

19. TREE DECLINE

19.1 PROCESSES

19.1.1 Cause

There are a number of causes of tree decline. These include clearing and fragmentation, intensive grazing, insects, dieback, chemicals, climatic conditions, management practices, fungi and failed recruitment. Clearing results in the loss of native flora and fauna. There are two levels of clearing - broadacre clearing (areas cleared for future agricultural use) and erosive clearing (small but gradual clearing of areas of remnant vegetation for pasture development, through grazing, rural sub-divisions and roadside works) (6).

Dieback is a condition where trees have a rapid decline in health and may eventually die. Causes include insects, nutrient and pH levels, soil water availability, dryland salinity and physical damage by stock and machinery. Small, disturbed areas of remnant vegetation are the most vulnerable to dieback because they lack structural diversity, have high natural tree mortality and are under pressure from insects (6).

Failed recruitment occurs as a result of the removal of new growth due to grazing pressures and the breakdown of natural regeneration processes resulting in the failure of native seeds to germinate (6). Failed recruitment has also been a result of competition from weeds, soil compaction, altered nutrient levels, climatic conditions, loss of native fauna, altered fire regimes, soil water availability and the use of artificial fertilisers and chemicals.

Mistletoe is another cause of tree decline. In a natural, healthy system a balance between mistletoe and host trees is maintained by possums and insects, which act as controlling agents. If the natural system becomes unbalanced this can lead to the amount of mistletoe increasing and tree decline. Increases in the mistletoe population has been caused by a loss of fire regime, excessive land clearing, intensive land use, scattered tree cover, loss or reduction of controlling agents population due to habitat degradation and creation of a modified habitat for mistletoe birds which are the primary agent of spread. Habitat fragmentation can lead to reduced growth rates, breakdown of natural regulatory processes and death of the host tree (6).

19.1.2 Upstream/Downstream Inter-Relationships

Tree decline is associated with reduced biodiversity, rising water tables, salinity, soil structural decline and erosion, declining water quality, reduced agricultural stability, loss of habitat for wildlife leading to threatened species and diminishing economic returns (6).

19.2 PRESENT CONDITION

19.2.1 Extent and Distribution

A State of the Environment report stated that nearly 90% of temperate woodlands in Australia have been cleared. The majority of the Little River Catchment, with the exception of the Catombal Ranges and Goobang National Park, has been severely affected by tree decline, with almost complete loss of the understorey layer. This is a severe problem because so little habitat remains that not only are the vegetation communities under threat, but the many populations of fauna and birds dependent on the vegetation are on the brink of extinction.

Several Catchment Management Units CMU within the Little River Catchment have less than 1% timber cover, particularly around the Yeoval area (13). As tree clearing is closely associated with agricultural development and land capability, the areas most suited to cropping have been extensively cleared.

On a regional basis, dieback affects more than half of the Central West Catchment, in particular, areas on the Slopes and Tablelands and Red Gum communities further inland. The Burrendong survey determined that almost 40% of scattered farm trees that were present in the early 1950s have been lost in 35 years (7).

19.2.2 Severity

Tree cover in the Little River Catchment is significantly less than recommended by DLWC (see Table 21.) In some areas there is little or no tree cover remaining.

Table 21: Actual and Recommended Tree Cover for CMUs in the Little River Catchment (adapted from the Macquarie River Catchment Land Degradation Survey)

Name	Actual Tree Cover %	Recommended Tree Cover % *
Yeoval South	0.00	5.31
Upper Sandy Creek	0.00	12.94
Yeoval North	0.07	5.75
Gundy Creek	1.32	7.25
Suntop	2.15	7.46
Wandoo Wandong	3.07	11.63
Cumnock	4.43	7.24
Baldry/Little River	4.96	9.62
Curra Creek	8.59	10.6

* Recommended tree cover is based on the following guidelines (57):

- Classes I to III - 5%
- Classes IV, V - 10%
- Class VI - 25%
- Classes VII, VIII - 100%

19.2.3 Environmental Impact

There are only small remnants of vegetation left in the agricultural areas of the catchment and many of these areas are of poor quality. This is likely to result in further dieback, and very low rates of regeneration. Other environmental impacts include increased sheet and streambank erosion, rising groundwater, decline in wildlife habitat, loss of nesting sites and fauna biodiversity, decline in populations of insect eating birds and loss of shade for stock (54).

19.2.4 Social and Economic Impact

Current economic impacts include the costs associated with dryland salinity and rising watertables. Other impacts include loss of carrying capacity and shelter for stock, reduced aesthetic value, as well as the cost of replanting trees and protecting stands of remnant vegetation.

19.3 THE FUTURE

19.3.1 Trends

Continued tree decline will lead to further loss of biodiversity and animal habitat and potential loss of production due to erosion and salinity. Charles Sturt University has predicted that 42% of remnant vegetation on the Molong 1:100 000 map sheet will be lost under current land management practices, while 34% of what is regarded as good condition vegetation will be degraded as a result of the management practices (7). The introduction of the Native Vegetation Conservation Act should lead to a slowing in the rate of clearing of native vegetation.

19.3.2 Projected Environmental Impacts

If clearing and tree dieback continue at current rates there will be extinction of species due to losses of fauna habitat, as many remnants are already virtually too small to maintain viable populations of birds or other fauna. Poor regeneration and dieback will lead to the complete loss of remnant vegetation stands. Other environmental impacts include dryland salinity, saline streams and groundwater, sedimentation of waterways, rising water tables, loss of productive land and extreme erosion (54). Clearing needs to be controlled to ensure natural regeneration of vegetation, and to protect the existing biodiversity (7).

19.3.3 Projected Social and Economic Impacts

Future costs could be extremely high. Replanting will be the biggest expense and fencing off of remnant vegetation is also very costly. The associated costs of land degradation are discussed elsewhere. At this time, methods to value the ecosystem services are inadequately developed to provide estimates of biodiversity losses.

19.4 CURRENT ACTIVITIES

19.4.1 Consultation

The Central West Total Catchment Management (TCM) Remnant Vegetation Strategy was developed in 1997 using vegetation maps, fields surveys and field trials and considering policies and management strategies used by the various agencies. There was extensive public consultation throughout this process.

19.4.2 Planning

There is no Regional Vegetation Plan for the area covered by Little River. A Plan of Management, Fire Management Plan and a Bush Fire Risk Management Plan have been prepared for Goobang National Park. The Plan of Management covers tourism, access and weeds. An Environmental Impact Assessment has also been undertaken for the Draft Fire Management Plan.

The TCM Remnant Vegetation Strategy was used to develop a Remnant Vegetation Action Plan. The Plan identifies strategies to protect and enhance areas of remnant vegetation in the Central West Region.

The Soil Landscape maps could be used to indicate what species were most likely to have been present prior to clearing, because of the close association of vegetation with soils. This would be a valuable tool in determining the best species to replant in different parts of the landscape.

The Endangered Fauna of Western NSW (92) has provided the basis for developing a computer based model, based on climatic data (using a 50 * 50 km sq grid) that predicts the fauna species likely to be found at a specified location. The model is capable of calling up individual species and can be in any specified area e.g. map sheets, Local Government Areas. When used in conjunction with maps of existing vegetation, this is a valuable tool in highlighting the vegetation communities that need to be preserved or enhanced.

19.4.3 Research and Development

Environment Australia (EA) and Land and Water Resources Research and Development Corporation (LWRRDC) established a national program of research and development on the rehabilitation, management and conservation of remnant vegetation in 1994. The program was established to assist government agencies, community groups and landholders manage and protect remnant vegetation. Ecological and socio-economic factors are also being researched to provide an understanding of market values, incentives, improved legislation and landholder involvement.

DLWC and CSIRO established a Farm Forestry trial in a low rainfall area near Arthurville, looking at timber, pulp, paper and flowers. CSIRO trialed Acacia species for farm forestry in the Little River catchment.

19.4.4 Implementation

Projects dealing with tree management, tree planting and reforestation are carried out across the Macquarie River Catchment. The Molong RLPB has developed a biodiversity database. The RLPBs are also running exclusion plots to monitor the impact of stock of Travelling Stock Routes.

Greening Australia works with the community to achieve sustainable vegetation management by implementing Bushcare. They aim to increase the area of bushland, provide advice on revegetation, participate in workshops and field days, assist community groups with projects, maintain a regional seed bank, and provide ongoing monitoring and evaluation of vegetation projects. Greening Australia run the Central West Remnant Vegetation Education/Extension Initiative that deals with failed recruitment, dieback and clearing and fragmentation. In the Little River Catchment, 92 hectares of remnant vegetation has been identified as suitable for funding under this scheme. This is approximately 12.5 kilometres of fencing valued at \$15000.

The Grassy White Box Woodlands project has been initiated to prevent further losses of the grassy White Box woodlands. The project provides incentives and support for the conservation and regeneration of these woodlands. Woodland sites are assessed for their conservation value and incentive funds may be provided to support fencing and conservation management initiatives. Voluntary Conservation Agreements, administered by the National Parks and Wildlife Service can also be developed. Funds are available through the NVCA Incentives package for the conservation of remnant vegetation. Data is not available on the total area fenced off under the NVCA Property Agreements in the Little River Catchment.

Macquarie Food and Fibre have provided funding for two plantation plots of fifty hectares, (one in Little River and one in Talbragar Catchment) as an initiative by downstream users to contribute to the cost of upstream works. STIPA promotes the use of native grasses for revegetation programs. The Roads and Traffic Authority, in conjunction with Greening Australia, have developed Environmental Guidelines for Road Construction and Maintenance Workers. The RTA has also been running the Central West Roadside Corridors program, which provides funding for community projects and landholders adjacent to highways to establish or protect vegetation. Plantings have been undertaken along the Mitchell Highway, just to the east of the Little River Catchment.

19.4.5 Monitoring and Evaluation

The Macquarie River Catchment Land Degradation Survey (1994) produced maps and statistics of tree cover in the region (13). Compilation of Vegetation Mapping in the Central West Region - Status Report provides an overview of data collection projects that have been undertaken in the Central West (87).

Other associated projects covering the Central West include the Murray Darling Basinscare Mapping Project 305, Macquarie River Greenways Program, Remnant Woodland Mapping Project (CSU), Natural Vegetation of the NSW Wheatbelt (NPWS), Protected Lands Upgrade Mapping, Rural Lands Protection Board (Vegetation Data) and the Burrendong Survey.

19.4.6 Best Management Options (BMOs)

Greening Australia has information available on techniques suitable for establishing trees. The most commonly used method of tree establishment is tube stock. Direct seeding is less common because it has a lower rate of successful establishment. Further work needs to be done into direct seeding to improve establishment success. It is currently not known what areas of remnant vegetation are required to maintain wildlife populations and the integrity of the remaining vegetation. Further research into this issue is required and targets and recommendations need to be developed from the research findings.

19.4.7 Identified or Perceived Barriers

Some landholders are reluctant to plant wildlife corridors as these are seen to harbor pest animals. Generally, landholders believe that compensation should be given for protecting pieces of land for management under conservation agreements. The agreements are seen to be of public benefit and for this reason, the wider community should provide some compensation. Various incentive schemes have been implemented to reduce this perceived barrier, such as Bushcare, NPWS Property Agreements, Grassy White Box Woodlands and the Native Vegetation Conservation Act Incentives package.

19.4.8 Institutional

A number of pieces of legislation are associated with vegetation management. These include the Native Vegetation Conservation Act, Forest Resource Legislation, Plantations and Reafforestation Act, State Forests Agreements, Threatened Species Conservation Act and Conservation Agreements (NPWS). The Department of Urban Affairs and Planning administer the Harvest Guarantee legislation, which secures the landholders' right to harvest timber from plantations.

The Native Vegetation Conservation Act 1997 was introduced as a result of the State Government's native vegetation reform program (replacing SEPP 46). The Act aims to prevent inappropriate clearance of native vegetation, and sustainably manage the native vegetation that remains. There are also programs in place such as the preparation of Regional Vegetation Management Plans (supported by DLWC and NPWS) and Property Agreements between DLWC and landholders. Funding may be available for Property Agreements.

Due to the extensive clearing that has occurred in the Little River area, all remnants are considered by NPWS to be potential habitat for threatened species. Consequently, it is unlikely that clearing on private land would be permissible under the Threatened Species Conservation Act, even if it was approved under the Native Vegetation Conservation Act.

19.4.9 Investment

Various levels of government have provided a number of incentive programs to reduce the economic hardship of improving the status of vegetation across Australia. Bushcare is a major component of the NHT, and along with MDB 2001, has made large sums of money available for revegetation and protection of remnants.

There is ongoing funding through RTA, Greening Australia and others available to community groups and landholders adjacent to highways to purchase materials, trees, fencing and chemicals. Funding amounting to \$15 million over three years was made available under the Native Vegetation Conservation Act for vegetation conservation projects.

19.4.10 Cost Sharing

Costs of conserving native vegetation are largely met by landholders through lost production. However, there is a strong push for a public good contribution from the wider community. Proposals such as reduced rates and tax concessions are being considered in order to compensate landholders for giving their land over for conservation values. Investment programs have been set up to fund tree plantings and farm forestry programs. State government agencies such as State Forests and NSW Agriculture run programs including Farm Forestry and Farming for the Future. These are mostly funded using NHT funds.

Carbon credits is another investment program being developed. The Kyoto Protocol was developed to encourage countries to cap, and then reduce, their carbon dioxide emissions by setting greenhouse emission targets. Countries will be permitted to trade their emission target allocations, offset their emissions against specific tree planting initiatives or invest in Clean Development Mechanism (CDM) projects.

The Sydney Futures Exchange (SFE) is developing domestic emissions trading scheme. When this scheme begins in July 2000, companies will be able to purchase and trade credits against their emission targets. Establishment of suitable plantations is necessary immediately to maximize their potential for producing carbon credits during the Kyoto Protocol commitment period (2008-12). Two sources of credits may be traded - carbon dioxide equivalent permits (units of the country's original allocation) and credits from sequestration projects (plantations etc) (88).

Credits for salinity and biodiversity are also being considered to stimulate vegetation plantings.

19.5 ANALYSIS

19.5.1 Identified or Perceived Gaps

There is almost no information about vegetation communities on a species/floristics scale; only the presence or absence of trees. There is also a lack of information regarding the understorey and there is very little landholder activity in this area. There is little information known about dieback and mistletoe (cause and control of tree health). There is a need to expand previous work on vegetation, survey the extent of dieback in all regions, and determine management requirements. At present there is no regional vegetation plans in the Central West under the Native Vegetation Conservation Act. It is unlikely that a plan would be developed for the Little River Catchment in the near future because there is so little vegetation remaining on private land.

19.5.2 Key Stakeholders and Contacts

Department of Land and Water Conservation

Andrew Briggs - Native Grasses, Wellington
Vanessa Allen - Vegetation Management Officer, Dubbo
Robert Gibson - Vegetation Management Officer, Dubbo
David Pritchard - Vegetation Management Officer, Orange
Gary Howling - Regional Vegetation Planner, Dubbo

NSW Agriculture

Kathy Waters - Native Grasses, Trangie

CSIRO

Suzette Searle, Canberra (Acacia trial)

Greening Australia

Gary Alan - Manager, Central West, Bathurst
Janet Brown - Project Officer, (NPWS Office) Bathurst
Vanita Colquhoun - RTA Project, (DLWC Office) Coolah
Les Deane - Seed Nursery, Molong

Grassy White Box Woodlands

Mollie Whitehorn & Geoff Tonkin, Cumnock

RLPB

Alison Nowland and Chris Lane, Molong RLPB

STIPA

Darryl Cluff, Project Officer, (DLWC Office) Coolah

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