



Department of
Primary Industries



NSW

DRAFT ACTION PLAN

NSW SOILS POLICY

OCTOBER 2011



Draft Action Plan

NSW Soils Policy

Goals

The *NSW Soils Policy* will improve soil condition and productivity and increase the area of land that is managed within its capability, by promoting sustainable use and management of soils, and providing a framework for coordination and collaboration across all stakeholders in NSW.

Objectives and Strategies

- 1 Improve community awareness and understanding of soils, to enhance commitment to better soil and land management
 - 1.1 Increase community awareness of the intrinsic environmental and biodiversity value of soils
 - 1.2 Increase community engagement and citizen science
 - 1.3 Increase support for community natural resource management (NRM) groups
 - 1.4 Embed soil management within the school curriculum
- 2 Provide a comprehensive, current and accessible soil knowledge base to inform land use and catchment planning
 - 2.1 Strengthen programs to develop soil data, information and knowledge management systems
 - 2.2 Better coordinate soil resource assessment and mapping
 - 2.3 Foster soil research and development (R&D) in areas of emerging significance
 - 2.4 Consolidate a monitoring, evaluation and reporting strategy for NSW soils
- 3 Develop the human capacity to better deliver management of soil resources
 - 3.1 Encourage and support collaboration across the soils professional network
 - 3.2 Encourage increased emphasis on professional soils education within a wide range of NRM and related tertiary disciplines
 - 3.3 Develop and promote in-service training in soil management
 - 3.4 Update and enhance soil change management programs

- 4 Improve institutional arrangements that encourage and support sustainable soil management and discourage practices that damage soil condition
 - 4.1 Further integrate soils within the regional NRM model, particularly within Catchment Action Plans developed by Catchment Management Authorities (CMAs)
 - 4.2 Support the consideration of soils in local and regional planning and development approval processes
 - 4.3 Develop strategies to better manage competing interests, particularly on soils of strategic agricultural significance
 - 4.4 Encourage and facilitate innovation in the use of existing and new market instruments
 - 4.5 Improve incentive programs for better soil management
 - 4.6 Review soils and related legislative frameworks
- 5 Foster technical and policy innovation in developing new sustainable soil use and management practices, markets and other institutional arrangements
 - 5.1 Develop and promote new and improved soil management systems for resilience to climate variability and resource use efficiency
 - 5.2 Develop and promote new and improved soil management systems for climate change mitigation and resource use efficiency in agricultural and forestry systems
 - 5.3 Develop and promote soil carbon farming market initiatives and methodologies
 - 5.4 Develop methodologies to protect and manage agricultural soils within urban and peri-urban areas

Objectives, Strategies and Actions

The strategies and actions set out in this table will be led by NSW state government agencies and Catchment Management Authorities, in collaboration with universities and other educational institutions, research institutions, professional bodies and organisations, Landcare groups, farmers' groups and other interested stakeholders.

Responsibilities, priorities and timeframes for individual actions will be established through the NSW Soils Network.

Objective 1

Improve community awareness and understanding of soils, to enhance commitment to better soil and land management

Strategy 1.1

Increase community awareness of the intrinsic environmental and biodiversity value of soils

- 1.1.1 Consider developing web-friendly soils communication tools that can be promoted through the www.soils.nsw.gov.au web hub and through a wide range of other websites.
- 1.1.2 Consider featuring articles in the quality mass media making the links between good soil management and broader economic, environmental and social goals such as healthy food and people, food security, sustainable timber production and reduced greenhouse emissions.
- 1.1.3 Consider developing and delivering soils training into the existing communication channels and networks of key stakeholders including farmers' organisations, Catchment Management Authorities and non government conservation organisations, especially those interested in climate change responses.
- 1.1.4 Support credible spokespeople able to respond promptly to media interest.

Strategy 1.2

Increase community engagement and citizen science

- 1.2.1 Consider integrating soil monitoring components into existing community environmental monitoring (CEM) programs, and/or develop such components for use by groups such as Landcare, Dunecare, schools and farming systems research groups.
- 1.2.2 Consider exploring the potential to develop a soil carbon assessment and monitoring toolkit and sustainable land use assessment kit that is suitable for use by keen and informed lay people, CEM groups and schools.
- 1.2.3 Establish long term community driven demonstrations and trials which protect the soil resource.

Strategy 1.3

Increase support for community NRM groups

- 1.3.1 Recognise Landcare as a key means to achieve voluntary community action on soils
- 1.3.2 Assist Landcare and other NRM community groups, to set realistic goals for soil management where required.
- 1.3.3 Articulate a complementary relationship between voluntary community Landcare groups actions, and CMAs within the regional model.
- 1.3.4 Continue to support local, grassroots, voluntary activities through grant schemes including the range of voluntary land use agreements and covenants.
- 1.3.5 Ensure support for voluntary Landcare and other NRM community groups remains a key performance indicator for CMAs¹.
- 1.3.6 Consider engaging members of the Landcare facilitator network in relation to actions on soils.

Strategy 1.4

Embed soil management within the school curriculum

- 1.4.1 Consider assessing the extent to which contemporary soils issues are addressed within the NSW and national school curriculum, and the draft National Action Plan for Education for Sustainability, and improve soil management curriculum resources for schools where practical.
- 1.4.2 Consider working with relevant groups such as the agriculture, science, environment and geography teachers' networks and teaching institutions to assess current soils units and redevelop if required so that they can readily be incorporated into the school curriculum at appropriate levels.
- 1.4.3 Consider looking for opportunities to pilot such units with enthusiastic teachers and schools in areas with serious soil degradation problems and/or significant opportunities to improve soil management.
- 1.4.4 Consider involving schools in soil management issues through providing learning experiences.

¹ For example through providing educational information and materials for Landcare and other NRM community groups

Objective 2

Provide a comprehensive, current and accessible soil knowledge base to inform land use and catchment planning

Strategy 2.1

Strengthen programs to develop soil data, information and knowledge management systems

- 2.1.1 Consider undertaking an audit of soil knowledge assets to identify those at risk of being lost, and/or which could be made more accessible².
- 2.1.2 Consider undertaking a user needs analysis for soils information in NSW to determine the range of existing and potential users, the type of information they want and their preferred means of accessing it, to capture emerging areas of data requirements as well as address existing deficiencies.
- 2.1.3 Consider identifying senior and/or specialist staff and other professionals with valuable soils expertise for the capture of acquired knowledge to share with other users before it is impossible, difficult or expensive to access.
- 2.1.4 Ensure that the state soil database (SALIS) is as functional, accessible and up to date as possible, incorporating data from federal agencies and recent field experiments and that scientific and metadata standards are adhered to³.
- 2.1.5 Develop a single web hub for all NSW soils information designed around user needs in order to enable key government agencies and educational institutions to interface with it effectively.

Strategy 2.2

Better coordinate soil resource assessment and mapping

- 2.2.1 Consider developing a plan for completing the soil and land resource information coverage across NSW ensuring adherence to state-wide standards, and based on existing coverage and – current and future needs – including strategic land use planning considerations.
- 2.2.2 Consolidate and build upon current work to evaluate the present condition of the state's soils resources, and the future requirements for soil management and the mitigation of degradation.
- 2.2.3 Prepare or update contextual datasets and databases that characterise the drivers of soil change, most notably land use, land management practices, vegetation cover, climate and fine-resolution terrain information, and ensure they are available in a user-friendly form (e.g. through the soils web hub and other natural resource websites).

² For example spatial datasets, maps, research reports, conference proceedings, journal and magazine articles, consultancy reports, models, decision support systems, reference books, guidelines and manuals

³ Including, for example, trials and soil tests results done by farmers groups, private companies and generated through CMA demonstration projects wherever possible

Strategy 2.3

Foster soil research and development (R&D) in areas of emerging significance

- 2.3.1 In a complementary project to the audit of knowledge assets and the user needs analysis proposed at 2.1, consider undertaking a scoping exercise to articulate soils knowledge gaps and define researchable questions, identifying which of these should be targeted through national initiatives and which (if any) are specific to NSW.
- 2.3.2 Based on this scoping exercise, consider developing a soil research prospectus for NSW, identifying the key research questions, the best means of tackling those questions and linking to research programs already undertaken by universities and other research institutes.

Strategy 2.4

Consolidate a monitoring, evaluation and reporting strategy for NSW soils

- 2.4.1 Continue monitoring of NSW soil condition, including reporting on the 2008 soil monitoring baseline, and filling key monitoring gaps in the baseline⁴.

Objective 3

Develop the human capacity to better deliver management of soil resources

Strategy 3.1

Encourage and support collaboration across the soils professional network

- 3.1.1 Consider working with the Australian Society of Soil Science Incorporated (ASSSI) and the Soils Community of Practice (CoP) to develop and keep updated a comprehensive register of people in NSW with formal soil science expertise and/or with extensive practical knowledge and experience in soil management.
- 3.1.2 Consider looking at ways to support this collaboration, for example through the soils web hub, and to involve network members in rewarding activities.
- 3.1.3 Consider investing in leadership across the network, using both existing programs and new tailored programs to develop cohorts of leaders across the soil sector⁵.

⁴ This will permit scientifically valid standards for stakeholders to monitor the effectiveness of their land management practices on soil condition ; and adopting soil monitoring methods (e.g. SoilWatch) for assessing soil and land capability and sustainable land management actions

⁵ For example the Australian Rural Leadership Program; the Williamson Community Leadership Program and the Vincent Fairfax Fellowship Ethics in Leadership Program

Strategy 3.2

Encourage increased emphasis on professional soils education within a wide range of NRM and related tertiary disciplines

- 3.2.1 Consider undertaking a needs analysis for tertiary graduates with specialist soils expertise, and for tertiary graduates with broader training that incorporates solid soil science understanding.
- 3.2.2 Consider analysing existing capacity in soil science courses at tertiary levels within NSW against the need to give undergraduates exposure to soil science within a range of tertiary education courses and in post-graduate training and research in soil science⁶.
- 3.2.3 Consider identifying current and likely future gaps in capacity against need, and scope what would be required to fill those gaps.
- 3.2.4 Consider looking for opportunities to encourage and contribute to the development of a national approach to soil science education at undergraduate and postgraduate levels.
- 3.2.5 Consider updating soils curriculum materials to reflect the possibilities provided by technologies such as Geographic Information Systems (GIS) and databases, global positioning systems (GPS), airborne gamma radiometric remote sensing, digital terrain analysis, simulation modelling, statistical analyses, on-line access to data and the presentational possibilities of new technologies and products.

Strategy 3.3

Develop and promote in-service training in soil management

- 3.3.1 Consider providing in-service adult education courses (combining face to face and web-based teaching) in soil science and management aimed at policy staff, planners, community group leaders and interested landholders.
- 3.3.2 Consider delivering 'train the trainer' type workshops to teach advisory staff (public and private) about issues like soil carbon, and to use and extend soil assessment, mapping and monitoring tools.

Strategy 3.4

Update and enhance soil change management programs

- 3.4.1 Consider developing a better-coordinated approach to the provision of practice change programs in NSW, led by the NSW Soils Network or equivalent body.

- 3.4.2 Consider identifying and promoting best practice on-ground soil and land management projects from across the regions, showing how state agencies, CMAs, industry groups and farmers are working to improve soil management.
- 3.4.3 Consider developing and updating soil materials and tools in practice change programs around consistent messages, informed by the identified knowledge needs.
- 3.4.4 Consider investigating the potential for mentoring programs to link up experienced people who have extensive soils expertise with less experienced advisory staff or students within soil related fields, as a means of transferring and extending insights, know-how and contacts.
- 3.4.5 Consider demonstrating effective soil management by the work undertaken by government agencies on public lands.

Objective 4

Improve institutional arrangements that encourage and support sustainable soil management and discourage practices that damage soil condition

Strategy 4.1

Further integrate soils within the regional NRM model, particularly within Catchment Action Plans developed by Catchment Management Authorities

- 4.1.1 Develop best practice modules (with differences across soil climate zones as appropriate) that can be incorporated into the CAP of each NSW CMA to guide and prioritise activities to improve soil condition, including those activities that improve soil capacity to store carbon.
- 4.1.2 Identify promising initiatives already being used by CMAs and ensure that these are prominent in the soils knowledge base and in-service training programs⁷.

⁶ For example degrees such as agriculture, forestry, geography, water management, climate science and generalist environmental science and natural resources degrees

⁷ For example the Lachlan CMA's Conservation Farming Training Manual, and Land Strategy Manual concentrating on the improvement of soil health

Strategy 4.2

Support the consideration of soils in local and regional planning and development approval processes

- 4.2.1 Consider undertaking relevant mapping of agricultural lands to inform future strategic policy making with respect to agricultural activities consistent with the Rural Lands SEPP 2008.
- 4.2.2 Consider promoting agricultural activities where best placed in terms of existing agricultural land uses, potential synergies from clustering related industries, as well as soils, climate, water and proximity to markets in order to reduce land use conflicts on a regional basis.
- 4.2.3 Consider developing training and/or information packages for town planners and other land use decision makers, who may have a non soils related professional background to improve the consideration of soils within the planning system.
- 4.2.4 Consider contributing to research initiatives and projects relevant to balancing urban and rural development within peri-urban areas.

Strategy 4.3

Develop strategies to better manage competing interests, particularly on soils of strategic agricultural significance

- 4.3.1 Support regional strategic land use assessments that identify the optimum balance of agriculture and mining in specific regions subject to land use conflict.
- 4.3.2 Develop 'fit for purpose' best practice standards for appropriate rehabilitation of mining lands commensurate with the preferred end use of the land.
- 4.3.3 Ensure that these standards are applied to all new and revised mining approvals and performance against these standards is adequately monitored, reported and enforced.

Strategy 4.4

Encourage and facilitate innovation in the use of existing and new market instruments

- 4.4.1 Consider reviewing research into the benefits of soil management and costs of soil degradation and management to identify areas of market failure and potential market signals to improve soil outcomes.
- 4.4.2 Consider promoting the development of soil carbon trading schemes to be incorporated within a national emissions trading scheme.

Strategy 4.5

Improve incentive programs for better soil management

- 4.5.1 Identify gaps in current incentive programs to help address market failure in soil management through delivery tools such as Catchment Action Plans.
- 4.5.2 Consider articulating a framework for the sharing of costs between private beneficiaries and government for improved soil management.
- 4.5.3 Consider investigating the establishment and promotion of new incentive programs⁸.

Strategy 4.6

Review soils and related legislative frameworks

- 4.6.1 Review the operation of, and mechanisms available under, the *Soil Conservation Act 1938* and its relationship with other relevant legislation to ensure that a comprehensive, contemporary and effective legislative base exists to facilitate the improvement and best practice management of soils in NSW.
- 4.6.2 Investigate opportunities for promoting the concept of soil protection and improvements within the legislative framework.

Objective 5

Foster technical and policy innovation in developing new sustainable soil use and management practices, markets and other institutional arrangements

Strategy 5.1

Develop and promote new and improved soil management systems for resilience to climate variability and resource use efficiency

- 5.1.1 Through a NSW Soils Network, consider working with private consultants and farming system research groups to identify and document outstanding examples of innovative soil management practices that have performed well in drought conditions.
- 5.1.2 Consider exploring opportunities to expand the soils-related information coming from trials and to incorporate this information into soils extension activities.

⁸ For example, in particular, new programs that reward good grazing (soil) management in the semi-arid pastoral lands for more effective drought management

Strategy 5.2

Develop and promote new and improved soil management systems for climate change mitigation and resource use efficiency in agricultural and forestry systems

- 5.2.1 Consider developing efficient, user-friendly methods for measuring and monitoring soil carbon and soil carbon potential maps eg improve existing models with better field validation of widest possible range of soils / climate combinations.
- 5.2.2 Consider developing a means of assessing soil carbon sequestration from biomass accumulation based on time series analysis of satellite imagery.
- 5.2.3 Consider completing an assessment of impacts of climate change on NSW soils and develop an adaptation strategy.
- 5.2.4 Consider identifying the most effective ways of building soil carbon over time, in different soil climate zones, in collaboration with relevant interested agencies and groups.
- 5.2.5 Consider building on research work and credible farm demonstrations in NSW to determine whether there is adequate coverage of experimental sites looking at soil carbon sequestration at farm and landscape scales (e.g. link soil carbon sequestration experiments with established MER soil carbon monitoring sites).
- 5.2.6 Consider seeking to fill any identified gaps in the existing experimental framework with new trials of the most promising approaches, using action research methodologies to involve interested stakeholders.

Strategy 5.3

Develop and promote soil carbon farming market initiatives and methodologies

- 5.3.1 Consider identifying and developing effective methods of soil carbon capture and storage.
- 5.3.2 Consider developing carbon farming approaches and methodologies.
- 5.3.3 Consider developing rigorous monitoring frameworks to confirm effectiveness of programs and to support their wider application.

Strategy 5.4

Develop methodologies to protect and manage agricultural soils within urban and peri-urban areas

- 5.4.1 Consider undertaking a pilot project to map flows of water, nutrients and higher productivity soils to encourage water reuse at urban/rural interface within the Sydney basin..
- 5.4.2 Consider identifying opportunities to establish urban food production trials, with monitoring to include soil sustainability issues as well as the carbon footprint and economic efficiency of different systems.
- 5.4.3 Evaluate the properties, benefits and risks of applying recycled organic and inorganic wastes to agricultural and forest lands, communicate key findings to government, industry and the community, and prepare guidelines to ensure the safe, sustainable re-use of these materials.