Papas and Ben Kefford from NRE and Dr Dayanthi Nugegoda from Melbourne's RMIT University, will work with an RMIT Masters student to develop a mathematical model to help natural resource managers, Catchment Management Authorities and researchers prioritise salinity remediation and stream restoration works, with the aim of preserving in-stream biodiversity.

"We are studying macroinvertebrates because they form an essential part of the food chain for fish and birds and are excellent indicators of environmental health," said Phil Papas.

"In the same way miners used canaries to detect gas leaks in mines, researchers will use macroinvertebrates to estimate the impacts of salinity and other pollutants such as heavy metals and organic pollution on a wide range of fauna."

For further information contact Phil Papas at the Arthur Rylah Institute for Environmental Research on (03) 9450 8665.

Phil Papas (in hat) demonstrating macroinvertebrate identification to members of the Victorian Field Naturalists.

Groundwater levels – up and down

Groundwater tables across much of southern Victoria and the Wimmera have been trending downwards over recent years, a new study has revealed. This appears to have been due to the recent run of relatively dry years.

The study showed that with a return to more typical climatic conditions, agricultural losses due to salinity could increase five-fold. As much as 20,000 kilometres of Victorian roads could be located in areas where they are prone to damage due to shallow watertables. The habitat of up to 8% of threatened native plants and animals could also be at risk of salinity within 50 years. Further work is needed to identify the land most at risk from salinity.

The study – *The Extent and Impact of Dryland Salinity in Victoria* – was undertaken by consulting firm Sinclair Knight Merz (SKM) in conjunction with the NRE Centre for Land Protection Research, (CLPR) Bendigo, as part of the National Land and Water Resources Audit.

Scenarios from the study were presented at a Melbourne seminar in June, attended by more than 150 water, land and environmental managers and researchers with an interest in salinity trends. The seminar stimulated widespread interest and debate, with many questions being fired at the presenters, Craig Clifton and Greg Hoxley from SKM and Mark Reid from CLPR.

Craig said the work followed on from the Murray Darling Basin Commission's Salinity Audit, which identified land at risk of salinity in northern Victoria and estimated the future impacts of this on salinity levels in the Murray River and its major tributaries.

"This work is really a broad-brush estimate of the land at risk from rising groundwater over the next 50 years in the different regions, based on what has happened over the past ten years throughout Victoria," said Craig.

"We've also estimated the potential impact on agricultural production, rural and urban infrastructure and native flora and fauna.

"Downward trends in watertables in the non-Murray Basin areas of Victoria are not expected to last once rainfall patterns return to normal. The study has estimated salinity risk scenarios based on best and worst case scenarios. In the best case, watertables generally continue to fall as they are now and salinity does not worsen. In the worst case, where trends are based on the wet years from 1989 to 1993, there may be a three-fold expansion in the area of land with shallow watertables.

"The next step is to use a more detailed approach, using more accurate representations of the landscape and water balance models, to obtain an understanding of salinity risk at farm or subcatchment scales. The Broken and North Goulburn plains area of Victoria is being used to trial this more rigorous approach."

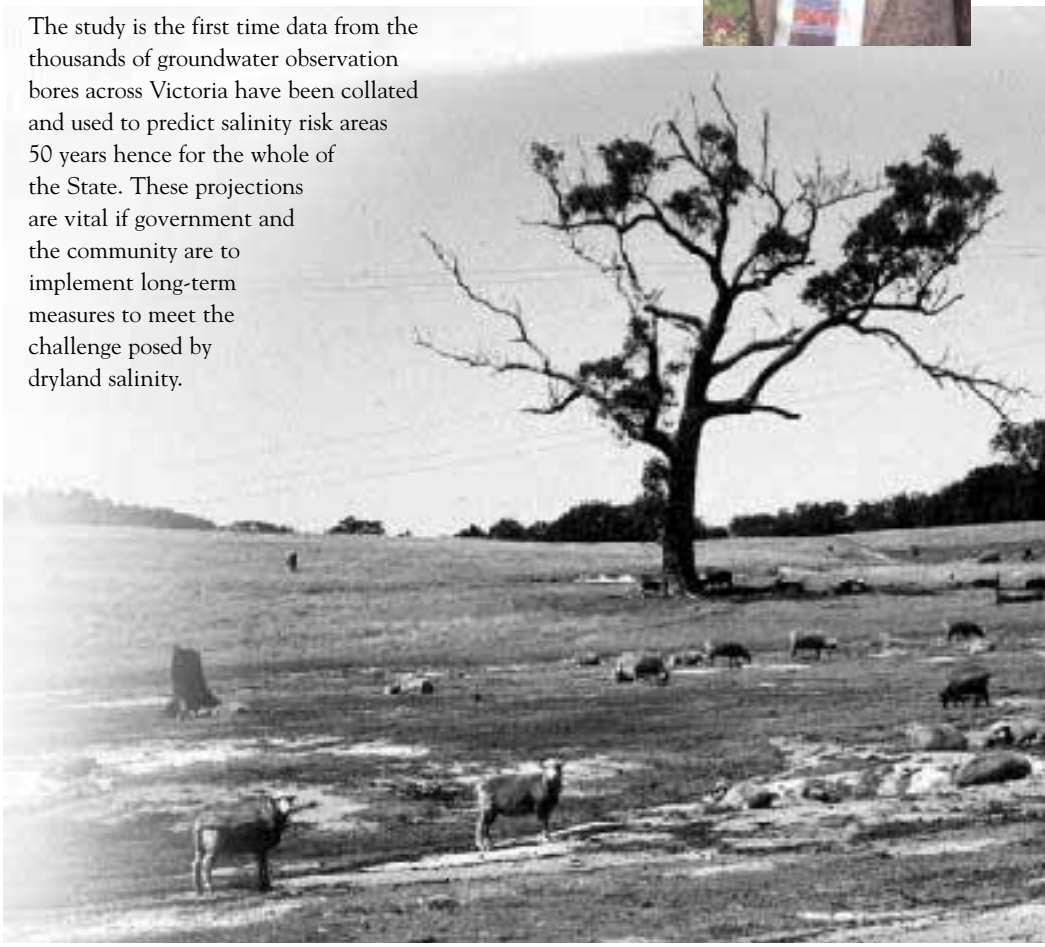
Information from the study will provide a valuable resource for reviews of regional dryland salinity plans, which are being conducted over the next six to 12 months.

The *Extent and Impact of Dryland Salinity in Victoria* report will be published shortly on the National Land and Water Resources Audit website: www.nlwra.gov.au

For more information on the National Dryland Salinity Program in Victoria, contact Communication Co-ordinator Jo Curkpatrick on (03) 9328 5301.

Craig Clifton at the salinity seminar held in Melbourne last June.

The study is the first time data from the thousands of groundwater observation bores across Victoria have been collated and used to predict salinity risk areas 50 years hence for the whole of the State. These projections are vital if government and the community are to implement long-term measures to meet the challenge posed by dryland salinity.



Research Results

From denial to action – local

Houses and their foundations are cracking, roads and pavements are crumbling, backyard lawns are dying, and parks and sports fields are under threat as soil salinity moves from the bush into towns and cities across the country.

The number of salt-affected towns around Australia continues to increase. Victoria's salt-affected towns include Bendigo, Castlemaine, Maldon, Pyramid Hill, Kyabram, Tatura, Tongala and Stanhope. In NSW there is Wagga Wagga, Griffith, Forbes, Parkes, Yass, western Sydney and Dubbo. In WA Merredin, Katanning and Wagin. SA has Tintinara, Coomandook, Murray Bridge, Renmark, Tumby Bay and Minlaton. Even Launceston in Tasmania has salinity on its golf course.

The Murray-Darling Basin Commission's salinity audit estimates that salt is costing municipalities across Australia $100 million annually in damage to infrastructure like roads and buildings.

Not only do towns suffer from the effects of salinity, but studies in NSW show that the towns can undermine the efforts of nearby farmers to tackle dryland salinity. Maintaining rose gardens, manicured lawns and emerald sports ovals involves extensive watering that lifts the watertable.

Salinity has gone urban and towns must be increasingly innovative to counter it.

A National Dryland Salinity Program research project has found that Australian local governments vary in their preparedness to cope with urban salinity. Project leader Trevor Budge from the Research Planning and Design Group, said the study found that there are seven stages of local government awareness and action on dryland salinity.

1. Lack of recognition – even denial.
2. Realisation of significance and implications.
3. The quick fix.
4. Uncertainty and even confusion.
5. The need for a planned approach.
6. Preparation of a strategy.
7. Implementation.

"We found that up to 50% of councils are at stage 2; many councils (in known salt-affected areas) have failed to even recognise there is a problem, or are in denial," said Trevor.

"Many councils are limited in their capacity to act because of financial and resource constraints, or they consider salinity is a natural resource management issue and is not their primary responsibility.

"We have also found that the leading municipalities dealing with urban salinity are Wagga Wagga Council in NSW, Coorong Shire Council in SA and participants in WA's Rural Towns Program. These councils can offer valuable lessons to other municipalities and fast track their progress through the seven stages," said Trevor.

Salt on Tatura golf course.

Urban salinity in Wagga Wagga

Wagga Wagga is a city of 56,000 people, located 450 kilometres south-west of Sydney. In some areas of Wagga Wagga there are obvious symptoms of salinity.

Elizabeth Madden, who heads an innovative community education program with Wagga Wagga Council, estimates that 10 to 15 houses have been treated for salinity-related problems at $20,000 per dwelling with no beneficial environmental or structural outcomes. There are potentially 600 residential houses affected by salinity. Up to 100 of these currently require some form of remedial work.

Wagga Wagga is susceptibile to salinity due to its combination of heavy clay soils and small catchment discharge area. Nevertheless the problem is exacerbated by human activity. Without a change in current behaviour, the present value of the cost of salinity to the region could be $3.2 million per year or $95 million over 30 years.

An action plan launched in 1994 has resulted in the development of an urban Landcare group, a salinity awareness and education program and the development of the Wagga Wagga Natural Resource Management Plan. The plan has been developed by the Wagga Wagga Urban Landcare Group in consultation with Wagga Wagga City Council and the Department of Land and Water Conservation.

WA's Rural Towns Program

Agriculture WA runs the Rural Towns Program, an initiative of the WA Salinity Action Plan to combat salinity in regional WA by providing incentives and funding for co-ordinating community effort to overcome salinity.

Mark Pridham, Manager, Rural Towns Program, said there are currently 27 shires and 28 towns involved.

"The program promotes awareness of salinity and provides technical and financial assistance to local government and their communities to develop salinity management strategies for controlling salinity and rising groundwater.
The State Government provides up to 50% of the cost of a project.
Money is available for preparing salinity management strategies, as well as detailed geophysical investigations, field surveys and on-ground work," said Mark.

An abandoned property east of Ouyen.

government and salinity

By Mal Brown

Merredin – a town surrounded by salt

Merredin is located in WA's wheatbelt. Groundwater moves slowly through large regional aquifers with low slopes. It takes an estimated 3000 years for groundwater to move from the top of the Merredin catchment to Merredin town. Clearly, the only land that has contributed groundwater directly to the Merredin town in the 100 years since the region was developed is land in or close to the town.

Usually the most effective treatment for preventing urban salinity damage is reducing recharge within the town site and enhancing discharge in and around the town by engineering treatments, such as pumping. In most cases, benefits from revegetation of surrounding farmland will be insufficient to prevent major damage to town infrastructure.

For towns such as Merredin, which have fresh water piped to them for domestic use, the problem is exacerbated by release of this imported water into the ground from garden irrigation systems or septic tanks.

Roads and salinity

Salinity often results in cracked roads, potholes and corroding bridges – it can cause up to a seven-fold decrease in the life of a road. Repairs to one kilometre of major highway can cost $1 million. Salt has already cost Wagga Wagga Council an estimated $8 million in repairs. Dealing with the problem may involve building higher embankments, putting geotextiles or extra rocks under new or rebuilt roads, or replacing existing clay with predrained rockfill.

High watertable damage to a rural road.

At Yallagundry in NSW, the Road Traffic Authority (RTA) has taken a holistic approach to road maintenance. The Sturt Highway outside of town slowed the drainage of a rural catchment, creating severe waterlogging and salinisation of land nearby. Trees and grasses were dying and the rising salt damaged both road and culvert.

The RTA worked with a landholder fencing off land nearby and planting salt-tolerant grasses to absorb excess water. Eucalypts, acacias and casuarinas were planted on mounds to keep them above the salty water. Further up the catchment another area was fenced off and planted with trees to intercept water. Now, six years later, the land is dry and a suite of new grasses and trees are thriving despite residual salt. No new damage is evident in the road.

For further information contact Trevor Budge on (03) 5441 6552.

Salinity management in Victoria:

Message from NRE

Catchment Management

By Peter Sutherland, Executive Director, CAW Division, NRE

Since the launch of *Salt Action: Joint Action* in 1988 the Victorian Government has been working with the community to address salinity. Communities in salt-affected areas have developed 21 regional salinity management plans. Each of these plans aims to identify and promote sustainable land uses and each strives to minimise environmental damage.

While there has been substantial progress towards the original objectives of *Salt Action: Joint Action*, salinity remains a substantial and growing problem. The direct cost of salinity in Victoria is estimated to be $50 million per year, with some 140,000 hectares of irrigated land and 120,000 hectares of dryland significantly affected.

Dryland severity

Our knowledge of the extent and severity of dryland salinity has significantly increased. It is now apparent that groundwater levels are rising over large areas of dryland Victoria and by 2050 a ten-fold increase in the area affected by salt is expected.

The increase in dryland salinity is responsible for rising river salinity which reduces water quality for downstream users, erodes the biodiversity of aquatic ecosystems and land salinisation, which in turn reduces agricultural productivity and damages regional and urban infrastructure.

Recent groundwater and catchment modelling research indicates that many best practice agricultural systems in the grazing and cropping industries cannot reduce the amount of water leaking into the groundwater systems compared to native vegetation.

In many regions large-scale revegetation with trees represents the only prospect of halting or reversing rises in the watertable.

Targets and strategies

These findings highlight the need for substantial landuse change. Clearly we must redouble our efforts to manage salinity. To guide our efforts it is important to focus on realistic outcomes and to set medium-term targets to measure performance in working towards these outcomes.

The draft Future Directions Report released by the Minister for Environment and Conservation, Sherryl Garbutt, earlier this year proposed a range of targets including:

- By 2015 there will be a real reduction in the environmental and economic impacts of salinity.
- By 2005 critical recharge zones within catchments will be identified with 40% to 60% of these critical areas revegetated by 2015.
- By 2005 a quarter of agricultural production will be produced from natural resources that are managed within their capacity. By 2015 this will increase to half the value of agricultural production.

Public comment on the report has been very positive with widespread support of targets. The final State strategy will be released in August and will provide a framework for review of regional salinity plans.

Victoria's challenge is to build on the achievements and lessons to date through the following strategies:

- partnerships for integrated catchment management;
- understanding catchment processes;
- appropriate actions for particular landscapes;
- building skills and capacity for change; and
- efficient water use.

Review of plans

Catchment Management Authorities are currently working with communities and government to undertake a review of Victoria's salinity management plans by December 2000. The review will provide a State-wide stocktake of salinity management plans and look at areas requiring improvement.

Catchment and Water (CAW) is the division of the Department of Natural Resources and Environment responsible for maximising the environmental, economic and social benefits of integrated catchment management and sustainable development of resource based industries.

Getting the big picture on salinity

By Irene Grant

Building up a picture of the spread of salinity throughout the north-east is the aim of a project currently being undertaken by NRE, the North East Catchment Management Authority and Goulburn Murray Water in the Ovens catchment.

The program, which has placed continuous salinity monitoring equipment on four streams in the region, will monitor and measure salt loads as part of the North East Salinity Strategy.

According to Peter Ockenden, NRE salinity team leader, the equipment is designed to measure the real salt loads coming out of selected north-east catchments.

The gauges have been installed on the Black Dog Creek, Indigo Creek, the Ovens River and the Three Mile Creek (the lower end of the Fifteen Mile Creek) at Wangaratta.

The gauging station constructed on the Three Mile Creek will measure electrical conductivity and salt export and build a picture of a catchment approach to land management.

"The stream gauges will allow us to build a picture of what the total salt export is for the catchment," said Peter.

"The equipment 'wakes up' every 15 minutes and if it detects a change in the salt concentration or stream flow it sends this information to a nearby data logger; if there is no change it goes back to sleep.

"This information, which measures all salts in the water, not just sodium chloride, is then downloaded monthly.

"As the flow increases, the concentration of salt reduces, but the total tonnage of salt is increased. Which shows us that while there is a large amount of salt being washed out of the river, there is also a large amount of fresh water which is keeping the system fresh."

It is vital, said Peter, that more is understood about the spread of salt as the Ovens catchment provides 14% of the total flow into the Murray River.

"We have measured over 1000 tonnes in one week, in one stream, that is a massive amount of salt."

In addition to stream monitoring NRE also has in place a network of groundwater bores around the catchment to measure the rise of the groundwater table.

This data is being used to complement the stream flow information.

"Unless we fit together what is happening in the ground and in the streams we don't really know whether we are making a difference with our on-ground works.

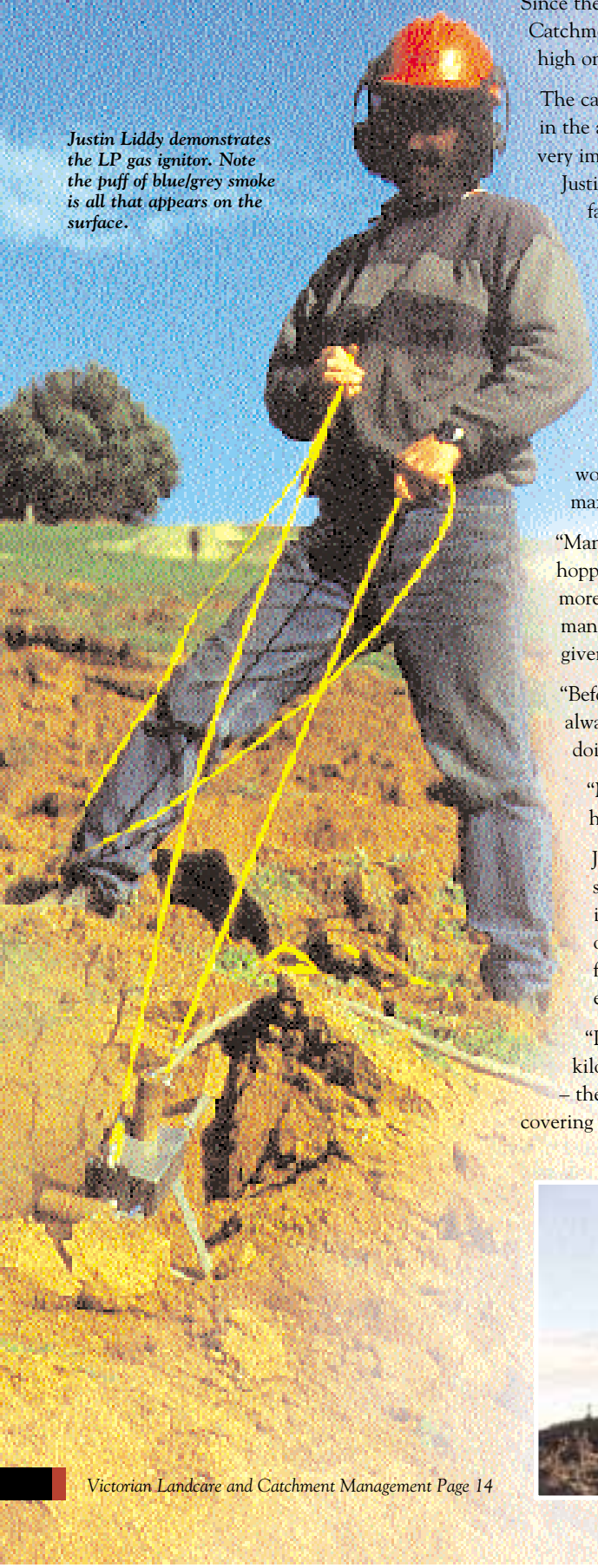
"There does not seem to be enough action in terms of land management projects which are making a difference to the spread of salinity in the catchment.

"We can do all the monitoring work we like but unless we can do the work which will make a difference we will get nowhere."

For more information contact Peter Ockenden at NRE Wangaratta on (03) 5720 1750.

Peter Ockenden tests salinity in the Three Mile Creek near Wangaratta.

Rabbiting the Woady Y



Justin Liddy demonstrates the LP gas ignitor. Note the puff of blue/grey smoke is all that appears on the surface.

Since the inception of the Woady Yaloak Catchment Program rabbits have been high on the community's agenda.

The catchment group's achievements in the area of rabbit control have been very impressive, however according to Justin Liddy, the group's rabbit facilitator, where you have two rabbits left you still have a rabbit problem.

The program involves one-to-one facilitation with landholders who want to control their rabbits. Justin said that this hands-on approach ensures follow-up works are completed to ensure maximum impact on the population.

"Many landholders see one or two hopping around and think nothing more of it, but in reality there may be many more times that active in a given area.

"Before any control program, we always estimate the numbers by doing a transect count," he said.

"Many people are surprised with how many we actually see."

Justin explained that they use a spotlight to count all the rabbits in a transect or line along a fence or laneway and multiply this by a factor of 10 to get a rough estimate of the real population.

"If you count ten per half kilometre, you have a real problem – there could be up to 200 rabbits covering 2.5 hectares," he said.

With seven rabbits eating as much as one sheep, the impact on the farmer's bottom line is obvious.

Baiting

Having estimated the numbers present, the group undertakes baiting programs in late summer to achieve a rapid knockdown in rabbit numbers. This can be successful if undertaken correctly, but Justin said it does not take many rabbits to build the population up to high levels again and that baiting is only part of the story.

The group use 1080 poison obtained through NRE, but has also used Pindone poison in areas closer to built-up areas.

"As the group's rabbit facilitator, I am responsible for obtaining the carrots for the baiting program and liaising with the NRE staff who administer the poison," said Justin.

A week-long program

The group has mechanical bait layers for landholders to use to lay their trails. Justin explained that the trails are located in the areas that the rabbits are scratching and feeding, and not just around the warrens.

"A typical 1080 baiting program runs over a week, involving two free feeds and one poison feed.

"We usually start on a Monday night, run the second free feed out on Wednesday night and hit the rabbits with the poisoned feed on the Friday night."

Justin stressed the importance of picking up the dead rabbits on the following Saturday and Sunday mornings.

"One of the problems of baiting with 1080 poison, is the possibility of secondary poisoning of off-target birds and mammals.

"By picking up all the carcasses you can find first thing in the morning, the chances of working dogs or birds of prey eating them is greatly reduced.

Lex Hadler (left) and Justin Liddy watch the excavator rip warrens in the Misery Moonlight Hills.

aloak

By Paul Crock

"One of the barriers to farmers laying baits for rabbits is this risk of secondary poisoning and although we encourage farmers to simply muzzle or restrain their dogs during and after baiting, the perception of risk is, unfortunately, still a limiting factor," Justin said.

Using Pindone

"In areas closer to towns, or where dogs can not be restrained or muzzled, we have used Pindone poison successfully."

Justin explained that Pindone was a cumulative anticoagulant poison, which relies on multiple doses to block the production of the vitamin K enzyme in the liver of the rabbit.

"Vitamin K co-ordinates blood clotting in the animal. When Pindone blocks the enzyme that recycles the vitamin K in the liver, the rabbit's blood clotting system fails and the animal dies.

"Because Pindone is a cumulative poison, rabbits need three poison feeds, three to four days apart," Justin said.

"After the second feed, rabbit numbers begin to decline, after the third feed, numbers are greatly reduced."

Justin Liddy shows Michael Rowe (left) rabbit damage while Fat Albert and Geneve look on.

Justin said the group used Pindone on diced carrots, however there was now a pre-prepared Pindone oat bait called Rabbait available through rural merchants.

"Because of the reduced risk of secondary poisoning with Pindone, landholders can purchase the bait over the counter at most local farm supply stores," he said.

Follow-up control

After completing a baiting program, Justin was quick to point out the need for follow-up works.

"Baiting is one thing to achieve a rapid knockdown in rabbit numbers, but it does not take many to build the population up to high levels.

"Theoretically, 20% of a rabbit population can breed back to 200% of the pre-baiting population within two years if no follow-up control is undertaken," he said.

Justin provides technical advice on all types of follow-up control methods for group members.

"Control options we use include ripping warrens to prevent reinfestation, clearing rabbit harbour such as furze or gorse and spiny rush, clearing rock heaps and cleaning up mine sites and fallen trees."

Members of the group have used commercial excavators with long ripping tynes to rip warrens along creek banks and on the sides of hills with great success.

In areas that are more accessible, bulldozers or large wheeled tractors with single tynes have all proven to be effective. Justin said that the bigger the machine the better, as its weight helps to crush down the warrens as it goes.

The group has also used fumigators in the past as a means of follow-up with varied success, mainly due to the fear of the poison gas and its corrosive effect on machinery.

In the past three to four years, the group has trialled and adopted LP gas technology.

Justin explained that the process involves introducing LP gas under pressure into the warrens with a special machine that then ignites the gas.

"The ignition of the gas depletes oxygen in the warren and puts paid to the inhabitants.

"We have found that it is quicker, safer and about 10-15% more effective than using conventional fumigators," Justin said.

For more information about the Woady Yaloak Catchment Project's rabbit program, contact Justin Liddy on (03) 5344 7421.

Rob McColl

By Graeme Anderson

Group News

Rob McColl and Rosemary Hart discuss future projects for the Meredith-Bamganie Landcare Group.

Rob McColl won the 1999 Victorian National Landcare Program Individual Landcarer Award. Over the past seven years he has devoted an incredible amount of time and attention to the Meredith-Bamganie Landcare Group.

Like many Landcare leaders his efforts are often unnoticed by the community at large. Hundreds of telephone calls, farm visits, late night meetings, district tours, grant applications and general Landcare mayhem are just a normal part of Rob's life... so why does he bother?

Q. How did you first become involved in the Landcare group?

A. I was involved with the group when it first formed, but at the time I was flat out working as a builder and didn't have much spare time. I helped as treasurer for a while, then I ended up having heart surgery. When I returned from that I finally had a bit of spare time and somehow ended up becoming group president. Being a local I knew that these groups can only operate if everyone at some stage pitches in and has a go – so I did.

Q. What keeps you involved in Landcare?

A. Seeing the improvement in our local landscape. No matter where I drive locally I go past a project of some description – whether it be salinity works, tree growing, farm forestry, rabbit and weed removal, or erosion control. It's great to see completely degraded areas being transformed and knowing that the group helped it happen in some way.

Q. What are the greatest challenges facing Landcare?

A. The burden of paperwork and increasing time commitments is making it very difficult for us. We are all volunteers doing community work and there is a limit to how much we can take on. I think too many people expect too much from Landcare groups. We need more professional longer-term support. Having part-time or short-term projects creates a lot of messing around and no sooner have you started than the project finishes up, leaving everyone bewildered.

We would like to see more government-based Landcare staff who we can call on to help us with our projects on a continuing basis. Landcare communities are going to be here for the longer term – tackling long-term problems – so it makes sense to provide longer-term support.

Q. What are the keys to a successful Landcare group?

A. You need a few things – a dedicated and efficient group executive who keep the key activities ticking along. Our team of Helmut Woerner, Rosemary Hart, Phil Rendell, June Cameron and Mary Szkuta do a wonderful job and without their contribution our group would not survive. Another key is to provide local and personalised support for landholders – get them started and involved in small projects and most of the time they move on to bigger and better things. Getting people started is critical.

We also need ongoing technical support from NRE. Grant programs that are flexible and integrated are very important. Our group is good at integrating the projects – usually the rabbits, weeds, erosion and salinity go hand in hand and you cannot control them unless you tackle them all at once in an integrated way.

Above all, groups need to get organised and get busy – don't wait for someone else to organise everything for you or it may never happen.

A waterway revegetation project at Meredith.

– the man from Meredith-Bamganie

Meredith-Bamganie's catchment stocktake

The Meredith-Bamganie Landcare Group and the Geelong office of NRE recently conducted a catchment stocktake to look at the results of ten years of Landcare work in the 6000-hectare Woodbourne Creek subcatchment. The area has been a target area for Landcare group and NRE activity due to a high incidence of erosion, salinity and rabbit damage.

The catchment stocktake was surprisingly simple. Using the Landcare group aerial photo, project lists and local knowledge, over 60 Landcare projects were identified and key details measured. The process only took a couple of days, has provided some great feedback and was done without the use of GIS.

Since 1990, the Landcare program in the subcatchment has:

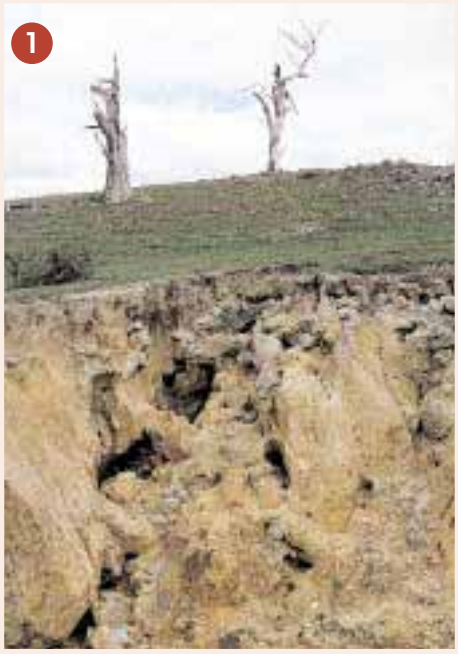
- treated/protected 11,125 metres (52%) of active erosion/saline gullies;
- treated/protected 14,813 metres (25%) of the degraded waterways in the catchment;
- protected 66.2 hectares of remnant vegetation;
- revegetated 3.5% of the catchment (174,210 trees) with trees and farm forestry;
- undertaken 67.5 hectares of tunnel erosion control;
- removed 127.8 hectares of rabbit harbour; and
- constructed 38 kilometres of Landcare-related fencing, including 13 kilometres of rabbit-proof fencing.

Landcare incentives

Of the 60 individual Landcare projects undertaken in the subcatchment over the past ten years:

- 40% were supported by the former NRE Land Protection Incentives Scheme (salinity/soil conservation);
- 28% were supported by the Natural Heritage Trust;
- 14% were supported by the Rabbit Buster Program; and
- 18% were supported privately (e.g. farm forestry investment, Victorian Treefarm Project).

The catchment benchmark process is ongoing. It provided some useful and welcome feedback for all involved in local Landcare action. For further information contact Graeme Anderson at NRE Geelong on (03) 5226 4667.



1. *Before. Active erosion caused by dispersive soils, rabbits and a lack of perennial vegetation.*
2. *After. The erosion has been battered and rabbits removed. The site will be revegetated with grasses and trees will be planted to control erosion in the long term.*
3. *Before. A severely eroded gully.*
4. *After. Erosion and rabbits have been removed and topsoil respread and resealed. Careful grazing management will ensure the area stays well covered with grass.*

SHARING THE LOAD –

secrets for avoiding burnout

Group Ideas

By Penny Richards

"Traditional societies protect, care for and rest their teachers... we exploit ours," muses Bill Mollison of permaculture fame. The same may be said of some of our Landcare group leaders and committee members. How can Landcare groups ensure they don't get burnt out and lose effectiveness as a group?

Pat Corr, Co-ordinator for the Arthur's Creek and Cottlesbridge Landcare Groups, says their secrets to success are having a set calendar of dates for general meetings, working bees, newsletter deadlines, executive and subgroup meetings.

Large calendars and short meetings…

"A large group calendar is sponsored by a local printer and most members have this displayed on their fridge," says Pat.

"The executive and committees meet separately so general meetings are devoted to speakers on a wide range of topics to interest members. This also helps to draw good crowds.

"The group ensures monthly working bees are short and held at convenient times, and they don't let them drag on past the scheduled time. That way members know what the time commitment for these activities is and they find it rewarding to come along," says Pat.

A reminder system such as a telephone tree works well for this group.

Hands-on activities and having a social aspect to meetings help encourage participation. Rolling-on activities maintain interest – such as having a seed sowing activity in December, a seedling swap night in autumn, followed by a planting-out day in spring.

Pat says another good idea is having members who are prepared to act as 'information brokers' on topics such as weed control, machinery operation, and occupational health and safety.

"It all helps to spread the load."

Pat Corr (left) and members of the Arthur's Creek Landcare Group on a whole farm planning farm walk.

The Rotary example

Martin Fuller, Co-ordinator for the South Gippsland Landcare Network, suggests groups consult the manual for Rotary clubs.

"There may be some useful tips contained in there – after all Rotary clubs never burnout!"

Bill Willett, Co-ordinator for the Burgoigee Creek, Hodgsons and Horsehoe Creeks and Springhurst/Byawatha Landcare Groups, recommends that office-bearers change at regular intervals – every two years or so.

"This means members are more willing to nominate for positions, when they know the length of the commitment."

Bill advises that subgroups or committees may be appropriate if a group covers a large area or many subcatchments.

"Once subgroups form, usually activity and on-ground works boom," says Bill.

Put energy into the interested

Bill also recommends groups don't over-expend effort on trying to involve absolutely everyone in the subcatchment or group.

"Concentrate on the interested members and focus on what interests they have in common and, through on-ground action, the others will come onboard eventually. Regular stocktakes are also important. They ensure groups stay true to their interests and are implementing activities that are a priority for them and not someone else's priorities."

Pat Corr and Bill Willett both agree that acknowledging achievements and successes of the group is important, and recommend having your own local awards and celebrations.

And finally, more pearls from Bill Mollison. "Our first survival priority should be to recruit others... to train others and get good back-up teams in the field."

If your group has useful tips or ideas for avoiding burnout please send them to the editors.

The Boorhaman wetlands – a swamp no longer

By Margrit Beemster

The Boorhaman wetlands, along the lower reaches of the Ovens River, are regarded as one of the most valuable series of wetlands in north-east Victoria. They contain some of the most significant colonial nesting bird colonies in the region. The task at hand is a big one – to change the perception that wetlands are problem areas on farms.

"The problem is that many farmers see them as swamps not as wetlands," says Boorhaman and District Landcare Group Co-ordinator, Laurelle Goldsack.

"A lot of the wetlands in this area have, in the past, been drained, sown down to pasture or crops, or dams have been built."

One of the main aims of the Boorhaman Wetland Education and Management Program is to stem that trend by educating landholders on the environmental significance of wetlands, and how they can be protected by changing the grazing regime and better management. River red gums, for example, need periodic wetting and drying to thrive. Reduced grazing means less pugging, increased water quality, a reintroduction of understorey species and decreased turbidity.

The NHT-funded project, now in its second year, also includes funding for ten kilometres of fencing off and revegetating wetlands on private property.

Willing landholders

Laurelle Goldsack says it is encouraging to see landholders like Ian Stevenson who are willing to protect their wetlands.

Ian Stevenson, who lives on a 19 hectare property north of Wangaratta, will this year fence off two hectares of an area that would have been a wetland before a dam was put in by a previous owner.

Ian has already kept the stock out; planted 300 trees (river red gum, yellow box, rough barked honey myrtle and silver wattle) grown by the children at the Boorhaman Primary School; and done a quick burn of the grasses to allow for natural regeneration from the existing red gums.

"I want to see that part of the farm return to as natural a condition as possible," says Ian, who added that the funding for the fencing materials made the project feasible.

"It's no good for grazing. In winter you can't get on it and even if the grass does grow in summer it drowns in winter.

"Swamps and wetlands are not wastelands, they are not problem areas. They are a valuable source of biodiversity, provide a habitat for our native animals and birds, and are a filter zone for our water."

Veronica Lanigan, the North East Catchment Management Authority's Water Quality Officer, says improving the health of the wetlands will lead to better water.

For further information on the Ovens Basin Water Quality Strategy contact Veronica Lanigan on (02) 6055 6260.

The White Swamp – home to the wetland plant 'billy buttons' on a farmer's property near Boorhaman.

Landholder Ian Stevenson (with pup Merle) in the area he will be fencing off on his property.

Catchment Management

The Living Systems

There's no doubt that land management is undergoing a great deal of change. Traditional industries are waning and new industries emerging. These changes raise many questions relevant to life on the land.

For example, how should I manage the land for the sort of natural environment I want to leave future generations of my family? How can my family and industry benefit from increased buyer demand for 'green' products? If I fail to account for environmental values, will I be locked out of environmental management system based trading? What indicators can be used to measure the health of my property?

The Living Systems Project is an integral part of the Farm$mart and Land for Wildlife programs and is funded by the NHT.

The project aims to help landholders benefit from the contribution biodiversity (plants, animals and the systems they form) can make towards the sustainability of their property, industry and lifestyle.

What do farmers value?

The Living Systems Project conducted a brief survey of broadacre landholders to determine what values are of significance to them and why they have retained native bushland.

Wellbeing (being healthy and satisfaction with lifestyle) was valued most highly by the majority of respondents. Future environmental stability (having a sustainable farm and enjoying the landscape) was second choice overall, followed by relationships (having close relationships with family and friends and providing for your children) and fourth was economic/wealth (having a profitable business, generating new markets and managing debt).

Retention of native vegetation was most commonly linked to its intrinsic beauty and its contribution to the enjoyment of the landscape. Direct benefits such as stock shelter or timber reserves were also identified as being important. For a few respondents, remnant vegetation was retained because there was no reason to remove it or it was perceived to be unproductive land.

Working with Landcare groups, the Community Planning Program will develop a planning framework to enhance biodiversity in local landscape plans and will encourage ongoing involvement in planning, implementation and monitoring.

Project

By Penny Richards

Biodiversity, values and sustainability

The Living Systems Project is exploring how biodiversity can contribute to the range of landholders' values including wellbeing, sustainability, relationships and wealth. For example, wellbeing relates to having good health and this is promoted through less use of pesticides (natural pest control) and relief from stress (time to relax with a stroll through your bush). Relationships are strengthened through the commonly held value of wanting to leave the land in better condition for the next generation.

Vegetation contributes to sustainability in many ways such as lowering watertables and preventing erosion. Biodiversity can contribute to increased wealth through such things as increased property values, ecotourism, carbon credits, and in the future, accreditation for sustainable products.

The Living Systems Project is being delivered through three programs.

1. The Education and Training Program will provide specialist input and support to the Farm$mart workshop series, ensuring they offer Victorian landholders the best available information on how living systems can benefit them.
2. The Industry Support Program will work in partnership with industry to examine how industry can benefit from biodiversity.
3. The Community Planning Program will assist Landcare groups to include biodiversity in landscape plans.

For further information or to join the Living Systems Project mailing list contact Penny Richards at NRE on (03) 9412 4538.

Relationships are strengthened through the desire to leave the land in a better condition for future generations.

Junior Landcare

Dederang's living links

By Margrit Beemster

The group of children eagerly peering into a bucket of water says it all. What better way to learn about the environment and water quality than from first hand-experience!

Their excitement as they 'discover' mayfly nymphs, a tiny shrimp and mud-eyes in the water from a seasonal creek that runs through the school grounds is delightful to watch. It confirms that education, particularly of our children, is the key to looking after our environment.

For the 60 children from the Dederang Primary School in the north-east's Kiewa Valley, the 'Living Links' project at their school provides an ideal opportunity to be involved in an ongoing project which links the school, the local Landcare group, Waterwatch and the North East Catchment Management Authority.

Doug Connors, parent and Landcare group member, said the kids and their enthusiasm are a perfect example of the next generation of Landcare at work.

Transforming the old pony paddock

The project is located in the school's old pony paddock.

"It was just a mess, an unsightly snake pit overgrown with willows, thistles and weeds," said Bruce Birrell, teacher and Waterwatch Facilitator.

There's been an amazing transformation since the project began 12 months ago. The old fence was removed; a parent bulldozed away the willows and rubbish; another used an excavator to clear the watercourse and put in a frog pond, a yabby pond and an island.

The children have lined the creek with rocks, planted 50 native trees and shrubs, and are collecting seeds to grow their own trees in a new shade house.

Dederang Primary students have their own frog pond.

Landcare group members Peter and Rhonda Serpell work with the students each week.

"It's exciting to see the kids do the whole lot," said Peter.

"They've started with a plan and gone from there. We give them guidance but it is very much their project."

The Landcare group has applied for funding to build footbridges and raised walkways to prevent damage to plants by children at play. More understorey species will be planted, and hollow logs and nesting boxes provided to encourage birds to return. For the kids it's all good fun.

"I like learning about bugs and plants," said Desiree Gohe, eight, from Dederang.

For Charlie Connors, seven, from Kancoona, who likes building bridges out of rocks across the creek, "it's better than doing maths" – the conventional way, that is.

For further information on the Upper North East Water Quality Strategy contact Veronica Lanigan on (02) 6055 6260.

Teacher Bruce Birrell shows Genevieve Jones, Desiree Gohe and Charlie Connors how to test water quality.

Genevieve Jones, seven, enjoys the 'old pony paddock'.

A poorly managed water frontage.

Tips on managing water frontages

Water frontages, both public and private, comprise the land immediately alongside creeks and rivers, including the riverbank itself, plus land surrounding lakes and wetlands. Water frontages can vary in width from a narrow strip to a wide, densely vegetated corridor. They are generally very valuable, and often fragile. Many of Victoria's water frontages are in a degraded condition.

There are many good reasons to manage water frontages effectively:

- decreased erosion, greater bank stability;
- improved water quality, reduced algal growth;
- healthier land and water ecosystems;
- better stock management;
- increased capital values of properties;
- shade and shelter;
- lowered water tables; and
- increased fish stock.

Managing frontages is not cost-free but the benefits gained and the problems avoided outweigh the costs in the medium to longer term.

Tips on stock management on frontages

- Use the appropriate type of fencing to regulate animal access and grazing pressure.
- Use fenced frontages as a living haystack.
- Build hanging or drop fences across narrow streams.
- Use portable electric fences along frontages and across streams.
- Install electronic fences – stock wear an ear tag and transmitter boxes emit a continuous signal to form a virtual boundary – the ear tags respond with an audio signal followed by an electronic stimulus.
- Restrict access to streams with formed access points where a graded slope is protected with concrete, gravel or logs to form a walkway.
- Once areas are fenced they still need to be managed, for example, pest plant and animal control.

Tips on offstream watering

- Connect water troughs to a permanent water supply like a dam or a reticulated water supply, rather than by pumping from the stream.
- Provide groundwater using an electric or solar pump or windmill.
- Pump small volumes using the flow of the water to a header tank.
- Consider nose pumps.

Tips on retaining frontage vegetation

- Retain and improve existing frontage vegetation by fencing.
- Grow vegetation on the bank face itself.
- Encourage native vegetation as shade and shelter for livestock, particularly shorn sheep and newborn lambs.
- Combine natural riparian vegetation with a rough grass buffer strip to improve water quality.
- Allow snags to remain in streams to provide habitat.

Tips on revegetation of frontage areas

- Select a range of vegetation including indigenous grasses, reeds and shrubs, as well as trees.
- Establish vegetation as far down the base of the bank as possible.
- Choose smaller plants near the lowest part of the bank.
- Plant native trees – their fine roots can provide additional soil strength to at least three metres depth.
- Protect the new plants by fencing.

Remember that there is not just one right way to manage all frontages – choose the best approach for your own situation, according to the size of the stream, whether it is regulated, or flood-prone and so on.

It is a condition of all Water Frontage Licences that the public has the right to enter and remain for recreational purposes, except for camping, on licensed water frontages. A further condition is that the licensee must provide suitable means of pedestrian access through any fence crossing the frontage.

Finally, work with neighbours and the catchment community. Frontage management is not about small disjointed plots but about well managed corridors along all our streams and rivers.

These tips were put together by the Working Group on Crown Water Frontages. Contact your local Catchment Management Authority or Land Victoria officer for further information.