

Leadership needed on clearing

Native vegetation is the backbone of productive farms and healthy catchments. To save it, governments must organise their carrots and sticks.

Since European settlement, the clearing of native vegetation has dramatically altered the hydrology of the Australian landscape. Despite the knowledge that land-clearing causes dryland salinity, the practice continues apace.

In 2001, a study by the Queensland Herbarium, the New South Wales Royal Botanic Gardens and the NSW National Parks and Wildlife Service found that 687 800 hectares of native vegetation is cleared every year, approximately two-thirds of which is remnant bushland.

As well as the threat of dryland salinity, which is predicted to affect 17 million hectares of farmland by 2050, the capacity of the landscape to withstand drought has been severely compromised.

About 50 000 km of streams have been degraded by sand deposition, and sediments are moving off hill slopes much faster than soil is formed. Our bird life has also suffered, with one in five native bird species threatened with extinction and most woodland bird species in decline (see *Ecos* 111 and 113).

Most land-clearing is occurring in Queensland, NSW and Tasmania. Despite measures to reduce vegetation loss (see story on page 26), breaches of state vegetation laws continue, with few prosecutions.

According to Dr Sandra Walpole, a Natural Heritage Officer with the NSW National Parks and Wildlife Service, a lack of detailed data on the economic benefits and costs of remnant native vegetation conservation has hampered development of effective policies to deal with its decline. But the evidence that native vegetation benefits both on-farm production and broader catchment values is mounting.

For example, a farm study in northern NSW found that the gross value of pasture

output was highest when the proportion of tree area across the farm was 34%. Another five-year trial showed that sheep with access to shelter in remnant vegetation produced 31% more wool and were 21% heavier than their unsheltered counterparts.

'These and other studies will allow land managers and extension agencies to justify the retention of native woody vegetation in both grazing and cropping enterprises on economic grounds,' Walpole says.

Economic information alone, however, will not stop the clearing of land. Rather, a combination of approaches that includes better legislation, regulation, education, incentives, voluntary arrangements and management agreements is needed.

Whichever way it is done, the Wentworth Group says that halting the broadscale destruction of remnant native vegetation is the single most important action the Queensland, NSW and Tasmanian governments can take to protect the future of Australia's landscapes.

'If these states show such leadership, we would encourage the federal government to provide matching financial assistance to ensure these controls are implemented in a manner that is fair to farmers – because it is in the national interest for this to be done,' the group says.

The group suggests that if the states do not act, financial assistance from the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality should be withheld.

New agriculture

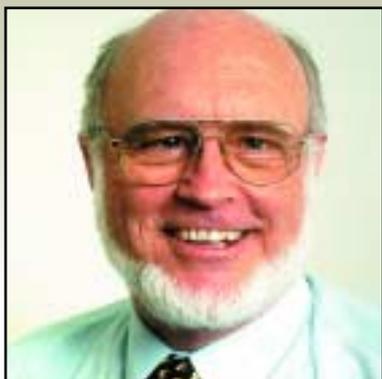
A variety of approaches are required to adapt to, and in some cases ameliorate, the problems of salinity and biodiversity loss caused by land-clearing.

CSIRO Land and Water chief, Dr John Williams, says new farming systems are needed which, unlike our annual crops and pastures, do not leak excessive nutrients and water past the root zone.



CSIRO Land and Water

Some 687 800 hectares of native vegetation is cleared in Australia every year, approximately two-thirds of which is remnant bushland. Most of the clearing is occurring in Queensland, NSW and Tasmania.



Dr John Williams says that only an end to land-clearing, and extensive re-vegetation with native or other plants with similar recharge rates, will reduce groundwater to pre-clearing levels

‘The essential design criterion of sustainable farming is to ensure that present-day flows of water, nutrient, carbon and energy match the magnitude of flows that evolved to suit the way our landscape functions,’ Williams says.

‘The recharge under current agriculture, using the best practice of the day, is from two to 20 times greater than that required to make a significant impact. To be effective, recharge reduction must yield leakage rates similar to native vegetation, and occupy approximately 40% of a catchment or landscape.’

In the CSIRO publication, *A revolution in land use: emerging land use systems for managing dryland salinity*, Williams and his colleagues canvass options for change.

A suite of novel land uses, matched to the diverse climate, soils and hydrological conditions, are proposed. They include:

- commercial tree production for large areas of current crop and pasture zones, to produce fruits, nuts, oils, pharmaceuticals, bush foods and forestry products such as specialty timbers, charcoal, and biomass energy;
- new farming systems comprising the best current annual and perennial plants, the best agronomy, companion plantings, rotations and combinations;
- new forms of cereals, pulses, oilseeds and forages selected or bred for characteristics that reduce deep drainage and nitrogen leakage; and

- the reassignment of land so that landscape productivity is enhanced in suitable landscapes, while other parts are removed from production.

A significant research effort is required to develop these ideas and, if and when they are implemented, Williams says it will take at least 20–50 years before a substantial reduction in groundwater levels becomes apparent. It will take even longer to markedly reduce stream salinity.

In the meantime, engineering strategies to manage recharge and discharge, and saline production systems (such as salt tolerant fodder grasses and salt tolerant trees for horticulture), will be required.

In the long term, only an end to land-clearing and extensive or complete re-vegetation with native or other plants with similar recharge rates, will reduce groundwater to pre-clearing levels, Williams says.

‘The challenge is to build an ecologically sustainable landscape consisting of a mosaic of commercial land uses that yield food and fibre, coupled with native ecosystems that provide a suite of “ecosystem services” (see story opposite), valued and paid for by stakeholders and beneficiaries.’

More about land use and salinity

Stirzaker R Lefroy T Keating B and Williams J. *A revolution in land use: emerging land use systems for managing dryland salinity*. CSIRO Land and Water. www.clw.csiro.au/publications/general.html

Williams J. *Farming without harming in an old, flat, salty landscape*. CSIRO Land and Water. www.clw.csiro.au/staff/williamsj/index.html

Williams J and Gascoigne H (2003) Redesign of plant production systems for Australian landscapes. In: *Proceedings of 11th Australian Agronomy Conference – Solutions for a Better Environment*. Deakin University. www.cdcsign.com.au/agro2003

The Wilderness Society (2001) *New data on Australian land-clearing rates reveals 22% increase in old estimates*. www.wilderness.org.au/member/tws/projects/Woodlands/newdata.html

National Land and Water Resources Audit 2001. www.audit.ca.gov.au/ANRA/atlas_home.cfm

Walpole S. *Economic values of conserving native vegetation*. www.npws.nsw.gov.au/wildlife/biodiversity/strategy/ibca/bioregional/drp/04_econ_value_native_veg.pdf

Signs of progress

IN THE past five years, the following measures have been introduced to address vegetation loss:

- Land-clearing was listed as a key threatening process under the *Environment Protection and Biodiversity Conservation Act (1999)* in early 2001. The listing does not give the federal government power to intervene in state matters, but demonstrates the importance of the issue.
- Government programs were funded by the Natural Heritage Trust that focus on remnant vegetation management, and protection and revegetation through conservation plantings.
- The National Framework for Management and Monitoring of Australia’s Native Vegetation was launched in March 2000 and Australian governments have developed related work plans.
- The federal and state governments agreed to implement A National Action Plan for Salinity and Water Quality in Australia in November 2000, which among other measures prohibits land-clearing where it leads to unacceptable land and water degradation.
- Australia signed the Kyoto Protocol on greenhouse gas reductions in 1998, which has stimulated research and documentation of vegetational land cover change.

More about the measures

State of the Environment Australia, 2001 Fact Sheets. www.ea.gov.au/soe/2001/factsheets/index.html