Coorong Tatiara

Sustainability, Agriculture & the Environment

Summary of recharge reduction under perennial & annual vegetation reports undertaken in the Coorong & Upper South East Districts in the early 1990's

This Fact Sheet Covers: Report Background, Introduction, CSIRO Reports, Review of Previous Studies, Key Outcomes Summarised Across These Plans & Strategies & Studies

Report Background

Dryland salinity was a growing concern for agriculture in the Coastal Plain of the Murray Basin during the 1980's and early 1990's. As with other areas of South Australia and the Victorian Mallee, the studies showed that clearing of native vegetation and replacement with shallow rooted crops and pasture species had led to significant increases in recharge rates (Walker et al 1992; Kennett Smith et al 1994).

Introduction

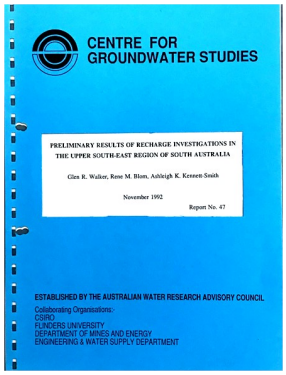
A five year study (1992 to 1997) into the cause of dryland salinity was conducted between Cooke Plains and Coomandook by CSIRO Division of Water Resources and Department of Mines & Energy.

The Cooke Plains and Coomandook groundwater recharge studies are among the most extensive conducted in South Australia. The outcomes of these reports have been applied across the Upper South East / Coastal Plains landscape and form the basis for the Coorong Districts Soil Conservation Board District Plan, three editions of the Coorong District Local Action Plan and the dryland salinity components of the Tatiara Local Action Plan, and numerous other salinity studies and publications State wide.

CSIRO Reports

A five year study (1992 to 1997) into the cause of dryland salinity was conducted between Cooke Plains & Coomandook by CSIRO Division of Water Resources & Department of Mines & Energy.

The aim of study was to develop (by calibrating against field data) a groundwater flow model in order to predict the impact of groundwater levels for land management options which are available to the areas landholders for the control of dryland salinity. It considered options which included continuing current land management practices, reducing groundwater recharge & enhanced groundwater discharge.



Information gained from these studies was used as baseline information for many local & regional plans & strategies.

Review of Previous Studies

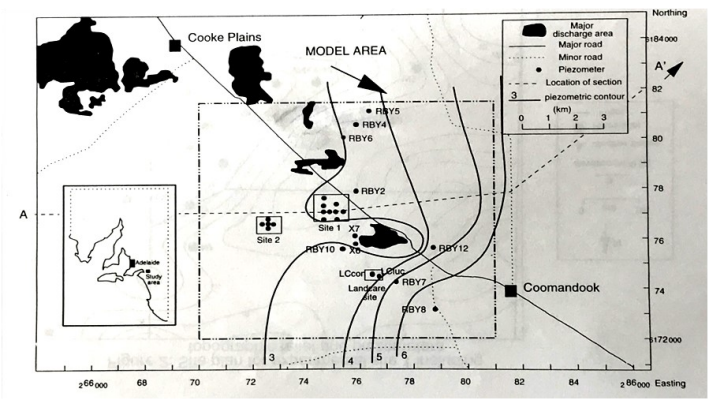
The Coorong Tatiara Local Action Plan and Coorong and Tatiara District Councils have recently completed a Dryland Salinity related project reviewing the studies carried out in the Coomandook Cooke Plains area since the early 1990's.

The report ***"Undertake interpretation of recharge reduction under perennial and annual vegetation reports undertaken in the Coorong and Upper South East Districts in the early 1990's"*** provides a review of all dryland salinity and recharge related documents produced across the Coorong and Tatiara Districts over the last 30 years. This report provides a synopsis of the background and key findings from each report.

The report concludes that key recommendations for the management of dryland salinity are consistent across all reports and studies. The basis of these reports, the extensive CSIRO groundwater and recharge studies undertaken in this region, underpin all standing on ground works targets and technical recommendations. The CSIRO groundwater and recharge studies undertaken from 1992 - 1997 are the most extensive and detailed groundwater and recharge studies undertaken on the dryland salinity affected areas of the coastal plain in South Australia.

To access the full report please use the following link:
https://www.coorong.sa.gov.au/__data/assets/pdf_file/0024/776112/CSIRO-Study-updated-logos-14.10.2020.pdf#CSIRO%20Study%20updated%20logos%2014.10.2020

The Initial CSIRO study area at Coomandook



The key outcomes summarised across these plans and strategies and studies

Actions aimed at slowing dryland salinity processes are often profitable to the landholder, while having a range of other benefits. Other reasons to undertake actions formally considered dryland salinity focused include; restoration of native vegetation, reducing wind erosion, protecting groundwater quality, increasing groundcover and maintaining soil carbon.

Preventative works need to be carried out over a large scale to be effective. A reduction in recharge of at least 50% and preferably 90% is needed over thousands of hectares. To achieve this level of adaptation, the recharge reduction solutions need to be cost effective and ideally profitable.

To implement planned works within ten years to achieve at least a 50% reduction in recharge.

The recommended strategies to achieve this are;

- Establish deep rooted perennial pastures or fodder shrubs.
- Increase crop and pasture water use by increasing their health and productivity.
- Establish trees and shrubs as forestry blocks and windbreaks to use up water that drains below the surrounding crop and pastures root zone. The density of plantings will depend on the species, age and health of the trees, climate, soil and landscape position.

The *second approach* to managing dryland salinity is to manage affected soils that result from rising water tables.
Following are some strategies for rehabilitating and potentially preventing the spread of these salt affected areas.

On cropping land with low to moderate salinity;

- Use salt tolerant crops such as barley or canola.
- Sow salt tolerant pasture cultivars, e.g. Balansa Clover, Messina, Puccinellia, Tall Wheat Grass.
- Grow high yielding crops and pastures to maximise plant water use.
- Aim to overcome other limiting factors ie. low fertility, disease control, weed control and seed bed preparation.
- Maintain crop and pasture residues to ensure the soil surface is covered at all times, reducing evaporation.

On land that is highly saline;

- Pastures need to be fenced off to enable the control of grazing pressure. Where possible keep these areas separate from annual crop and pasture land.
- Establish salt tolerant perennial pastures.
- Encourage and maintain surface cover at all times to reduce evaporation and prevent salt concentrating at the surface.
- Graze perennial pastures in Spring and Autumn and allow them to set seed on a regular basis to maintain stand density.
- In areas suited for revegetation, establish salt tolerant native trees and shrubs around the edge of salt affected sites to increase water use and halt or slow down the rate of spread.
- Rip bare patches to roughen up the soil to promote the leaching of salt.
- Where possible, cover any bare patches with sheep crutchings, hay, straw, or similar material to reduce evaporation, encourage natural regeneration and reduce erosion.
- Drainage and groundwater pumping may be an option in some areas.

Establish salt tolerant pastures such as Puccinellia

Coomandook Landcare Groundwater Monitoring Network

Following local concern at the amount of valuable cropping land being lost to dryland salinity and also the work being done locally by the CSIRO, funding was obtained to install 25 strategically placed piezometers to aid landholders in monitoring groundwater levels and aid changes in management practices.

The Coomandook Landcare Network comprises 25 shallow wells up to 5.5m deep that were drilled in April 1994.

This network is not part of the official
DEW Water Connect network.

Coorong Tatiara Local Action Plan

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https://www.coorong.sa.gov.au/council-services/coorong-tatiara-local-action-plan/water-security

Australian Government | National Landcare Program