

NRM AND SOIL HEALTH



Regional natural resource management organisations are drivers of change for soil health and improved land management. Soil degradation and loss of topsoil is a significant challenge facing producers and has implications for waterway health and carbon storage. These featured projects represent a small snapshot of the many large and small soil health activities being delivered by regional NRMs across Australia.

VICTORIA

Securing North East Soils Through Knowledge Exchange

The North East Catchment Management Authority (NECMA) is supporting two intensive soil extension programs and nine community groups to tackle the issue of acid soils. This is helping to improve knowledge exchange between farmers, researchers and industry, and is boosting the adoption of restorative land management practices that will improve soil condition.

Acid soils are a major cause of land degradation and threaten the productivity of agricultural soils in North East Victoria. Nearly half of the 5 million hectares of Victorian land affected by very acidic topsoil are found in the North East region.

Led by NECMA through NLP funding.

<https://www.necma.vic.gov.au/Projects/Current-projects/Securing-North-East-Soils>

HIGHLIGHTS

- Support for two soil extension programs delivered by Agriculture Victoria and Murray Dairy
- The 'GrazFert' Agriculture Victoria program involves 60 participants. A soil management plan is being developed for each participating farm
- In 2019-20, 23 farming businesses in the Ovens/King Valley and Upper Murray were supported through the GrazFert program
- The 'Fert\$mart' Murray Dairy program supports development of a soil and nutrient management plan for 24 dairy farmers
- Two community soil health projects were funded in 2019-20; Ovens Landcare Network and Riverine Plains Inc.



Healthy Soils Sustainable Farms

This project helped farmers take the next step in production efficiency and reduce the impacts of erosion, salinity and nutrient run-off. West Gippsland Catchment Management Authority (WGCMA) engaged with around 900 people and worked with them to develop and implement management plans for soil, nutrients and grazing. As a result of project activities, 119 farms adopted sustainable practice change. Addressing production inefficiencies brings economical benefits and helps reduce the impact of environmental pollutants entering waterways and the atmosphere.

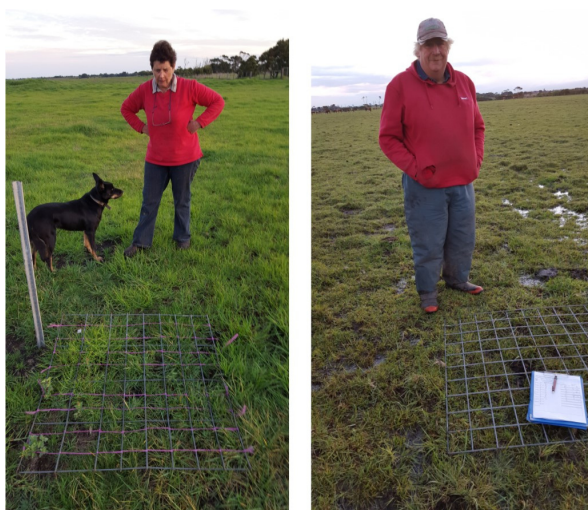
Feedback from participants indicate that adopting these new practices has improved their bottom line and the health of their soil.

Led by WGCMA with NLP funding (2013-2018)

<https://www.wgcma.vic.gov.au/for-farmers/healthy-soils-sustainable-farms>

HIGHLIGHTS

- 10,100 ha improved management practice implemented
- 35,205 ha changed to sustainable practice
- 71 events held across the region



Ann Coulson (left) and Bryan Walpole in their paddocks of Quantum fescue. Quantum fescue has had excellent persistence in saline and waterlogged paddocks (June 2016).

WESTERN AUSTRALIA

Healthy Soils Healthy Rivers Program

Maximising nutrient-use efficiency and minimising the impacts of fertilisers on waterways is bringing benefits to producers and the environment in the Swan-River region through a collaborative effort between NRMs, farmers and industry to improve soil health and water quality.

This program was delivered by regional NRMs and State Government and supported landholders across multiple sub-catchments to improve production efficiencies and reduce fertiliser inputs. One land manager reported a 35% reduction in nitrogen use as a result of the program.

Positive feedback from participants helped to attract additional funding (via Wine Australia) to expand the project to wine grape producers from other catchments.

A joint initiative between Perth NRM, Wheatbelt NRM, WA State Government and NLP (Round 1).

<https://www.perthnrm.com/project/healthy-soils-healthy-rivers/>

HIGHLIGHTS

- 130 participants involved in the program
- One-on-one support from a recognised industry-appropriate agronomist
- Program participants received a comprehensive nutrient management report



Southern Soils

A new website is helping WA's South Coast community understand climate predictions for the region, how future climate trends might impact farming enterprise and what can be done to manage that risk.

Developed by South Coast NRM (WA), the Southern Soils website includes resources such as case studies, information sheets, YouTube videos and links to a variety of regionally relevant sustainable agriculture topics. <https://www.southernsoils.org.au/>

Talkin' Soil Health Conference

Every second year Wheatbelt NRM works in partnership with other NRM regions in Western Australia to hold the Talkin' Soil Health conference - the largest, public soil health event in WA. Wheatbelt NRM funds project administration with out-of-pocket expenses reliant upon sponsorship and aim to attract the highest quality speakers while maintaining affordable ticket pricing.

QUEENSLAND

Improving native vegetation and soil condition of grazing lands

'By working with land managers and helping them learn more about erosion management we improve both land and water quality outcomes.' Erich Brown - Cape York NRM Land and Water Officer.

Multiple regional NRM groups in North Queensland are working with graziers on 16 properties to improve the soils and waters of the Mitchell and Palmer Catchments. As well as reducing erosion and improving water quality in one of Cape York's most significant catchments, the project is supporting training to help graziers improve their skills and knowledge in native vegetation and soil erosion management. Designing developing property-specific action plans that fit into landholders' broader vision for their property is a key aspect of this project.

Delivery partnership between South Cape York Catchments, Northern Gulf NRM and Cape York NRM, funded by the Queensland Government's Natural Resources Investment Program
<https://capeyorknrm.com.au/projects/improving-native-vegetation-and-soil-condition-grazing-lands-within-joint-management-area>

HIGHLIGHTS

- Gully remediation works underway with works completed at two creek sites
- Property specific action plans developed for ten land managers
- Early wet season burning completed on 3 properties to protect groundcover and reduce risk of late season wildfire
- Fencing of paddocks and fragile springs sites
- Off-stream watering points installed at seven properties
- Identified and controlled problem weeds at one property to restore healthy pastures

Herbert River Gully and Grazing Project

Engineered erosion solutions and improved land management practices on cattle stations are protecting healthy top soil and productive land, preventing thousands of tonnes of fine sediment from the Herbert catchment (a priority region for sediment reduction) reaching the Great Barrier Reef each year.

Gully erosion and leaking tailings dams from historical mining sites on grazing land are an issue in this catchment. Terrain NRM is working with landholders to target erosion hotspots and prevent the loss of top soil. Feedback from graziers has been positive, as they are seeing changes to their landscape and improved cattle health.

Funded through the Australian Government's Reef Trust IV Program <https://terrain.org.au/herbert-gully/>

HIGHLIGHTS

- 2,000T p.a. total sediment saving across all sites
- Major earthworks on 4 cattle stations (rock chutes, bund walls, a basin)
- 15 workshops engaging landholders on grazing naturally and soil health
- 14km of fencing and new watering points to keep stock off stream banks
- 4 ha of revegetation across 3 remediation sites

Sustainable Soils for the Burdekin

Across nearly 9,000 ha in the Burdekin, 69 farming entities have adopted sustainable practices to increase productivity, improve ecosystem services and build climate change resilience. This is thanks to a five-year Sustainable Soils project that built on relationships with industry, local government, Traditional Owners and Landcare groups to strengthen the understanding of soil health and management within the Burdekin catchment grazing and grower community.

Engagement and extension activities helped participants build and share knowledge about sustainable soil practices and five producer peer groups were developed. Issues associated with sediment and nutrient loss were addressed through improved grazing and cropping practices.

Led by NQ Dry Tropics, with NLP funding (2013-2018)
<https://www.nqdrytropics.com.au/projects/sustainable-agriculture/sustainable-soils-project/>

HIGHLIGHTS

- 10 trial sites for improving soil health across at least 2,400 ha
- 25 workshops delivered to 265 attendees
- Assisted 130 grazing/intensive cropping land holders to conduct soil resource management self-assessment.



NORTHERN TERRITORY

NT Soil Consortium

Territory Natural Resource Management established the NT Soil Consortium to bring together soil experts, industry and land managers. Soils in the Northern Territory are highly variable and difficult to manage conventionally. The Consortium has engaged with over 275 people and is helping land managers put practices in place that will improve soil condition on farms through workshops, courses and discussion groups.

Delivered by TNRM for the NLP's Smart Farm Small Grants.
<https://www.territorynrm.org.au/healthy-soils-nt>

HIGHLIGHTS

- 52 farmers adopting sustainable land management practices across 4M hectares
- Annual Soils Symposiums hosted in Alice Springs, Darwin and Katherine bringing the latest research, information, news and case studies from soil experts and industry leading farmers to a regional audience
- 'Digging Deeper' soil education program helped 18 farmers understand soil processes and how to implement changes to address soil issues

NSW

Healthy Soils, Productive Pastures

Greater Sydney Local Landcare Services is helping to improve and protect the region's soil condition, biodiversity and vegetation by providing landholders with funding incentives to carry out on-ground projects on their property and adopt best practice land management strategies.

While COVID restrictions have hampered the planned series of field trials, demonstration days, and field days to showcase best land management practices, and workshops on topics such as pastures and soil health, Greater Sydney LLS are planning three soil health demonstration sites and a soil and pastures workshop in 2021.

Led by Greater Sydney LLS through NLP funding
<https://www.lls.nsw.gov.au/regions/greater-sydney/key-projects/healthy-soils,-productive-pastures>

HIGHLIGHTS

- Established a pasture blends trial site at a demonstration farm in Richmond
- Field day presenting information on the pasture trial as well as the stages and techniques required for pasture establishment, attended by over 70 people



Soil testing and interpretation workshops

South East Local Landcare Services is running a Soil Testing and Interpretation Program that includes 12 regional workshops to help producers better understand plant nutrition requirements and key factors contributing to soil health.

Landholders are also being guided through the highly successful 'Five Easy Steps' program, which teaches the value of soil testing and how to use soil test information to plan fertiliser and livestock investments. It provides a framework for implementing a sustainable grazing system, matching stocking rate with land capability and fertiliser use.

Funded through the NLP's Better Land Management Project.

HIGHLIGHTS

- Over 700 soil samples taken from 17 properties from Nov-Dec 2020
- Approximately 200 producers participating in workshops

Farming Forecaster

Developed with graziers, Farming Forecaster is an innovative decision support tool that places soil moisture, local weather, pasture production and livestock performance information at farmers' fingertips. By bringing together key information, it is helping farmers plan early to address issues such as soil moisture, pasture growth and livestock performance.

Farming Forecaster gives producers a clearer picture of future trends impacting production, and gives them the information they need to be proactive about grazing management. Managing pastures to maintain adequate levels of groundcover is key for improving soil health, reducing run-off and soil erosion and managing weeds. Farming Forecaster provides real-time information on predicted ground cover levels 3-4 months into the future and predicts the likelihood of critical groundcover thresholds not being met.

Farming Forecaster is supported by the Commonwealth's National Landcare Program through their Smart Farming Partnerships project. <https://farmingforecaster.com.au/>

SOUTH AUSTRALIA

Regenerating Soil Health

This project is looking at carbon levels in different soil types and permanent-pasture management systems in the high-rainfall grazing systems of the Hills and Fleurieu region.

Soil organic carbon has an impact on overall soil health and limits to production. By establishing benchmarks for optimal/achievable soil organic carbon (SOC) land managers will be better informed to make management decisions and improve their understanding of natural limitations to soil carbon as well as the potential on farmed land.

Supported by Hills and Fleurieu NRM Board through NLP funding.

HIGHLIGHTS

- Field sampling work and testing complete, report to follow
- New soil DNA testing process measuring bacteria and fungi in different soils
- Assessed SOC in different grazing and management systems (including regenerative farming practices), and adjacent native vegetation sites
- Fire impact analysis is being carried out

Recovering Eroded Land in SA's Pastoral Zone

The Landscape Legacies Project collected historical data from soil management works in the arid lands to help land managers living in rangeland environments learn from tried and tested approaches prior to starting or expanding their own projects.

Land managers were able to work with industry experts to learn about different soil management practices and look at ways to improve retention of soil moisture and perennial vegetation on their properties.

Supported by SA Arid Lands NRM Board through NLP funding (2018)

https://www.landscape.sa.gov.au/saal/land/land-management/Recovering_Eroded_Land

HIGHLIGHTS

- Seven case studies covering soil management works and mechanical techniques including pitting, contour ripping, water ponding and diversions
- Case studies showcase best-practice soil management activities from around the region

Building Resilient Agricultural Systems on Kangaroo Island

This project is empowering farmers to naturally build soil health and soil carbon for improved production and profit, and for better environmental and social outcomes. It is demonstrating practices and systems that increase ground cover and improve soil carbon and organic matter, which in turn improves water infiltration and plant nutrient availability.

There is a focus on holistic grazing managing; increasing species diversity in the paddock, valuing native vegetation, using cell and rotational grazing for optimum pasture production, while building long-term resilience to support adaptation to a changing climate.

Led by the Kangaroo Island Landscape Board through NLP funding

[https://www.landscape.sa.gov.au/ki/land-and-water/Building_Resilient_Agricultural_Systems_on_Kangaroo_Island_P
roject](https://www.landscape.sa.gov.au/ki/land-and-water/Building_Resilient_Agricultural_Systems_on_Kangaroo_Island_Project)

HIGHLIGHTS

- KI Healthy Soils Group established to build a community of practice and collaborate with mainland regenerative farmers to build a support network for practice change
- Four demonstration farms established, challenges and lessons learned will be shared with other farmers
- Using biochar and dung beetles is being explored as a way of increasing soil carbon and soil water holding capacity



TASMANIA

Dung Beetle Ecosystem Engineers project

Tasmania has little dung beetle activity during winter and spring. The Cradle Coast Authority (CCA) is addressing these seasonal gaps as part of its Dung Beetle Ecosystem Engineers project through the introduction of the tunnelling dung beetle, *Onthophagus vacca*.

This species is active during spring and, since confirmation that it could reproduce under Tasmania's temperate conditions, the CCA has been working with low input and organic graziers to increase the knowledge and benefits of tunnelling dung beetles in grazing enterprises, and establish more nursery colonies of *O. vacca*. Tunnelling dung beetles perform valuable services for livestock producers including improved soil structure and fertility, reducing surface runoff and the need to harrow pasture, and benefits to animal health.

Supported by Meat & Livestock Australia, through funding from the Department of Agriculture. Regional extension support provided by Cradle Coast Authority through NLP funding.

HIGHLIGHTS

- *O. vacca* can increase in population by at least a factor of six each breeding cycle in northwest Tasmania
- Six *O. vacca* nursery colonies have been established in northern and northwest Tasmania on low input or certified organic dairy and beef enterprises covering over 2,500 ha.
- Three more nursery colonies will be established during September 2021

