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Executive Summary

1. Introduction

A “Local Greening Plan” is a structured and systematic approach to managing vegetation to help maintain biodiversity in a local government area for the longterm” (Greening Australia, 1995).

The Maitland Greening Plan has been developed to provide a strategic framework for the future management of vegetation in the Maitland Local Government Area (LGA). The Greening Plan focuses on the vegetation that remains in the Maitland LGA, whilst also providing a strategy for revegetation works. This includes measures to address land degradation issues, firm up wildlife corridors for biodiversity management and opportunities for the inclusion of woodlots and farm forestry.

The Maitland Greening Plan was developed, with the assistance of a Coordinating Group representing a cross section of community interests relating to bushland management issues. The Greening Plan will provide Council with details of a variety of environmental issues (all relating to vegetation management), and options to mitigate or solve these problems.

The Maitland Greening Plan is a local response to the global issue of vegetation clearance and biodiversity loss, and the range of land degradation issues that result from such actions. In this respect the Greening Plan is an important part of Council’s commitment to Ecologically Sustainable Development.

The following principles have guided the development of the Maitland Greening Plan:

1. ***To produce a positive, transparent plan, which will inform and educate the Maitland Community.***
2. ***To ensure the maintenance and enhancement of the natural heritage and biodiversity, now and in the future for the Maitland Local Government Area.***
3. ***To recognise the importance and value of a healthy functional environment and the provision of an opportunity for passive recreation for the Maitland Community.***
4. ***To identify critical locations, stakeholders, management issues, options and assistance packages that best achieve the above objectives.***
5. ***To incorporate the principles of ESD (Ecologically Sustainable Development) into the long-term management of vegetation in the Maitland LGA.***
6. ***To propose a retention target for different vegetation communities in the Maitland LGA***

What is biodiversity and why is it important?

As detailed in the glossary, biodiversity or biological diversity is defined as the fabric of nature, the many and intricate components that make up the natural world, and most importantly the relationships that exist



The suitable management of Maitland’s many and varied bushland environments is the central aim of the Greening Plan.



between them that have developed into crucial processes upon which all life depends.

Biodiversity has an economic value, in terms of the advantages derived, such as agricultural productivity, or the cost involved in repairing the impacts of its loss, such as erosion or salinity. Biodiversity also has a social or cultural value in respect to aesthetics or scenic attributes, in terms of defining a sense of place, as well as an ethical or moral value in regard to basic respect for other people and life forms.

A brief outline of each section of the Maitland Greening Plan follows:

1. Introduction

The Maitland Greening Plan is also an important part of Council's commitment under Local Agenda 21 to work towards increased community awareness on environmental issues relating to vegetation in the Maitland Local Government Area (LGA).

The Community Vision for Maitland states that: *"Community awareness of environmental issues will be enhanced through educational activities and Council's own strategies"*.

Council has sought to actively involve the community in the preparation of the Greening Plan, taking into account the interests of different groups and individuals. The Greening Plan encourages a positive and cooperative approach by the whole community.



Salinity is another important issue in the Maitland LGA. Salt not only impacts on land value and productivity but also impacts upon community assets such as roads and buildings.

2. About the Maitland LGA

Section 2 of the Greening Plan provides a summary of the unique land use history and environmental characteristics of the Maitland LGA.

It is noted that the lack of vegetation in the Maitland LGA is a direct legacy of the historical development of the City, which has included land clearing for timber, agriculture, mining and urban development.

The environment that we have inherited is a product of past decisions, which have generally been made in good faith, without the benefit of hindsight that we now have. The Greening Plan, therefore, does not seek to lay blame for any of the issues of land degradation with which we must now contend. Rather, it is hoped that we can move forward with a better understanding of our environment.

Section 2 of the Greening Plan includes a map of remnant bushland in the Maitland LGA (Figure 6, page 9), which has been produced by Council. This clearly shows that remnant vegetation in Maitland is very fragmented. Section 2 of the Plan provides a summary of the effects of the loss of vegetation, including biodiversity decline, erosion, salinity, water quality decline, and Eucalyptus dieback.

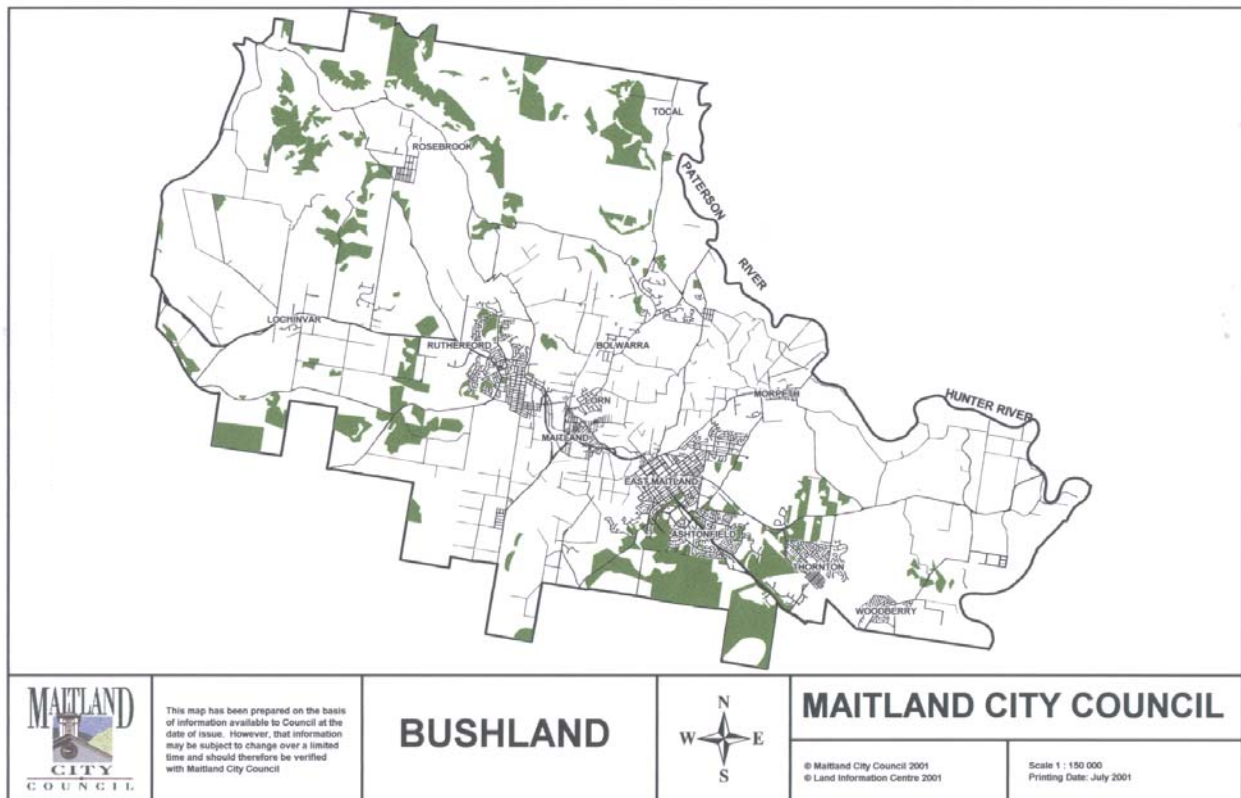
Also, detailed in the second section is the extent of issues such as soil erosion and soil salinity that have resulted as a direct consequence of past land management practices.

Both soil erosion and soil salinity present major land management, agricultural productivity and future sustainability issues for residents in the Maitland LGA.

3. Existing Vegetation

In Section 3 of the Greening Plan, the characteristics of the remnant vegetation are examined in greater detail. Maps are provided to show the types of vegetation communities that existed prior to European settlement compared with those which exist today (Figures 14 and 15 respectively).

Bushland in Maitland tends to occur as either large structurally intact areas of bushland in close proximity to existing urban areas, or as small isolated patches in the agricultural landscape. Both types of bushland present specific management issues for landholders and Council.



From the bushland survey work that has been undertaken as part of the development of the Maitland Greening Plan, it has been established that Maitland's fragments of remnant vegetation are in various stages of decline, due to impacts such as livestock damage and weed invasion, as well as their isolation in an otherwise cleared landscape.

The Greening Plan examines the implications of this decline from a regional perspective, recognising that Maitland's geographic position in the Hunter Valley makes it the primary place for some vegetation communities (e.g. those found on floodplains) and a place of transition between vegetation communities to the north and south of the Valley.

It is clear that there is a need for the enhancement of Maitland's existing vegetation to provide linkages and habitat corridors. Existing fragments of vegetation need to be reinforced with additional plantings, wherever possible, to maximise their habitat value. This is the case for urban as well as agricultural areas.

The individual vegetation communities of the Maitland LGA have been assigned a conservation significance, based on their local and regional distribution in relation to regional conservation targets. The conservation ranking will be used to prioritise management assistance. (Figure 23, page 34).

4. How Do we Manage Our Existing Vegetation?

The retention of bushland is more complicated than simply avoiding development in bushland areas. If bushland is to be retained for the purposes of biodiversity conservation, management goals need to be established to ensure the long-term survival of these areas.

Retention requires a “Duty of Care” from the relevant landholder, which can create an additional burden for these people. The Greening Plan therefore, proposes management incentives to offset this additional burden as discussed in the Future Options section of this report. The Greening Plan also proposes mechanisms that allow for the transfer of this duty of care to other individuals through conservation linked subdivision and through Council acquisition of priority bushland areas where possible.

The range of differing management requirements for agricultural, urban and structurally intact bushland areas are detailed in this section, as are the considerations that must be incorporated in development design where bushland will be affected.

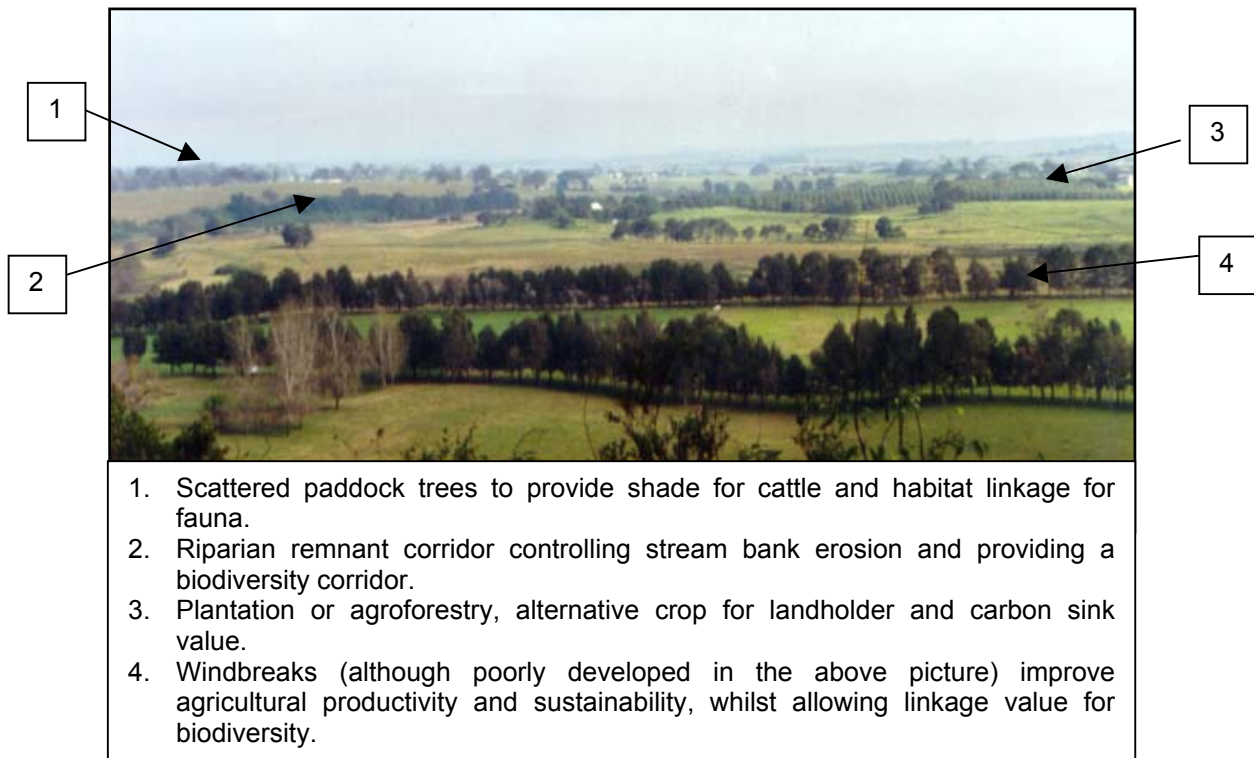
Section 4 of the Greening Plan also highlights the importance of individual property planning and provides some useful suggestions about the effective inclusion of vegetation as part of property planning. For example, the Plan considers the value of windbreaks and shade trees to farm productivity.

5. Revegetation

In Section 5, the opportunities for revegetation are considered. A series of corridors and priority sites are proposed (Figures 32 and 33, page 52 & 53 respectively) as the basis for community action in the future. The design principles for these linkages are established, recognising that they will often take place through highly productive agricultural areas.

However, it is not suggested that wholesale replanting of these corridors will be feasible. Whilst Council would be supportive of broad-acre revegetation, it is far more likely, in practice, that revegetation will take place along watercourses, in wetland areas and in planned windbreaks, woodlots and shelter belts, complimenting existing land use and providing economic benefit through productivity improvement or a direct return eg. farm forestry.

The Plan promotes the principle of revegetation in its many forms, as shown in the following illustration.



6. What Can We Do?

Section 6 of the Greening Plan outlines the options for vegetation management in the Maitland LGA. It is recognised at the outset that there are some very difficult issues to be faced.

Firstly and most significantly, there is the question of financing any conservation initiatives. The vast majority of Maitland's remnant vegetation is in private ownership. The owners of these areas incur costs related to the conservation of bushland (e.g. weed and rubbish removal). In some cases, the owners have expectations regarding the use or development of their bushland areas, which are not entirely conservation oriented.

There is, therefore, the question of who pays for the conservation of these areas of remnant bushland. If it is the individuals who currently own the bushland, there is a question of equity. Why should the individuals pay for the greater good of the community? If it is the community that pays, then how do we raise sufficient funds to purchase and manage the bushland areas?

A range of funding options are considered in Section 6, including:

- the implementation of a special environmental rate (or levy);
- government grants;
- developer contributions;
- a tree removal fee; and/or
- corporate sponsorship.

The Greening Plan then presents a range of spending options, assuming that funding can be obtained. These options include:

- incentives to landowners, such as rate relief and financial assistance for tree planting/fencing.
- public acquisition of bushland areas;
- the use of conservation leases;
- public education programs;
- the employment of a Vegetation Advisory Officer.

A range of possible programs are detailed in Appendix 1.

Finally, Section 5 includes a range of policy and regulatory options, which can be considered by Council. These include:

- a moratorium on the clearance of native vegetation;
- a “*no net vegetation loss*” policy;
- percentage retention of individual communities;
- maintaining the status quo;
- revision of Council’s Tree preservation Order; and/or
- review of Council’s zones and regulations as they relate to native vegetation, including conservation incentives;

RECOMMENDATIONS

The Greening Plan has presented a range of options relating to the provision of financial resources and the associated actions by Council and landowners. None of these options alone will provide the perfect solution to the environmental problems being faced in the Maitland LGA. However, it is recommended that Council and the community adopt a suite of these options, covering financial management, vegetation management, education and motivation and regulation, which will together provide a holistic approach and an effective solution.

The following conclusions and recommendations are, therefore, presented for consideration:

Recommendation 1

That Council ratify the vegetation retention targets established in Section 3.5 (page 33) to establish clear goals for bushland conservation in the Maitland LGA.

Goals for bushland retention have been established with the assistance of the Greening Plan Coordinating Group, on the following basis:

At the regional level, the 30% proposed by the Hunter Catchment Management Trust as a vegetation retention target for the Hunter Valley, is considered to be an appropriate target.

At the local level the minimum 10% retention target (JANIS) is considered to be appropriate having regard to the highly urbanised nature of the Maitland LGA and the fact that most vegetation communities have local retention rates of less than 10% of their original distribution.

Conservation Ranking	Regional Significance	Local Significance	Relevant Communities	Conservation Outcomes
1	Regionally <30%	Locally <10%	<ul style="list-style-type: none"> Hunter Valley Dry Rainforest*; Alluvial Tall Moist Forest*; Swamp Oak Sedge Forest * 	No further Clearing Protection under LEP Priority Revegetation
2	Regionally <30%	Locally >10%	<ul style="list-style-type: none"> Central Hunter Riparian Forest; Hunter Lowlands Red Gum Forest*; Swamp Oak Rush Forest 	No Net Loss Limited Clearing (10%) with revegetation
3	Regionally >30%	Locally <10%	<ul style="list-style-type: none"> Hunter Valley Moist Forest; Coastal Foothills Spotted Gum Ironbark Forest; Seaham Spotted Gum Ironbark Forest; Lower Hunter Spotted Gum Ironbark Forest; Coastal Plains Smoothbark Apple Woodland; Swamp Mahogany Paperbark Forest 	No Net Loss LHSGIF (minimum 6.75%) locally supplemented in longer term by revegetation
4	Regionally >30%	Locally >10%	<ul style="list-style-type: none"> Fresh Water Wetland Complex 	N/A Wetland

It is recommended that each vegetation community be considered individually (as shown in the above table). A special case is proposed for the Lower Hunter Spotted Gum Ironbark Forest, including consideration of trade-off options, due to the circumstances of that community (see p 34/35). A minimum conservation target of 6.75% is proposed for LHSGIF, with the aim of conserving the remaining vegetation in the long term and supplementing conservation initiatives with revegetation.

Recommendation 2

That Council raise the necessary revenue to achieve sustainable vegetation management and revegetation endeavours, including implementation of a Special Rate (Environmental Levy).

Substantial funding will be required to maintain existing vegetation and to initiate proposed revegetation works. It is therefore recommended that Council and the community pursue a range of funding options, to maximise the revenue base and associated outcomes from the Greening Plan.

A special rate (environmental levy) is proposed as the primary means of raising revenue, subject to consideration of the response to any proposed levy from the Maitland community. A separate report detailing the Special Rate would need to be submitted to Council and the Minister of Local Government in order to initiate the rate, depending on the community response to the Greening Plan.

It is anticipated that the special rate would be applied equitably to all landholders within the Maitland LGA to achieve many of the recommended outcomes of the Greening Plan.

In addition, it is recommended that Council and the community seek funding for specific environmental programs through grant funding and other revenue sources.

Recommendation 3

Acquisition of bushland with a high conservation significance and development threat.

Council should consider the purchase of limited areas of native vegetation, with priorities determined in relation to the conservation value of bushland and the degree of public benefit.

This would ensure landholder rights are taken into account in regard to community expectations in relation to bushland management. This is anticipated to be the single greatest expense proposed under the Greening Plan, and it is hoped that land that has multiple benefit to the people of Maitland such as passive recreation can be obtained and secured. The ongoing management of these areas is also an important consideration in regard to expenditure.

Recommendation 4

Council establish a Native Plant Distribution Program

The Native Plant Distribution program will provide for the propagation and distribution of local, native plant species to landowners who will participate in the program on a voluntary basis. Council will determine priorities for distribution, based on the priorities in the Greening Plan as outlined in the opportunity corridors detailed in Figure 33 on page 53.

The main focus of the program would be rural properties, in locations where revegetation corridors have been identified. For example, Council might support a landowner proposing the revegetation of a riparian corridor, which helps to establish a link between other existing areas of remnant vegetation. Council would provide the trees free of charge, subject to their successful establishment on the property as proposed. A simple management agreement would be necessary to provide the long-term protection of these areas provided for by public funding to assure their long-term presence in the landscape.

Recommendation 5

Community Education Trial Sites

Priority education sites should be rehabilitated as a result of the Greening Plan, providing examples of key land degradation issues. This program would demonstrate best management practices regarding degradation issues apparent at each site. In most cases the sites would have more than one environmental problem and would provide opportunities for good exposure to the public due to their locations. They would provide opportunities for the involvement of the community and public education.

Recommendation 6

Council undertake Urban Bushland Reserve Management

Bushland reserves, and any bushland acquired and placed in public ownership will require management to ensure that the ecological characteristics of the area are maintained for future generations. Weed control and access control (in relation to rubbish dumping and community recreation) are the most important requirements in this regard.

Recommendation 7*Provision of Conservation Grants to Individual Landholders.*

It is recommended that Council consider the use of conservation grants for areas of privately owned bushland, which are not publicly acquired and recognised to have conservation significance. The grant payment would be subject to the establishment of a conservation agreement with Council, for the management of the land during the period of the agreement. See Section 6.3 ii on page 65. Specific undertakings such as buffer plantings, corridor development or erosion control would be provided through such conservation grants.

Priorities for conservation agreements would need to be determined by a Council, possibly with the assistance of an Advisory Panel (detailed below in Recommendation 12), based on the Greening Plan.

Recommendation 8*Provide Equipment for Restoration/Rehabilitation Projects*

An equipment loan program could be established for community groups and landholders to achieve outcomes in relation to environmental management. Materials such as weed spray units, stem injection equipment, tree planting equipment, herbicides and other general equipment could be made available to stakeholders to achieve the outcomes of the Greening Plan. Such a program would enable outcomes in relation to vegetation cover, habitat quality and noxious and environmental weed control programs throughout the LGA to be achieved.

Recommendation 9*Environmental Awards*

Encouragement and recognition of landholders who are involved in environmental management will be an important adjunct to other initiatives. Recognition for restoration works throughout the LGA could therefore be undertaken to highlight success stories. The Maitland Show, given the strong agricultural focus would provide a good forum to present such an award and prize.

Recommendation 10*Council Review current LEP Provisions*

The Greening Plan has proposed a review of the current Tree Preservation provisions in Maitland LEP 1993, to better manage vegetation throughout the Maitland LGA. It is proposed that a separate report be presented containing new draft provisions for consideration by Council and the community. This is likely to include a series of categories for different areas (eg. rural and urban) and to enable the protection of specific vegetation communities (including all elements, not just trees over 3m).

Areas of revegetation would be likely to be covered by a specific category, with less emphasis on conservation generally so that there is not a disincentive to revegetation. A Development Control Plan (DCP) is proposed to accompany the new LEP provisions that will also require separate exhibition to the Greening Plan.

Recommendation 11*Conservation Incentives Clause (Part of LEP review Rec. 10)*

A Conservation Incentives Clause in Council's LEP would provide an opportunity to develop programs for the conservation of native vegetation for undertakings not ordinarily permissible in the zone, which would have a conservation outcome. Developments such as bushland lots may need such a clause to provide for conservation outcomes. Details of such a clause will need to be developed to complement Council's strategic planning and would need to be place on public exhibition.

Recommendation 12

Council employ a Vegetation Advisory Officer to implement recommendations of the Greening Plan and educate and involve the community.

There will be considerable expertise required for the implementation of the Greening Plan. It is therefore recommended that Council consider the need for a Vegetation Advisory Officer, who would provide the technical expertise for plan preparation, as well as coordination and assistance to landholders, community groups and Council officers.

Recommendation 13

Review the Greening Plan.

It is recommended that the Greening plan be reviewed periodically to map the progress of the implementation of the proposals mentioned within the document and to ensure that eh Plan remains relevant and up to date.

Conclusion

Given that a large proportion of the remaining bushland in the Maitland area is found on private land, any conservation endeavours will require close liaison with relevant landholders to ensure that successful outcomes are achieved. To achieve a more sustainable form of vegetation management the Maitland Greening Plan has proposed a range of motivational and regulatory mechanisms to manage vegetation in a manner that will benefit landholders and the community.

The success of the Maitland Greening Plan will depend upon the cooperation and involvement of the whole community. Council has therefore sought to involve the community in the process of preparing the

Greening

Plan.



(Greening Australia 1995)

1 Introduction

1.1 What is the Maitland Greening Plan?

The Maitland Greening Plan is essentially a collection of information about vegetation and related environmental issues in the Maitland Local Government Area (LGA) and a framework for the management of that vegetation towards increased sustainability in the long term.

Maitland City Council is one of an increasing number of local authorities, which are involved in the preparation of vegetation management plans for their local areas.

The Maitland Greening Plan covers the Maitland Local Government Area (LGA), addressing a wide variety of issues that influence vegetation at a local scale, including the wider context of vegetation management from a regional and national perspective. The Greening Plan focuses on the management requirements of the small area of remnant vegetation while providing the strategy for the wider revegetation of the Maitland region in response to issues of land degradation.

The Maitland Greening Plan aims to provide an appreciation of the importance of vegetation and related environmental management issues in the local area. It therefore provides information on the variety of environmental issues related to vegetation management for the benefit of everyone involved in the process.

In many ways, our local environment can simply be viewed as the result of our collective actions as individuals. This is particularly true in Maitland, where the vast majority of land is held in private ownership and where there is a relatively long history of land clearance associated with human habitation.

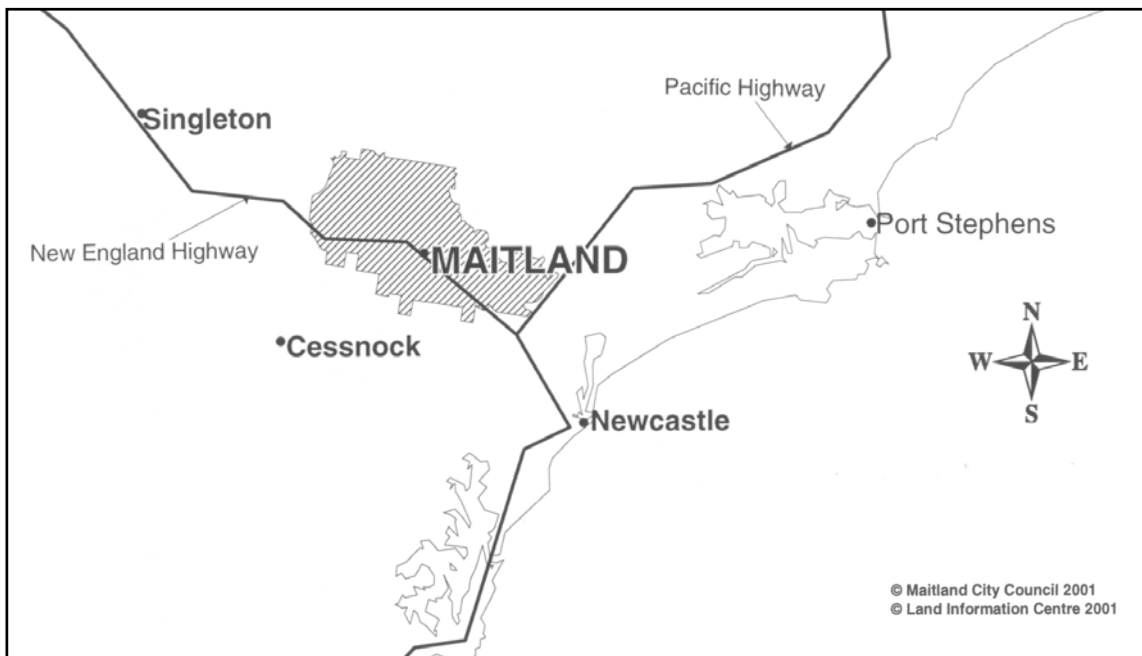


Fig. 1 Locality Plan

1.2 The Development of the Maitland Greening Plan

Development of the Maitland Greening Plan

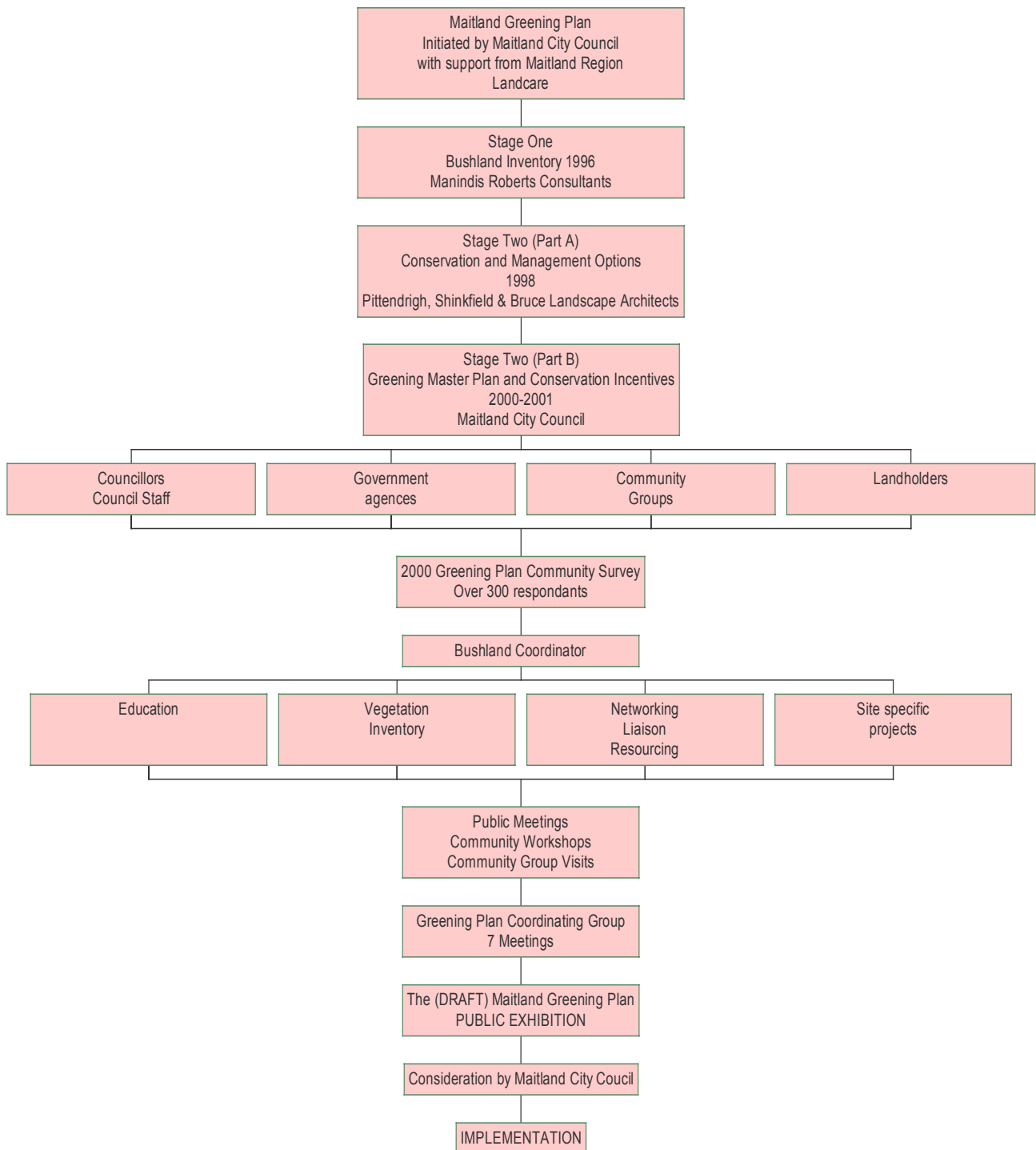


Fig 2: The development of the Maitland Greening Plan followed the model detailed above.

The process of developing the Maitland Greening Plan included the formation of a Coordinating Group, which brought together a cross section of interests in the Maitland community. The Coordinating Group for the Greening plan has included Councillors, Council representatives, residents, landowners and representatives of

environmental and rural residents groups including Landcare, Greening Australia and the Hunter Catchment Management Trust. This has provided a range of opinions and contributions on the subject of vegetation management.

From the outset, the Coordinating Group established a set of goals for the Greening Plan, which are shown below:

1.2 Goals for the Maitland Greening Plan

- 1. To produce a positive, transparent plan, which will inform and educate the Maitland Community.**
- 2. To ensure the maintenance and enhancement of the natural heritage and biodiversity now and in the future for the Maitland Local Government Area.**
- 3. To recognise the importance and value of a healthy functional environment and the provision of an opportunity for passive recreation for the Maitland Community.**
- 4. To identify critical locations, stakeholders, management issues, options and assistance packages that best achieve the above objectives.**
- 5. To incorporate the principles of ESD (Ecologically Sustainable Development) into the long-term management of vegetation in the Maitland Local Council Area.**
- 6. To propose a retention target for different vegetation communities in the Maitland LGA**

1.3 Ecologically Sustainable Development

Ecologically Sustainable Development (ESD) has been enshrined under the 1997 amendment to the Local Government Act (Local Government Amendment *Ecologically Sustainable Development Act* 1997) which basically amends the Local Government Act to include the principles of ESD. Councils are required to “have regard to the principles of ecologically sustainable development in carrying out their responsibilities (Local Government Act, s7(e)).

The inclusion of ESD principles as follows, have been a major driving force for the development of the Maitland Greening Plan, and as such provide part of the response to ESD and Local Agenda 21 (Local Agenda 21 is the process in place in each local government providing direction on how ESD is to be achieved).

ESD has been basically defined as:

“Using, conserving, and enhancing the communities resources so that ecological processes, on which all life depends, are maintained, and the quality of life, now and in the future, can be increased.”
(Maitland City Council, 1996)

ESD is defined by the following principles:

- 1. Intragenerational and Intergenerational equity:** aims for equity within and between generations.
- 2. Integration of economy and environment:** aims to achieve a balance between economic activities and conservation of environmental assets.

3. **Precautionary Principles:** requires risk, uncertainty and irreversibility to be dealt with cautiously. For example, lack of full scientific certainty should not be used as a reason for postponing environmental protection measures.
4. **Conservation of Biological Diversity:** aims to conserve biodiversity for present and future generations.
5. **Improved valuation, pricing and incentive mechanisms:** namely, that environmental factors should be included in the valuation of assets and services, such as:
 - I. Polluter or exploiter pays—that is, those who damage the environment, generate pollution and waste should bear the cost of rehabilitation, containment, avoidance or abatement,
 - II. The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
 - III. Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.
6. **Recognising the global dimension:** recognises the impacts of resource use and externalities on other regions or countries.

Local Agenda 21 (LA21)

A key element of a Local Agenda 21 is improvement of the frameworks and systems used for planning, policy making and their implementation. Local Agenda 21 has developed into a process with much international support.

Because it was developed specifically for local government it is tailored to the needs of local government. As such it is a good process for Australian local governments to use to achieve the outcome of ESD. Local Agenda 21 encourages the involvement of people in determining the nature of sustainable development locally rather than just relying on improved planning processes. LA21 relies on:

1. Stronger community and local government partnership;
2. Ongoing community involvement in the resolution of sustainable development issues;
3. Integrated decision making which takes all foreseeable economic, social and environmental considerations into account;
4. Development, implementation and periodic review of a long term, integrated action plan which incorporates sustainable development principles
5. Changes that promote a continual improvement toward sustainable development.

(Cotter & Hannan, K. 1999)

Fig. 3 The Objectives and Principles of Local Agenda 21.

1.4 How Does the Greening Plan Relate to ESD and LA21?

The principles of ESD as detailed above have been integral in the development of the Maitland Greening Plan. The Maitland Greening Plan has been developed to conserve and improve the current state of the local environment for current and future generations, effectively integrating the economy and the environment by demonstrating the benefits of biodiversity to agricultural landholders and the impact that further clearing of remnant vegetation will have on local land degradation issues and by proposing targets (to be ratified by Council) for the retention of remnant vegetation. The precautionary principle should be utilised in the assignment of such targets as the link between further clearing and land degradation has been established. The conservation of biodiversity is the central aim of the Maitland Greening Plan that is the local response to the global issue of vegetation clearance and biodiversity loss.

Further to the principles of ESD, the Maitland Greening Plan has been developed in accordance with the principles of Local Agenda 21 as detailed in Figure 2. The involvement of the community in the development of the Maitland Greening Plan and the education and

information dissemination role that has been included in the process is an example of Council's fulfilment of LA21 principles in the planning process.

1.5 The Way Forward

From Council's perspective, the Greening Plan must provide a workable framework for the implementation of agreed outcomes, which is supported by the general community. The Greening Plan therefore contains recommended actions by Council as well as the community.

Council is responsible for the implementation of a range of different legislation with relevance to native vegetation. The Greening Plan therefore, provides a summary of this legislation and recommends changes to Council's existing policy framework. This recommended framework will provide clear guidelines to assist Council to arrive at decisions regarding native vegetation.

It is also hoped that the Greening Plan will provide vision and direction for the community. The Plan therefore includes a range of educational, motivational and other incentives to assist landholders and the community to be involved in conservation and revegetation works.

Given the high percentage of bushland in private ownership, strong community links and partnerships with landholders need to be developed to ensure the successful implementation of the Plan. This will require all parties getting involved, not just Council.

In short, the aim of the Greening Plan is to provide a clear blue print for action, whilst at the same time assisting and motivating the community to work towards responsible environmental management. It is hoped that the Plan will provide a framework for a more sustainable future for the Maitland area, for the benefit of present and future generations.

1.6 Issues to be Addressed by the Maitland Greening Plan:

Apart from the many environmental values placed on bushland as described in later sections of this plan, it is important to remember that there is an often unrecognised economic value associated with vegetation.

The CSIRO have calculated that, Australia wide, ecosystems provide services worth over \$1,300 billion per year (Bateson, 2000). Examples of these services include the fresh water provided by the Eucalyptus Ash Forests to Melbourne to a value of \$250 million per year, insect pest control from Gunbower forest islands in the Murray River catchment worth an estimated \$675,000 per 1000ha of adjacent cropland (Bateson, 2000). A local example is the value of Hexham Swamp as a commercial fish and prawn rockery providing around \$1.5 million worth of fish and prawns per year to local markets (HCMT, 2000).

From a social perspective, bushland views have been identified in the Maitland City Council Community Survey as a key feature of the Maitland LGA that residents value.



Bushland views help define a sense of place through natural character. Vegetated ridges and riverbanks provide a backdrop, particularly from a distance.

Scenery and visual character, quiet tree lined country lanes and vegetated riverbanks etc. all provide a certain character and appeal that enhance the amenity to the area for residents and tourists.

The environmental aspects of vegetation management must, therefore, be seen in the context of a broader range of considerations, including issues such as recreation, aesthetics, social and economic values.

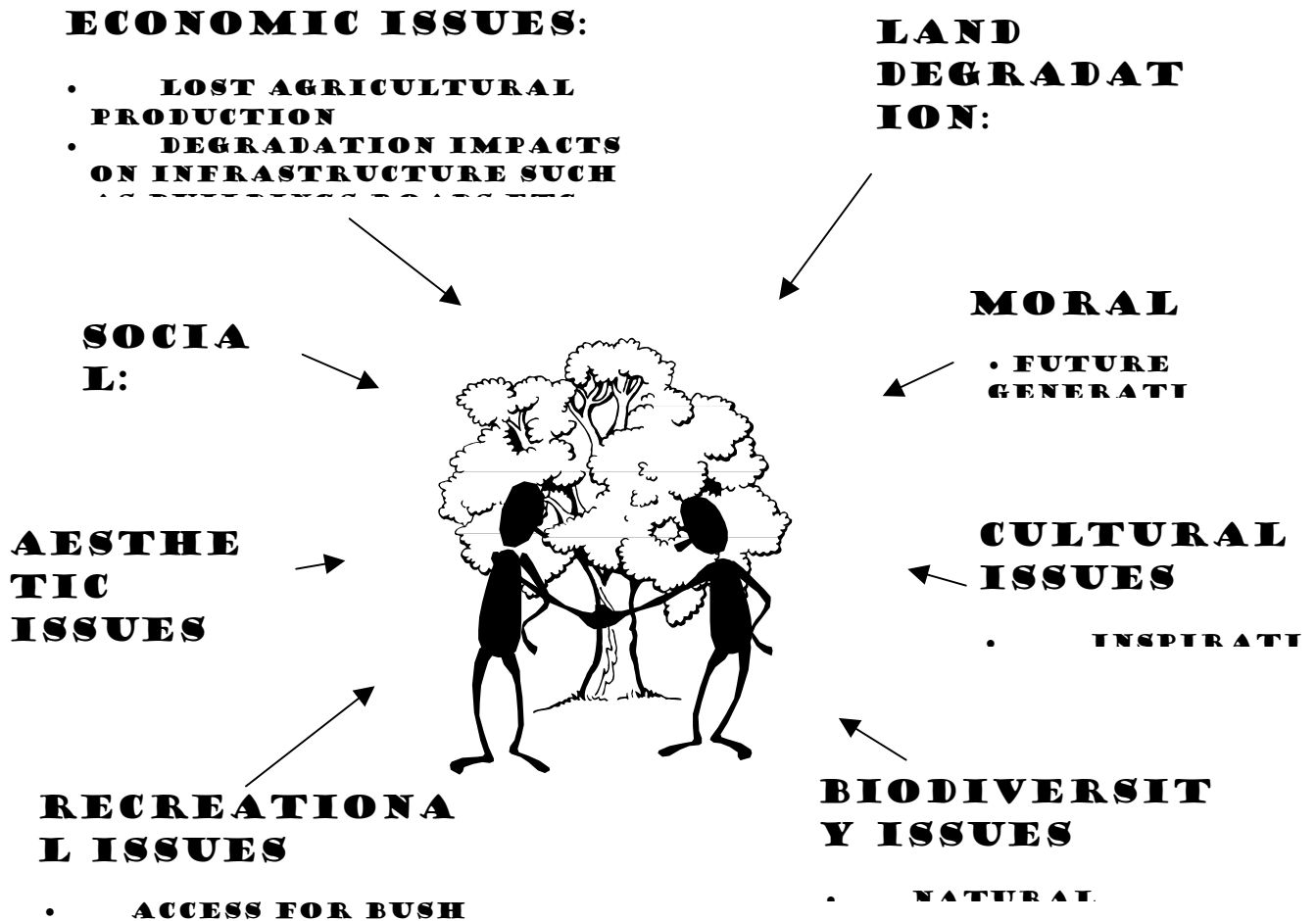


Fig. 4 Important issues dealt with as part of the Greening Plan.

2 About the Maitland Local Council Area

2.1 Land Use History

There has been a very long and continuous human influence on vegetation in the local area, firstly, during the time of Aboriginal land management, when “*firestick*” management practices were used and, secondly, when the first European settlers arrived in the area and introduced their own form of land management.

Maitland was one of the first areas to be settled by Europeans outside of the Sydney region. The timber resources cut from the area and the subsequent exposure of the fertile soils of the floodplains were highly prized by the fledgling colony. Early settlers were encouraged to clear native vegetation as an important part of establishing European settlement in Australia. The Government policy of the day encouraged land clearance, conducted by early settlers. The development of the economy of the early settlement and subsequent national identity were forged through the clearance of vegetation for agricultural pursuits. Unfortunately, however, the methodology had been developed for the European environment and did not transpose well on to Australia.

Today, in recognition of this issue, NSW Agriculture as well as a number of peak farming bodies, such as the National Farmers Federation advocate stewardship of the land and the recognition of natural capital and environmental protection, as an integral part of all agricultural endeavours as a means of achieving sustainability.

It is clear that the pattern of vegetation which existed at the time of European settlement must have been outstanding. Early journals and diary entries of a number of early settlers are testimony to this, as is the quality and quantity of timber, particularly Red Cedar cut from Wallis Plains. Such information is important to adequately plan revegetation undertakings in the Maitland LGA, to ensure healthy and sustainable revegetation works are conducted in the LGA.

Maitland occurs at the northern limit of the Sydney basin, with the Hunter River delineating the Permian geological area to the south, and the distinctly different vegetation unit in the Carboniferous geological landscape to the north. Further to this is the actual shape of the Hunter Valley, in that the valley extends so far inland with only a very low range of mountains separating the Hunter Valley from the inland slopes and plains, a fact which has further added to the uniqueness of the vegetation present in the Hunter Region (Peake, T, 2000).

Although the actual area of native vegetation has been greatly diminished, the diversity of vegetation types is still testament to what the vegetation must have once been like. Ten distinct vegetation communities remain in the Maitland LGA (originally fourteen) with one community (the Kurri Sand Swamp Woodland*)



Early Vegetation Management Practices
(Source Unknown)

Glen Albrecht, in his book “Rediscovering the Coquun”, 2000, includes the following extract from an early settler in relation to the Louth Park area.

“...there is one of the thickest vine brushes in NSW, so that it is difficult to penetrate even a few yards. Here I saw a most enormous tree... known by the title of the Great Fig. The trunk does not rise more than thirty feet before it separates into branches of such magnitude as to equal trees of considerable size. Will it be credited that the former owner of the farm had actually commenced felling this “giant of the forest”. He was only prevented from fulfilling his intentions by the remonstrations of the settlers around.”

already listed as “an endangered ecological community” under the Threatened Species Conservation Act.

2.2 Existing Vegetation

* The Kurri San Swamp Woodland remains as a very small isolated vegetation unit in the east of the LGA, too small to be mapped on the LHCCREMS maps.

the Maitland LGA occurred very early in the history of European settlement. The vegetation that survived the initial clearance in most cases survived until recent times. In the agricultural landscapes remnant vegetation is largely restricted to small isolated pockets usually in areas that were too steep to clear in the first place. A large area of remnant vegetation also exists in the south-eastern portion of the Maitland LGA, which has been excluded from agricultural development due to poor soil and the presence of mining activities for well over a century. These areas to the south of Ashtonfield constitute large areas of structurally intact vegetation.

Over 90% of the vegetation has been cleared in the Maitland LGA, due to the areas agricultural and urban land use history. This has resulted in a very low cover compared to the average clearing rate for the rest of the Hunter region. Figure 5 details the extent of various landuse activities in the Maitland LGA.

Such a low level of vegetation cover has an enormous bearing on the future environmental integrity of our region while explaining the severity of degradation issues that are currently faced by the Maitland Community.

Figure 6 on the following page outlines the extent of remnant vegetation in the Maitland LGA.

The majority of vegetation remaining exists on private property. Although a small area of structurally intact bushland does remain in Council control (as detailed in Figure 7 on page 10).

2.3 Environmental Issues

A variety of environmental issues have directly resulted from the broad acre removal of vegetation over the history of European settlement in the Maitland Area. The Greening Plan Coordinating Group has recognised that many of the environmental problems being experienced in the Maitland LGA are directly related to the quality of the areas’ remnant vegetation. It was agreed that efforts to enhance areas native vegetation could focus on areas affected by environmental degradation. If effectively managed the reinstatement of native vegetation has the potential to significantly reduce land degradation.

Maitland already faces significant environmental issues in respect to:

- 2.3.1 Biodiversity Decline (Habitat Loss and Species Extinction)
- 2.3.2 Salinity
- 2.3.3 Erosion
- 2.3.4 Eucalyptus Die Back

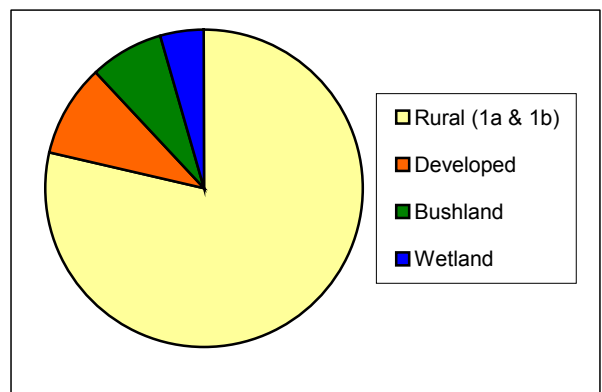


Fig. 5 Principle Land use activities in the Maitland LGA

FIGURE 6

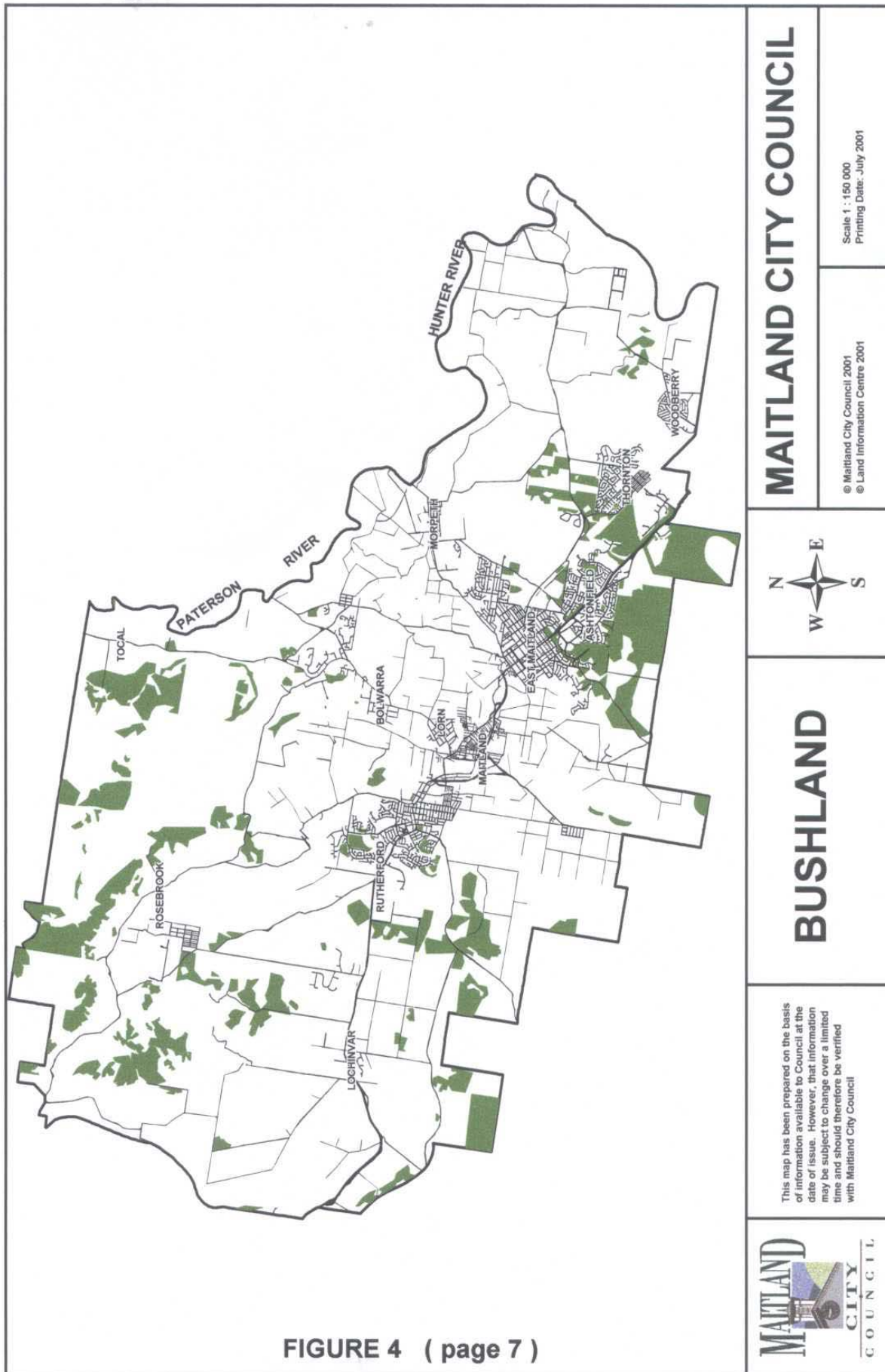
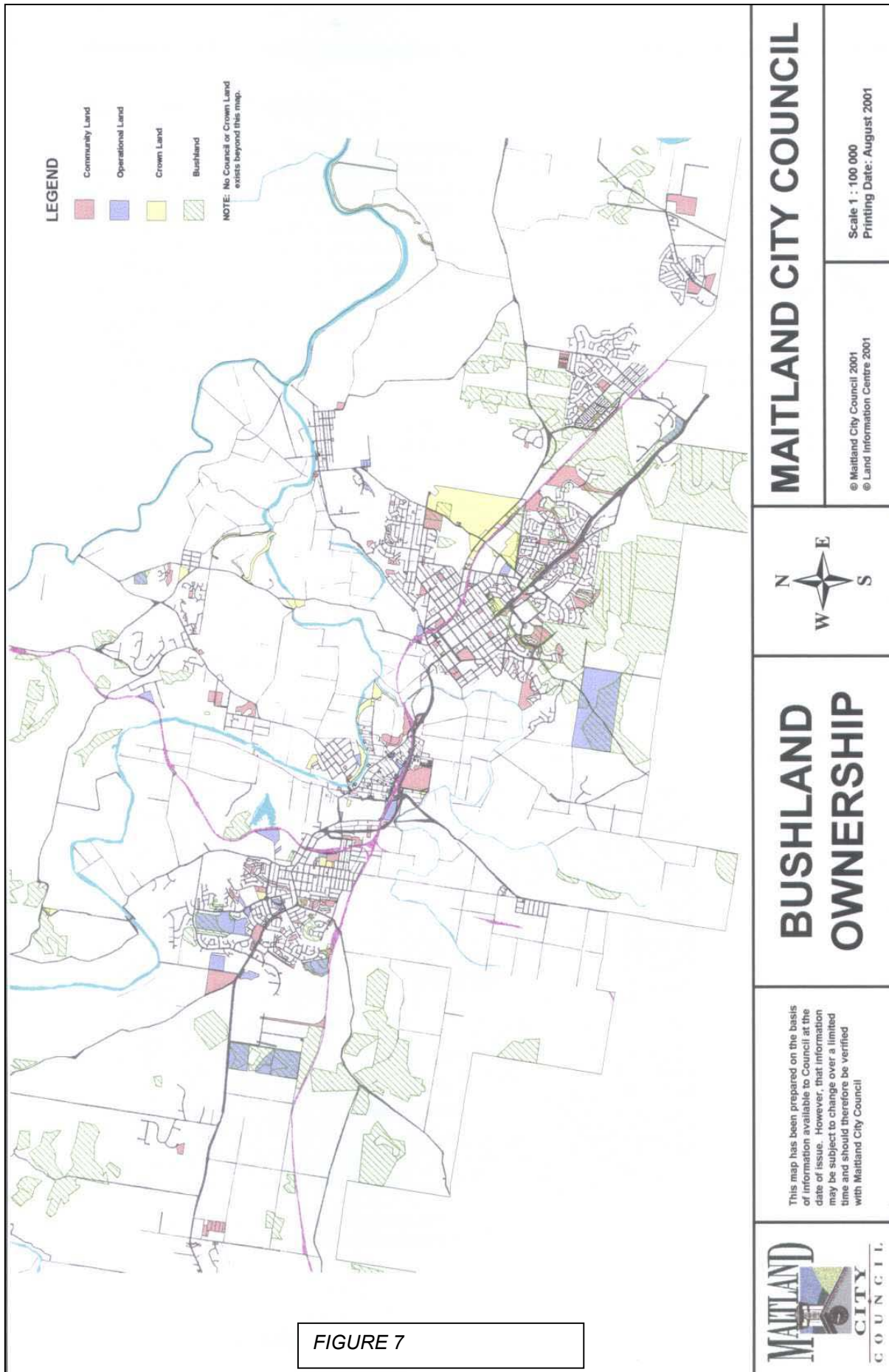


FIGURE 4 (page 7)



2.3.1 Biodiversity Decline:

Biodiversity refers to the enormous array of organisms that are responsible for the continuation of life on this planet. Biodiversity is not only the actual presence of a particular species, but the “work”, in a biological sense, that the species is responsible for.

For example, trees produce oxygen for clean air and absorb carbon dioxide reducing greenhouse gas emissions. At the local level trees are important for the control of soil erosion and salinity. Owls and raptors control rodents, insects pollinate plants and allow seed production, bacteria and fungus regenerates soil, wetlands purify water allowing fish and bird species to breed.

Biodiversity recognises the myriad of intricate relationships that exist, particularly at the ecosystem level. Such ecological relationships are very complex and take a long period of time to develop. Revegetation, therefore, is not a good alternative for areas of remnant vegetation in their natural state, which have a range of species and a range of relationships developed over time.

Remnant vegetation is crucial for biodiversity management. It provides the avenue for biodiversity to move through the landscape, for migration and dispersal of species into new areas, previously denuded. Revegetation can be conducted in such a manner as to promote a greater level of biodiversity, but not as a replacement.

Vegetation management for the preservation of biodiversity must, therefore, focus primarily on *in situ* management, (ie: conservation of vegetation in its natural state).

Biodiversity is important at three distinct levels:

1. Genetic diversity: recognising that a diverse gene pool is required to ensure the continuing evolution of a species and life in general;
2. Species diversity: recognises the importance of a range of species, particularly in terms of their “richness” and “abundance” within communities and ecosystems.
3. Ecosystem diversity: refers to the variety of habitats, communities and ecological processes that occur in nature. At the ecosystem level biodiversity recognises the diversity of communities each made up of species, and the diversity of interactions between community members.

(NSW Biodiversity Strategy, 1997)

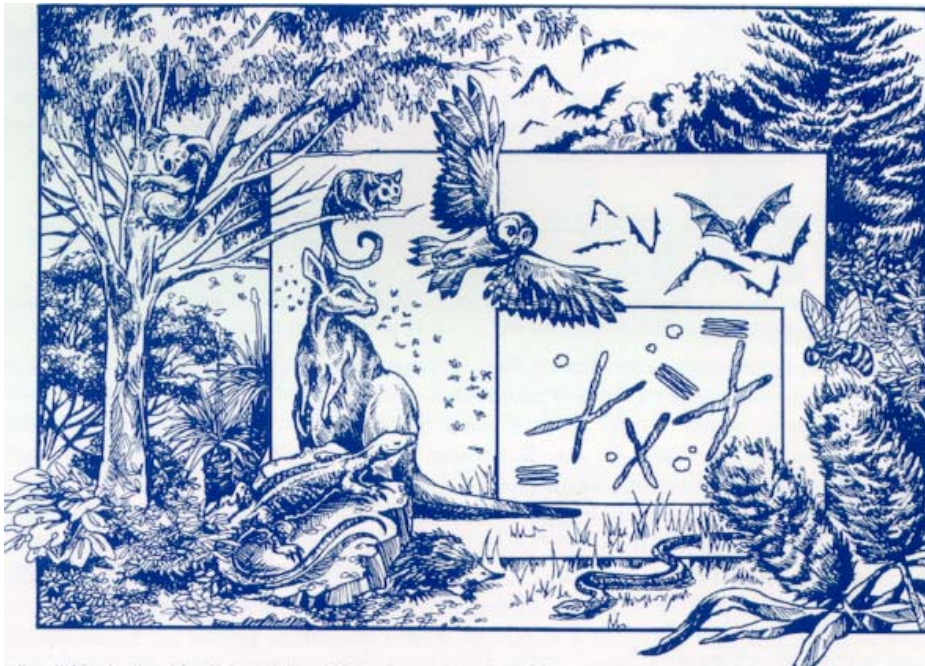


Fig 8 Biodiversity has three important levels for which careful management is required (Greening Australia, 1995).



Broad Acre vegetation removal throughout a large proportion of the region has seen a great deal of **biodiversity** disappear. Millers Forest (left) is known to have been covered with large stands of Flooded Gum, Sydney Blue Gum, Red Cedar and other rainforest

Several “key threatening processes” have been highlighted for biodiversity by the NSW biodiversity strategy including:

I. Habitat modification and fragmentation:

Habitat fragmentation is the clearing of the landscape leaving small isolated “pockets” of vegetation. Depending on the degree of isolation and the size of the remnant, the populations of plants and animals within become very unstable. The importance of genetic exchange (the first level of biodiversity) becomes crucial in maintaining small isolated populations. Fragmentation of habitat further compounds the issue of habitat modification because the smaller the remnant is in area, the more susceptible it becomes to edge effects.

Habitat modification and fragmentation result from land management practices such as land clearance, wetland drainage and river “improvements”, modified fire regimes and cattle grazing in forested areas. Habitat modification and fragmentation reduce the natural resilience of ecosystems, making them unsustainable in the long term and unable to cope with natural calamities such as storm damage and disease.

To protect biodiversity landholders need to avoid situations where habitat modification occurs through issues such as:

- Unsustainable Bushfire management
- Unmanaged/unwanted public access
- Trail development
- Rubbish dumping
- Unsustainable fire wood collection
- Livestock grazing
- Unnecessary clearing
- Weed removal (unmanaged)
- Bush rock removal

Strategic revegetation and corridor retention/creation are required to address habitat fragmentation. Remnant areas of native vegetation need to have some form of connectivity with other remnant areas to ensure the processes of migration and dispersal can be maintained. The varieties of options available to facilitate such connectivity are outlined in the revegetation section of the Greening Plan, but essentially require more vegetation in the landscape.

Edge Effects

The edge of any biological system is a very dynamic environment, as species and processes from each system cross over to the other. Ecologically an edge is known as an ecotone. Weeds become an important issue on the edge of a remnant system. The size and particularly shape become important to the management requirements of the area in terms of surface area to volume ratios. The core habitat and its quality present in the remnant is proportional to the edge or surface area of that system.

Cattle Grazing in Bushland Areas.



Cattle will eat out and trample all but the most resilient of species in the understorey including any regenerating canopy species. In this case the prickly Egg and Bacon hush and Black Thorn are all that

Unsustainable Bushfire Management

Key Threatening Process under the Threatened Species Conservation Act:

High Frequency Fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition.

Australian biodiversity has evolved a range of mechanisms to cope with fire, which is understood to be a key component of the Australian environment. Various survival strategies of Australian biodiversity depend upon two key features: a) the ability of species to maintain life cycle processes, and b) the maintenance of vegetation structure over time as habitat. Various vegetation communities have evolved to specific fire regimes, allowing the continuation of these two processes. These processes can be disrupted due to an increase in the frequency of fires in relation to unsustainable bushfire management and arson. High frequency fire is defined as two or more successive fires close enough together in time to interfere with or limit the ability of plants or animals to recruit new individuals into a population, or for

II. Introduced species:

The Maitland region has a wide variety of problematic plant and animal species that are impacting on biodiversity. A Noxious Weeds program exists in the Maitland LGA with Council staff and resources actively controlling a prescribed group of plants that have been identified in relation to agricultural productivity. (Appendix 12)

Weed species in bushland areas usually become a problem in relation to nutrient issues associated with storm water management. Animal species that cause problems are usually predators that have superior hunting abilities, which local fauna have not evolved to cope with. (eg: Cats, Dogs and Foxes)

Weed species are usually the symptom of a problem relating to habitat alteration and modification mentioned above, but lead to biodiversity management issues in their own right. Lantana, for example, will invade rainforest gully areas and Alluvial Tall Moist Forest and eventually dominate the area through the smothering of other species as well as increasing the fire regime which will have a disastrous impact upon the species that occur in these areas.

Weed removal, particularly from vegetated areas, but also from other sensitive areas, (ie. steep slopes, large infestations and wetland areas) needs to be conducted in an ecologically sensitive fashion. Although a problem, weed communities do provide some habitat value and food resource for animals and particularly bird species that are found in the area and as such their control should focus on restoration of the vegetation community in which they are found.

Several animal species also have been introduced to Australia since European development. These include domestic and feral cats and dogs on the fringe of urban areas as well as foxes, goats and unmanaged livestock that may be present in the rural landscape. Feral Cats and European Foxes have both been identified as key threats to biodiversity under the Threatened Species Conservation Act (NPWS, 2001, 980320a & f000234a).

Weed Invasion into urban bushland reserves



Cassia from neighbouring gardens invades bushland.

A list of species that require control in bushland systems is found in Appendix 10 & 12 of this report.

III. Over Exploitation:

There are many examples of the unsustainable management of natural resources that have led to local, regional and complete extinction. Over exploitation of the Red Cedar Tree led to the first environmental regulation brought in by Governor King early in the history of the European Settlement. Red Cedar and Rosewood, the objects of the first timber exploitation in the area are now close to being extinct in the Hunter region.

IV. Pollution:

The contamination of soil and water systems has led to a demise of biodiversity, particular in the aquatic environment. Nutrient pollution and runoff contains a variety of substances, including:

- chemicals, oils, litter and detergents from urban areas;
- pesticides,
- fertilisers,
- salt (from saline runoff) and
- sediment (from erosion).

All material that washes into the environment is of concern; some biodegradable materials in small quantities can be absorbed or assimilated, if quantities are dilute.

The salinity problem in the Maitland LGA not only is an issue of land degradation but also one of pollution. Runoff from areas with a high salt concentration causes pollution to the down stream aquatic environment that can be seen in the high conductivity values recorded in the Maitland region.

2.3.2 Salinity:

Salt is a naturally occurring compound, crucial for a variety of process such as soil development and a range of biological processes. Salinity invariably occurs as a result of poor land management and leads to a concentration of salt in the top soil in localised areas, often rendering the land completely useless, as well as impacting on the wider environment, particularly on our creek and river system. Approximately 9.5% of the Maitland LGA is affected by salinity.



Salinity impacts in the Maitland LGA. Unfortunately like many areas of Australia that have been over cleared in the past Maitland now faces a major salinity problem. Salinity is an issue that results from all forms of land use in a catchment and not just from the landholder who is directly affected

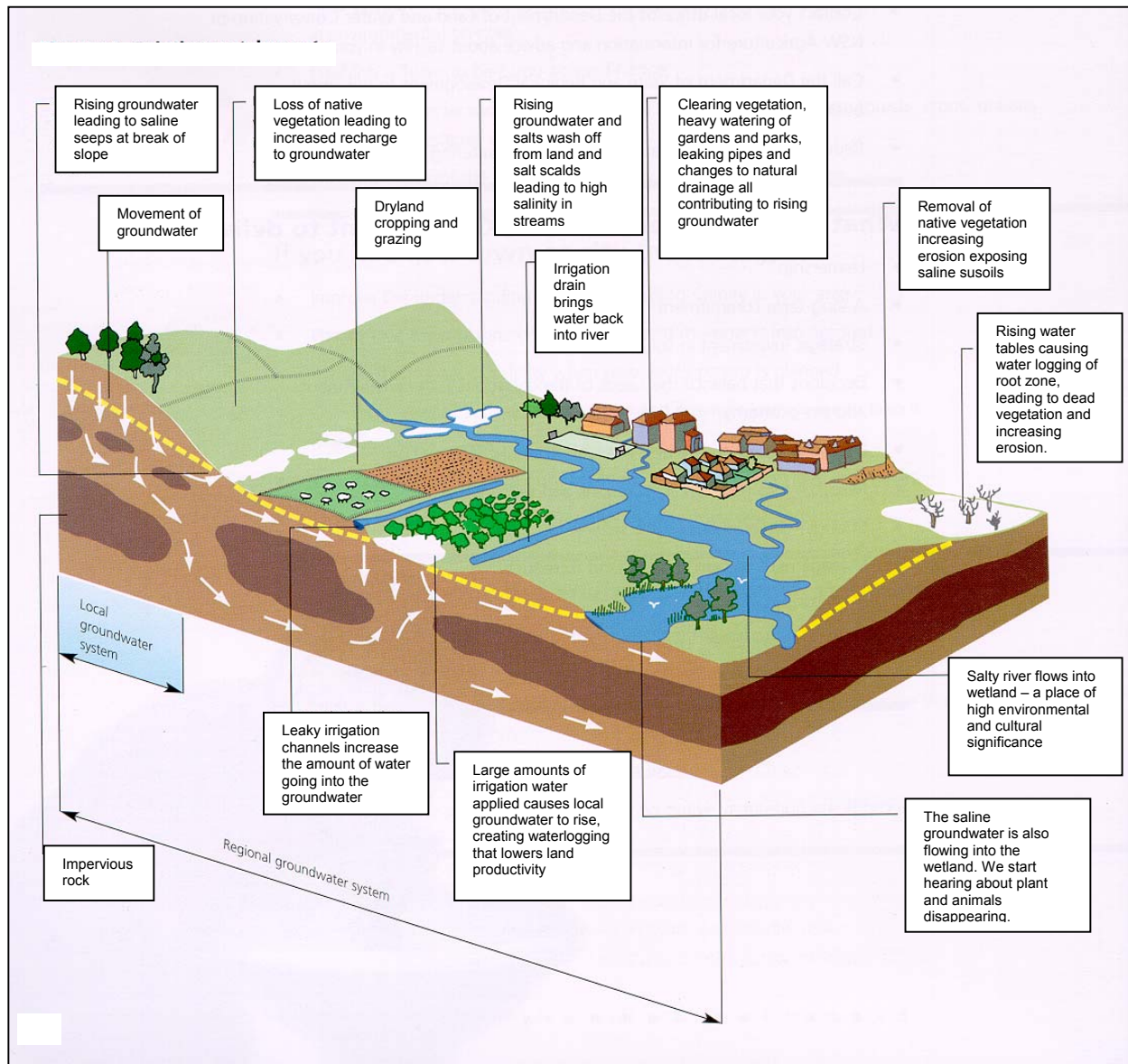


Fig. 9 The Land management practices that lead to salinity issues. (DLWC, 2000)

Salinity in the Maitland area is complex, being the interaction of a variety of processes all of which lead to the concentration of salt in the upper soil profile. Firstly there is the issue of dry land salinity, the most common form of salinity that is affecting large areas of Australia. Dry land salinity results from the large-scale removal of deep-rooted native vegetation resulting in a raising water table.

Compounding this situation is the issue of the geological setting of the Maitland region, being largely composed of sedimentary rock material laid down during the Permian period some three hundred million years ago, when the area was brackish swamps, high in salt. When this landscape begins to erode, the salt contained in rock material is washed down the drainage line to the low points of the catchment.

Salinity in the Maitland region also results from residual salt remaining from sea level changes in more recent geological times (over the last hundred thousand years) associated with the last two major ice ages. Low points around Maitland were inundated during interglacial periods at approximately ten and one hundred

Salinity is already impacting upon social infrastructure within the Maitland LGA. For example the Tenambit sports oval required \$15,000 worth of drainage equipment to remedy an on going problem associated with salt scalds on the oval.

thousand years ago. The other major cause of salinity occurs due to past and present mining activities where stock piles of overburden (comprised of Permian sediment) high in salt leach a great deal of salt into runoff water following rain events, also concentrating salts in the low points of the catchment.

Salinity requires specialist restoration techniques to restore the deep-rooted plant species to the area. Areas effected by salinity and the catchments in which these problems occur require a greater vegetation cover and should be considered for revegetation works, including plantations, windbreaks and corridors.

The issue of irrigation salinity adds weight to the importance of existing vegetation and revegetation within the recharge zones to mitigate problems associated with salinity. High irrigation rates associated with the maintenance of ornamental gardens are actually contributing to the problem of salinity in the Maitland LGA. The watering that takes place increases the water that moves through the saline ground material concentrating mobile salts to the low points in the catchments. Residents are encouraged to use native plants that do not require as much water.



A local example of salinity, which is becoming increasingly apparent through out the Maitland region.

FIGURE 10

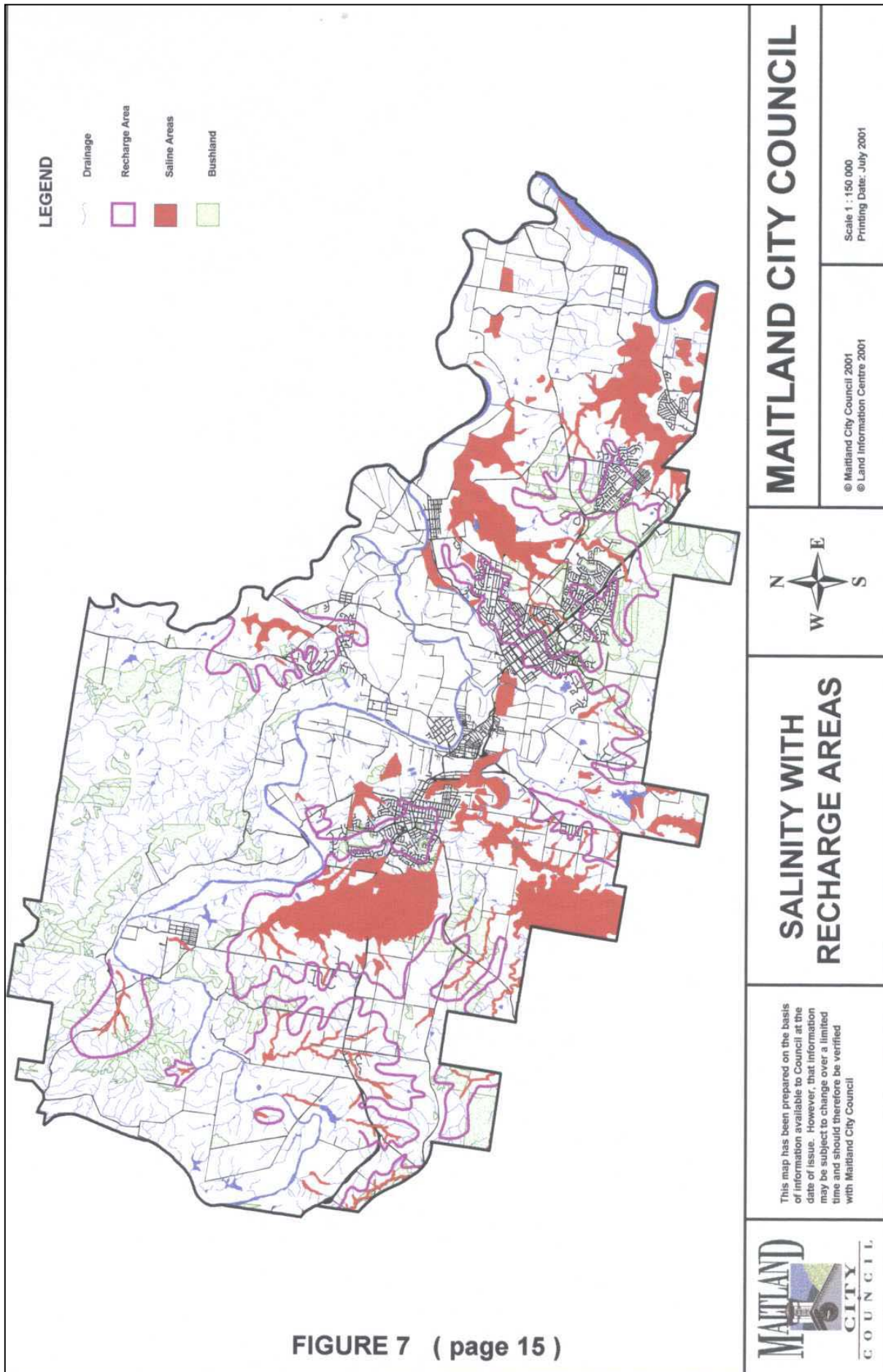


FIGURE 7 (page 15)

2.3.3 Erosion:

Erosion is a natural process in the development of the landscape. However, it is the rate of erosion that has become a major issue with human development. Under natural conditions vegetation protects the soil both from the initial force of rain-drop impact, and the root zone provides a fabric to hold the soil together. Once the vegetation is removed soil crusts can develop from raindrop impact limiting the amount of infiltration (that part of a rain event that actually soaks into the soil) and hence increases the amount of water flowing over the surface of the land. Simple physics are involved in erosion, water moving down slope provides the energy, which is proportional to, the velocity or speed at which the water is moving, and this provides the work to carve the landscape once the resistance of vegetation is removed.

There are two major forms of erosion that affect the Maitland region. Firstly, there is soil erosion, which includes sheet, rill, and gully erosion as well as mass movement. The other main form of erosion is known as stream bank erosion, which, as the name suggests, affects the banks of watercourses.

The different types of erosion are summarised below:

I. Sheet Erosion:

Sheet erosion is the most common form of soil erosion and is often the hardest to recognise. Sheet erosion involves the loss of soil material from across the entire slope without concentrating the water into actual channels, as is the case with the other forms of erosion. Sheet erosion becomes apparent when fence lines begin to become exposed where the erosion is active, or conversely fence lines begin to be buried in the depositional areas associated with sheet erosion. Where sheet erosion is occurring landholders should consider the use of contour drains, such as the designs of Keyline Agriculture. Appropriately incorporated windbreaks and shade trees can also be useful in reducing the problem of sheet erosion.



Sheet erosion leads to the loss of valuable top soil, lowering the value of the land and the land-use options

II. Rill Erosion:

Rills are small grooves that develop when water running off the landscape begins to concentrate into channels and is usually apparent in ploughed areas. Rills are the first obvious sign of an erosion problem. If rill erosion continues landholders should consider changing land-use to a less intensive activity. Contour drains and incorporated wind breaks can be useful to alleviate rill erosion.



Severe gully erosion is unfortunately common in the Maitland area.

III. Gully Erosion:

Gully Erosion is the most obvious form of erosion where large wash ways become a permanent feature of the landscape. As with other forms of erosion, the reduction of water speed or velocity will limit the amount of work that can be done. Revegetating watercourses can be a good insurance policy to avoid gullies developing. However, once they appear, they are very difficult to remedy.

IV. Stream Bank Erosion:

Stream bank erosion is another highly obvious form of erosion, in this case specific to the edges of permanent water courses (also known as the riparian environment). Where past land-use has stripped river banks of their vegetation, or stock are allowed to water directly from the river channel, stream erosion will persist.

Stream bank erosion has an enormous impact on water quality as well as altering the behaviour of the river channel in general, often resulting in large tracts of land adjacent to the river being consumed by floods and hence lost to the landholder.

Riparian zones should be fenced off from cattle. Decentralised watering points should be established with water being pumped from either the river or dams. The riparian zone is a very important area to establish wildlife corridors, if a landholder looks at the long-term land-loss associated with stream bank erosion, the creation of a wildlife corridor can be a very viable option. If stock has to cross a water course then a fenced access path should be established and secured with sleepers or rubble on both sides to minimise any damage that may occur.



Here a section of riverbank has had the native vegetation removed. The weed species that are now present (Willow) do not have an appropriate root structure to hold the bank together and slumps occur, not only leading to a loss of land for the landholder, but adding to the demise of water quality.



Pictured is one of the few areas of natural riparian vegetation remaining in the Maitland LGA. A full component of riparian vegetation is able to hold the bank together during flood events limiting land lost to the river, as well as providing an important biodiversity corridor through the landscape.

V. Mass Movement:

As the name suggests mass movement is when large areas of the landscape change, either suddenly as in the case of a landslide or slowly as in the case of a soil creep. Mass movement is usually associated with the clearance of steep land, and significant rain events. Soil creeps are quite common in the Maitland area and are recognised by a series of small terraces occurring down a slope that are often mistaken for cattle tracks. Mass movement should be considered at the property planning stage. Steep areas should not be developed and left timbered to minimise the threat of mass movement.

Erosion effects large areas of the Maitland district, not just in terms of quality topsoil lost from areas but also in relation to the issue of siltation where eroded material is deposited in creek and river systems causing further problems with water quality.

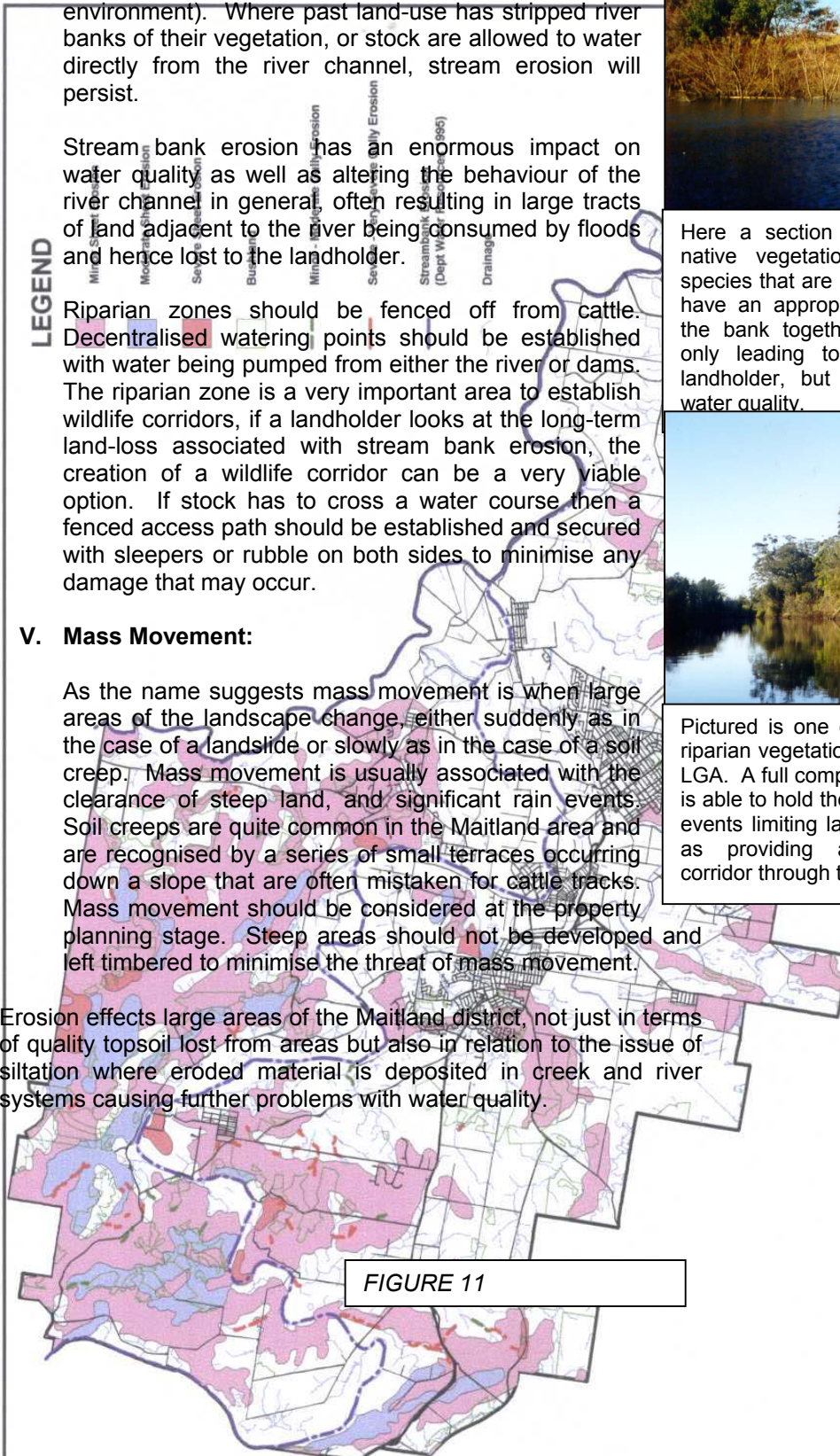


FIGURE 11

EROSION

This map has been prepared on the basis of information available to Council at the date of issue. However, that information may be subject to change over a limited time and should therefore be verified with Maitland City Council

2.3.4 Die Back:

The Maitland region has been described as a “hotspot” for die back (Hunter Catchment Management Trust, 2000). Die back is a condition that often affects Eucalypt trees, usually in a developed landscape, that ultimately leads to their demise. Die back is of serious concern for the trees remaining in the agricultural landscape especially when coupled with the issue of a low vegetation retention rate in the first instance. Die back is particularly relevant to isolated trees in paddocks and areas of intense regrowth, which are at serious risk of death and require urgent attention.

Black Thorn (*Bursaria spinosa*) considered a pest by many landholders is now recognised as an important means of attracting biological control agents for the natural control of the insect larva which cause die back.

Although die back is often caused by the cumulative impact of a number of processes, including cattle damage, excess nutrients, root pathogens and insect attack, the effects of the condition can be mitigated through revegetation and the provision of a healthy habitat to retain biological control agents for some of the culprits of dieback. (Refer to Fig 12)

The provision of understorey species around such isolated trees has a number of benefits to individual trees affected by die back. The obvious benefit is the control of cattle compaction and nutrients introduced from cattle excrement and the control of their rubbing or girdling. The fence provides an obvious limit to the application of fertilisers as well. The more subtle benefits of such plantings include encouragement of bird and predator insect species that will help to control the beetle larva that is a principle culprit of die back.

Die Back is also a major problem in areas where intensive regrowth has occurred. In the Maitland area the Spotted Gum (*Corymbia maculata*) and Forest Red Gum (*Eucalyptus tereticornis*) regenerate vigorously when favourable conditions occur such as the removal of heavy stocking rates. Such regrowth, if allowed to develop to maturity is likely to suffer die back because of the severe competition that occurs between individuals present. Active management of such areas would be needed to control die back in the form of thinning of the woodland to allow a greater biodiversity, particularly of the understorey species where landholders are concerned about this issue. However, given the extent of other environmental issues apparent in the LGA, such management requirements are not seen as an immediate priority.



Die back is a major problem for any vegetation that has survived the initial clearing of the landscape. The Maitland region has been described as a hot spot for die back which if left unchecked will further diminish vegetation resources that remain in the LGA.

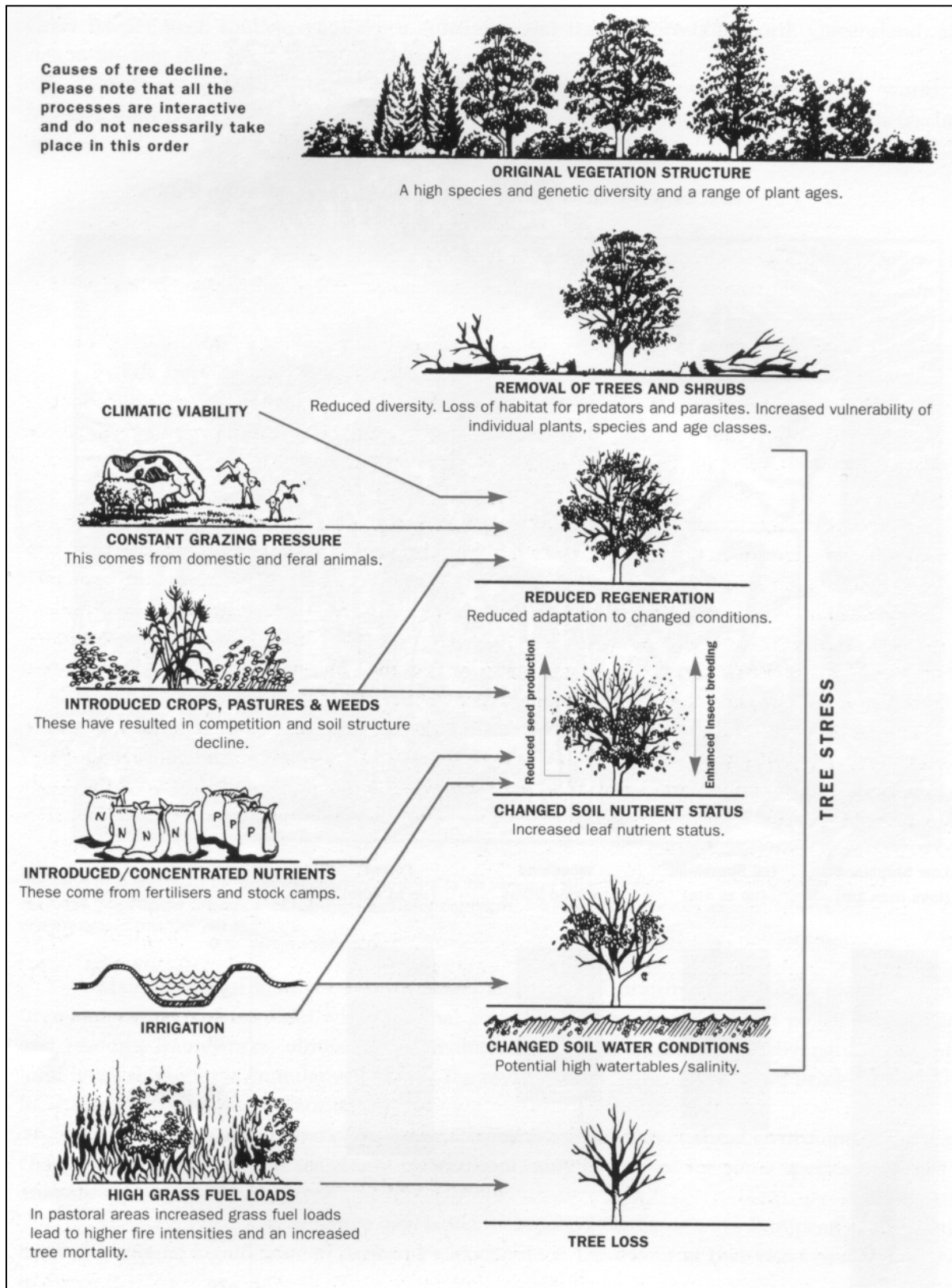


Fig. 12 Causes of Die Back (Greening Australia, 1995)

3 Existing Vegetation

3.1 Introduction

One of the fundamental goals of the Maitland Greening Plan is to ensure the maintenance and enhancement of the natural heritage and biodiversity now and in the future for the Maitland Local Government Area.

It is therefore important to focus on the issue of local vegetation for biodiversity management. With the current state of knowledge relating to vegetation distribution within the Hunter Valley, it is now possible to go beyond the issue of simple vegetation cover and focus upon the vegetation communities that are present in the local area and the wider region. With an increased understanding of vegetation community distribution, the Maitland Greening Plan can work towards appropriate management priorities for specific vegetation communities.

In this respect a great deal of work has been undertaken by a variety of research organisations, such as CSIRO and National Parks and Wildlife Service, to establish best management options for vegetation for the preservation of biodiversity and the control of land degradation. The central focus of such research, and its application to Maitland relate to the proportion of the original extant of each community required to adequately preserve biodiversity. In this section, the extent of Maitland's vegetation communities will be examined at a local and regional level, followed by a discussion of the implications for future management of native vegetation in the Maitland LGA.

3.2 Local Vegetation Conservation

The current extent and variety of vegetation types in the Maitland LGA, are detailed in Figure 14 on page 25.

In addition, Figure 15 shows the original extent of vegetation communities in the Maitland area. The LHCCREMS vegetation model was developed by correlating geological and soil zones in the LGA with the vegetation type known to occur on such zones.

For example the Lower Hunter Spotted Gum Ironbark Forest only occurs on the clay based soils derived from the Permian rock system found on areas of relief south of the Hunter River. So we are able to safely say that where clay based soils derived from Permian material occurs, Lower Hunter Spotted Gum Ironbark forest would have once been found. Other parameters such as rainfall, aspect and topography have been included to develop the model for which the National Parks and Wildlife Service and the LHCCREMS have produced a map of the region with existing and pre-European vegetation community extents.

Native Vegetation or bushland is more than just trees. To ensure areas of native vegetation provide habitat value for biodiversity a plan for all vegetation is required not just trees. Whilst trees provide protection for everything below in the form of a canopy and shelter in the hollows, the understorey and herb layer are crucial in the provision of food for the variety of animal and bird species that are found in the area as well as being important in the control of erosion and die back.

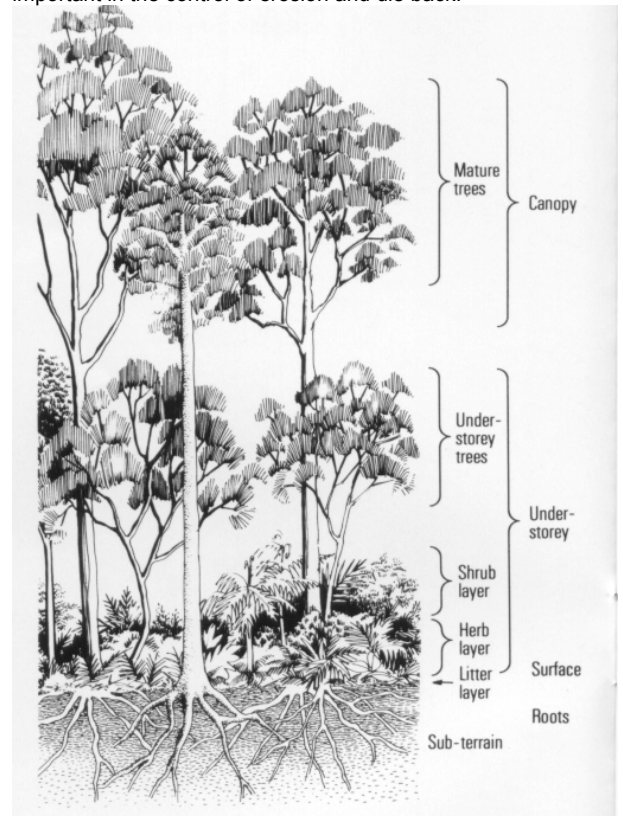
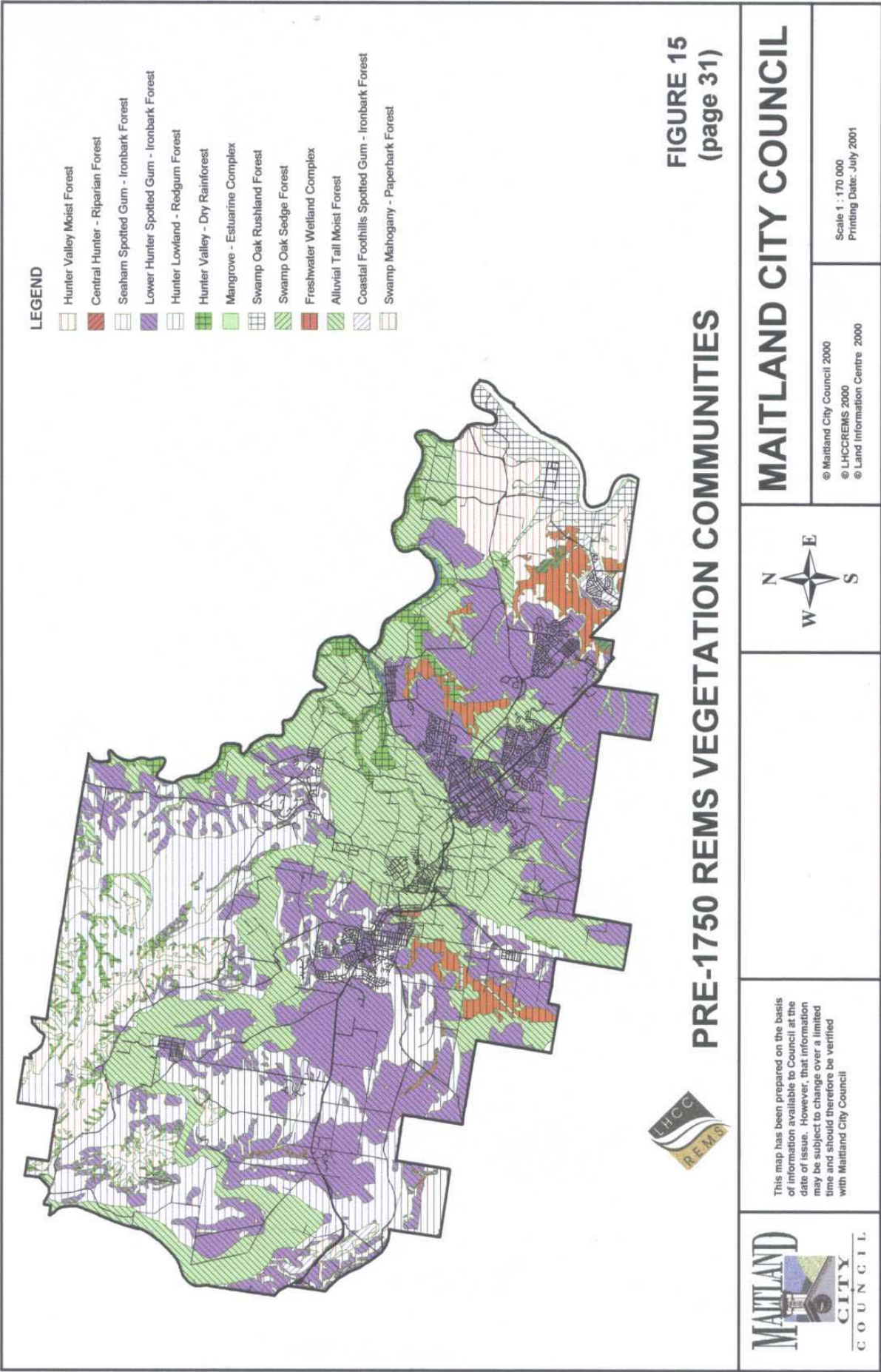


Fig. 13 The Structure of Remnant Vegetation (Greening Australia, 1994).



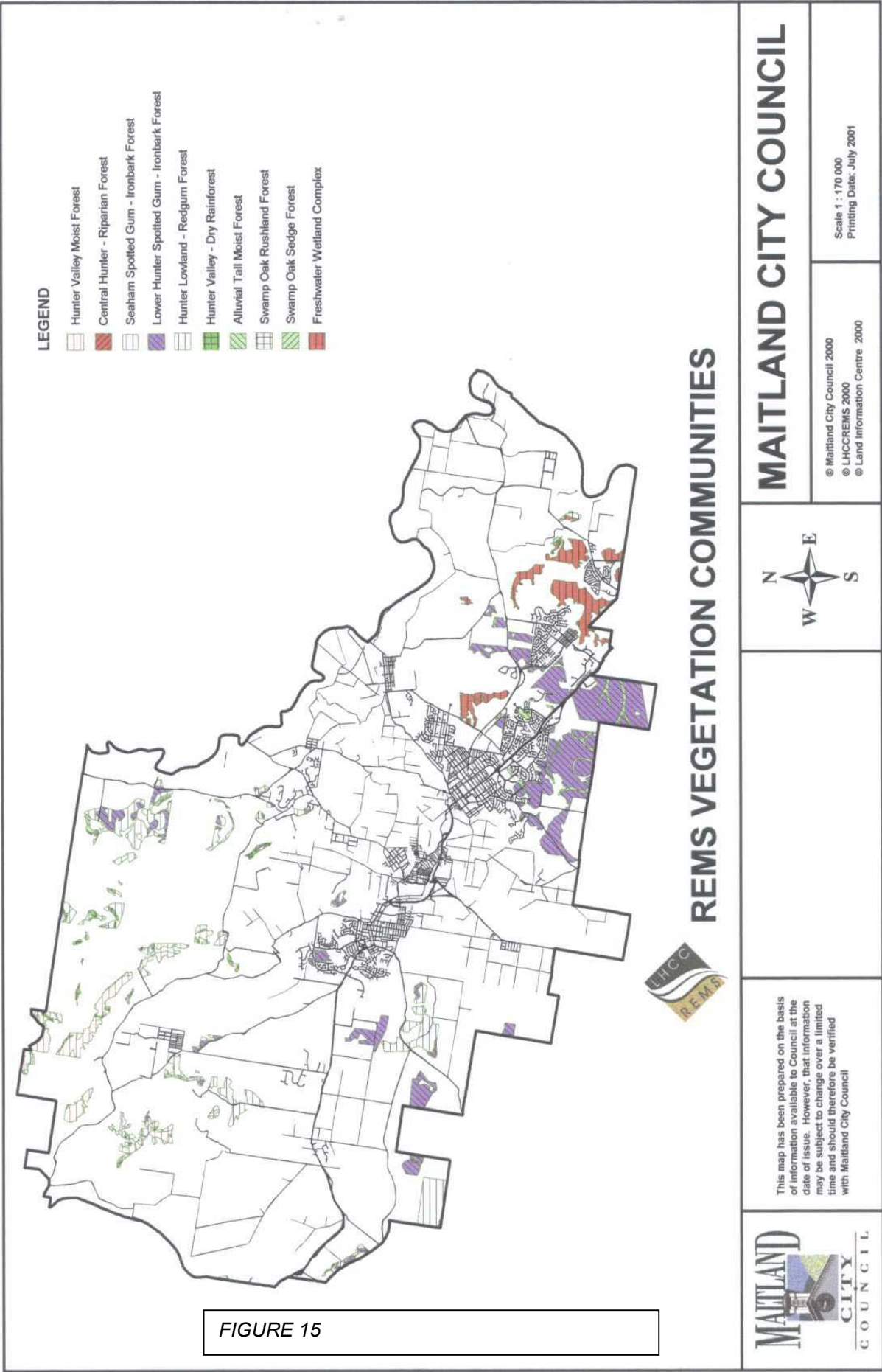


FIGURE 15

3.3 Vegetation Types of the Maitland LGA. Then and Now – A Snap Shot of Vegetation Change

The vegetation communities present in the Maitland LGA are defined by the following species make up. The actual extent original and present, for each vegetation type is also displayed in the figure below.

Vegetation Type	Dominant Species	Extent 1750 ¹	Extent 2000 ²	% Reduction
Hunter Valley Dry Rainforest	<i>Angophora floribunda</i> ; <i>Ficus rubiginosa</i> ; <i>Streblus brunonianus</i> ; <i>Alectryon tomentosus</i> ; <i>Rapanea variabilis</i>	1283ha	60ha	94%
Alluvial Tall Moist Forest	<i>Eucalyptus saligna</i> ; <i>E. robusta</i> ; <i>E. tereticornis</i> ; <i>Syncarpia glomulifera</i> ; <i>Casuarina glauca</i> ; <i>Glochidion ferdinandi</i> ; <i>Ficus coronata</i> ; <i>Acmena smithii</i> ; <i>Callistemon salignus</i> ; <i>Alphitonia excelsa</i> .	9704ha	104ha	98%
Hunter Valley Moist Forest	<i>Corymbia maculata</i> ; <i>Eucalyptus punctata</i> ; <i>E. fibrosa</i> ; <i>Angophora floribunda</i> ; <i>Allocasuarina torulosa</i> ; <i>Melaleuca styphelioides</i> ; <i>Notelaea longifolia</i> ; <i>Rapanea variabilis</i> .	1535ha	384ha	75%
Central Hunter Riparian Forest	<i>Casuarina glauca</i> ; <i>Eucalyptus tereticornis</i> ; <i>E. amplifolia</i> ; <i>E. camaldulensis</i> ; <i>Angophora floribunda</i> ;	56ha	13ha	77%
Coastal Foothills Spotted Gum Iron Bark Forest	<i>Corymbia maculata</i> ; <i>Eucalyptus umbra</i> ; <i>E. siderophloia</i> ; <i>Syncarpia glomulifera</i> ; <i>E. acmenoides</i> ; <i>Allocasuarina torulosa</i> ; <i>Melaleuca nodosa</i> .	258ha	0ha	100%
Seaham Spotted Gum Ironbark Forest	<i>Corymbia maculata</i> ; <i>Eucalyptus creba</i> ; <i>E. punctata</i> ; <i>E. fibrosa</i> ; <i>Acacia falcata</i> ; <i>A. implexa</i> ; <i>Lomandra longifolia</i> ; <i>Dianella caerulea</i> .	5209ha	219ha	96%
Lower Hunter Spotted Gum Ironbark Forest	<i>Corymbia maculata</i> ; <i>Eucalyptus fibrosa</i> ; <i>E. punctata</i> ; <i>Syncarpia glomulifera</i> ; <i>Melaleuca nodosa</i> ; <i>Dianella revolute</i> ; <i>Themeda australis</i> .	12789ha	1204ha	91%
Hunter Lowlands Redgum Forest	<i>Eucalyptus tereticornis</i> ; <i>E. punctata</i> ; <i>Angophora floribunda</i> ; <i>E. globodea</i> ; <i>E. fibrosa</i> ; <i>E. acmenoides</i> ; <i>Breynia oblongifolia</i> ; <i>Daviesia ulicifolia</i> ; <i>Pomax umbellata</i> ; <i>Dichondra repens</i> .	4449ha	672ha	85%
Swamp Oak – Rushland Forest	<i>Casuarina glauca</i> ; <i>Melaleuca ericifolia</i> <i>Eucalyptus robusta</i> ; <i>Eucalyptus tereticornis</i> ; <i>Phragmites australis</i> ; <i>Baumea juncea</i> ; <i>Juncus kraussii</i> .	938ha	10ha	98%
Swamp Oak Sedge Forest	<i>Eucalyptus robusta</i> ; <i>E. tereticornis</i> ; <i>Melaleuca styphelioides</i> ; <i>M. quinquenervia</i> ; <i>M. ericifolia</i> ; <i>M. nodosa</i> ; <i>Carex appressa</i> ; <i>Gahnia clarkei</i> ; <i>Juncus usitatus</i> .	49ha	6ha	88%
Freshwater Wetland Complex	<i>Melaleuca styphelioides</i> ; <i>Casuarina glauca</i> ; <i>Melaleuca linarifolia</i> ; <i>Juncus usitatus</i> ; <i>Typha orientalis</i> ; <i>Baumea articulata</i> .	1105ha	5ha	99%
Mangrove-Estuarine Complex	<i>Avicennia marina ssp. australasica</i> ; <i>Sarcocornia quinqueflora</i> ; <i>Aegiceras corniculatum</i> .	8.9ha	0ha	100%
Swamp Mahogany – Paperbark Forest	<i>Eucalyptus robusta</i> ; <i>Glochidion ferdinandi</i> ; <i>Melaleuca thymifolia</i> .	1561ha	0ha	100%
Total		38936ha	2677ha	93.2%*

Fig 16 Vegetation Communities of the Maitland LGA

(¹ LHCCREMS, 2000), (² LHCCREMS, 2001)

More detail available in Appendix 5

(*Total remaining remnant vegetation does not include regrowth).

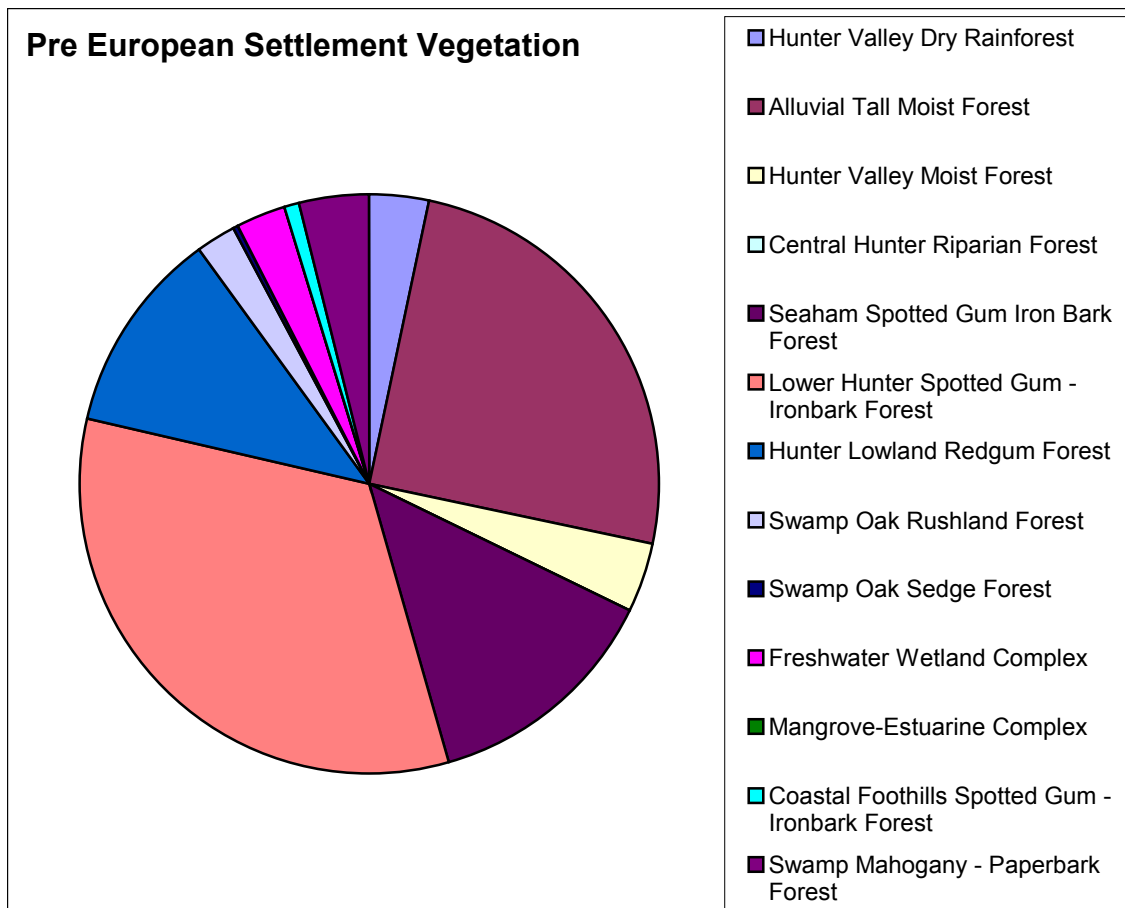


Fig. 17 Pre European Vegetation Community Extent for the Maitland LGA. (LHCCREMS, 2001)

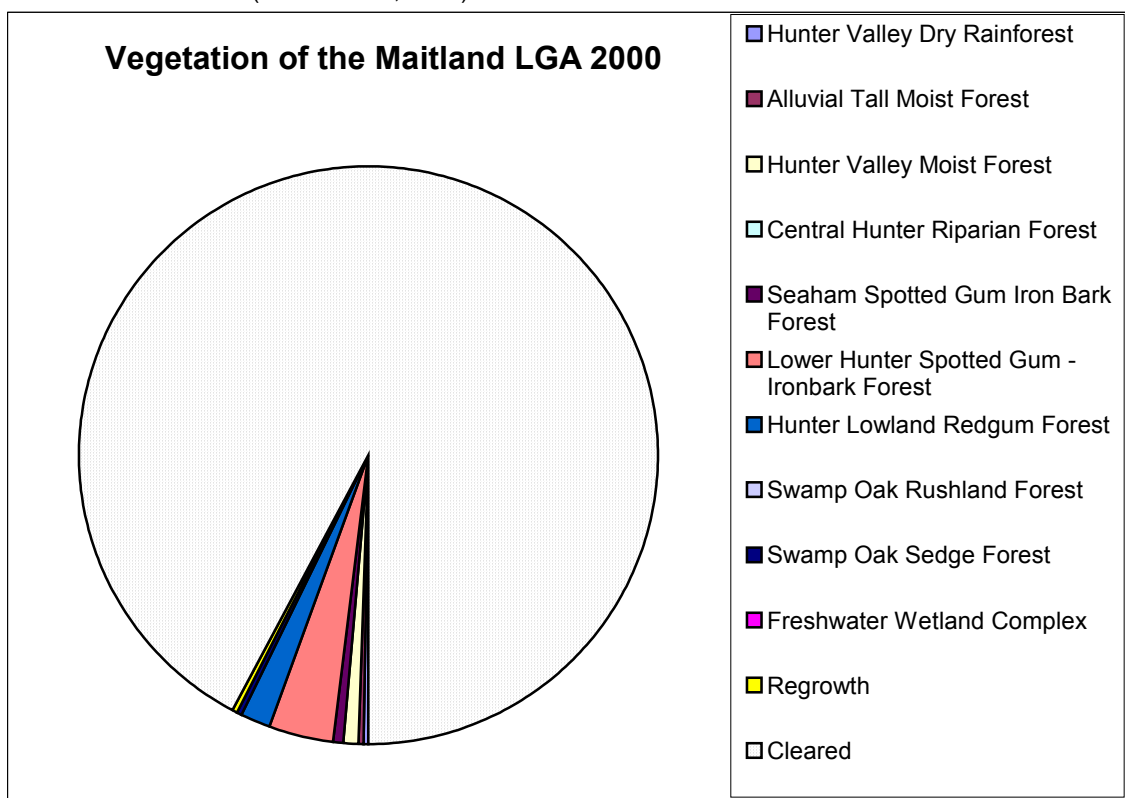


Fig. 18 Current Vegetation Community Extents for the Maitland LGA. (LHCCREMS, 2000)

The previous Figures (17 & 18) show the former and present distribution of Maitland's vegetation communities. These figures show vegetation distribution only and do not detail the land use of the area. A large proportion of the vegetation removed from the LGA was done so very early in the history of European settlement. Flood plain vegetation communities have been most seriously impacted upon by vegetation clearance as a result of the rich alluvial soil upon which they developed. The Alluvial Tall Moist Forest, the Rainforest of the flood plain and the Swamp Mahogany Paper Bark Forest have been most seriously impacted upon by agricultural developments in the flood plain areas.

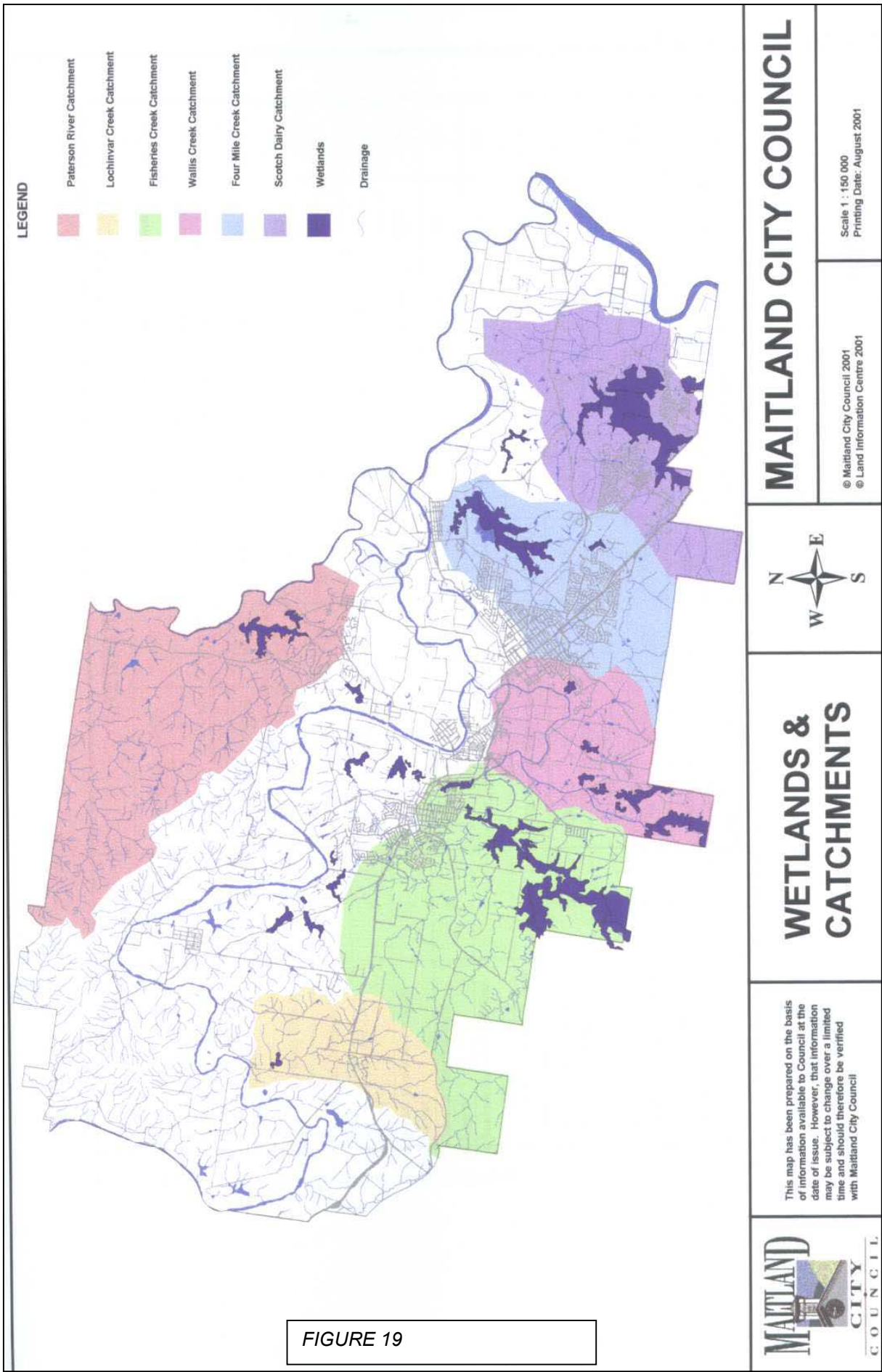
Although the extent of native vegetation remaining in the Maitland LGA has been severely reduced over the past 200 years of European settlement, the diversity of vegetation communities within the Maitland area remains quite high, relating to the ecological and geological history of the region. At least ten distinct vegetation communities remain in the Maitland LGA, from the fourteen or so that are likely to have existed two hundred years ago.

Maitland still retains a significant extent (672ha) of the Hunter Lowlands Red Gum Forest, which has been reduced at a regional level by over 70%. The other two dominant communities are the Lower Hunter Spotted Gum Ironbark Forest and the Seaham Spotted Gum Ironbark Forest both of which have also been severely diminished.

Several clear patterns emerge from the study of the previous figures:

1. Maitland retains only very limited extents of all vegetation communities once found in the LGA, all communities have been cleared beyond their threshold for the maintenance of the biodiversity they contain;
2. Approximately one third of the remaining remnant vegetation is confined to ridge lines and steep country in the north western portion of the LGA, where further clearance is limited due to the steep nature of the land;
3. Approximately one third of the remaining vegetation occurs as large structurally intact areas of remnant bushland existing in close proximity to the rapidly urbanising areas in the south eastern portion of the LGA;
4. Several of the vegetation communities present in the Maitland LGA are poorly conserved at the regional level with only limited extents of most communities in existence within existing conservation reserves such as National Parks.
5. Maitland retains a large area of wetlands throughout the LGA. Approximately 1600ha of wetlands exist, which is equivalent to 4.5% of the Maitland LGA, present as several different wetland types. Several wetland systems within the Maitland LGA have been recognised as significant and are protected under State Environmental Planning Policy (SEPP) 14 due to their ecological value. Wetlands of the Maitland LGA are mapped in Figure 19 on the following page.

The vegetation communities that occur in the Maitland LGA are found only in a small geographical range at the regional level. With this in mind it is important to focus on vegetation management at the local level within the natural range or niche of the relevant vegetation communities.



The limited extent of remnant vegetation in the previous figures is a function of land use. The vegetation communities of the valley floor and flood plain areas have been heavily cleared as a function of their value to agriculture or due to pressure for urban expansion.

3.4 Regional Vegetation Conservation

It is important to consider the extent of Maitland's vegetation communities in the region as well as the area of each community that is already conserved. This is illustrated in Figures 21 and 22.

The Figures show that a significant proportion of each of Maitland's remaining vegetation communities has been cleared at the regional level. The amount cleared varies between 34% and 82% of what originally existed. The - 7% reading for Freshwater Wetland Complex is an anomaly due to the establishment of this community following the clearance of other types of wetland communities.

At the regional level, the Lower Hunter & Central Coast Regional Environmental Management Strategy (LHCCREMS) data indicates a higher level of vegetation cover, with an average of 55% of the original cover retained in the LHCCREMS region (Gosford, Wyong, Lake Macquarie, Newcastle, Port Stephens Maitland and Cessnock). However, the LHCCREMS data does not cover the Singleton and Dungog LGA's, which are immediately adjacent to the Maitland LGA, which prevents direct comparison. From other vegetation inventory work undertaken in the Hunter Valley, Singleton retains around 75% and Dungog retains around 80% of their original vegetation cover (Peake, 2001), however, it is important to point out that both LGA's contain large areas of State Forest and National Parks. Vegetation mapping of the upper Hunter Valley floor undertaken by the Hunter Valley Catchment Management Trust has shown that Singleton still retains 30-40% of its valley floor vegetation (Peake, 2001), as opposed to the 2-3% of the valley floor in the Maitland LGA.

On face value, the existence of higher percentages of vegetation cover in surrounding Local Government areas might suggest that Maitland's low percentage vegetation cover is less of an issue. In other words, why does it matter if Maitland has a low vegetation cover, when surrounding areas have significantly more vegetation?

From the data presented in Figures 21 and 22, it is clear that the particular types of vegetation existing in the Maitland LGA are poorly conserved at the regional level. The amounts conserved in Column G of the table range from less than 1% to 27%. Our local vegetation communities make up less than 2% of secured conservation reserves such as National Parks (LHCCREMS, 2000). It is also important to point out that no vegetation is conserved within the Maitland LGA in any secure reserve, although limited extents are found within areas zoned for environmental protection.

The Hunter Valley and the Maitland LGA in particular, present a major cleared zone on an otherwise mosaic of vegetation that exist along the east coast of Australia. This presents major issues for species dispersal and migration.

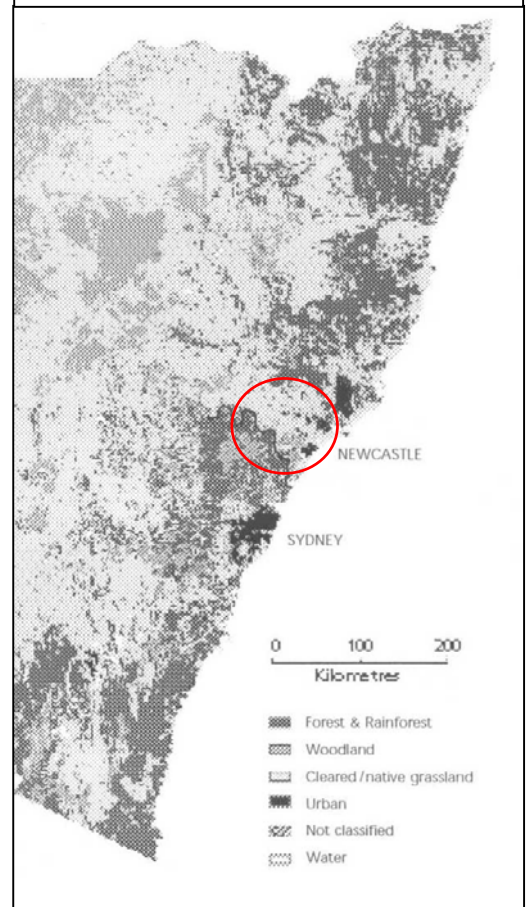


Fig. 20 NSW Vegetation Cover in relation to the Hunter Region. (DLWC, 2000)

		REGIONAL						LOCAL			
	Conservation	Pre 1750	2000	Percent	Extent	Percent		Pre 1750	Extent 2000	% Remaining	% Remaining
Map Unit Name	Rank	Total (ha)	Total (ha)	Conserved	Conserved	Regional Cleared		Maitland Total (ha)	Maitland Total (ha)	(of Regional extent 1750)	(of Local extent 1750)
Hunter Valley Dry Rainforest	1	3054ha	1326ha	9%	269ha	54%		1283ha	61ha	5%	6%
Alluvial Tall Moist Forest	1	25383ha	4565ha	<1%	171ha	82%		9704ha	104ha	2%	2%
Sw amp Oak Sedge Forest	1	2112ha	596ha	6%	119ha	72%		49ha	6ha	<1%	12%
Central Hunter Riparian Forest	2	1841ha	1186ha	<1%	5ha	36%		56ha	13ha	1%	23%
Hunter Low land Redgum Forest	2	18252ha	4856ha	2%	402ha	73%		4449ha	670ha	14%	15%
Sw amp Oak Rushland Forest	2	6529ha	2449ha	4%	244ha	47%		938ha	11ha	1%	2%
Seaham Spotted Gum Iron Bark Forest	3	14802ha	6975ha	8%	116ha	53%		5209ha	219ha	3%	4%
Low er Hunter Spotted Gum - Ironbark Forest	3	65677ha	26917ha	9%	6017ha	59%		12789ha	1204ha	5%	9.50%
Coastal Foothills Spotted Gum Ironbark Forest	3	30813ha	16939ha	12%	3783ha	55%		258ha	0ha	0%	0%
Sw amp Mahogany Paperbark Forest	3	14114ha	4763ha	10%	1412ha	34%		1561ha	0ha	0%	0%
Hunter Valley Moist Forest	3	7427ha	4906ha	15%	1105ha	34%		1535ha	384ha	8%	15%
Freshw ater Wetland Complex	4	3522ha	3773ha	18%	658ha	-7%		1105ha	5ha	<1%	-7%
Total Area		245612ha	112235ha	1%	29244ha	45%		38936ha	2677ha	1%	6.80%

Fig 21 Regional Vegetation Extents and conservation state achieved.
(LHCCREMS 2000)

3.5 Retention Targets

The Coordinating Group for the Maitland Greening Plan decided that the establishment of targets for the retention of vegetation communities is an essential part of the Greening Plan. The targets will act as a measure of the success of the implementation of the Plan by Council and the community.

In order to establish targets, a review of scientific literature was undertaken in relation to the extent of vegetation required to adequately preserve biodiversity.

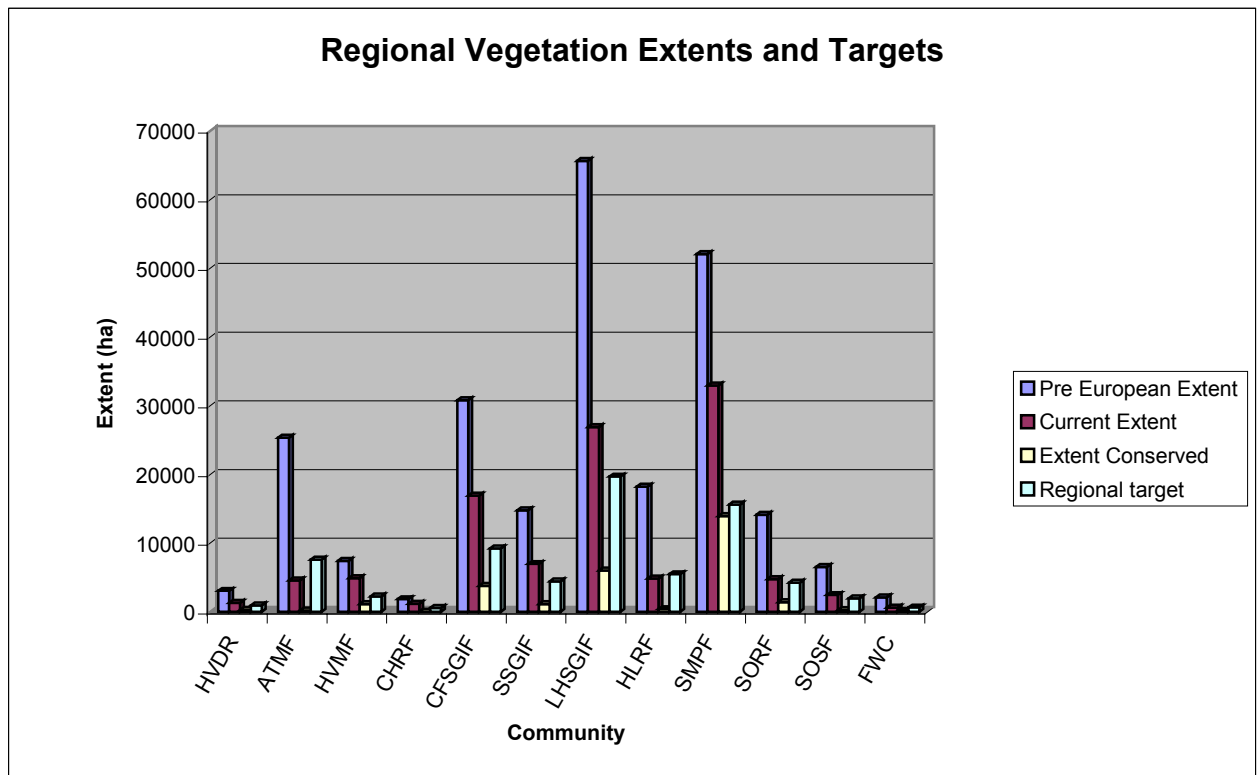


Fig 22 Regional Vegetation Extents and Conservation Status of Native Vegetation Communities of the Maitland LGA

In summary, a great deal of work has been done in Australia and over seas in relation to the area or extent of particular ecosystems required to achieve the conservation of biodiversity. Such targets tend to range between 30% (proposed by the Hunter Catchment Management Trust as a vegetation retention target for the Hunter Valley) and the 10% proposed in special circumstances by the JANIS report and applied to the Regional Forest Agreement (RFA) process for Australian Forests.

The National Parks and Wildlife Service consider that a reduction of more than 60% in any vegetation type is significant and subsequently assign a Threatened Community nomination under the TSC Act (Threatened Species Conservation Act, Section 12) as this has serious consequences in relation to biodiversity management. It is therefore significant that the majority of vegetation communities present in the Maitland LGA have been cleared by more than 50% at the regional level and that three of the communities have been cleared by more than 70% (i.e. Alluvial Tall Moist Forest; Hunter Lowland Redgum Forest and Swamp Oak Sedge Forest).

Various authors make the distinction between conservation targets that have biological relevance, in that they actually preserve biodiversity, and those

targets that are politically based and really have limited value in the preservation of biodiversity.

Soule and Sanjayan (1998) in an article in the Science Journal suggest that true biodiversity conservation requires up to 50% of the original distribution of an ecosystem or community to be conserved for biodiversity, and that figures of 10% may be politically palatable but have little conservation value.

Kirkpatrick (2000) cites research undertaken with bio-indicator species to ascertain the loss of vegetation on biodiversity. It was found that extinctions started to occur when the extent of vegetation fell below 40% of its original distribution (Kirkpatrick, 2000).

The report undertaken by the Joint ANZECC / MCFFA National Forest Policy Statement Implementation Sub-committee (JANIS) suggests a minimum retention rate of 15% but conclude that this retention rate can be lowered to 10% where socio-economic considerations are prevalent.

The Coordinating Group considered these issues, and has concluded that different vegetation retention targets should apply at the local and regional levels.

At the regional level, the 30% proposed by the Hunter Catchment Management Trust as a vegetation retention target for the Hunter Valley, is considered to be an appropriate target. This is likely to be consistent with the Regional Vegetation Management Plan which is currently being developed for the Hunter under the Native Vegetation Conservation Act by the Department of Land and Water Conservation.

At the local level, the minimum 10% retention target is considered to be appropriate having regard to the highly urbanised environment which exists in Maitland and the fact that most vegetation communities, have local retention rates of less than 10% of their original distribution.

The conservation significance of the vegetation communities of the Maitland LGA have been ranked according to the above conservation targets, as shown below:

Conservation Ranking	Regional Significance	Local Significance	Relevant Communities	Conservation Outcomes
1	Regionally <30%	Locally <10%	<ul style="list-style-type: none"> Hunter Valley Dry Rainforest; Alluvial Tall Moist Forest; Swamp Oak Sedge Forest. 	No further Clearing Protection under LEP Priority Revegetation

2	Regionally <30%	Locally >10%	<ul style="list-style-type: none"> Central Hunter Riparian Forest; Hunter Lowlands Red Gum Forest; Swamp Oak Rush Forest 	No Net Loss Limited Clearing (10%) with revegetation
3	Regionally >30%	Locally <10%	<ul style="list-style-type: none"> Hunter Valley Moist Forest; Coastal Foothills Spotted Gum Ironbark Forest; Seaham Spotted Gum Ironbark Forest; Lower Hunter Spotted Gum Ironbark Forest¹; Swamp Mahogany Paperbark Forest 	No Net Loss LHSGIF (minimum 6.75% locally) supplemented in longer term by revegetation (see notes below)
4	Regionally >30%	Locally >10%	<ul style="list-style-type: none"> Fresh Water Wetland Complex 	N/A Wetland

Fig. 23 Conservation Significance based on local and regional vegetation extents.

3.6 Implications

In most cases, Maitland's vegetation communities have already fallen below 10% locally and/or 30% at the regional level. In these cases, Council needs to be realistic about the amount of the vegetation community, which will be able to practically conserved in the long term.

Revegetation is an option but is costly and depends on a range of issues such as land use and land ownership. It is therefore intended that where the retention targets have already been exceeded, the conservation outcomes in figure 23 will provide the basis for future management decisions.

In most cases, the recommended conservation outcome for Maitland's vegetation communities is that there be "no net loss". This means that Council will consider limited loss of vegetation only if the ultimate outcome is the maintenance of existing levels of that community. Revegetation is seen as an inferior outcome to the retention and management of remnant native vegetation but will be considered in some instances where other practical alternatives do not exist.

Details of the implementation of a "no net loss" policy will need to be developed in conjunction with details in relation to trade offs and draft amendments to Maitland LEP 1993 in relation to vegetation management.

However, the extent of these implications may not be as great as they would first appear. Much of the LGA's remaining vegetation is located on land which is unsuitable for development, such as land which is too steep to clear. This is essentially why the land has not been cleared in the past.

In addition, the areas nominated for urban investigation in Maitland's Urban Settlement Strategy are almost entirely located outside of areas of remnant vegetation. The exception is on land to the north of Thornton, which is already expected to be cleared for clay extraction in any case.

Nevertheless, there are very real implications in other parts of the LGA, which need to be considered. The most significant area is expected to be on land to the south of Ashtonfield and East Maitland, where large, contiguous areas of Lower Hunter Spotted Gum Iron Bark Forest (LHSGIF) extend beyond the Maitland LGA into the Cessnock LGA.

There are strong socio economic pressures that exist in that location for reasons including employment generating development and, as a result, some of the remaining bushland in this location is already zoned and/or approved for urban development.

The remaining area of LHSGIF is mostly the responsibility of a few landowners, who collectively have responsibility for its on-going management, including issues such as illegal rubbish dumping, weed invasion, fencing and the like. The implications of restricting all future development in this location are therefore particularly significant for these landowners, particularly as Council has limited capacity to simply acquire and manage these areas of bushland on behalf of the community.

The Coordinating Group has therefore considered that there may be a need to be a special case for the LHSGIF community when determining targets conservation. Generally speaking, it was accepted that the remaining areas should be securely reserved wherever possible and that revegetation initiatives should aim to increase the local distribution of that community to 10% in the long-term.

The implications of several percentage retention options were considered by the Group, as shown in figure 24 below.

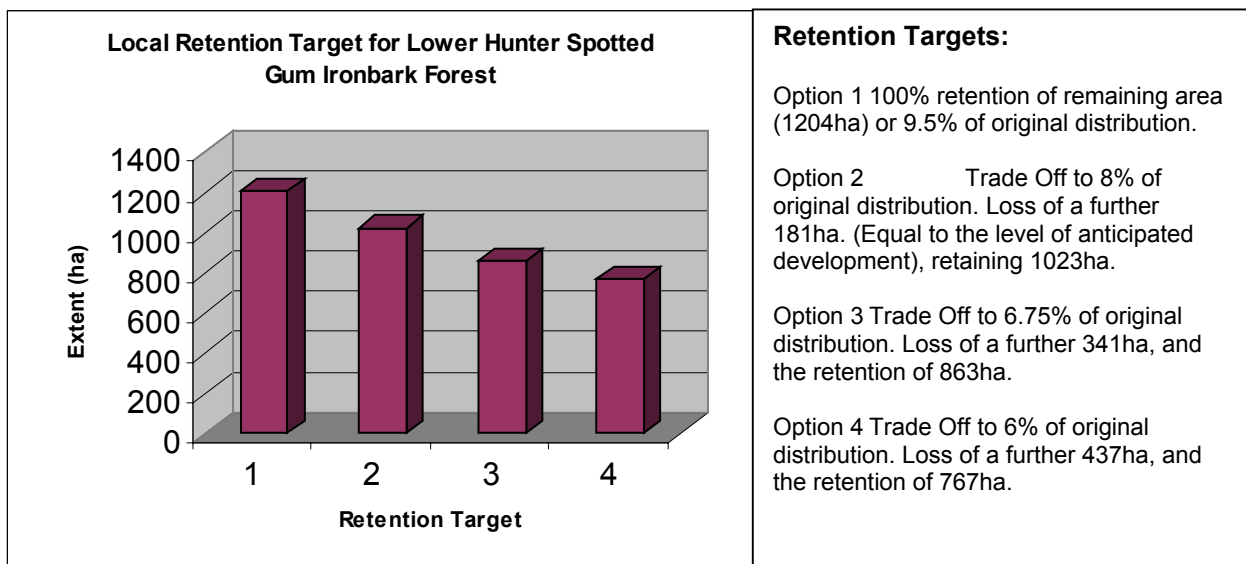


Fig 24 Trade Off Options for the Lower Hunter Spotted Gum Ironbark Forest.

Option 1 shows the level of LHSGIF that exists at the present time. The option to conserve all of this vegetation was considered to be a very difficult one, given the costs associated with purchasing urban zoned land and compensating landholders for losses. The zoned/approved land within the LHSGIF is likely to reduce the total

area of that community at the local level from 9.5% of its original distribution to 8%. This is shown diagrammatically in Figure 24 as a reduction from Option 1 to 2.

Options 3 & 4 show further losses of vegetation in the LHSGIF community, in recognition of economic development pressures and as a means of increasing the likelihood that Council will be able to realistically achieve the conservation of the remaining areas of LHSGIF.

However, it was considered that there may be a case for some loss of remnant vegetation in this community given that the regional level the Lower Hunter Spotted Gum Ironbark Forest community is retained above the regional retention target (30%) with approximately 40% remaining. Maitland is currently responsible for 20% of that area based on its original regional distribution.

Maitland's role in the regional retention of this community was considered in the context of Maitland's role as a key economic zone in the region. In conclusion, it was considered that there is little that Council can do to prevent the clearance of LHSGIF vegetation in accordance with existing zones and approvals. Allowance was made for investigations to the north of Thornton and for trade offs in other areas, incorporating revegetation wherever possible, and securing remaining areas of bushland for long term conservation.

In these circumstances, it was considered that it would be misleading and potentially counterproductive to identify a target for LHSGIF which could not be achieved. A special case was therefore proposed for LHSGIF, to allow for expected further losses, with a long term goal to increase the amount LHSGIF through revegetation and to obtain a secure conservation status for as much of the remaining LHSGIF as possible.

This does not suggest that revegetated areas have the same value as remnant areas of LHSGIF, but simply recognises that there will be further losses.

Accordingly, it is proposed that Council provide some scope for trade-offs as discussed in the Greening Plan and that the minimum percentage for the conservation of LHSGIF be stated as 6.75% (Option 3), with the objective of maximising revegetation in the longer term.

The conservation of 6.75% of LHSGIF would amount to the retention of 863 Ha of LHSGIF under long term conservation, in addition to any revegetation which is implemented in connection with trade-offs and future urban development. The 6.75% target is a considerable goal for Council and the Maitland community. It would make a substantial contribution to the long term maintenance of 30% or more of LHSGIF at the regional level.

4 How Do We Maintain Our Vegetation?

4.1 Introduction

This section of the Greening Plan is concerned with the management of areas of native vegetation and the characteristics of Maitland's remnant vegetation, which will determine management priorities.

As mentioned earlier, around 95% of remaining bushland occurs on private property. The management of Maitland's remnant vegetation is therefore the responsibility of a large number of individuals with a range of interests and values. The Greening Plan is advocating a "partnership" approach to environmental management with private landholders, including increased knowledge and awareness of the management issues by all parties.

The management of native vegetation is a complicated matter. Issues such as the responsibility and cost of maintaining bushland will need to be considered in the implementation of any actions under the Greening Plan.

A range of management options are required for the different circumstances which occur throughout the Maitland LGA. For example, the different management requirements for areas of structurally intact native vegetation, urban areas and areas of regrowth.

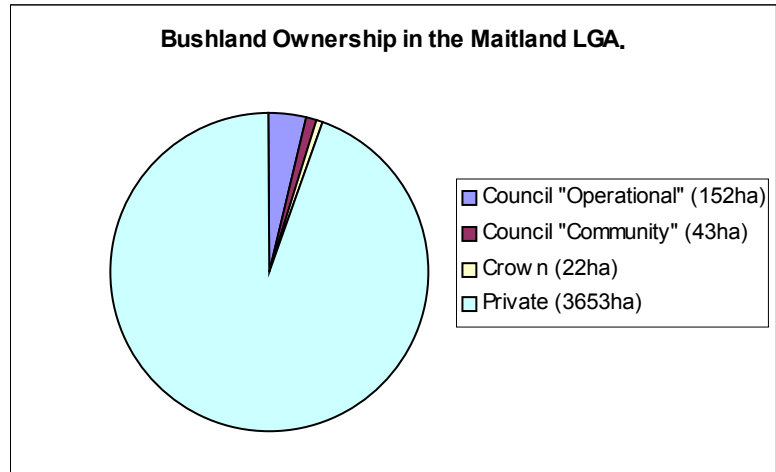


Fig. 25 Bushland Ownership in the Maitland LGA

It is anticipated that the following information on management requirements will complement the framework for assessing conservation significance, which is presented in Section 3. It will provide a useful basis for any member of the community to determine the types of management considerations which apply to a particular piece of bushland. Council will also use the information on management requirements when determining management priorities.

4.2 Broad Management Considerations

There are a number of vegetation management issues that are common to all areas to ensure the future presence of biodiversity and the amelioration of land degradation issues in the Maitland region. The following considerations are important in all areas of native vegetation be they in the urban or agricultural landscape and should be considerations where management assistance is provided to individual properties or other revegetation endeavours in the Maitland LGA.

Regionally Significant Populations/Ecosystems

Similar in concept to the Threatened Species significance, this acknowledges that at a regional level rarity and vulnerability is of concern, unfortunately such communities are not always afforded the luxury of legislation to protect them and rely upon suitable management to ensure their long term sustainability.

Regionally significant vegetation communities include those that have been listed under the Threatened Species Conservation Act. Further to these, the Greening Plan proposes a ranking for conservation significance of communities in the LGA based upon their local and regional distribution as shown in Figure 23 on page 4.

Buffer Areas Significant Vegetation

For the areas of high conservation significance to be adequately maintained there needs to be a degree of protection not only in the legal sense but also in an ecological sense (i.e. a buffer between that particular community and surrounding cleared land), to ensure that edge effects do not impact upon their structure and function.

Size of Remnant Area

Larger remnant areas contain more species and greater diversity (genetic, species and ecosystem) than a small area. A small isolated area contains fewer species than an equivalent sized area within a larger area of bushland. Edge effects (clearing, weed invasion, etc.) will compromise the integrity of the ecosystem on the perimeter of the remnant, hence the larger the area, the greater the area of the remnant that is not affected by external degrading processes.

Degree of Connectivity (Wildlife Corridors)

The closer remnant areas are to one another the more likely migration and dispersal can occur and thus a greater long-term ecological sustainability of the area. Ecologists refer to “gap tolerance” being the distance of cleared area over which a particular species is likely to move. Gap tolerance is generally related to the size of the organism, smaller organisms are less likely to leave remnant areas than larger organisms. Organisms need to be able to move through the landscape in order to meet mating, dispersal and migration requirements.

Wildlife Corridors are basically links between areas of remnant vegetation. Wildlife Corridors are often developed along drainage lines (permanent and ephemeral) as stock should be excluded from these areas due to erosion issues anyway. Appropriately designed, wildlife corridors can also fulfil many of the other outcomes of a greening plan ie: windbreaks, plantations etc.

Degree of Disturbance

The quality of a remnant area will also relate to the degree of disturbance (weed invasion, altered fire regimes, access pressure, rubbish dumping). Generally speaking, the higher the degree of disturbance the lower the value of the area as a conservation reserve. The degree of disturbance relates to the size and shape of the remnant to a large extent. Buffer zones are important, particularly in relation to “sensitive” vegetation communities such as rainforest and wetland areas.

Structural Diversity

What delineates remnant forest areas from that of recent regrowth is the diversity of age and species contained within. Structural diversity can relate to the ability of the remnant area to naturally regenerate and thus maintain some form of sustainability in the long term. Structural diversity is also important in the provision of breeding sites for a variety of small mammals and bird species.

Shape of Remnant Area

The shape of a remnant area is a key determinant of the sustainability of vegetated areas in the long term and generally determines the proportion of quality habitat contained in an area. The ratio of surface area to the volume contained within is, therefore, an important consideration. The closer the shape of the area is to a circle the better the shape is considered to be because of the reduced potential of “edge effects”. The more irregular the shape the greater the surface area to volume and hence influence of the edge effect. Buffer planting can be utilised to reduce shape irregularities.

Habitat for Threatened Species

As certain bushland areas are known habitat for threatened fauna and flora species, covered under the Threatened Species Conservation Act, their habitat must be preserved. Unfortunately lack of management of biodiversity in the past has left a number of threatened plant and particularly animal species in very small isolated and degraded bushland areas. Buffer planting and corridor development is crucial for the long-term survival of many of the locally occurring threatened species and existing remnant areas.

Salinity Recharge Areas

In recognition of the salinity issue that is occurring in the Maitland LGA, the vegetation that occurs in recharge areas should be valued as a means of reducing the future impact of this problem. Revegetation should also be targeted within salinity recharge areas (as per Figure 10, page 17).

Habitat for Migratory Species

Certain areas of the Maitland LGA are visited on an annual basis by a variety of migratory bird species, some of which are protected by State, Federal and International conservation agreements. The known habitat areas for such species should be managed accordingly.

Wetlands

Maitland retains a similar area of wetlands as bushland. The value of wetlands in relation to biodiversity conservation, water quality and tourism has been highlighted and should form an important part of the Maitland Greening Plan. Wetlands are also an important focus for revegetation works as they are not a productive part of the farm environment (in an agricultural context) and can add significant biodiversity to a farm through simple restoration and protection works.

Stream Banks and Flood Plain Areas

Drainage lines (including river banks) and flood plain areas are important areas for revegetation to address issues of degradation already mentioned. Due to the flood mitigation works that have been constructed to protect Maitland from future flood events, some important considerations need to be kept in mind in these areas.

Levee banks should be excluded from any form of planting activity. The root structure of some species could diminish the stability of these constructions that would lead to their failure during flood events. A buffer of 5 metres should be maintained from the toe of levee banks.

Within the floodplain, designated floodway areas exist, which are designed to carry floodwaters during peak flood events. The

Department of Land and Water Conservation requires that trees in floodway areas be no closer than 7 metres from trunk to trunk.

Any riverbank plantings below Aberglasslyn on the Hunter and all areas of the Paterson River in the Maitland LGA require approval from Department of Land and Water Conservation before planting can take place.

Road Side Vegetation:

Road side corridors are another form of Greening Corridor that fills empty space that may be left in road easements. Apart from providing windbreak benefits to properties adjoining roadside vegetation corridors, if appropriately planted, can also provide a significant aesthetic improvement to the area. Roadside vegetation should avoid large tree species and principally focus on shrubbery and small trees which will not impact upon road safety issues.

It has also been proposed that Council revegetate roadside reserves that exist in the Maitland LGA that are either no longer utilised or were never developed.

4.3 Application of Management Approach to the Maitland LGA.

For the purposes of this Plan remaining vegetation in the Maitland area can be represented by four distinct categories:

- 4.3.1 Agricultural bushland existing as small isolated agricultural back blocks that are scattered across the rural areas of the Maitland LGA, likely to have survived the original clearance of the landscape as they were unsuitable for agriculture in the first instance, usually as the areas are too steep;
- 4.3.2 Large, structurally intact areas of bushland that are mainly located in the south-eastern areas of the LGA retained due to the low fertility of the soil and the long term presence of mining operations in the area;
- 4.3.3 Urban bushland, occurring as small isolated patches or reserves of bush scattered throughout the urban areas of the city;
- 4.3.4 Intense regrowth, where vegetation was cleared initially, but over the years have been left, allowing natural regeneration to take place leaving a monoculture of single age class and species.

Each of these areas have distinctly different management issues as summarised below:

4.4 Agricultural Bushland

Agricultural areas are an important focus of the Maitland Greening Plan, as it is within the agricultural landscape that a range of remnant vegetation communities and their biodiversity is retained. It is also within the agricultural landscape that many of our land degradation issues are most evident and where the majority of opportunities for revegetation exist.

It is not the intention of the Maitland Greening Plan to create an extra burden or expense for landholders in such areas, but rather a strategy to encourage greater stewardship of the environment that is compatible with agriculture landuse.

An issue of major concern, particularly within the rural community, relates to public access to private land and increasing to community interest in vegetation or other attractions such as riverbanks and wetlands. It is not the aim of the Greening Plan to provide access to any private property. Private property rights are enshrined in Common Law and the Greening Plan, and the general community should respect such rights. The Greening Plan will only seek to create recreational access to publicly owned land.

Small remnant areas require active management to ensure they are sustainable in the long term. Due to their small size and isolation many of the small remnant areas are at risk simply due to the pressures of small populations and the threat of weed invasion. The small remnants scattered throughout the Maitland LGA contain a diversity of vegetation communities and associated species.

Management requirements for agricultural bushland include:

- Appropriate mapping and assessment;
- Landholder education and involvement;
- Appropriate fencing and stock control;
- Buffer plantings;
- Inclusion in farm management plan;
- Weed management;
- Sustainable bushfire management;
- Linking with other vegetated areas;
- Increase in vegetation in the wider landscape which complements current land use; and
- Fence off riparian zone and replanting.

Few landholders in the Maitland LGA are able to meet their own firewood requirements let alone meet their own fence post requirements.

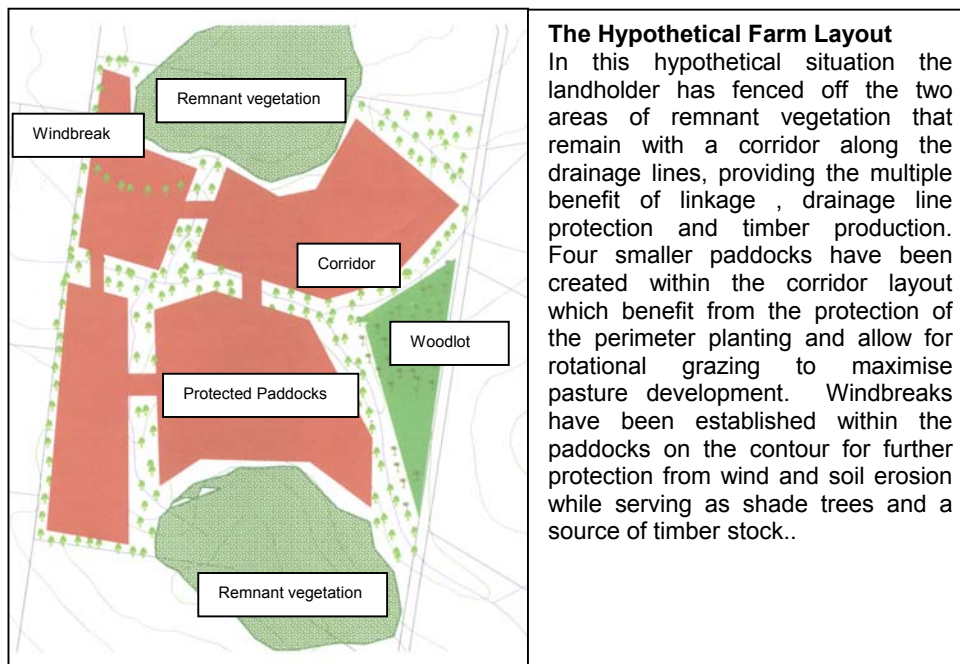


Fig 26 Hypothetical Property layout for sustainable land management.

In the agricultural environment, native vegetation can be utilised for a variety of on farm benefit, including the role biodiversity has in the relation to productivity improvement, water quality management and over all long-term sustainability. The Greening Plan encourages the following vegetation management practices for the farm environment:

I. Protection of Remnant Vegetation (Habitat or Biodiversity Reserves):

Remnant vegetation is the remaining vegetation characteristic of the area prior to its development. Remnant vegetation preserves the biodiversity of an area, providing habitat for the variety of flora and fauna and other life forms that constitute an ecosystem. The Maitland area retains very little remnant vegetation, and this is subject to a variety of pressures as discussed throughout the Greening Plan.

It is therefore appropriate that remnant vegetation be valued as an important part of the local environment. Management practices such as fencing and weed control should be used to protect the value of these areas. Fencing off remnant vegetation has a number benefits to the landholder including the promotion of biodiversity as already detailed, the better control of stock limits time taken to retrieve stock from bush paddocks, while providing an improved environmental condition and landscape amenity.

Gross value of pasture output is at its highest level when the proportion of remnant vegetation area is 34% (Gunnedah, NSW, Walpole, 1998).

The NSW Department of Agriculture promotes the following services provided by effective biodiversity management:

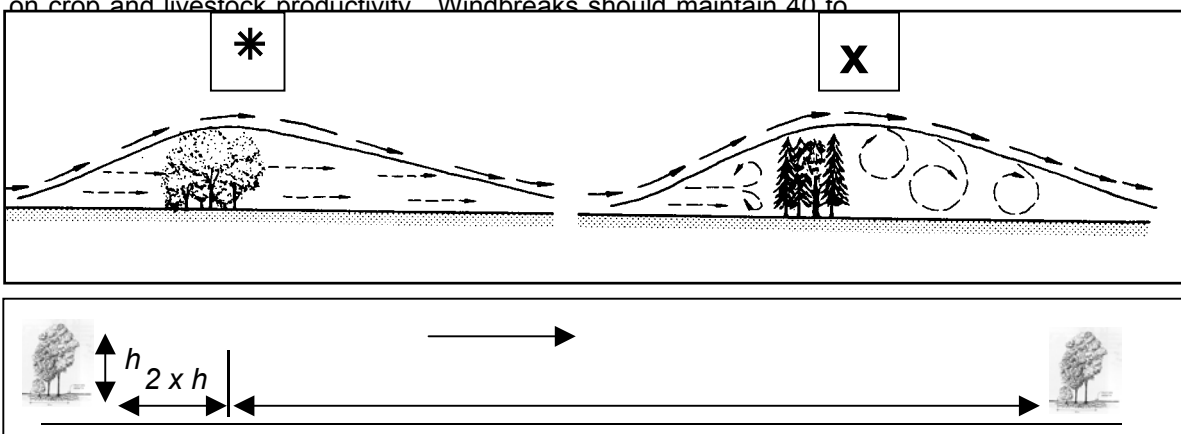
- Honey eaters consume 24-36kg of insects per hectare per year. They, and other species that eat insect pests need a well developed understorey for survival.
- Insectivorous bats can consume up to 600 small flying insects an hour. These include army worm moths and mosquitoes. Most bats need hollows in trees for roosting.
- Sugar Gliders can eat over 4000 Christmas Beetles per year. Sugar Gliders need a diverse understorey and hollow bearing trees.
- Over 10 native wasp species parasitise scarab beetles larvae (a principle culprit of Die Back). These predatory insects need a diverse native understorey. The adult wasps feed on nectar and pollen from shrubs such as wattles.
- Magpies feed on Scarab Beetles larvae, and in healthy woodlands will consume 50% of insects present (up to 30kg/ha/yr).

Source: Physical Property Planning, Farming for the Future, NSW Agriculture, 1999.

Fig 27 Value of Biodiversity. (NSW Agriculture, 1999)

Windbreaks:

Properly planned windbreaks will reduce wind stress for 10 to 20 times the height of the windbreak across the ground (Lines-Kelly & Currey, 1992). Windbreaks need to be at least 5 to 10 metres wide at the base. Windbreaks made up of suitable native trees and shrubs adequately spaced across the landscape will have a noticeable effect on crop and livestock productivity. Windbreaks should maintain 40 to



Appropriately developed windbreaks can provide shelter for at least 10 times the height of the windbreak, although some competition (for crop and pasture) does occur for about twice the height of the windbreak ($2 \times h$). With this in mind roads or stock corridors should be developed in the $2 \times h$ area.

Over a 5 year trial, a 31% wool production increase and 6kg (21%) more live weight was found in sheltered areas compared with sheep without shelter. This equated to an increase of \$4 per head if sold in August 1984. The plots sheltered by barriers had 18% more pasture (Armidale

On a day of 27°C, unsheltered cows will have 26% less dairy milk production than shaded stock (Australia, in Walpole 1998).

Lambing losses decreased from 20% to 10% of the lambs born alive in sheltered areas, (with wind speed halved by adequate wind breaks), resulting in a 5% increase in the percentage of

Shade trees are established in paddocks for livestock to utilise during extreme weather. Special attention needs to be given to the ground immediately below the shade tree, small fences or some sort of ground protection such as unstable rubble may be required.

Fig trees make very useful shade trees, they develop very large spreading canopies, can tolerate high nutrient conditions associated with high concentration of excrement below, and due to their long fruiting time will support a high diversity of bird and bat species.



Livestock will utilise existing trees for shade during the hotter part of the day. Shade trees should be provided in paddocks rather than relying on remnant vegetation that may remain. An important consideration in property planning is the proximity of shade to watering points.

Plantations/Woodlots:

Australia is lagging behind the rest of the world in relation to plantation development. As old growth timber harvesting becomes increasingly unviable, both in terms of the economic considerations and social acceptability, a new source of timber must be created to avoid the unsustainable harvesting of developing countries' forests as well as our own. Plantations also have value under the carbon trading schemes. However, very large areas are required to meet obligations under this proposal.

Plantations offer a new sector for the agricultural community. Although a commercial venture not without associated risk, farm forestry does offer attractive rewards for landholders to become involved. A variety of incentive schemes are available through State Forests of New South Wales and Greening Australia. Maitland City Council in partnership with Greening Australia is establishing a trial woodlot at Millers Forest to demonstrate the application of farm forestry.

Maitland City Council and Millers Forest Progress Association with the assistance of Greening Australia are establishing a 5ha Plantation Demonstration site at Duckenfield. The expected return from timber ventures at this site is expected to be between \$300,000 and \$400,000 over the 20 year life cycle of the plantation (commencing 2001).



Agroforestry (woodlots and plantations) can be highly organised in areas specifically dedicated to plantations, or can be achieved through active management of regrowth and planted areas. Selective logging may be carried out in windbreaks, shelter belts and even remnant areas if conducted in a sustainable fashion.

Riparian Vegetation

The former department of Public Works, realising the problems with erosion in the riparian environment embarked on a major revegetation program along the banks of river systems during the 1940's and 1950's. Unfortunately they used the Willow as their main focus for replanting, which apart from introducing what is now regarded as a weed, had little value for the protection of streams, due to its limited root zone. If a similar program had been under taken with a mix of deep rooted Eucalypts and surface rooting rainforest species such as Figs and Casuarinas the problem would be now well under control.

All drainage lines, both permanent and ephemeral, in the Maitland LGA should be made the focus of revegetation incentives as a means of controlling gully erosion and subsequent land loss, but also as a means of improving water quality through out the catchments of the Maitland LGA

From an incentives perspective fencing and plant distribution should be conducted from the top of the catchment down to allow for any natural regeneration through seed dispersal.

Wetlands

Maitland's wetlands have been heavily impacted upon by changing land use within their catchments, including drainage and infilling in various locations and the removal of wetland forest communities, which were important in buffering the wetlands from external processes. The wetlands also suffer from the impacts of erosion and salinity, and as a result of flood mitigation works, which often isolate the wetland systems from the river environment.

This has effectively stopped all movement of fish species from the river to wetland areas that are crucial nursery habitat for many fish species to breed. The Hunter Catchment Management Trust is currently working on the Hexham Swamp Rehabilitation Project that is opening the floodgates on Iron Bark Creek to allow species and materials to move from the river environment to the wetland system. The project is expected to contribute to increasing commercial fish stocks in the Hunter estuary and near by marine areas.

In most cases the fencing off of these areas from livestock and some minor replanting works are all that is necessary to allow natural regeneration to take place in these communities. Such actions would

return the wetland systems of the Maitland LGA to their former function and importance in relation to local biodiversity.



Maitland retains a variety of significant wetland habitats throughout the LGA. Although many are degraded, some minor management considerations will ensure these areas are retained and improve for future generations.

4.5 Structurally Intact Bushland

Maitland retains a large structurally intact bushland area in the south east of the LGA. Such areas have different management requirements from small bushland areas that occur in the otherwise cleared agricultural landscape or in urbanised areas.

The large structurally intact bushland areas to the south of Ashtonfield are an important focus, particularly for retention as they are the major reserve of biodiversity (ecosystem, species and genetic) in the Maitland LGA. This is due to their size (lack of edge effects etc.), and the diversity of species and their varied age class. It should be noted that timber getting for pit props has occurred in this area in the past, but the integrity of the ecosystem has remained intact. A large number of habitat trees (which were of no use as pit props) still remain throughout the area, which also retains an intact understorey layer, along with a diversity of faunal species. Several plant and animal species listed under the Threatened Species Conservation Act are known to occur in this area.

The enormous pressure of urban expansion is also a major issue for large bushland areas in the urban fringe.

In Maitland, the management requirements for large structurally intact bushland areas relate to their proximity to urban areas and the degradation caused by residents through:

- Rubbish dumping;
- Weeds (garden escapees);
- Inappropriate bushfire management;
- Domestic animal predation of native fauna; and
- Community education and awareness.

The single greatest threat to the areas of large structurally intact bushland areas is from continued development in bushland areas. In the previous section of this report, retention goals have been established for specific vegetation communities that characterise Maitland's natural heritage.

To achieve the proposed retention goals, Council will need to consider the acquisition of bushland areas as a means of suitably protecting bushland areas with conservation significance. When considering acquisition Council also needs to be aware of the ongoing management costs for bushland areas estimated to be in the order of \$50 per hectare per year (WBM, 1999).

4.6 Urban Bushland

Urban bushland is an important cultural asset for the people of Maitland and should be valued accordingly. Living in close proximity to bushland areas provides a quality of life for the enjoyment of local residents. The environmental cost of this lifestyle choice are high as a number of inadvertent and misguided deliberate actions have a significant impact on urban bushland areas.

Urban bushland reserves tend to be very small, irregularly shaped and surrounded by urban areas. These factors combine to limit the value of such reserves for biodiversity conservation.

Many of the urban bushland reserves that exist in Maitland are utilised for inappropriate activities such as rubbish dumping, particularly building waste in areas of recent development, and suffer from problems including weed invasion from surrounding gardens and trailer parking. Sometimes, residents clean up reserve areas, with the best of intentions, but this often involves the mowing and the removal of understorey (scrub) and debris, all of which are important habitat components of these reserves.



Loved to death. The other end of the management spectrum, here a local resident has “tidied up” the bushland reserve, removing all understorey and native herb species. Bushland management requires a careful balance between weed control and habitat integrity.

Management requirements for urban bushland reserves and structurally intact bushland areas in close proximity to bushland areas would focus on;

- Managing weed control;
- Halting Mowing/Slashing;
- Halting “Tidying Up”;
- Rubbish Dumping;
- Firewood Collection;
- Domestic Animal Control;
- Storm water management; and
- Community education.

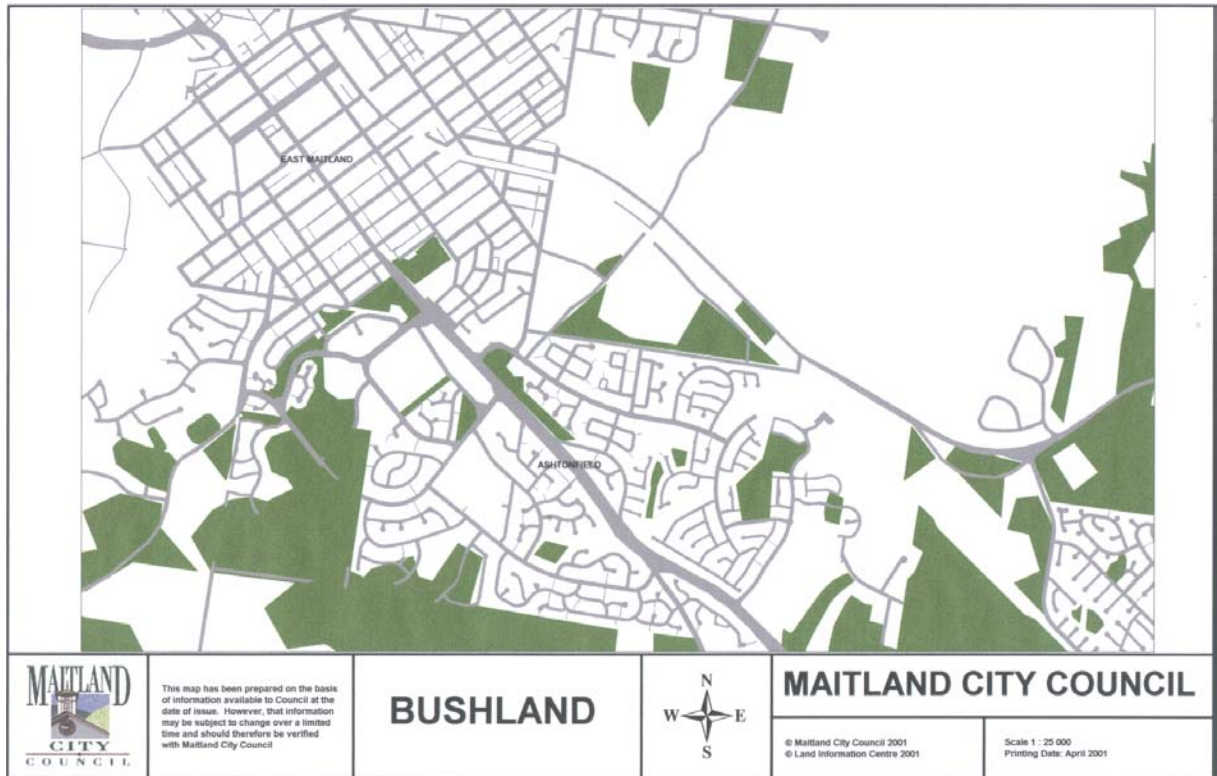


Fig 29 Urban Bushland in the Eastern portion of the LGA

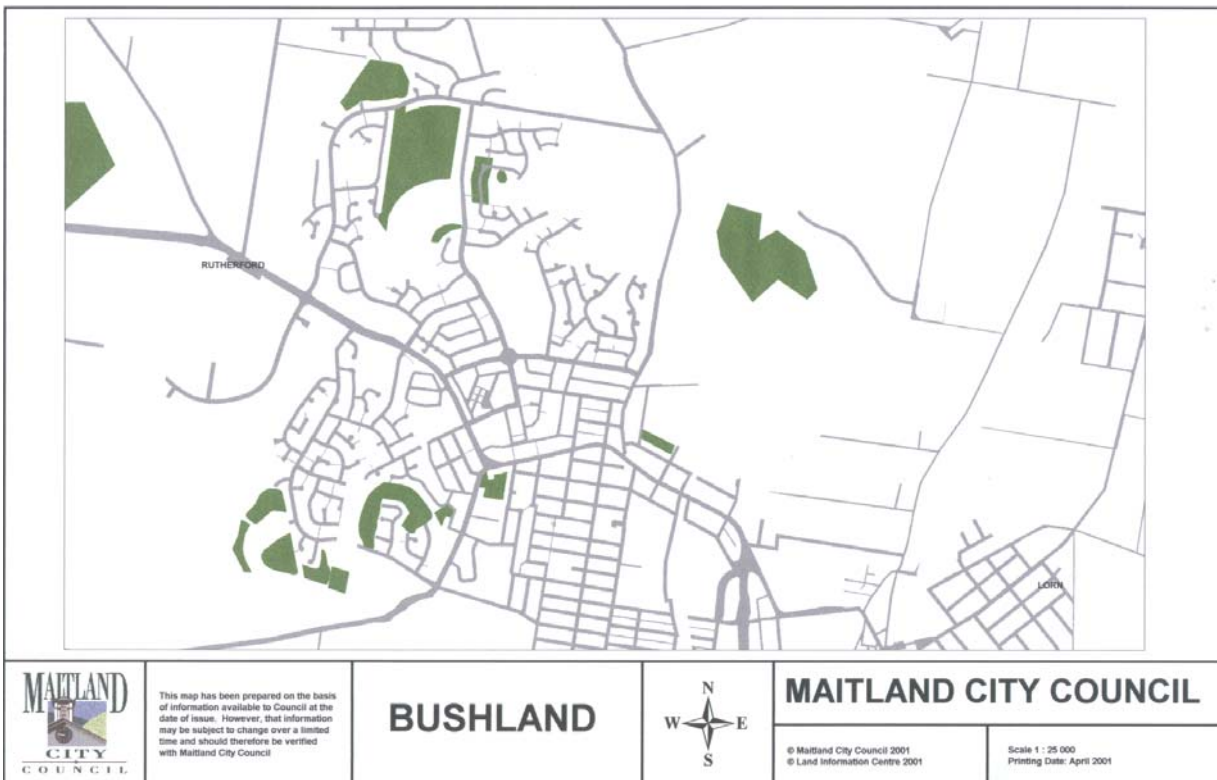


Fig 30 Urban Bushland in the Western portion of the LGA

Existing urban bushland in urban areas also has a role in the salinity issue for the Maitland LGA. All of the urbanised areas of the Maitland LGA are found within salinity recharge areas, refer to Figure 7 on page 17. As such, issues relating to species selection for gardens (in relation to water requirements) and the retention of bushland areas

within these recharge zones is important to controlling and reducing the issue of salinity in the Maitland LGA.

4.7 Regrowth

Intensive regrowth areas need management to ensure that the naturally regenerating vegetation develops into a self-sustaining natural ecosystem. Where large areas of regrowth occur of a single species and age class, active management is required in the form of thinning to allow greater biodiversity to re-establish within the site.

Regrowth in the context of the Maitland Greening Plan refers to areas of unmanaged natural regeneration tending to be dominated by Spotted Gum (*Corymbia maculata*) and Forest Red Gum (*Eucalyptus tereticornis*) species, which quickly re-establish following disturbances. The problem with regrowth is that the stands tend to become dominated by a single age class of a single species, lacking the diversity in age and species structure that is important for habitat value and, hence, biodiversity.

It is important that selective thinning is undertaken in regrowth areas to open the system up to allow a greater species diversity to occur. A variety of timber products are available from regrowth sites, but, in general, are limited by the smaller timber sizes. The Hunter Farm Forestry Network and Greening Australia run regular information and field days relating to regrowth management.

Management requirements for areas of regrowth would take the form of:

- Thinning of dense single species areas;
- Augment species present;
- Understorey development;
- Habitat creation (particularly for known biological controls of dieback); and
- Weed control.



Thin strips of bushland handed over to Council as part of the subdivision process add natural character to urban areas. Unless managed appropriately they will quickly be lost through various edge effect processes, here bushland is being engulfed by Lantana.

5 Revegetation

5.1 Introduction

One of the principal aims of the Maitland Greening Plan has been to plan for the strategic revegetation of the LGA in a manner that complements current land use, whilst beginning to address many of the land degradation issues listed in Section 2 of this Plan.

The vision of the Maitland Greening Plan is to develop greater ecological sustainability across the Maitland Region. This will be achieved through the improved management of existing vegetation and the coordinated revegetation of degraded areas with the aim of providing multiple benefits to the community and landholders, within the Maitland LGA.

There is a much greater acceptance in the wider agricultural community of the need for greater sustainability and the improved management of the environment that is the basic contributing factor to agricultural productivity. It is within this management philosophy that revegetation works are envisaged.

It is important to stress that revegetation can not be seen as a means of off setting further bushland clearance in relation to biodiversity retention, particularly in the short term. Remnant vegetation and the numerous species it contains and the ecological processes that sustain them cannot be transposed to other areas as a replacement for cleared areas. Revegetation, when conducted as buffer plantings around existing bushland can improve the condition of the associated remnant, but not replace it. The habitat value of remnant vegetation depends on the provision of breeding sites for all of the fauna elements of an ecosystem. Most such breeding sites require the development of hollows in trees, which usually take several hundred years to form.

Revegetation does have a crucial role in the abatement of land degradation processes such as salinity and soil erosion in the short term. The abatement of such land degradation issues is the principle aim of revegetation endeavours, as is the firming up of wildlife corridors and the buffering and augmentation of existing bushland areas, particularly those considered to have high conservation significance.

5.2 The Vision:

The vision of the Greening Plan in terms of revegetation is to increase the presence of native vegetation in the landscape so as to improve habitat for biodiversity in the local area in the long term and begin the process of reducing the impact of land degradation on the landholders and the wider community.

Revegetation works conducted through out the LGA will also have an impact on landscape amenity, whilst creating an additional agricultural sector through the development of farm forestry in the LGA.

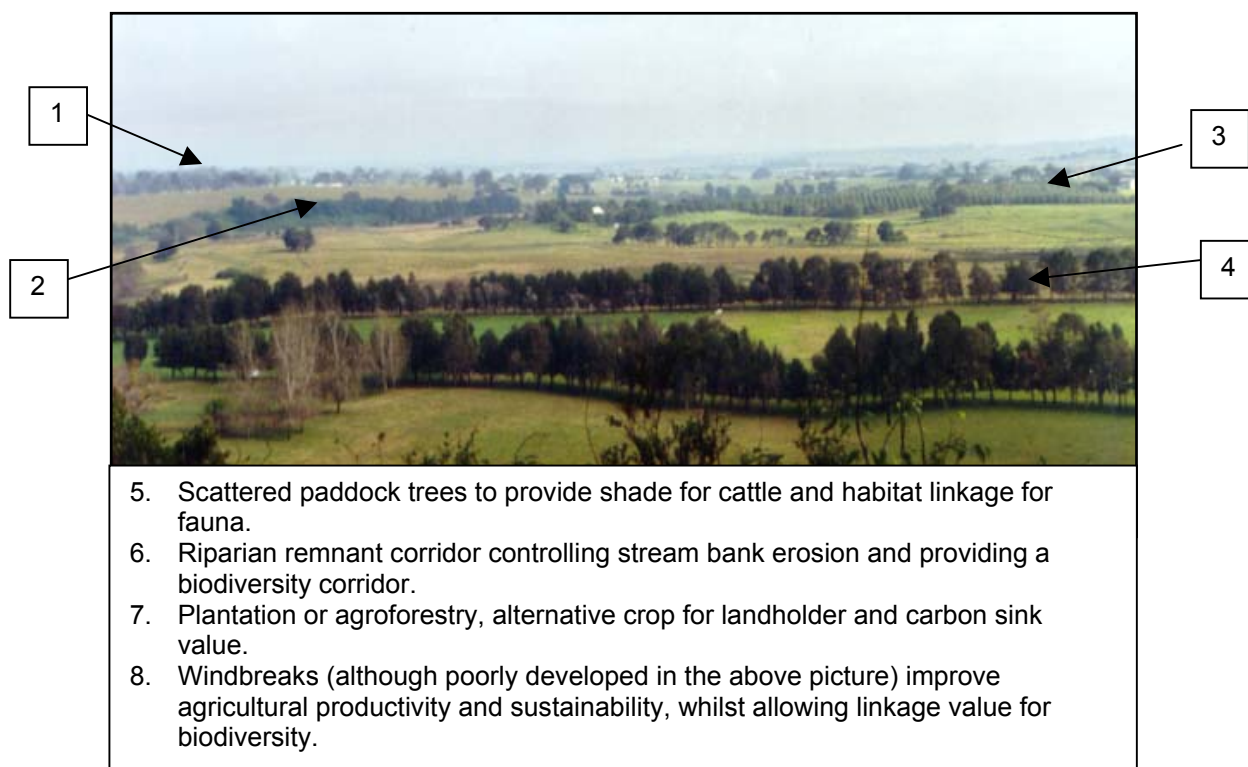


Fig 31 The Vision: A small piece of the Maitland LGA where some revegetation works have already been undertaken, demonstrating one of the central aims of the Greening Plan, to

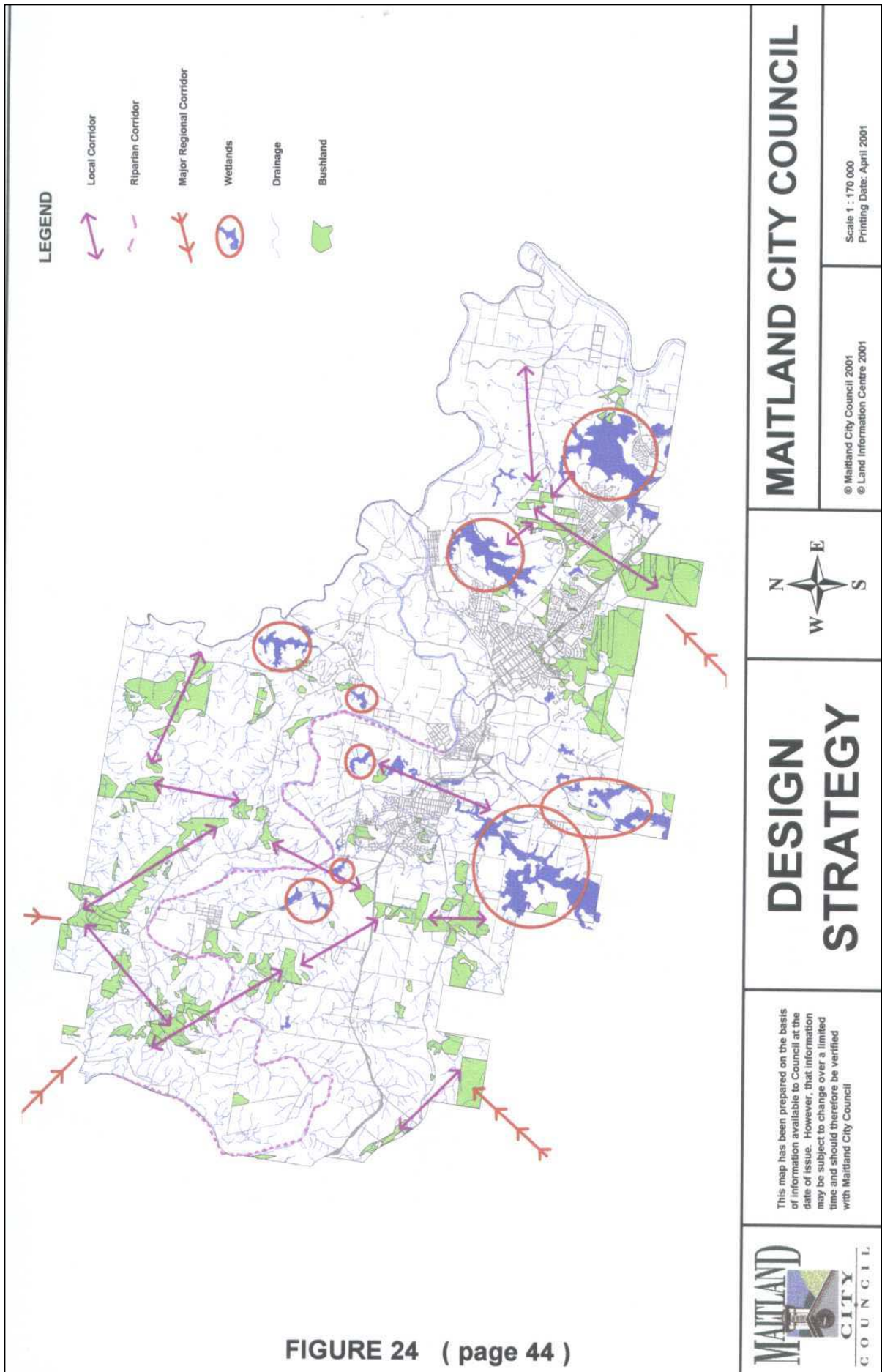
increase the level of native vegetation and biodiversity in the agricultural landscape, providing a benefit to landholders.

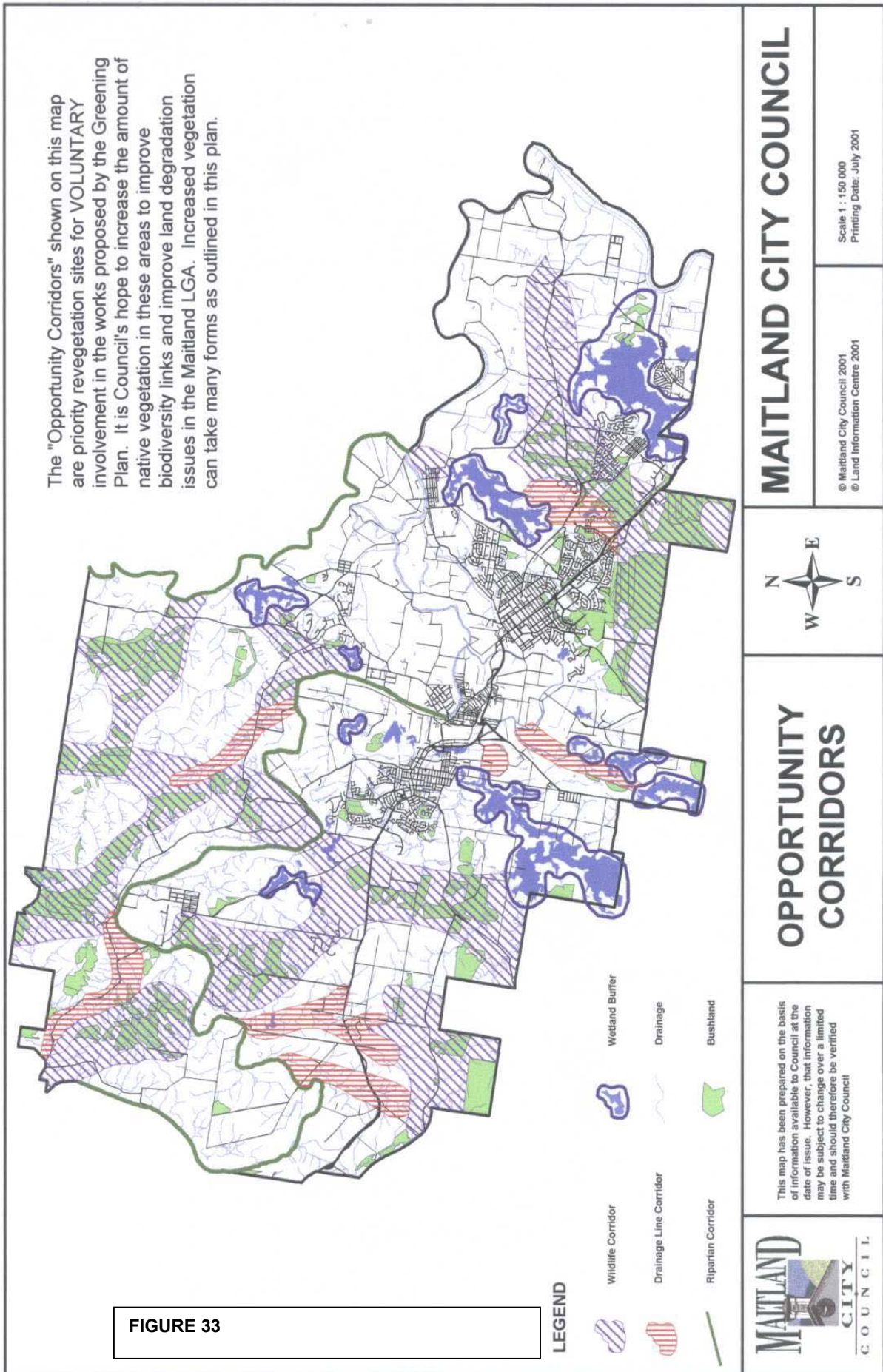
5.3 Implementation

Revegetation works are proposed to be undertaken as part of the Maitland Greening Plan. Priority revegetation sites and corridors have been identified as shown in Figures 32 & 33 based on the following rationale:

1. Buffer and augment existing vegetated areas with high conservation significance;
2. Connect areas of existing vegetation;
3. Stabilise drainage lines;
4. Restore wetland areas;
5. Rehabilitate areas impacted upon by land degradation;
6. Augment communities with limited extents (<10%);
7. Recreate vegetated vistas to add to visual amenity for the region.
8. Benefit landholders through local comfort and productivity improvements.
9. Recreation opportunities on publicly owned land.

FIGURE 32





Priority Revegetation Areas

The Greening Plan Coordinating Group has nominated priority areas for revegetation based on biodiversity considerations and existing land degradation issues. The revegetation priority sites are highlighted in Figures 32 & 33. Council will seek opportunities (grants/revenue) for funding and other assistance for the implementation of revegetation works in these priority areas as a catalyst to other general revegetation works through out the Maitland Local Government Area. The priority areas for revegetation have been nominated to address significant issues of environmental degradation, provide linkages and increase community awareness and participation in environmental rehabilitation. In addition, the revegetation works will seek to buffer existing vegetation communities wherever possible with locally sourced plants wherever possible.

Replanted areas will minimise the distance travelled by bird and animal species between existing, isolated remnants. This will help facilitate wildlife movement, especially the migratory forest bird species known to utilise the area at certain times of the year, by creating “stepping stones” for biodiversity movement through the landscape.

Revegetation Corridors

General corridors have been identified for revegetation, linking areas of existing vegetation both within and external to the Maitland LGA, as shown in Figure 33. These corridors have been called “opportunity corridors”, to reflect their status as an opportunity for landholders and the community at large, and the fact that Council will not make revegetation mandatory in these locations. It is not expected that entire areas nominated as corridors in Figure 33 will be revegetated. The Greening Plan seeks to increase the presence of vegetation in these areas in a variety of ways (refer to section 4.3, page 40), within the established land use or in accordance with landholder expectations:

The revegetation works will contribute to visual amenity by recreating vegetated vistas and will benefit local landholders through local comfort and productivity improvement. Revegetation works will not lead to public access to the nominated locations other than with the consent of the landowners concerned.

Revegetation endeavours will be voluntary. The benefits of revegetation and sustainable or active vegetation management will be highlighted through community education programs. Local examples of best practice agriculture, such as that being developed at the CB Alexander Agricultural College at Tocal will be promoted to interested landholders.

There has been some concern within the Greening Plan Coordinating Group that landowners may be adversely affected in future years in terms of future landuse restrictions, if they undertake revegetation now as the establishment of vegetation may limit the potential for further development.

In response to this issue it has been stated that Council will do its utmost to ensure that landowners involved in rehabilitation endeavours are not disadvantaged in the future for undertaking necessary environmental management activities that are ultimately in the best interests of the City as a whole.

Revegetation is more likely to occur in non-productive agricultural areas, such as creek lines, ridgelines and/or wetlands. Similarly, the establishment of windbreaks and corridors encouraged in productive areas are expected to enhance the natural value of properties, particularly where agriculture is concerned, due to the potential for productivity gains. This is discussed in Section 4.6.

Nevertheless, if public funds are to be used to provide revegetation on private property, there is a need for a level of guarantee or accountability to ensure that the revegetated areas are maintained in the long term to achieve the function they were provided for. Areas where revegetation occurs will be considered in the context of vegetation management provisions which will be drafted and publicly exhibited as proposed amendments to Maitland LEP 1993.

5.4 The Benefits of Revegetation

I. Buffer significant vegetation communities.

The size and shape of habitat areas is important in the quality of habitat a bushland area can provide. Large areas support an exponentially greater number of species than smaller areas. The diversity of vegetation communities will influence the overall biodiversity of the area, and the quality of the area is impacted upon by a variety of factors that are known as “edge effects”. In this respect shaping is important to minimise the surface area to volume ratio of a bushland area. Buffer planting may help reduce edge effects and improve the quality and viability of the bushland area. Actual buffer plantings are included in corridor developments in Figure 33, but revegetation incentives should focus on areas in close proximity to existing vegetation especially the LHCCREMS communities that have been assigned conservation significance.

Buffer plantings are also important around “sensitive” vegetation communities, such as Gully and Dry Rainforest areas, Alluvial Tall Moist Forests and Wetland areas which have greater exposure as a result of clearing. In these locations, plantings of appropriate edge species is required.



The area pictured at left contains a range of vegetation communities covering a hilltop. The irregular shape of the vegetation results in its degradation through issues such as weed invasion and die back associated with “edge effects”.

The future sustainable management of the area would require the fencing off of the bushland areas, mostly existing as “back blocks” to several properties existing in the local area.

Buffer plantings would be encouraged to create a more regular shape for the bushland unit, thus minimising management issues in the area as well as linking with other remnants.

Revegetate eroded areas and salinity recharge areas. (Refer to Fig 10 & 11)

The return of native perennial vegetation to areas affected by land degradation is the simplest and most effective means to reduce the impact of erosion and salinity in the Maitland LGA.

a) Erosion:

Areas impacted upon by erosion require the reestablishment of native vegetation (canopy, understorey and ground cover see Fig. 13) in drainage lines and in areas where sheet erosion is evident. Midstorey or shrub layer vegetation is the most important component of the vegetation in controlling erosion. This is due to the roots and leaf matter of the shrub layer preventing active erosion. Areas that maintain a good tree cover, but have lost the understorey through cattle grazing and other clearing practices can still have a high rate of erosion as the roots tend to be much deeper in the subsoil, and rain that is intercepted by leaves of the canopy species gathers to form larger droplets, thought to actually increase erosion.

b) Salinity:

Salinity is a more complicated environmental issue to rectify given the variety of issues that are involved (refer Fig.9, page 15). To adequately combat salinity, a greater value needs to be placed on existing vegetation and revegetation in the upper catchment (recharge areas). Figure 10 shows the salinity recharge areas in the Maitland LGA, where an increased plant presence would help reduce salinity problem in the lower points of the catchment. This is achieved through the biological service provided by vegetation in the form of evapo-transpiration, where water is taken up by vegetation and released to the atmosphere as water vapour, reducing the volume of water flowing to the low parts of the catchment. Revegetation endeavours are also encouraged in the low points, where deep rooted perennial vegetation play an important role in the reduction of localised water tables which also reduces salinity. Two important vegetation communities that were once found in the floodplain area, Alluvial Tall Moist Forest and Swamp Mahogany Paperbark Forest, should be encouraged for reestablishment in these areas to help alleviate the problem. Further study of the salinity problem in the Maitland LGA is essential.

Create Vegetation Linkages.

Corridors are crucial for wildlife movement through the Maitland LGA, especially in terms of the range of migratory bird species that move north-south for breeding purposes some of which are recognised at the national and international level as being rare or threatened. Corridors are also crucial for more sedentary species for generational dispersal in relation to territory pressure and population densities, and dispersal to fulfil breeding vacancies in surrounding habitat areas. Ecologist's talk of "gap tolerance" for different species, being an indication the distance across open ground that a particular species will travel. In this report the fragmented nature of vegetation in the Maitland LGA is a major issue.

Corridors are also of crucial value to migration in the context of global climate change, now recognised, to be underway. As the earth's climate has changed in the past, species habitats have altered accordingly, and large-scale migrations have occurred. This process will be severely hampered in the future due to the lack of vegetated areas for biodiversity to move through.

Revegetation initiatives to provide linkages between existing vegetated areas need to be planned in a strategic fashion. Corridor development should focus on exclusive "wildlife corridors" where landholders are in agreement. The requirements of a dedicated wildlife corridor are similar to that of riparian corridors in terms of stock control, species range and landscape dissection. A multifunction corridor could meet objectives of biodiversity exchange as well as riparian/drainage protection and would thus be viewed as a multiple benefit.

Although corridors are the most suitable form of revegetation to provide a linkage value, if it does not fit in with landholders property management it should be remembered that a variety of other revegetation options can be considered that at least lower the "gap" distance, and effectively act as "stepping stones" in the landscape. These may include windbreaks, shade trees and plantations.

Reestablishment of locally extinct or heavily reduced vegetation communities.

Several major vegetation communities have been either severely reduced in their original extent or have become locally extinct due to past conflict in land use. Comparison of Figures 14 and 15 shows the extent of vegetation loss in the LGA. The Alluvial Tall Moist Forest has been reduced by 98% and the Swamp Mahogany Paper Bark Forest has been reduced by 100% of its former distribution. This occurred due to the value of this land to agriculture because of the high quality soil in the area, as detailed previously in this report. Whilst it is not the aim or expectation that these communities will be returned to their pre European extents, a focus on the reintroduction of these communities, through revegetation endeavours within the existing land use frame work would have major biodiversity benefits.

Recreate vegetated vistas.

Although not regarded as a significant ecological parameter, the re-establishment of vegetation in significant visual areas has been raised as a benefit of revegetation works. The character of the Maitland district is an important consideration. However, in most cases the addition of corridors, windbreaks etc, would eventually add to the visual amenity and future environmental sustainability for the region.

Local comfort and productivity improvements.

In urban areas, revegetation can add significant amenity value to public open space, in terms of shade and greater contact with the natural environment. Strategic revegetation in urban areas can also have an impact on the micro-climate through the shading of road surfaces and buildings (bitumen and concrete are heat absorbers which re-radiate heat at night, maintaining high temperatures at the local scale). Drains can sometimes be converted to managed creek lines and artificial wetland areas, which not only create biodiversity benefits but also have significant water quality and visual amenity benefits.

Native landscaping is increasingly becoming more popular. This has happened through the realisation that native plants require less effort and water to maintain and provide habitat value in urban areas. There are also a variety of attractive Australian native plants that blend well with mainstream horticultural endeavours. Maitland City Council Parks and Gardens Section has already begun the wide scale use of locally sourced native plants for use in landscaping works.

In the agricultural landscape strategic revegetation has been proven to have major productivity benefits to landholders. These include the abatement of land degradation (which causes serious productivity decline due to the reduction in productive area) and the reduction of stress from heat and hot/cold winds on crops and livestock. Much work has been done on the economic benefit of retention and re-establishment of vegetation on farms as detailed in the previous section. Such benefits take the form of increased survival rates for livestock offspring during weather extremes, increased feeding during hot weather that increases milk production in dairy cattle or bulk weight in beef cattle.

On farm revegetation works can lead to a greater sustainability of the property and improve aesthetics and these combine to increase property values. Furthermore, soil micro-organisms responsible for the replenishment of soil fertility are found in higher densities closer to areas of existing remnant vegetation, with potential economic gains for landholders. The establishment of woodlots and plantations farms can also derive direct financial gain through alternative crops including the actual timber, but also dried flowers and bushfoods.

Recreation opportunities on publicly owned land.

Areas of publicly owned remnant vegetation provide an opportunity for passive, nature based recreation for residents and tourists to enjoy and experience natural areas. The recreational use of such areas needs to be carefully managed to ensure that it does not compromise the natural value of the area which is the principle attraction. Although limited application of recreation in bushland areas is possible in the Maitland LGA due to the small amount of area in public ownership, some provision exists for this in the eastern portion of the LGA, particularly through the Maitland City Council Linkages Plan.

5.5 Urban Context:

Urban landscaping, street trees and recreational assets have long been under the jurisdiction of local government. However, in more recent times, some local Councils have rationalised their lawn mowing and landscaping operations and developed more economically and environmentally sustainable practices overall.

In recent years, Maitland City Council Parks and Garden Section has been placing a greater focus upon the use of locally sourced native plant species for urban landscaping purposes. In addition, many other land managers responsible for large areas are focussing on native landscaping as a sustainable form of landscaping.

Locally sourced native plants are being utilised to decrease maintenance costs, minimise water usage, and most importantly allow for some form of representation of biodiversity within the built up area. Native vegetation still provides ornamental value and some habitat

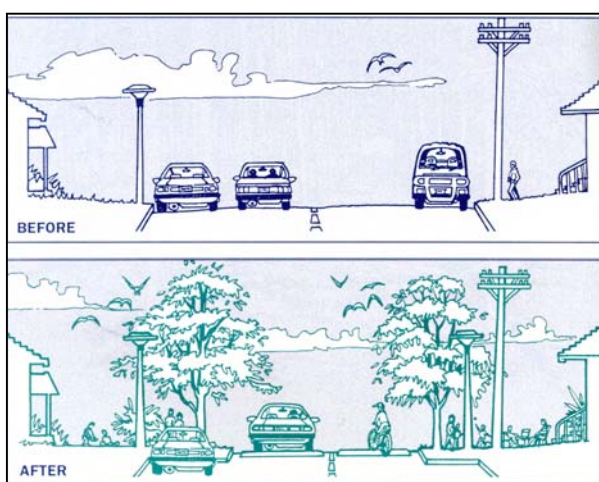
benefit, particularly for bird species. The University of Newcastle is an example of the possibilities of native landscaping.

In the Maitland LGA, there are heritage issues that relate to the use of non-native species particularly in the older areas of the City, ie. Central Maitland and Morpeth.



The Melaleuca Ponds site at Metford is a good example of how native plants can be used in a landscaped urban park. Apart from being attractive to local residents and visitors, such areas can provide habitat opportunities for local wildlife, especially birds.

Traditionally, community recreation has been limited to swing sets and sporting fields. Maitland City Council has embarked upon an ambitious community recreation project focusing on passive nature based recreation known as the Maitland Linkages Plan. Through the Maitland Linkages Plan, public access to community owned bushland will be encouraged, providing opportunities for environmental awareness and appreciation, and a recreational asset in the form of walking and cycle trails.



Vegetation can have a positive influence on suburban areas by providing character. Vegetation can also provide shade and reduce the severity of hot weather on local residents whilst encouraging some wildlife back into urban areas.

Fig. 34 Vegetation Amenity Value in Urban Areas (Greening Australia, 1995)

Maitland Landcare is particularly active in urban areas. For example, East Maitland Landcare operates in Green Hills Gardens on One Mile Creek; Friends of Morpeth Common Landcare operate at Morpeth

Common; and the Environmental Youth Council operate in the vicinity of Maitland Court House. Other groups include Largs Landcare, Metford Public School Landcare, and school groups such Maitland High, Bolwarra and Tenambit Public Schools also involved in environmental programs. Community involvement in urban environmental restoration projects is an important example of the possibilities available through partnerships between Council and the community.

5.6 Conclusion

In conclusion, Council supports, in principle, all revegetation within the Maitland LGA conducted with native plants. The development of the Greening Plan allows Council to gain an understanding of problems and issues that are apparent in relation to environmental management in line with the priorities of State and Federal Government environmental bodies, particularly as they relate to issues of salinity and erosion control. In recognition of the importance of the reestablishment of native vegetation, Council is encouraging the involvement of private landholders in the development of opportunity corridor, for the establishment of suitable wildlife corridors, the revegetation of drainage lines and the establishment of priority trial sites to demonstrate best practice revegetation. Unfortunately Council will not be able to implement the level of revegetation work proposed in the plan without assistance. Council will, therefore, rely on the cooperation of community, particularly landowners, in the implementation of revegetation initiatives.

6 Future Options

6.1 What Can We Do?

The focus of the Maitland Greening Plan is to provide a strategic framework for the management of existing vegetation while providing a logical rationale for the rehabilitation and restoration of the wider environment. The basic aim of the Greening Plan is to ensure a greater degree of management for native vegetation within the Maitland LGA.

Given the low level of native vegetation cover and the extent of various issues of land degradation throughout the LGA, the Greening Plan is concerned with both a regulatory and voluntary perspective. A framework for the motivation and encouragement of landholders needs to be formulated, backed up where necessary with suitable policy and regulation.

Council therefore needs to consider a range of “incentives” to encourage landholders to become involved in the implementation of restoration works throughout the LGA.

In addition, Council needs to generate awareness of the importance of the issues relating to vegetation management, including the current problems relating to land degradation, and of the solutions that are currently available for identified issues.

Finally, the need for regulations must be considered in the process, because landholders cannot always be relied upon to do the right thing. Changes, such as a review of Council’s Tree Preservation Order need to be considered. However, it must be stressed that regulation will only be used as a last resort in relation to the management of existing vegetation. Involvement in the restoration programs proposed

in the Greening Plan will be on a voluntary basis, with the advantages of best practice management anticipated to encourage landholders involvement.

Given the high proportion of remaining bushland in private ownership, an effective partnership needs to be created between Council and local landholders. The future implementation of the Greening Plan will require the development of the following components:

6.2 Financial: How Council Can Establish a Revenue Base

A revenue base is of critical importance if Council is to provide motivation, incentives, materials and other assistance to landholders to implement the Greening Plan. A revenue base is also critical if Council is to pursue bushland acquisition and the on-going management of such areas. This funding needs to be obtained in an equitable manner, across all members of the Maitland community rather than specific landholders being expected to bear the cost for sustainable environmental management.

Direct Budgetary Allocation

Councils existing funding could be diverted from current commitments to environmental rehabilitation endeavours. However, Council's resources are already limited by rate capping and it is highly unlikely that significant funding will be able to be freed up from existing commitments to fund the initiatives proposed in this Plan. Any financial allocation would need to be weighed up against the range of financial demands already placed on Council.

Council has committed \$50,000 in the 2001/2002 budget to undertake greening endeavours, which will enable the initiation of restoration programs within the Maitland LGA. The \$50,000 is intended to be used for the establishment of a Native Plant Distribution program to provide landholders with suitable plant stock to re-establish native vegetation in priority areas (as per section 5.3).

Special Rate (Environmental Levy)

An Environmental Levy is a funding mechanism which has been used by other local councils to generate significant funds to implement a variety of environmental restoration programs throughout their local government areas. An environmental levy would, therefore, be an effective way of generating a revenue base to implement the Maitland Greening Plan and other environmental initiatives.

Ministerial approval must be sought to establish an environmental levy in NSW. An Environmental Levy can be applied to all rate payers across the LGA, adjusted in accordance with property value, or it can be voluntary in nature. The application of a base rate across all landholders would be the most effective and equitable means of raising a significant amount of money for environmental works.

At present, there appears to be some support within the community for an environmental levy (refer to question 16 in Appendix 13). However, the extent of this support and the willingness of the community to contribute to a special rate needs to be further determined. An investigation of community attitudes towards an environmental levy would need to be undertaken before a levy was implemented.

Council will need to investigate the ability, or otherwise to raise income on a per property basis. Annual charges are generally restricted to

water supply services, sewerage services, drainage services, and waste management services. The main option is therefore raising income as a special rate.

In raising a special rate, Council has the option of raising income via an ad valorem rate, or a combination of an ad valorem and base amount. An ad valorem rate relates specifically to the land value of the property. The higher the land value, the higher the rate.

Using a combination of both an ad valorem and base amount provides a balance between the number of properties and the land value. Each property is rated the same base amount plus a calculation using the property's land value. This reduces the burden on properties with a high land value and allows a more equitable distribution of the rate levy.

Using the ad valorem and base amount provides a large number of options because the base amount can be changed until Council is satisfied that the distribution is fair and equitable. It should be noted that revenue from a base amount cannot be more than 50% of the total amount raised from a special rate.

It needs to be emphasised, however, that Council has not made any decision to implement a special rate, nor any decision about how a rate would be applied if it were levied. This information is presented to facilitate discussion on the issue.

A summary of the special rates introduced by other local councils is provided below:

LOCAL COUNCIL	Year Established	Amount Generated
HORNSBY SHIRE COUNCIL	1994	\$1.9m/yr
Coff Harbour City Council	1997	\$700,000/yr
Eurobodalla Shire Council		\$450,000/yr
Warringah Shire Council	1996	\$2.8m /yr
Gosford City Council	1997	\$1.4m over 15 years
Lake Macquarie City Council	1999	\$1.3m/yr
Ulmarra Shire Council	1996	\$60,000 /yr
Drummoyne Council	1998	\$260,000
Hastings Council	1997	\$350-400,00/ yr.
Parramatta City Council	1997	\$1.1m/yr

Fig. 35 Environmental Levies used in other Council areas
(Information Supplied by Port Stephens Council)

Funds generated through an environmental levy have been used for a range of activities relating to environmental management. These include research and inventories of environmental issues not yet fully studied in the Maitland LGA ie. salinity, restoration/bushland management, water quality issues and green house initiatives. The

most important allocation of funds from an environmental levy would be to allow Council to acquire areas of bushland with high conservation significance or development threat. Details of where an environmental levy would be spent in Maitland would need to be prepared for consideration with any proposal for a levy.

An environmental levy is arguably the most effective way for Council to implement the proposals presented in the Greening Plan in a fair and equitable manner, ie. the application of a base rate across the entire Maitland Community, not just bushland landholders or members of the agricultural community.

Appendix 1 details a range of environmental programs which could be instigated if such a levy were to be introduced.

Grants

State and Federal Governments provide regular grant funding for environmental management. Council and community groups, such as Landcare, are already active in the pursuit of grant funding. This currently includes NHT funding for the employment of a Landcare Coordinator over the past five years, as well as employment of Bushland Coordinator for the development of the Greening Plan.

A variety of smaller grant programs exist for groups and individuals. These include the annual EPA Environmental Trust Fund for NSW, funding from the Hunter Catchment Management Trust (HCMT) for small projects and a fencing program, also by the HCMT. Landcare has been successful in receiving corporate sponsorship from the Hunter Water Corporation for other minor projects.

Another new initiative is the farm forestry trials at Duckenfield and Tenambit, by Maitland City Council and Maitland Landcare respectively. These initiatives are the result of a program of assistance by Greening Australia, involving the provision of materials to establish the farm forestry trial sites.

It is anticipated that the Greening Plan will be of substantial value in future applications for grant funding by Council and/or community groups, demonstrating a coordinated and strategic approach to vegetation management. It is therefore expected that Grant funding will provide some form of income for the Greening Plan. However, it is not known to what extent.

Section 94 Developer Contributions

Council currently levies contributions on new development in the City for public amenities and services pursuant to Section 94 of the Environmental Planning & Assessment Act 1979. These developer contributions provide another possible source of funding for the implementation of initiatives in the Greening Plan.

The Department of Urban Affairs & Planning have issued guidelines for the application of Section 94 contributions. These guidelines require that contributions are “*reasonable*” and equitable. There must be a direct link or “*nexus*” between the facilities or services provided and the demands directly generated by the new development. Council must also consider the “*apportionment*” between existing and new populations, when funding facilities with Section 94 funds.

These requirements impose significant limitations on Councils, which make it difficult and highly impractical to purchase bushland areas using Section 94 developer contributions.

There may be some potential to increase the percentage of existing Section 94 spending on passive open space. However, investigations by Council indicate that Section 94 funding is unlikely to provide substantial funding for bushland conservation initiatives. The use of Section 94 funding for general bushland conservation is unprecedented in NSW to Council's knowledge.

Tree Removal Fee

A tree removal fee has been utilised in some local government areas as both a deterrent to unnecessary clearing in the first instance, and as a mechanism to fund further revegetation works to offset bushland development in accordance with a no net loss policy. Some local councils have tree removal fees as high as \$50 to \$80 per tree, which in a bushland development can amount to a sizable fee to be used for revegetation.

However, there is the potential for a fee to result in the indiscriminate loss of vegetation and limitations on normal management such as bushfire risk management.

The application of a clearing fee, whether on individual trees or levied at an area, is therefore an option which would need to be considered carefully by Council prior to its introduction.

Corporate Sponsorship

The opportunity exists for specific projects to be made available for corporate sponsorship. Projects such as corridor development, road-side vegetation programs and wetland rehabilitation projects could be made available for corporate funding. Expressions of interest have already been received from the business sector for the development of large scale restoration works.

Specific sections of high profile corridor plantings could be made available for corporate sponsorship, with advertising signs made available as an incentive.

6.3 How the Revenue Base Could Be Used

I. Rate Relief

A rate rebate would enable Council to return a portion of the rate paid on a parcel of land to the landholder, in exchange for bushland conservation. For Councils where such a mechanism exists experience has shown that landholders utilise the rate rebate for further conservation undertakings. However, the extent of relief would be unlikely to compensate owners of substantial areas of bushland for all of the costs of conservation, particularly the lost opportunity costs where development opportunities are forgone.

Differential rating is similar, except that only a portion of the initial rate is payable in the first instance.

The difference between rate rebates and differential rating relates to the way the Australian Taxation Office views the costs of production for primary producers. Land rates are viewed as a cost of production and

are thus 100% tax deductible and hence lower the taxable income of the landholder. A rate rebate allows a landholder to maintain the tax deduction whilst enjoying a rebate on their rates. Differential rating allows a landholder (other than Primary producers) to reduce the level of rates payable in the first instance. Rate relief in any form is effectively a reduction in rate income that must be borne by the community at large.

According to Lambert (1998), rate relief tends to receive a mixed reaction from the community. Local government authorities tend to seek state and federal government reimbursement for lost rate revenue and some residents express concern that the costs of rate relief are simply passed onto local ratepayers. However, it could be argued that this approach is consistent with the “whole of community approach” being fostered by the Maitland Greening Plan.

There has been concern from within the Greening Plan Coordinating Group, that rate relief cannot adequately compensate for the costs of conservation and lost opportunities in some cases. In any case, it has been noted that the majority of properties containing bushland are already zoned rural, with the lowest rates payable.

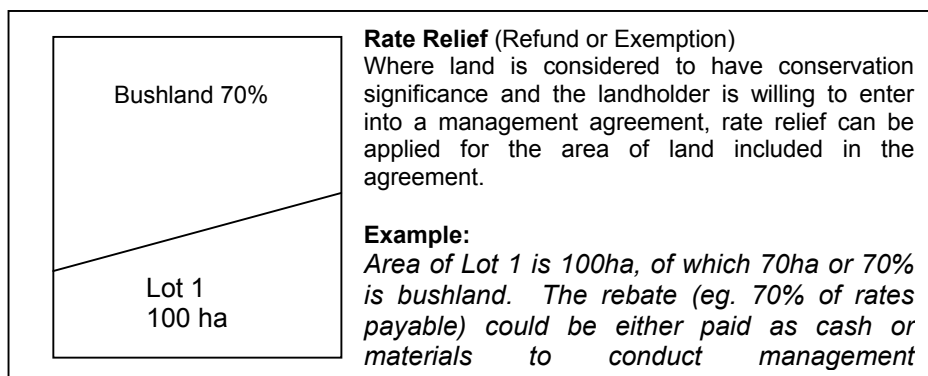


Fig 36 The Application of rate relief.

Individual Grants/Incentives

Research by Hamilton (1997) and Jenkins (1995) indicates that landowners place a high importance on the provision of funds to purchase materials for conservation purposes. According to Lambert (1998), these landowners generally do not want “handouts”. They want to be part of a cooperative effort and are willing to provide their time and labour but they require assistance with the costs of the materials.

Individual grants have been used successfully in other local government areas for particular landholders to undertake conservation or restoration works. For example, small-scale funding assistance for fencing is currently provided in the Maitland LGA by the Hunter Catchment Management Trust.

Binning & Young (1997) have proposed a sliding scale for assistance with fencing costs, with the level of assistance determined by the degree of surety that the fenced area will be conserved in the long-term. This approach may be suitable in the Maitland LGA. However, the details of the sliding scale would need to be determined. Concerns have been raised as to the “strings attached” to such incentives, particularly relating to limiting future opportunities, as discussed in Section 4. It is widely acknowledged (Farley, 2000) that some form of

management agreement or other form of protection such as the Tree Preservation Order, is required to suitably protect revegetation work conducted utilising public funding, for the long term. The careful planning of revegetation works at the property planning stage of the process will avoid future problems in this area.

The 2001/2 Maitland City Council Budget has included assistance in the form of a native plant distribution program. This would involve the propagation of local plants in a nursery and distribution to landowners in areas of priority in the Greening Plan (refer Fig 33). Council would also provide technical advice as a means of assisting landowners. Council has allocated \$50,000 in its 2001/2 draft budget for this purpose.

Concerns have been raised within the Greening Plan Coordinating Group that landowners may be adversely affected in future years if they undertake revegetation now. However, as discussed in Section 4.3, the revegetation initiatives are expected to predominantly take place in areas that could not be further developed for any purpose due to physical attributes such as creeklines and wetland areas.

The proposed program in 2001/2 is expected to act as a pilot program for similar assistance packages in the future. The on-going provision of incentives to individuals is likely to require substantial resources, including technical expertise and coordination by Council. However, it may be the best means of encouraging participation by landowners that would otherwise not occur.

Acquisition/Public Ownership

At present, there is very little, publicly owned bushland in the Maitland LGA. The vast majority of bushland is in private ownership, which means that the landowners possess the rights, powers and obligations in relation to the use of the land under common law.

As a result, it is regularly proposed that Council purchase areas of bushland to ensure their on-going conservation in the interests of the community. This reduces the level of uncertainty surrounding private ownership, increasing the potential for passive recreation opportunities and reduces the need for monitoring and regulation.

It may, therefore, seem a simple solution to the problem of conservation. However, there are substantial costs associated with acquisition, which generally cannot be met under Council's current funding arrangements, including the on-going costs of maintenance of the bushland areas. These costs are ultimately borne by the wider community.

Given the high cost of acquisition, it is important that Council consider the circumstances of the case and the relative benefits of acquisition compared with other conservation measures. For example, Council should consider:

- The conservation value of the property;
- The level of risk posed by on-going private ownership;
- The extent to which other options exist; and
- The value of the property in terms of public access if acquired.

Council should also consider the availability and suitability of schemes operated by other organisations, such as the establishment of a management agreement with the NPWS and/or the purchase of the

property through the National Heritage Trust's National Reserve System.

Public acquisition may be more feasible as part of the spending priorities arising from a special rate (environmental levy).

Conservation Grants/Agreements

A Conservation grant scheme could operate as a tool for conservation, whereby a formal management agreement is entered into between the landholder and Council for a parcel of significant remnant vegetation. The Conservation agreement would provide for payments to the landowner in return for the conservation and management of the land during the period of the agreement.

As with other options, the costs associated with conservation grants would rest with Council and ultimately the community at large. These costs would include the cost of developing a suitable legal agreement and could include the management responsibilities for the land, depending on the nature of the agreement.

Educational/Motivational

Sustainable land management has now become an important focus for agricultural management and landowners are increasingly becoming aware of the principles and techniques that relate to environmental restoration and management. Council could increase landholder awareness of environmental management by disseminating information and/or undertaking education events for interested landholders. There are already numerous suitable events such as field days and short courses, which are run by organisations, including DLWC, Greening Australia and NSW Agriculture, at which Council could make information available to relevant/interested landholders.

Vegetation Advisory Officer

A Vegetation Advisory Officer could be established after completion of the Greening Plan to provide technical assistance to Council staff, community groups and most importantly landholders, on a range of environmental management issues.

The Vegetation Advisory Officer would be available for site assessment and assistance with the preparation of management plans for specific properties. They would coordinate field days and educational endeavours, maintain the overall momentum for the Maitland Greening Plan and provide the supervision and monitoring of the bushland management programs through out the LGA.

Urban Bushland Reserve Management

Several bushland reserves exist throughout the urban areas of the Maitland LGA, which are already in public ownership. Due to the size and shape of these reserves and more importantly, the surrounding land use, there is a high degree of management required to ensure that their ecological integrity is maintained.

Council may, therefore, need to allocate additional funding for the management of these and any additional areas of bushland which are transferred to public ownership. Such funding could include additional technical expertise and staff training in the area of bush regeneration.

Coordination

If the initiatives suggested in this Plan are to come to fruition, Council will need to act in a coordinating role. For example, the public acquisition of land and/or the distribution of plants will require choices in terms of the priorities for assistance. This will follow logically from the Greening Plan, to some extent, but Council still has a key role as an impartial body to transparently administer any assistance packages.

It is, likely that Council will need to form an independent Advisory Panel, to provide recommendations in relation to priorities for action. It is envisaged that a Coordinating Group would include Council staff, landholders and community representatives, similar to the Greening Plan Coordinating Group, which assisted with the development of this plan.

6.4 Policy Provisions

There are a range of policy options, which could be considered by Council in relation to vegetation management. These range from the assessment of proposed development/land uses on an individual basis, as is presently the case, to a moratorium on the clearance of vegetation. The primary regulatory options are considered below:

II. Status Quo

At present, there is no general Council policy in relation to vegetation conservation in the Maitland LGA. The value of vegetation therefore tends to be considered as part of the development assessment and rezoning processes pursuant to the requirements of the Environmental Planning & Assessment Act 1979.

Consent is required for *“the ring-barking, cutting down, lopping, topping, removing, injuring or wilful destruction of any tree with a height of 3 metres or more”*, in accordance with Clause 29 of the Maitland LEP 1993. Development consent is required for the removal of trees in the environment protection zones in the Maitland LEP 1993.

Conditions of consent can be applied in relation to vegetation conservation with any development approval. Applicants can appeal against refusal or against any conditions of consent to the NSW Land & Environment Court.

The consideration of individual applications has been carried out primarily on the basis of information supplied by the applicant with the development application. As a result, the assessment of cumulative impacts on native vegetation and the environment has not been easily incorporated into the assessment process.

One of the benefits of the Greening Plan will be an increased capacity for Council and the community to take a strategic view of native vegetation as part of the assessment process in the future. It is therefore more likely that we will avoid the cumulative loss of native vegetation and that the importance of native vegetation will be properly recognised.

Nevertheless, there is a need for a policy position in relation to the different vegetation communities, depending on the level of conservation of those communities, which has been achieved at the local and regional level. Refer to Figure 23 on page 33.

It is proposed that Council take the following policy position in relation to native vegetation with reference to the conservation priorities described in Section 3 and repeated below:

No Loss

Three of the vegetation communities in the Maitland LGA have been reduced to below 30% of their regional distribution in 1750 and below 10% of their local distribution in 1750. They are:

- a) Hunter Valley Dry Rainforest;
- b) Alluvial Tall Moist Forest;
- c) Swamp Oak Rush Forest.

These vegetation communities are poorly conserved and it is therefore recommended that there be no further clearance in these areas.

A “no loss” policy would seek to preclude all clearance of bushland through regulatory restrictions. This means that Council’s regulatory provisions would restrict the clearance of vegetation. There would be a presumption against the clearance of vegetation, even where development is permissible with consent in the zone applying to the land. The emphasis in any development application received by Council would need to be on the conservation and enhancement of these areas of vegetation.

This approach may also need to apply in instances where a vegetation community has been reduced to an exceptionally low percentage of either its local or regional distribution in 1750. For example, a community may have an exceptionally low percentage retained at the regional level, in which case the remnant vegetation in the Maitland LGA (although higher than 10%), might form a critical part of the regional conservation of that community. Alternately, a very small percentage of a vegetation community may exist at the local level, despite there being reasonable levels regionally. A “no loss” policy may also need to apply if a vegetation community is listed as a threatened or endangered community under the Threatened Species Conservation Act.

No net loss

Under a “no net loss” policy, Council would adopt the principle of maintaining the levels of bushland at or above certain defined levels. There would be a presumption against the clearance of vegetation but Council would be able to consider applications for the removal of vegetation, subject to satisfactory compensation in the form of revegetation.

The introduction of a no net loss policy is not an ideal solution from an ecological perspective because it is likely to lead to some further clearance of vegetation and because revegetated areas do not have the same value from an ecological perspective as areas of remnant bushland. However, Council may have little choice in the circumstances.

Firstly, Council needs to acknowledge that around 95% of native vegetation in the Maitland LGA is in private ownership and that there are implications on owners of native bushland, particularly in locations where properties are entirely made up of bushland. Council needs to consider the impact of restrictions on landowners who will be left to manage bushland, without the potential for financial gain.

Secondly, Council has limited capacity to simply acquire and manage areas of bushland on behalf of the community. This includes limitations on the ability of Council to levy contributions, charge fees and/or accept the dedication of land in connection with any proposed development.

It is likely that some form of trade-off will need to be considered in areas where the minimum conservation targets for the vegetation communities have not yet been reached. As shown in Figure 23, a “no net loss” policy is proposed to apply to vegetation communities, which have either been reduced below 30% of their regional distribution or 10% of their local distributions, respectively. A special case is proposed for the Lower Hunter Spotted Gum Ironbark Forest, which is expected to be reduced below 10% of its 1750 local distribution in the near future.

In all cases where a no net loss policy is proposed, it will be necessary that Council develop planning and policy in relation to the implementation of a no net loss policy for particular communities, given the wide range of circumstances which exist.

In rural areas, restrictions on vegetation clearance will be perceived by some, as an unnecessary restriction on their right to use their land as they see fit. However, with a few exceptions, the properties containing bushland are not entirely made up of bushland and in most cases, it is the least productive lands which contain remnant bushland. It is also possible that opportunities for the on-going use of these properties could be enhanced by the presence of the vegetation, if Council is able to consider land use incentives for conservation.

The details of how a no net loss policy could be implemented are yet to be determined. However, it is likely that community title will be a key means of providing for conservation within the scope of the no net loss policy. This is because Council has limited capacity to acquire or accept the dedication of land into public ownership. Community title provides a means of ensuring the long-term conservation of bushland (i.e. in accordance with a management agreement), whilst keeping bushland in private ownership.

Nevertheless, despite its potential limitations, a no net loss policy is potentially the best means available to Council to provide limited flexibility for landowners and incentives for conservation. In the first instance, a no net loss policy would discourage further clearing of bushland areas. However, if a particular development was seen to be in the best interests of the City, or if Council wanted to provide an incentive for conservation (eg. on bushland rural properties), then a “no net loss” policy would provide the flexibility to consider such an outcome.

A no net vegetation loss policy could even go further, if necessary, to require a larger area of revegetation than clearance, to gradually increase the amount of bushland remaining in the LGA.

6.5 Regulatory Provisions

Irrespective of whether Council adopts a policy approach for specific vegetation communities, as described above, the suitability of existing regulatory provisions needs to be considered:

I. Existing State and Federal Legislation

In recognition of the importance of environmental issues, a range of recent laws have been enacted to ensure a path towards sustainability. These include:

- Local Government Act 1993;
- Local Government Amendment (Ecologically Sustainable Development) Act 1997;
- Environmental Protection and Biodiversity Conservation Act 1999;
- Native Vegetation Conservation Act 1997;
- Threatened Species Conservation Act 1995;
- National Parks & Wildlife Act 1974;
- Rural Lands Protection Act 1989;
- Catchment Management Act 1989;
- Noxious Weeds Act 1993;
- Protection of the Environment Administration Act 1991;
- Protection of the Environment Operations Act 1998;
- Environmental Planning & Assessment Act 1979;
- Rural Fires Act 1997;
- Environmental Offences and Penalties Act 1989;
- Rural Lands Protection Act 1989;
- Forestry Act 1916;
- Rivers and Foreshore Improvement Act 1948;

Council is required to work with State Government agencies such as the EPA, NPWS and DLWC in the implementation of these laws.

Most significantly, the Department of Land & Water Conservation is responsible for the Native Vegetation Conservation Act 1997. Under this legislation, the consent of the Department is required for the clearance of areas of vegetation in excess of 2 hectares, except in areas zoned residential.

Maitland LEP 1993

Maitland Local Environment Plan (LEP 1993) is the main legislative framework relating to land use within the Maitland LGA. The LEP contains a variety of zones, which generally determine the types of land use that are permissible throughout the LGA.

At present, the Maitland LEP (1993) has 3 conservation zones, which are:

- 7(a) Environmental Protection Wetlands (1170ha)
- 7(b) Environmental Protection (Buffer) (397ha)
- 7(c) Environmental Protection General (247ha)

The remainder of remnant bushland in the Maitland LGA is predominantly zoned 1(b) Secondary Rural under Maitland LEP (1993) and the clearance of trees requires approval pursuant to the Council's Tree Preservation Order and as part of any approval for development in these areas. There is therefore a general limitation on the clearance of canopy vegetation.

Council has plans to review Maitland LEP 1993, including the existing zones, definitions and clauses in the coming few years. These amendments will be based to a large extent on Council's strategic planning, including the Greening Plan, once it is finalised. However, it is not proposed to rezone land directly as a result of this draft Plan.

Tree Preservation Provisions – Maitland LEP 1993

Maitland City Council currently has Tree Preservation provisions in Maitland LEP 1993, applying to all vegetation over 3 metres in height throughout the LGA. The TPO, therefore, includes vegetation in the urban context in addition to rural areas and is generally more focused on individual trees than on areas of vegetation. Council also has a list of Significant Trees, registered for their heritage value.

The LEP provisions do not protect under storey vegetation, which is less than 3 metres in height. This is significant from the perspective of protecting biodiversity, since the understorey vegetation provides habitat and food resources for a range of species. Council could, therefore, extend its existing LEP provisions to the clearing of native vegetation generally, including, but not limited to, trees.

New provisions of this type would be better titled Vegetation Preservation to reflect the need to conserve and manage areas of vegetation rather than just trees over three metres in height. Council would need to maintain an up-to-date map of vegetation in the LGA, based on the inventory undertaken for this Plan. This could be done on a regular basis using aerial photography, satellite imagery and field inspections, where necessary.

The Vegetation Provisions would cover the clearance of areas of vegetation not covered by the Native Vegetation Conservation Act 1997. The NVC Act does not relate to land zoned urban or industrial, and allows for individual landholders to clear up to 2ha per year with out consent. It is important that this vegetation is included in consent requirements because of the limited extent of native vegetation currently found in the Maitland LGA, where the unmanaged clearance of “small” patches of vegetation could have a significant impact on biodiversity in the local area.

The policy considerations for different types of vegetation covered by the Vegetation Provisions, would be provided in a Development Control Plan. This would include policy on the management of individual trees, vegetation of particular communities (e.g. Hunter Valley Dry Rainforest), plantations/farm forestry and areas of regrowth/revegetation.

It is important that areas of revegetation are included for consideration under the VPO as Council's ability to provide funding assistance may depend on grant funding from other authorities, who will need a degree of certainty regarding the future conservation of the areas which have been replanted.

However, Council is conscious that landowners, who have committed their time and resources to revegetation, will not wish to be unduly limited in their future actions, as a result of having carried out revegetation works. It is proposed therefore that increased flexibility will apply in these areas given the positive actions taken by the landowners. Details of how applications for vegetation removal in these areas are assessed are proposed to be included in the DCP. The draft DCP will need to be exhibited separately for public input. The draft DCP is discussed further below:

Planning Considerations

It is anticipated that the Development Control Plan in relation to vegetation management would include:

- Objectives for vegetation management;
- Matters for consideration in relation to vegetation management;
- Guidelines on the information to be provided with applications.

Several other Councils in the Lower Hunter have prepared Development Control Plans in relation to vegetation management. The DCPs are able to make provision for any matter, which can be included in a LEP, but the DCP is able to include greater detail and is more flexible in its application to particular circumstances.

The DCP could include information on the application of any trade-off provisions which Council will consider, including conservation linked rural subdivision, community title subdivision and management agreements, as discussed below:

Conservation Linked Rural Subdivision

This approach has been used successfully in other areas to conserve and manage bushland areas. A formal management agreement, such as the NPWS Voluntary Conservation Agreement (VCA), may be used to achieve biodiversity protection. Alternatively, community title may provide a mechanism for long-term conservation of bushland areas, as discussed below.

Community Title

Community title could be utilised as a means of allowing some development in bushland areas of low to medium conservation value, in return for the management of core conservation areas.

Management of the community land would be undertaken by the body corporate, comprising all owners, in a similar fashion to shared management of common property in a strata title block of flats. The value of this process is that vegetation conservation can be undertaken in accordance with an agreed management plan.

The suitability of community title developments in bushland areas is likely to depend very much on the scale and design of the proposed development. If there is a need for a substantial number of lots, the impact on the environment may be too high. The location of community title developments will also depend on the compatibility of the proposal with Council's Settlement Strategy and Rural Strategy.

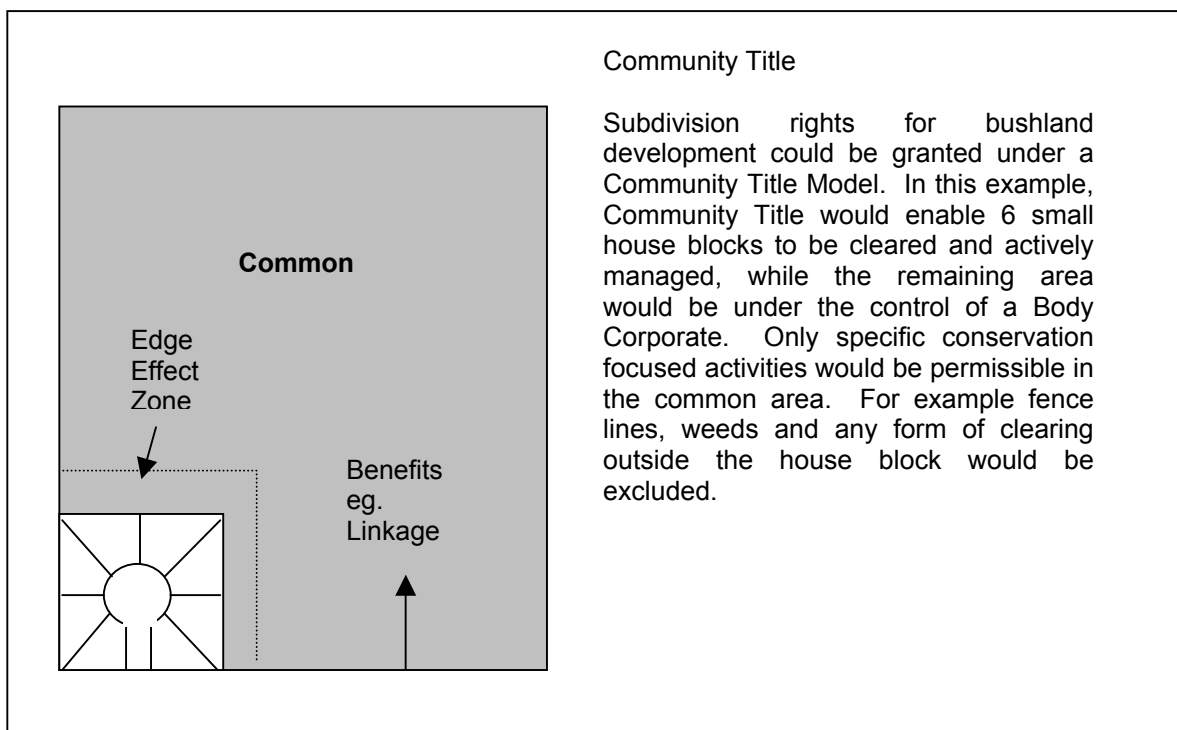


Fig 37 Application of Community Title.

The management requirements of the conservation area are potentially the major draw back for the community title model, as community members may not have the expertise or time to effectively manage these areas and Council may, therefore, need to require plans of management to be developed to provide appropriate conservation of bushland in those areas. Significant management requirements could also limit interested buyers to those who recognise natural values.

Council is also likely to require additional technical expertise to oversee the management agreements on the common area.

Management Agreements

A relevant management agreement for Maitland City Council is a formal contract between the landholder and a government body, including Council. The management agreements are conservation based and can be linked to a conservation zone and financial incentive

if that is the wish of the landholder. At present, conservation based management agreements exist with the National Parks and Wildlife Service and the Department of Land and Water Conservation.

The range of management agreements differ in respect to their formality, ranging from the Voluntary Conservation Agreement (VCA) offered by the National Parks and Wildlife Service, which is a binding agreement attached to the land title in perpetuity. A NPWS VCA has the advantage of being non rateable under the Local Government Act, which is a benefit to the landholder. The NPWS also offers a land for wildlife program, which is a similar management agreement, but less formal.

The NPWS recommend that interested landholders begin with the less formal agreement to get used to government involvement in their property's management.

The external body such as NPWS and DLWC could provide assistance in the form of technical expertise and materials to undertake necessary works in the prescribed areas.

A management agreement would be based on a property plan produced by the landholder outlining specific objectives and conditions for parts of the property. Management agreements could simplify the process of vegetation management by allowing activities such as clearing of fence lines, regrowth management and plantation development. Management agreements allow for much greater flexibility, taking account of the individual circumstances for each property assessed. Areas of high conservation significance could be likewise allocated conservation measures.

A conservation covenant is a formal agreement between the property owner and an external body such as Council or another government body (ie. NPWS and DLWC) with the objective of conservation.

The Department of Land and Water Conservation also offers a Property Agreement (PA) that allows individual landholders to develop tailor made strategies for the management of their vegetation. The development of a PA will allow access to funds available through the Native Vegetation Management Fund, a popular aspect of the new Native Vegetation Conservation Act, which is currently into its second round. DLWC and the NPWS both have a range of agreements and flexibility, to tailor management agreements to specific landholder requirements

Greening Australia also offers a Lower Hunter Native Vegetation Incentives Project that assists landholders with the provision of fencing for areas of important native vegetation, as well as recommendations for the future management of the area.

Appendix 2 from the National Parks and Wildlife Service's Local Council Biodiversity Planning Guide details a range of management considerations that need to be considered in relation to management agreements.

Transferable/Tradable Development Rights

Transferable Development Rights (TDR) have been considered as a means of providing landowners with an incentive to conserve important bushland areas. However, in the Maitland LGA, TDRs do not provide the appropriate basis for vegetation conservation.

The establishment of a TDR scheme involves the designation of conservation and development areas by Council. Owners within conservation areas are assigned saleable or tradable development rights, which can only be exercised in areas designated by Council as suitable for development.

Unfortunately, however, the use of TDR system, depends very much on the existence of suitable areas for additional development rights and demand for those rights in preference to non-TDR opportunities. This is a particular problem in the Maitland LGA due to the small amount of land in public ownership. In addition, the administration of TDR schemes is generally recognised as cumbersome and expensive and would, therefore, require substantial public resources for implementation.

For these reasons, the use of TDR schemes has not been used as part of bushland conservation initiatives in NSW and they are generally considered to be inappropriate for use as part of the Maitland Greening Plan.

6.6 Future Opportunities

The Greening Plan is based on the best information available at the time it was prepared. However, the information available on vegetation management and on the local environment is constantly expanding. The use of this information and the development of new innovations in vegetation management will play an important part in the implementation of the Greening Plan.

In some cases, the new information and innovations are being developed now. These include the use of biosolids as a fertiliser for revegetation projects and the application of various market based solutions to environmental management issues, such as carbon credits, biodiversity credits and salinity credits. A brief description of these opportunities is, provided below:

III. Biosolids

Over recent years there has been a number of trial applications for the use of biosolids in the revegetation industry, particularly in plantation development. Biosolids (also referred to as sludge) are the solid components of sewage, separated following the primary treatment of wastewater. As the name suggests, biosolids are a dry matter that can be dug into the soil, thus diverting waste from landfill and providing an alternative form of fertiliser. Biosolids are currently being marketed by the Hunter Water Corporation as an alternative fertiliser and are available from sewage plants in the Maitland LGA.

Biosolids have shown positive results in vegetation establishment, with growth rates accelerated over the first five years, after which nutrients are depleted and growth rates return to normal. State Forests are currently trialing continued application of biosolids during the development of a plantation allotment but results have not yet been released.

Whilst there are a number of benefits associated with the use of biosolids, such as the diversion of a waste into a resource and the increased growth rates of some species as a result, there are also a number of considerations that need to be kept in mind for the use of biosolids.

1. Biosolids are a fertiliser, and like all fertilisers the issue of nutrient contamination of water bodies is a major consideration.
2. Biosolids have a stigma associated with them in the general community relating to their origin.
3. There is often a range of seed material within the biosolids that can be introduced to revegetation areas, particularly tomatoes.
4. Transportation costs are an issue, and the bulk nature of biosolids can make them difficult to handle, particularly compared against a slow release fertiliser tablet.
5. Being derived from human effluent, health issues are a consideration.
6. Contamination with heavy metals and pesticides from the sewerage system has caused major problems in early trials (quality control is now undertaken by Hunter Water Corporation which has eliminated this problem to a large extent).

Nevertheless, biosolids may have some application in greening endeavours in the Maitland LGA, particularly in the plantation context, if their limitations are taken into account. Maitland could utilise a large volume of biosolids generated within the LGA for restoration works.

Market Based Initiatives

Market based initiatives have developed from the user/polluter pays concept of sustainable development. Whilst accepting the pollution/degradation issue as a by-product of development, it creates a mechanism to off-set this through the provision of 'credits' which the polluters are able to purchase to offset the degradation resulting from their action.

Carbon Credits

Carbon Credits are perhaps the best-known market based approach to natural resource management, capitalising on the sequestration (long term storage) of carbon dioxide in vegetation through the process of photosynthesis. The development of a commodity based on the value of sequestration to the planet depends on a market to buy, sell and trade the "credit".

This market was conceptualised as part of the Kyoto Protocol, and is based on the requirement that carbon-producing industries off-set their pollution through the purchase of carbon credits, provided by greening industries such as plantation developments.

Scientists are currently developing rates of sequestration for various plantation applications, but ultimately it will be the market that sets the price of credits. A guide to carbon sequestration can be seen in the figure of 100,000ha of new forest absorbing 1 million tonnes of Carbon Dioxide per annum, based on 50% of the dry weight of timber being carbon (Heathcote, 1999).

Carbon credits rely on plantations, as carbon sequestration is at a maximum in developing trees, which are then cut down for product, leaving the carbon stored in the timber and making way for more developing trees.

Carbon Trading will not commence until 2008, unless the Australian Government decides to introduce the scheme at a national level. Much of the framework for the process is yet to be developed, but could provide a mechanism to help offset some of the global warming issues currently being faced.

What is clear is that a plantation will need to be very large to attract credits. It is therefore unlikely that individual landholders in the Maitland LGA will benefit from this mechanism. However, it may be possible for plantations throughout the region to take a cooperative approach.

Salinity Credits

Similar to carbon credits, salinity credits are being trialed as a means to encourage the control of salinity. A value is assigned to vegetation in the upper catchment as a means of mitigating future salinity in the lower catchment. Various programs have been established throughout Australia including one in the Hunter Valley to help mitigate saline mine discharge.

Broad scale changes to agricultural land management are also likely to be necessary to reduce or eliminate the process of ground water rise, and control salinity. Extensive and strategic replanting of perennial vegetation in the landscape is required as discussed in this report. Depending on the catchment situation, revegetation may be required in as much as 50% of the area (Sandstrom, 2001)

Salinity Credits attribute a value to existing and replanted vegetation, but unlike carbon credits, salinity credits require the trees to become a permanent part of the landscape, as the service (i.e. reducing ground water levels) is only achieved whilst evapo-transpiration is taking place. Evapo-transpiration is the ability of a tree to take in water through their roots, which passes through the tree, leaving the leaves as water vapour. Mature trees can take up a great deal of water. Fig trees, for example, can release up to 10,000 litres of water per day through evapo-transpiration.

State Forests and Macquarie River Food and Fibre (an industry organisation representing irrigators in the Macquarie Catchment) have established a trial project in the Macquarie Catchment of the Murray Darling Basin. Under the scheme, an annual annuity payment is made to landholders in the upper catchment for the retention and further establishment of vegetation on their land. The payment is made by the Macquarie River Food and Fibre Group with State Forests acting as a broker.

Biodiversity Credits

Biodiversity credits are being looked at as a means of conserving biodiversity, but are only in the early stages of development by the state government. However, State Forests and the National Parks and Wildlife Service are both looking at how biodiversity credits may be instigated (Ridge, K. 2001). Once again, a framework would need to be established to allow private landholders and investors to trade in biodiversity, based on the purchase of credits gained from areas already conserved.

7 Recommendations

The Greening Plan has presented a range of options relating to the provision of financial resources and the associated actions by Council and landowners. None of these options alone will provide the perfect solution to the environmental problems being faced in the Maitland LGA. However, it is recommended that Council and the community

adopt a suite of these options, covering financial management, vegetation management, education and motivation and regulation, which will together provide a holistic approach and an effective solution.

The following conclusions and recommendations are, therefore, presented for consideration:

Recommendation 1

That Council ratify the vegetation retention targets established in Section 3.5 (page 33) to establish clear goals for bushland conservation in the Maitland LGA.

Goals for bushland retention have been established with the assistance of the Greening Plan Coordinating Group, on the following basis:

At the regional level, the 30% proposed by the Hunter Catchment Management Trust as a vegetation retention target for the Hunter Valley, is considered to be an appropriate target.

At the local level the minimum 10% retention target (JANIS) is considered to be appropriate having regard to the highly urbanised nature of the Maitland LGA and the fact that most vegetation communities have local retention rates of less than 10% of their original distribution.

Conservation Ranking	Regional Significance	Local Significance	Relevant Communities	Conservation Outcomes
1	Regionally <30%	Locally <10%	<ul style="list-style-type: none"> Hunter Valley Dry Rainforest*; Alluvial Tall Moist Forest*; Swamp Oak Sedge Forest * 	No further Clearing Protection under LEP Priority Revegetation
2	Regionally <30%	Locally >10%	<ul style="list-style-type: none"> Central Hunter Riparian Forest; Hunter Lowlands Red Gum Forest*; Swamp Oak Rush Forest 	No Net Loss Limited Clearing (10%) with revegetation
3	Regionally >30%	Locally <10%	<ul style="list-style-type: none"> Hunter Valley Moist Forest; Coastal Foothills Spotted Gum Ironbark Forest; Seaham Spotted Gum Ironbark Forest; Lower Hunter Spotted Gum Ironbark Forest; Coastal Plains Smoothbark Apple Woodland; Swamp Mahogany Paperbark Forest 	No Net Loss LHSGIF (minimum 6.75%) locally supplemented in longer term by revegetation
4	Regionally >30%	Locally >10%	<ul style="list-style-type: none"> Fresh Water Wetland Complex 	N/A Wetland

It is recommended that each vegetation community be considered individually (as shown in the above table). A special case is proposed for the Lower Hunter Spotted Gum Ironbark Forest, including

consideration of trade-off options, due to the circumstances of that community (see p 34/35). A minimum conservation target of 6.75% is proposed for LHSGIF, with the aim of conserving the remaining vegetation in the long term and supplementing conservation initiatives with revegetation.

Recommendation 2

That Council raise the necessary revenue to achieve sustainable vegetation management and revegetation endeavours, including implementation of a Special Rate (Environmental Levy).

Substantial funding will be required to maintain existing vegetation and to initiate proposed revegetation works. It is therefore recommended that Council and the community pursue a range of funding options, to maximise the revenue base and associated outcomes from the Greening Plan.

A special rate (environmental levy) is proposed as the primary means of raising revenue, subject to consideration of the response to any proposed levy from the Maitland community. A separate report detailing the Special Rate would need to be submitted to Council and the Minister of Local Government in order to initiate the rate, depending on the community response to the Greening Plan.

It is anticipated that the special rate would be applied equitably to all landholders within the Maitland LGA to achieve many of the recommended outcomes of the Greening Plan.

In addition, it is recommended that Council and the community seek funding for specific environmental programs through grant funding and other revenue sources.

Recommendation 3

Acquisition of bushland with a high conservation significance and development threat.

Council should consider the purchase of limited areas of native vegetation, with priorities determined in relation to the conservation value of bushland and the degree of public benefit.

This would ensure landholder rights are taken into account in regard to community expectations in relation to bushland management. This is anticipated to be the single greatest expense proposed under the Greening Plan, and it is hoped that land that has multiple benefit to the people of Maitland such as passive recreation can be obtained and secured. The ongoing management of these areas is also an important consideration in regard to expenditure.

Recommendation 4

Council establish a Native Plant Distribution Program

The Native Plant Distribution program will provide for the propagation and distribution of local, native plant species to landowners who will participate in the program on a voluntary basis. Council will determine priorities for distribution, based on the priorities in the Greening Plan as outlined in the opportunity corridors detailed in Figure 33 on page 53.

The main focus of the program would be rural properties, in locations where revegetation corridors have been identified. For example, Council might support a landowner proposing the revegetation of a

riparian corridor, which helps to establish a link between other existing areas of remnant vegetation. Council would provide the trees free of charge, subject to their successful establishment on the property as proposed. A simple management agreement would be necessary to provide for the long-term protection of these areas provided for by public funding to assure their long-term presence in the landscape.

Recommendation 5

Community Education Trial Sites

Priority education sites should be rehabilitated as a result of the Greening Plan, providing examples of key land degradation issues. This program would demonstrate best management practices regarding degradation issues apparent at each site. In most cases the sites would have more than one environmental problem and would provide opportunities for good exposure to the public due to their locations. They would provide opportunities for the involvement of the community and public education.

Recommendation 6

Council undertake Urban Bushland Reserve Management

Bushland reserves, and any bushland acquired and placed in public ownership will require management to ensure that the ecological characteristics of the area are maintained for future generations. Weed control and access control (in relation to rubbish dumping and community recreation) are the most important requirements in this regard.

Recommendation 7

Provision of Conservation Grants to Individual Landholders.

It is recommended that Council consider the use of conservation grants for areas of privately owned bushland, which are not publicly acquired and recognised to have conservation significance. The grant payment would be subject to the establishment of a conservation agreement with Council, for the management of the land during the period of the agreement. See Section 6.3 ii on page 65. Specific undertakings such as buffer plantings, corridor development or erosion control would be provided through such conservation grants.

Priorities for conservation agreements would need to be determined by a Council, possibly with the assistance of an Advisory Panel (detailed below in Recommendation 12), based on the Greening Plan.

Recommendation 8

Provide Equipment for Restoration/Rehabilitation Projects

An equipment loan program could be established for community groups and landholders to achieve outcomes in relation to environmental management. Materials such as weed spray units, stem injection equipment, tree planting equipment, herbicides and other general equipment could be made available to stakeholders to achieve the outcomes of the Greening Plan. Such a program would enable outcomes in relation to vegetation cover, habitat quality and noxious and environmental weed control programs throughout the LGA to be achieved.

Recommendation 9

Environmental Awards

Encouragement and recognition of landholders who are involved in environmental management will be an important adjunct to other initiatives. Recognition for restoration works throughout the LGA could therefore be undertaken to highlight success stories. The Maitland Show, given the strong agricultural focus would provide a good forum to present such an award and prize.

Recommendation 10

Council Review current LEP Provisions

The Greening Plan has proposed a review of the current Tree Preservation provisions in Maitland LEP 1993, to better manage vegetation throughout the Maitland LGA. It is proposed that a separate report be presented containing new draft provisions for consideration by Council and the community. This is likely to include a series of categories for different areas (eg. rural and urban) and to enable the protection of specific vegetation communities (including all elements, not just trees over 3m).

Areas of revegetation would be likely to be covered by a specific category, with less emphasis on conservation generally so that there is not a disincentive to revegetation. A Development Control Plan (DCP) is proposed to accompany the new LEP provisions that will also require separate exhibition to the Greening Plan.

Recommendation 11

Conservation Incentives Clause (Part of LEP review Rec. 10)

A Conservation Incentives Clause in Council's LEP would provide an opportunity to develop programs for the conservation of native vegetation for undertakings not ordinarily permissible in the zone, which would have a conservation outcome. Developments such as bushland lots may need such a clause to provide for conservation outcomes. Details of such a clause will need to be developed to complement Council's strategic planning and would need to be place on public exhibition.

Recommendation 12

Council employ a Vegetation Advisory Officer to implement recommendations of the Greening Plan and educate and involve the community.

There will be considerable expertise required for the implementation of the Greening Plan. It is therefore recommended that Council consider the need for a Vegetation Advisory Officer, who would provide the technical expertise for plan preparation, as well as coordination and assistance to landholders, community groups and Council officers.

Recommendation 13

Review the Greening Plan.

It is recommended that the Greening plan be reviewed periodically to map the progress of the implementation of the proposals mentioned within the document and to ensure that eh Plan remains relevant and up to date.

8 References

- Albrecht, G. (2000) Rediscovering the Coquun. River Forum 2000.
- Bateson, P. (2000) Incentives for Sustainable Land Management: Community Cost Sharing to Conserve biodiversity on Private Lands. A Guide to Local Government. Environment Australia and Environs Australia, Canberra.
- Binning, C. & Thorman, R. (1999) Decision Points for Biodiversity – Partnerships and Options for Implementing the Lower Hunter and Central Coast Regional Biodiversity Strategy.
- Binning, C. & Young, M. (1997) Motivating People Using Management Agreements to Conserve Remnant Vegetation. Research Report 1/97, Environment Australia, Canberra.
- Binning, C., Young, M. & Cripps, E. (1999) Beyond Roads Rates and Rubbish, Opportunities for Local Government to Conserve Native Vegetation. Research Report 1/99 Environment Australia, Canberra.
- Bradby, K. (2001) Working With the Property Market to Conserve Bushland. Western Australian Department of Land Conservation.
- Brouwer, D. (1998) Plan for Trees, A Guide to Farm Revegetation on the Coast and Tablelands. NSW Agriculture, Tocal.
- Charman & Murphy, 1994 Soils, Their Properties and Their Management, A Soil Conservation Handbook for NSW. Sydney University Press.
- Cotter, B. & Hannan K. (Environs Australia) (1999) Our Community Our Future: A Guide to Local Agenda 21. Commonwealth of Australia, Canberra.
- Cripps, E., Binning, C. & Young, M., (1999) Opportunity Denied: Review of the Legislative Ability of Local Government to Conserve Native Vegetation. Research Report 2/99, Environment Australia, Canberra
- Department of Land And Water Conservation (2000) Taking on the Challenge, NSW Salinity Strategy. NSW Government Printers.
- Department of Land and Water Conservation (2000) Rehabilitating Australian Streambanks with Longstem Native Tubestock. DLWC.
- Elix, J & Lambert, J. (1997) More Than Just Odd Trees. – Report on Incentives and Barriers to Rural Woodland Conservation Using Grassy White Box Woodlands as a Model. 1/99 Environment Australia.
- Fallding, M. (ed) (2000) Vegetation Management and Biodiversity Conservation – Hunter Region. Proceedings of a Workshop Held in May 2000 organised by the Hunter Environment Lobby Inc..
- Fallding, M., Kelly, A.H.H., Bateson, P. & Donovan, I. (2001) The Biodiversity Planning Guide for Local Government. National Parks and Wildlife Service.

Farley, R., & Toyne, P. (2000) Address to the National Press Club, Canberra "Landcare Architects Call for Radical Action to Save Farmland" (26/7/00) ABC Broadcasting 7.30 Report.

Farming For the Future (1999) Physical Property Planning. NSW Agriculture.

Goulburn Broken Catchment Management Authority (1999) Goulburn Broken Native Vegetation Management Strategy. Goulburn Broken Catchment Management Authority.

Greening Australia (1995) Local Greening Plans – A Guide for Vegetation and Biodiversity Management. Greening Australia.

Hamilton, S.D., Dettmann, P.D., and Curtis, A.L. (1997) Landholder Perceptions of Remnant Vegetation on Private Land in the Box-Iron Bark Region of Northern Victoria. Environment Australia.

Heathcote, R. (1999) Emerging Opportunities in Agriculture; Carbon Credits and Carbon Trading. The Australian New Crops Newsletter. Issue 11, January 1999.

Holmgren, D. (1994) Trees On Treeless Plains – Revegetation Manual for the Volcanic Landscapes of Central Victoria. Holmgren Design Services.

Hunter Valley Catchment Management Trust, (2000) Die Back Article Appearing the Newcastle Herald.

Hunter Valley Catchment Management Trust (1999) Public Forum, Hexham Swamp.

Jenkins, S. (1996) Native vegetation on Farms Survey. Resource Management Technical Report No. 164, Agriculture WA, South Perth.

Joint (ANZECC / MCFFA) National Forest Policy Statement Implementation Sub-committee (JANIS) (1997) Nationally Agreed Criteria for the Establishment of a Comprehensive, Adequate and Representative Reserve System for Forests in Australia. ANZECC.

Kirkpatrick, J.B. (2000) reservation, Retention and Reestablishment - Tradeoffs? From: "How Much Vegetation is Enough?: Setting Targets for Native Vegetation Conservation and Management" Nature Conservation Council.

Lambert, J. (1998) Alternatives to regulation. In Environmental Defenders Office (1998) Caring for the Land, Program and Conference Papers. EDO Sydney.

Lines-Kelly, R & Currey, A. (eds) (1992) Wind break Design. In Trees for the NSW North Coast. NSW Agriculture.

Lockwood, M. & Walpole, S. (1999) Benefit Cost Analysis of Remnant Native Vegetation. Johnstone Centre. Charles Sturt University.

Maitland City Council, (1996) Ecologically Sustainable Development (ESD) Local Initiatives Discussion Paper. Maitland City Council.

Miles, C.A., Lockwood, M. Walpole, S. & Buckely, B. (1998) Assessment of the On-Farm Economic Values of Remnant Native Vegetation. Johnstone Centre. Charles Sturt University.

National Parks and Wildlife Service (1997) NSW Biodiversity Strategy. NSW Government Printers.

National Parks and Wildlife Service (2001) Final Determination, European Red Fox as a Key Threatening Process. Final Determination 980320a.

National Parks and Wildlife Service (2001) Final Determination Bush Rock Removal as a Key Threatening Process. NPWS f991105a.

National Parks and Wildlife Service (2001) Final Determination of Predation by the feral cat (*Felis catus*) as a Key threatening Process. NPWS f000234a.

National Parks and Wildlife Service (2001) Preliminary Determination of the Loss of Biodiversity as a result of loss and/or degradation of habitat following clearing and fragmentation of native vegetation. NPWS p001117b.

National Parks and Wildlife Service (2001) Final Determination of High frequency fire resulting in the disruption of life cycles and processes in plants and animals and loss of vegetation structure and composition. NPWS f000324b.

Native Vegetation Advisory Council (2000) Draft Native Vegetation Conservation Strategy for NSW. Department of Land and Water Conservation.

NSW Agriculture, (1999) Physical Property Planning, Farming for the Future, NSW Agriculture

NSW Department of Water Resources (1987) Stream Bank Management for Erosion Control. NSW Department of Water Resources

Peake, T. (2001) Pers Comm

Peake, T. (2000) Pers Comm

Sanstrom, A. (2001) Salinity Control Credits, A Comment. Native Vegetation, Nature Conservation Council.

Soule & Sanjayan (1998) Conservation Targets: Do They Help? Science March 1998, pp279-80.

WBM, (1998) proposed Bushland Reserve for the Donaldson Coal Mine, Thornton: Conservation Values and Management.

Glossary

Agricultural bushland Small, generally isolated patches of bushland throughout the agricultural landscape.

Amenity Natural character, landscape and scenery.

Best management practice The practices that result from decisions made on the best available information. (BMP)

Biodiversity The variety of all lifeforms: the plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part and the services each provides.

Bioregions Bioregions reflect common environmental features such as topography, soil type and rainfall and so they often reflect patterns of land use and natural resource-based activities (including conservation).

Buffer zone Vegetation zone that protects sensitive vegetation communities (such rainforest and wetlands) from external environmental conditions that would otherwise impact upon the community.

Bushland An area of vegetation reflecting the original or pre European vegetation cover for the specific area. Bushland includes all elements of the specific vegetation assemblages or communities including the canopy understorey and herb layers. Components of all of these tiers of vegetation are necessary to define bushland.

Bushcare The program name for the National Vegetation Initiative that is part of the Natural Heritage Trust established by the Commonwealth Government in 1996.

Community title A form of subdivision where individual allotments and common property are accompanied by a management agreement through a body corporate. Same concept as common property in a strata title development.

Canopy Tallest layer of vegetation in a vegetation community.

Connectivity The degree to which native vegetation is connected. Relates to the migration and dispersal of biodiversity.

Conservation a management philosophy aimed at preserving ecological integrity whilst allowing for sustainable use of the resource.

Conservation covenant A formal management agreement between the landholder and a Government authority for the conservation management of a particular bushland unit. Usually linked to an incentive or reward.

Conservation/development a mixed land use where development proceeds with a required area to be maintained for ecological purposes.

Conservation lease A formal rent agreement over a long term is established for an area of high conservation significance between the landholder and a government authority. A management agreement is in place for the explicit purpose of preservation.

Conservation subdivision A single subdivision right for small to medium bushland parcels. A conservation covenant would be placed over the bushland unit and basic management obligations met as part of the process.

Corridor a vegetated area that links existing bushland areas allowing biodiversity exchange.

Degradation Any human-induced decline in the quality of natural resources or the viability of ecosystems.

Developer contribution Contribution levied by Council on newer developments pursuant with Section 94, of the Environmental Planning and Assessment Act (1979) as amended.

Die back A condition that ultimately leads to the death of certain Eucalypt species. Usually the result of rapidly changing/degrading landscape, pathogens or livestock damage.

Direct seeding Form of revegetation where local native seed is broadcast into prepared ground. Can be achieved by hand or machine.

Disturbance Any process that disturbs the ecological processes of an area, including altered fire regimes, weed invasion and clearance.

Drainage line A permanent or occasional watercourse.

Duty of care Moral obligation to Ecological Sustainability, Stewardship and future generations.

Edge effect: The region of degrading processes that begin to attack a bushland ecosystem from the outside. Weeds, rubbish dumping and feral animals all degrade a bushland system from the adjoining developed area. The smaller the surface area is in respect to the volume of the bushland unit the more likely ecological processes will be maintained.

Erosion The accelerated loss of topsoil due to inappropriate clearing of native vegetation.

Ecologically Sustainable Development (ESD) Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

Ecosystem The dynamic inter-relationships between all forms of living organisms and their abiotic: (non-living) environment. Ecosystems function as a complex, interconnected system.

Endangered Species Species which are in danger of extinction or whose survival is not likely whilst threatening processes continue.

Environment Levy A special or additional Local Government Rate specifically for the execution of coordinated environmental management programs.

Extinct All individual members of a species disappear into oblivion. A species is presumed to be extinct if it has not been located in nature for a 50 year period.

Farm forestry/agro forestry/woodlots Areas deliberately planted for production purposes.

Firestick Farming A name given to the land management practices of Aboriginal people that involved the use of mosaic control burns to regulate growth and biodiversity for their benefit.

Forest Eucalypt dominated bushland with canopy density over 30%.

Habitat Area required by a specific individual for the purpose of living requirements, ie. shelter, food, reproduction purposes. An intact ecosystem is saturated with all the life that it can support.

Indigenous vegetation Native vegetation that occurs naturally in a particular area

Landuse The type of activity that is undertaken on a specific area of land. Urban, Industrial, Commercial and Conservation are specific land use types.

Local Environment Plan (LEP) Adopted land use guide for local government area.

Longstem tube stock Newly developed growing technique which involves the production of an elongated stem. When planted most of the longstem is buried where lateral root tissue develops from epicormic buds. This feature is common in plants in the riparian environment where changing sediment levels lead to the evolution of this characteristic.

Management agreement A formal agreement that is attached to the land title is entered into between the landholder and a government agency with the explicit purpose of conservation of the bushland unit. Some form of reward is on offer for such an agreement.

Native vegetation Plants that are indigenous (before European Settlement) to the local area that include trees, shrubs, understorey and grasses and wetland plants.

Natural Capital A financial value that can be placed on certain services or function of biodiversity or the natural environment. (eg. Flower pollination, predator species to control pests).

Natural Heritage The natural character of all elements of the Australian landscape.

Natural Heritage Trust A scheme created in 1996 by the Commonwealth Government, and will invest \$1.25 billion in Australia's natural heritage over its first five years. It includes 18 programs for nature conservation.

Natural Resource Any material that is supplied through the processes of nature. Clean water from a healthy catchment, fresh food from soil, timber from sustainable forest management etc.

No Net Loss A policy that is put in place to protect remnant vegetation within the Local Government Area. The policy provides for some development and limited clearing, depending on the circumstances, but provides that the vegetation loss must be offset through the revegetation of an equal area elsewhere.

Moratorium A policy that requires an end to all clearing of vegetation in the Local Government Area. A moratorium is a form of vegetation protection.

Polluter pays People who may or do cause pollution should pay for the full cost of preventing, controlling and minimising the impact of their activities on the environment and other people. In the context of native vegetation, pollution is degradation of native vegetation and the "polluter" is the responsible land manager. (See also 'Duty of care'.)

Population the number of individuals of a particular species in a given area.

Precautionary principle Lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation where the threat of serious or irreversible environmental damage exists.

Preservation A management framework aimed at maintaining a ecological system in a specific condition. Usually used to maintain small populations of threatened species or communities. Should not be confused with conservation.

Principle of intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

Principle of uncertainty Our knowledge of natural heritage and the processes affecting it is incomplete and the full potential significance or value of natural heritage remains unknown because of this uncertain state of knowledge.

Property plan A strategic business plan that focuses on all aspects of farm production including environmental issues.

Property rights Rights that govern the use and ownership of a resource most commonly associated with the use and ownership of land.

Protection Taking care of a place by maintenance and by managing impacts to ensure that natural significance is retained. (Australian Heritage Commission 1997)

Public ownership An ownership model where Council acquires a piece of land and conducts the required management on behalf of the community.

Rare A species that characteristically has a limited distribution and/or abundance due to the specificity of their habitat requirements or that has a limited distribution and abundance because habitat resources have been modified or lost. The term is used to describe individual species that are not threatened or vulnerable by definition, but are at risk due to the small population size and/or limited distribution.

Rainforest A vegetation type consisting of a very dense canopy and species that are generally not of the Eucalypt or Sclerophyl species type.

Rate relief A financial incentive based on the rate system, where rates are either waived or refunded for an area if certain conservation measures are undertaken by the landholder.

Regeneration The natural regeneration of vegetation contributes to vegetation cover when the dominant species of the pre-existing vegetation type re-establish, but are less than 10 years of age.

Regional significance Organisms or vegetation communities that are no longer well represented in an area, usually due to inappropriate land management.

Regrowth Areas of vegetation that have developed following the complete clearance of the site, usually following a subsequent change in land use (eg. Cattle removed from grazing land allowing the germination of any seed bank remaining in the soil).

Rehabilitation The reconstruction of the landscape following severe degradation. This may involve the planting of native vegetation that may not have been present in the area but conditions no longer suite the original vegetation cover eg. Saline areas.

Remnant vegetation Areas of existing native vegetation that have not been planted, where the dominant species still remain and is greater than 10 years of age.

Resilience A character of a system that ensures it will always restore its function when compromised eg. the ability of the human body to heal itself.

Revegetation The deliberate planting of vegetation. Revegetation contributes to vegetation cover when the species composition and structure is similar to pre-existing vegetation types for that area.

Riparian Areas in and around the river system.

Salinity The concentration of naturally occurring salt material in the top of the soil profile where it becomes toxic to plant life. Salinity occurs due to inappropriate land use activities involving land clearing.

Sclerophyl A characteristic vegetation type made up of species that have hard dry leaf surfaces such as Eucalypts, Wattles and banksias.

Section 94 A developer contribution required under the Local Government Act to help pay for services required by the community (human) in the new area, eg. sports fields and play ground equipment.

Shade Tree Trees in paddocks specifically grown to provide shade for livestock.

Site plan A plan detailing the attributes that require consideration as part of an application to destroy, remove or lop native vegetation.

Structurally intact A vegetation unit that maintains all the elements of a healthy functioning ecosystem. Some disturbance may have been present but the ecosystem maintains the resilience to restore itself.

Threatened The generic term used to describe species that are rare, vulnerable, endangered or insufficiently known and are subject to threatening processes.

Tree Preservation Order (TPO) A local council by law under the Environmental Planning & Assessment Act (1979) to protect all vegetation over 3m excluding specified weed species.

Timber harvesting Ongoing timber extraction and production from native forest and plantations with follow up regeneration works.

Transferable development rights A development right is exchanged from one area to another which has less conservation value

User pays Pricing principle based on charging the user for the full supply cost of a product/resource.

Vegetation community A recognisable group of species that occur together in a system.

Vegetation protection order (VPO) A local government by law protecting vegetation communities in the same fashion as the TPO protects individuals.

Vulnerable Species likely to become endangered in the short term (approximately 25 years) if threatening processes continue.

Wetland Any area that is either permanently or temporarily inundated by water, which supports a mix of aquatic and terrestrial components

Windbreak A planting design to help protect livestock and pasture to achieve improved production in a sustainable fashion.

Woodlot Plantation or smaller area specifically for growing timber. Other planting designs can be seen as a woodlot, ie riparian corridor or windbreak if managed appropriately.

