18 March 2008

Jeanette Radcliffe
Committee Secretary
Senate Standing Committee on Rural and Regional Affairs and Transport
PO Box 1600
Parliament House
CANBERRA ACT 2600

Climate Change and the Australian Agricultural Sector

Thankyou for the invitation to make a submission on the above inquiry.

Mr Geoff Gorrie, the Chair of the National Land and Water Resources Audit Advisory Council has asked me to reply on his behalf.

I have attached part of a discussion paper to which the Audit Advisory Council has contributed identifying the Audit current tasks and some issues associated with developing a more enduring natural resource information management environment in Australia.

I specifically draw the Standing Committee's attention to two aspects of the discussion as they relate to the terms of reference of your inquiry.

First I draw your attention to the Assessment reports of the Audit and in particular the Australian Agricultural Assessment – this work identifies the cost of specific forms of land degradation to Australian agriculture and has provided basic information pertaining to the natural resources on which Agriculture depends. Clearly we will need to know the description of the soils and vegetation resources, and the capacity of our land managers to change land use and management practices to be able to model changing land use as a result of predicted changes in climate.

The Audit process for undertaking these assessments may present a way to coordinate the production of similar information in the future.

Next, the need for an enduring information collection and management infrastructure in Australia. We would see a major strategic activity to underpin Agricultures capacity to adapt and indeed to prosper under changing climatic scenarios is the capacity to monitor and report on changing resource condition, and the capacity of our land managers to change land management practice. Differing land use resulting from changing resource condition and suitability will have social and economic consequences, and our ability to monitor and report on these changes will be essential if we are to manage the change, and support individuals and industry in the process. Increasing the resource description and monitoring programs, particularly capitalising

Level 1, The Phoenix, 86 Northbourne Avenue, Braddon ACT 2612 | GPO Box 2182, Canberra ACT 2601
Phone: (02) 6263 6035 • Fax: (02) 6257 9518 | Web: www.nlwra.gov.au • Email: info@nlwra.gov.au

on improving remotely sensed information (for example land cover information), would be a strategic investment that may assist in defining agricultural opportunities and areas of risk.

We are currently undertaking a project developing a consistent reporting framework for assessing the contribution of Australian Agriculture to the environment, the economy and to the community. Called "Signposts for Australian Agriculture" it is based around collating and presenting in consistent form information that will provide evidence to answer questions associated with agricultures contribution to the triple bottom line. The framework and associated information is available from the Audit or www.signposts4ag.com/ .

On-going reporting on the "status" of Agriculture and the resources on which it depends will be required to ensure that we are capitalising on opportunities, reduce impact and build appropriate policy responses as a result of climate change.

I hope that you find the discussion document of interest and that you bring to the Committee's attention the wealth of information on natural resources and agriculture available on the Audit's web site and on the Australian Natural Resources Atlas. I am happy to supply hard copies of these reports if required.

Yours sincerely

Blair Wood
Executive Director

For Geoff Gorrie
Chair
National Land and Water Resources Audit Advisory Council

National Land & Water Resources Audit

An Initiative of the Natural Heritage Trust

A Discussion Paper

Table of contents

.

.

1 Background

The National Land and Water Resources Audit (the Audit) was established in 1997, under the Natural Heritage Trust of Australia Act (1997), to estimate

- the direct and indirect causes and effects of land and water degradation on the quality of the Australian environment;
- to estimate the effects of land and water degradation on Australia's economy and
- to provide a baseline for the purposes of carrying out assessments of the effectiveness of land and water degradation policies and programs.

The Audit's report in June 2002 (*Australia's Natural Resources 1997 – 2002 and beyond*) summarised the Audit's principal findings to that date, specifically the results of a range of assessments encompassing the condition of the nation's land, water and biodiversity resources. The Audit recognised that:

> "a continued investment in assessing Australia's natural resources to determine their status and change in condition as a result of use, will be cost effective and will underpin the success of the natural resource management initiatives".

The National Land and Water Resources Audit - 1997-2002, (the Audit), produced a series of reports on the condition of various aspects of the Australian landscape. The reports were developed around "themes", based on a needs analysis of the significant natural resource issues at the time. The majority of the Audit activity did not involve collecting new data – it involved collating and presenting information from existing datasets.

The themes and subsequent reports were;

Theme 1 - Australian Water Resources Assessment
Theme 2 - Australian Dryland Salinity Assessment
Theme 3 - Australian Native Vegetation Assessment
Theme 4 - Rangelands - tracking changes
Theme 5 - Australian Agriculture Assessment
Theme 6 - Australians and Natural Resource Management
Theme 7 - Australian Catchment, River and Estuary Assessment
Theme 8 - Australian Natural Resources Information
Theme 9 - Australian Terrestrial Biodiversity Assessment.

Audit reporting has provided major advances in strategic knowledge about the condition and management of the nation's natural resources. It has also highlighted that the extent, quality and timeliness of data are often insufficient to underpin effective use of market-based approaches and investment decisions. An ongoing assessment of the extent and quality of the national data for its suitability to underpin market-based approaches and natural resource management investment decisions is essential.

The various reports of the Audit (1997 – 2002), including the final overarching report and individual data sets are available on the internet www.nlwra.gov/atlas.

A key finding of the Audit in 2002 was that there were significant gaps in information. The baselines developed by the Audit in many of its projects were model-based. Modelling is a necessary and reasonable approach for national assessments and for developing the resultant understanding of cause and effect, but an enduring system of environmental reporting based the monitoring of key indicators requires long term consistent data and information to reinforce these assessment models.

The National State of Environment Report 2006 makes the following comment;

> "The year 2006 must be the last state of the environment report in which the committee initiates the process of indicator and data selection. Environmental data should be continuously updated and

made publicly available on the web. This will require strategic responses that are tailored to national, state and territory, and regional needs and that are sufficiently understood and accepted to be sustained."

"The committee is concerned that the perpetuation of current data gaps could lead to an uncoordinated response"*… to environmental issues and evidence based environmental decision making processes [Audit add-on]*.

Despite the previous activity of the Audit, and progressive State of Environment reporting, there is still no definitive overall view of the types of natural resource information that are required to be collected in the national interest, and managed as a national asset.

The task of the Audit from 2002–2008 is to continue to develop and seek agreement to an indicator-based reporting framework (the National NRM Monitoring and Evaluation Framework), that can commence establishing baselines and commence tracking aspects of natural resource management that have been agreed to by the Natural Resource Management Ministerial Council (the Matters for Target).

The Audit is developing and seeking endorsement for agreed indicators under the National Monitoring and Evaluation Framework, and will be identifying associated data and information needs.

A "mid term" review of Audit activity indicated that the Audit is on track to finalise the indicator framework and identify the information needs by June 2008.

2 Current Audit Activity

.

What the Audit has been tasked to do?

The outcomes that the Natural Heritage Ministerial Board required for the Audit during 2002 - 2007 are outlined in the Audit' Strategic Plan. In summary:

- Develop an agreed set of resource condition and social and economic indicators that will underpin evaluation of the Government's NRM initiatives. (Using the Matters for Target and indicator headings of the National Monitoring and Evaluation Framework).
- Coordinate the development of information standards.
- Support the development of a natural resource information infrastructure to allow community access to natural resource information.
- Undertake natural resource assessments as required, but on a needs basis.

How are we achieving recommendations and agreement?

The Audit is working in partnership with all jurisdictions in seeking recommendations and endorsement of the indicator framework. Specific activities include;

- Working with national issue based Coordination Committees, involving all jurisdictions and associated expert assistance to achieve the following tasks:
    - Specific indicator recommendation;
    - Methods and protocols for using the indicators; and
    - Identifying the products – how can the information against the indicators be presented (maps, graphs etc).
- Trialing the recommended indicators in all states and territories.
- Testing the issues of relevance and scale with regional NRM bodies.
- Facilitating National and jurisdictional workshops involving states, territories and representatives from regions (e.g. social and economic, wetlands, invasive species and coast and estuaries information workshops).

The Audit's key reporting areas 2003 - 2008:

- Identification of the recommended ***Indicators*** underpinning the National Monitoring and Evaluation Framework (NM&EF).
- ***Fundamental Data and Information Needs***–underpinning the NM&EF indicators.
- ***Integrated Resource Condition*** reports (including social and economic contexts) specifically related to: Rangelands
  Intensive Land Use Zone (most NRM Regions)
  Agricultural Industries–"Signposts for Australian Agriculture"
  The second Australian Terrestrial Biodiversity Assessment.
- ***Status of Natural Resource Information*** for all "Matters for Target" identified in the National Monitoring and Evaluation Framework, reporting on coordination mechanisms and collations of information against these indicators for selected matters e.g. invasive species–weeds and vertebrates, vegetation extent.
- ***A Status and Vision for the Australian Natural Resource Information Infrastructure*** (in collaboration with (ANZLIC—the Spatial Information Council).
- ***Assessments against some indicators for selected Matters for Target***–Invasive species, Vegetation and Social and Economic.

3 Establishing an enduring system for reporting on the changes in resource condition and the impact of NRM programs

What have we learnt?

- **Roles and Responsibilities** - identifying roles and responsibilities for monitoring, reporting and evaluation are essential.

- **Relevance** – if it is not relevant to regions and jurisdictions, data and information will not be collected in the medium to long term.

- **Indicator agreement** – it is relatively easy to reach jurisdictional agreement for the "extent" indicators however there are still large information gaps. Condition indicators are more challenging.

- **Baselines** – the development of baselines (actual or modelled) is critical ("*if you don't know where you started…..").*

- **Efficiencies** in data collection and use – requires **alignment of project inputs and reporting** ("*collect once use twice").* There is commonly required enabling data and information across many projects. Efficiencies in collection could occur if programs identify the needs of various projects and establish collection priorities. Coordination across programs can increase awareness and use of common datasets.

- Need for a **long term view** on resource condition collections – landscape change will take more time than project investment timelines.

- Data and **Information management –** there is a need for an agreed national framework for information management:
  - **Access to data** and information is a national issue – e.g. water data summit. National natural resource information needs to be recognised as a **national asset** that is collected, managed and available by all jurisdictions in partnership.

- Need to embrace new paradigms of information display - jurisdictional **NRM infrastructures require leadership** to take full advantage of collections undertaken by jurisdictions, and new ways to present information – e.g. the "Google Earth" phenomenon.
- Reinforce the jurisdictional partnerships – clarify data collection and access issues in **bilateral agreements**.

- The commissioning of **Integrated assessments are essential** to bring information together (social, economic and biophysical) to inform the policy questions in natural resource management and subsequent investment priorities. There is a pressing need to move from indicators to information.

- Some regions and jurisdictional agencies do not put a high priority on natural resource monitoring programs – an activity which is essential for identifications of long term trends in resource condition.

4 Issues in managing information for Natural Resource Management

The Audit and ANZLIC have identified that natural resource information management will be improved through:

- clear articulation of information needs;
- priorities and issues being dealt with in a less reactive, more strategic way;
- a long-term (10–30 year) strategic investment plan to provide NRM solutions;
- nationally consistent, up-to-date and accessible information on Australia's natural resources; and
- baseline and monitoring information to allow analysis of trends, and impacts of investment.

The value of business supported directly by natural resource use is significant with exports from this sector totalling at least $10 billion annually. Significant unvalued ecosystem services are also provided by a well managed environment (e.g. clean water, biodiversity cultural assets).

Sustainable natural resources management requires comprehensive information to support policy development and informed decision-making by all those involved. Natural resources are managed at various scales, from Australia-wide to state/territory wide to regions to single farm paddocks. Each management scale requires information with the appropriate level of detail.

Regional NRM groups and other resource managers (e.g. agricultural industry, environmental groups and individual landholders) require quick and easy access to government, regional and local information for planning and reporting requirements. The private sector is also demanding improved access to government information so they can enhance their capacity to provide value-added services to the NRM community. Information exchange between the suppliers of information and those that require it should be rapid and efficient.

Information required for natural resource management comes from a wide variety of sources:

- natural resource data (e.g. soil, vegetation, water);
- contextual data (e.g. land-use, administrative boundaries); and/or
- socio-economic data (e.g. capacity of land managers, value of commodities).

While much of the information is held and managed by government agencies, increasingly it is also being collected by community-based regional NRM groups and the private sector.

The information required to manage Australia's natural resources must be treated as a national asset and managed accordingly. The Audit (2002) reported that over $185 million is spent each year on water data collection alone by governments and industry. Also, over $20 million was invested in vegetation mapping over seven years through Australian-State partnership programs. Such information remains, however, difficult to find, standardise and integrate to support national assessments.

Long-term, systematic and coordinated management of our information assets would minimise costs of finding, recollecting or integrating data and maximise the return on investment through increased opportunities to apply existing data to decision-making for NRM.

Efficient and effective processes for accessing and utilising data and information will also maximise productivity and sustainability of natural resource dependant industries such as agriculture and forestry, as well as those that indirectly benefit e.g. tourism.

The Audit (2002) report made recommendations to implement an integrated and sustainable approach that would maintain the current investment in data collection and progressively build a consistent, national information infrastructure. While natural resource information infrastructures are being developed in many jurisdictions, with varying levels of investment, there is no significant commitment to an integrated or coordinated national approach (Audit, 2006).

Barriers to the access and use of information for natural resource management must be lowered. Current access and licensing arrangements have high transaction costs and need to be much more efficient.

A framework for improved information management will support:

- improved efficiency through reduced transaction costs and time for accessing information – resulting in reduced project risk and more timely outputs;
- information assets being used for many different purposes – leading to minimal duplication of expensive data collection and maximising information use;
- custodians being able to manage their data and information more efficiently by sharing skills, knowledge and experience – resulting in improved return on investments;
- information being managed by those who are closest to its source and providing points-of-truth for information – providing greater reliability and consistency;
- more efficient data integration – resulting in improved understanding of biophysical and socio-economic processes;
- better understanding of complex natural resource management issues, through the integration of information from many sources and processing with sophisticated applications and decision support tool; and
- more efficient access to information relevant to NRM.

5 Investing in natural resource information

Australia is characterised by intermittent investments in **data collection** associated with natural resource management, particularly description and assessment. These investments are often initiated by national programs arising as a response to current (short term) policy initiatives – for example the Accelerated Land Resource Assessment Program, and the National River Health Program contributed significantly information to the national data set. However, they were only relatively short term programs (less than 5 years).

Jurisdictions have collection programs that are designed to meet their immediate needs and not necessarily national (or multi jurisdictional) objectives. Natural resource management issues often transcend jurisdictional and administrative boundaries and there is a clear recognition that **a National or "whole of Australia" approach is required** to resolve these issues (e.g. water resource management, coastal NRM issues, and invasive species management). Internal jurisdictional priorities often do not include increased collection of information required for resource monitoring and reporting at the national level or to inform national decisions.

Monitoring of resource condition requires a **long term commitment and investment**. Monitoring needs to be an ongoing part of any program. Landscape change and associated resource condition change will require long term investments, not 3-5 year projects. There is a need for a decadal view to get long term trends. There is no clear institutional framework to identify who will be the "keepers of the long view" for natural resource information. There is a clear mandate for organisations like the Bureau of Meteorology and the Australian Bureau of Statistics to enable them to collect information over the long term. Their long term collections form a significant asset for analysing trends in information. Where are the equivalent organisations for the collection of other national natural resource information?

The **data and information needs** for NRM must be clearly identified and articulated. Data and information needs for national reporting (i.e. all jurisdictions), as agreed by relevant national fora, should be collected and managed as a **national asset.**

Data acquisition should be targeted towards **strategically filling gaps** in the key (fundamental) data and information required for NRM. This data collection should utilise nationally agreed standards and be aimed at maximum use (and hence cost efficiencies). The decline in investment in the collection of natural resource data must be reversed.

Programs need to be developed to **collect** relevant national data and information in priority areas (aligned with regional and jurisdictional information gathering). There is emerging evidence that there may be a possible "market failure" issue with respect to collection and collation of natural resource data and information required for monitoring and evaluation. It is clear that information on natural resource condition is important but **whose responsibility** is it to collect such information? There may be a large market for the information but limited investments are being directed at collections over the required long term. Governments are required to report on the effectiveness of their policies. Governments therefore need to be providing resources to collect the evidence required. There should be a mandatory resource condition monitoring requirement linked to publicly funded resource management programs/projects. Industry will also be increasingly required to demonstrate the environmental impact of their land use and management activities.

The Audit and ANZLIC have developed and obtained agreement for a **vision** and principles for an NRM information infrastructure that capitalises on emerging technologies (the web) and investment initiatives (e.g. the National Collaborative Research Infrastructure Strategy and the Terrestrial Ecosystem Research Network). These principles are being embedded within other information management and environmental reporting initiatives. Best practice principles (e.g. ANZLIC–ASDI) for developing a more collaborative approach to data collection, management, access and use should be embraced.

Community capacity for evaluating their performance in NRM is increasing. There is a clear **opportunity** to maintain this momentum and capture the benefits of coordination through alignment of techniques, use of standards and common use of fundamental information over 56 NRM regions; 9 state, territory and Australian governments; and almost 700 local government authorities – all with some form of reporting requirements against natural resource management investments.

All programs require evidence to show a return on investment. **Evaluation of the effectiveness of investment** in natural resource management activities should be on-going and based on evidence. Collecting the evidence requires a dedicated and long term investment in primary data, modeling and interpretative skills to develop useful reporting mechanisms. A dedicated resource allocation should be made to all NRM programs for monitoring and reporting. Clearly there needs to be a coordinating mechanism to develop collection priorities, fund these national priorities and seek collection efficiencies across thematic areas and assess and report on the results of the collection