

TABLE OF CONTENTS:

1	BACKGROUND	2
2	PREPARING A MANAGEMENT PLAN	3
3	PLAN FORMAT AND STRUCTURE.....	4
4	MANAGEMENT ISSUES	8
5	OBJECTIVES AND STRATEGY.....	9
6	MANAGEMENT GUIDELINES	10
7	IMPLEMENTATION	12
8	PLAN ADMINISTRATION.....	13
9	REFERENCES.....	14
10	APPENDICES	15
10.1	LAKE MACQUARIE CITY COUNCIL VEGETATION MANAGEMENT PLAN TEMPLATE.....	15
10.2	EXAMPLE OF A WORKS SCHEDULE	16
10.3	LAKE MACQUARIE CITY COUNCIL BUSH REGENERATION MONITORING FRAMEWORK	17

LIST OF TABLES:

TABLE 1 -	REQUIRED MANAGEMENT PLAN STRUCTURE	4
TABLE 2 -	EXAMPLE OF SPECIFIC MANAGEMENT ISSUES	8
TABLE 3 -	GUIDELINES FOR SPECIFIC AREAS OR LANDSCAPE TYPES	10
TABLE 4 -	COUNCIL CONSULTATION CHECKLIST	13

1 BACKGROUND

This document provides guidelines for the preparation of management plans for land with native vegetation within the Lake Macquarie Local Government area. These are normally described as vegetation management plans (VMP) and may provide for the protection and/or rehabilitation of native vegetation or guide activities directly affecting native vegetation.

1. These guidelines apply in circumstances such as the following:
2. Preparation of a management plan is a requirement of development approval.
3. Land is to be rehabilitated and/or dedicated to Council as a requirement of a legal agreement (eg associated with rezoning of land or a development proposal).
4. Land of conservation value is to be protected as an offset for development elsewhere.
5. Restoration is required under a court order or Council direction following unauthorised clearing or works.
6. Bush regeneration works are carried out by a contractor on Council owned or managed land.
7. Bush fire asset protection works or activities are required.

These guidelines outline the minimum standards that Lake Macquarie City Council will require for documentation of vegetation management plans. Management plans must identify relevant management issues, be site specific, and be concise and practical documents.

The guidelines apply to all situations where it is a Council requirement that a written statement or specification is prepared to describe the objectives, actions and processes that will be used to manage native vegetation on land. The land may be in private or public ownership, and the final plan may have a range of descriptions, including vegetation management plan, land management plan, rehabilitation plan, rehabilitation and maintenance plan, environmental management plan, bushland management plan, wetland management plan, or a similar name. Note that 'plan of management' has a specific legislative meaning under the Local Government Act 1993 and the Crown Lands Act 1989, and that a plan of management may include guidelines for vegetation management or may reference these guidelines.

2 PREPARING A MANAGEMENT PLAN

The management of land to protect its natural values requires proper consideration of the best ways in which the existing distribution, abundance and diversity of native species and communities can be retained, and the extent to which pre-existing natural ecosystems can be regenerated or restored.

A vegetation management plan must be prepared by a person qualified in natural vegetation management, ecology or bush regeneration, with a sound knowledge of site management impacts and processes. Where native vegetation must be rehabilitated or reconstructed, it is preferable to involve a qualified bush regenerator in the preparation and implementation of the plan.

Plans should be as brief as possible, and include only relevant material. A plan should generally include no more than 25 pages of text.

In most cases, a management plan will be prepared by a consultant. The consultant must be properly briefed and made aware of the Council's requirements before they are engaged.

Properly preparing and managing contracts is essential to achieving good on ground vegetation management outcomes. The preparation of a management plan and the undertaking of works can be combined or undertaken separately. However, where possible they should be done in conjunction with one another. The scope of bush regeneration contracts and issues to be taken into consideration are outlined in *Bush Regeneration: A Practical Guide to Contract Management* (Davies & Dixon 2003).

When engaging a contractor, preparing a project brief or contract consider the following matters:

1. Are the persons suitably qualified, and do they have appropriate experience relevant to the local area?
2. What are the requirements for project management (eg meetings and consultation)?
3. Are the project deliverables and time frames clearly understood?
4. Is there a requirement for neighbour or community consultation to be undertaken?
5. Have issues relating to public liability, workers compensation, and other insurance been considered?
6. Has all relevant information been provided to the contractor?

3 PLAN FORMAT AND STRUCTURE

The purpose of a management plan is to outline desired outcomes and to specify works and actions to be carried out to achieve these outcomes. It must clearly state quantifiable objectives that are to be achieved and should be suitable for both the landowner, approval authorities, and the persons who are required to undertake implementation actions.

The structure and format of the plan must be suitable for the purpose. It will usually include maps, photos and supporting text, and relevant background information. The required structure for management plans is shown in Table 1 together with an explanation of information to be included in each section. The plan structure may be varied where appropriate. It is essential that documentation clearly communicates important functions to enable effective on-ground management actions.

The Lake Macquarie City Council vegetation management plan template is included in Appendix 1.

Table 1 - Required Management Plan Structure

Section	Explanation
1. Introduction	
Name of plan and location	The plan must be clearly described and dated, and must show the land to which it applies, including a plan, street address, and property identifier (Lot & DP).
Land Ownership	Provide details of current and future ownership arrangements.
Administrative Context	Some plans may be the result of a legal agreement or be required to meet legal requirements (eg plans for Crown Land or plans of management for Council land). Where listed threatened species or endangered ecological communities occur, there are responsibilities under relevant State and Commonwealth legislation.
Definitions	Clear definitions are essential for the proper interpretation of the plan. For example, it may be important to specify the meaning of the terms "rehabilitation", "bush regeneration", and "bushland". See Appendix 1.
2. Background Information	
Planning and landscape context	Current and proposed land use and the landscape Context of the land to which the plan applies.
Existing native vegetation and weeds	Location and characteristics of existing plant communities and weeds should be identified on the site and on immediately adjacent land.
Natural values	A summary of ecological information, biodiversity values and previous studies and data should be included. Baseline ecological data may need to be compiled before a plan is prepared.
Other site values	There may be important community values and issues that need to be identified, such as Aboriginal cultural sites, heritage values, public access, walking tracks, utilities, view corridors, lookouts, or public health and safety issues.

Section	Explanation
Relationship with other plans, approvals or legislation	Identification of other approvals that may be required to carry out the management actions or works (eg under the Water Management Act 2000 or EPBC Act, or TSC Act or Fisheries Management Act).
3. Management Issues	The plan must specify key management issues to be addressed (eg threatened species, feral animals, weeds, fire management, habitat management, hydrology and earthworks, acid sulphate soils).
4. Objectives and Strategy	
Management Objectives	Clear objectives should underpin a management plan. Objectives are quantitative statements of what can be achieved, and must be able to be monitored. The objectives should reflect the management issues.
Management strategies and priorities	Strategies are statements outlining how the objectives will be carried into effect. Strategies should be linked to the management guidelines in the plan and should reflect the priorities for the site. Strategies and priorities should be based on proper analysis of the site values and ecological process, as reflected in the plan objectives.
5. Management Guidelines	
Issue guidelines	The management issues may be addressed by identifying generic principles and/or specific guidelines and actions. Guidelines for issues should be clearly listed in order of priority and be linked to relevant maps (eg vegetation condition). Examples of issue guidelines are outlined in a later section.
Area specific guidelines	The plan area should be divided into management areas, units or zones where different priorities apply or alternative approaches area required. These areas must be shown clearly on a map.
Monitoring guidelines	Guidelines for monitoring should be specified, including location and frequency of photo points, systematic flora and fauna monitoring requirements, and persons who need to review implementation.
6. Implementation	For each work and task (action), the plan must: <ul style="list-style-type: none"> • Describe the proposed work. For example, weed control methods for each species, maintenance tasks, etc. The location of where the task is to be undertaken should be shown on a map • Identify those responsible for completing the required works, and the required minimum qualifications for persons undertaking the work, task or action • Include a schedule of works to identify project milestones and completion dates (eg details of planting program) and best times of the year to plant

Section	Explanation
	<ul style="list-style-type: none"> • Outline the budget for the works • Outline risks and contingency measures (eg unexpected bush fire) • Processes for regular monitoring and review, including performance evaluation. This should include performance standards, provision for replacing plant losses, addressing deficiencies, weather events, etc. (Monitoring parameters could include weed density, response of natives to weed removal, species richness, survival rate of plantings, etc). <p>The minimum time period for which a plan is to be implemented is 3 years. Many sites will require active vegetation management to be undertaken over a 5 – 10 year period, or in perpetuity.</p> <p>Monitoring of the site is essential for successful vegetation management and habitat restoration.</p> <p>Monitoring should include both surveys and photos. A rehabilitation or restoration site should be monitored for approximately 5-10 years. If restoration is not progressing adequately, appropriate action must be taken.</p>
7. References	The plan must identify sources of information and relevant references justifying the proposed actions.
8. Maps	
Vegetation maps	Should show vegetation communities, and may identify key management issues (eg areas of weeds or disturbance).
Management units or zones	It is necessary to define management areas where different actions and requirements may apply. Normally, there will be a distinction between areas requiring vegetation rehabilitation and those requiring maintenance. This map should be at an appropriate scale which will normally be between 1:500 and 1:2,000.
Monitoring locations	Location of monitoring sites (eg vegetation quadrats) must be identified.
Other maps	<p>Depending on the management issues and site, other maps may be required. These may include maps showing:</p> <ul style="list-style-type: none"> • Vegetation condition • Key features (eg Land ownership, vegetation requiring protection, work or stockpile areas, contours and slopes, waterways) • Weed locations and distribution, and disturbance (eg National Trust disturbance codes)

Section	Explanation
	<ul style="list-style-type: none"> • Bush fire map including hazard reduction and asset protection requirements • Soil and water management • Erosion and sediment control • Site layout and/or location plan • Location of buildings, services and infrastructure (water pipes, drains, roads, fences, etc) • Areas of contamination or mine subsidence risk
9. Appendices	<p>Management plans should include append relevant information that must be provided to support the plan. This should include:</p> <ul style="list-style-type: none"> • Description of who prepared the plan, their qualifications, and details of any peer review • Detailed outline of biodiversity values, including a table listing native and introduced plant species • Description of key biodiversity values to enable these to be identified in the field.

The following sections provide further details on what is expected in relation to key sections of a management plan.

4 MANAGEMENT ISSUES

Examples of key management issues are outlined in Table 2.

Table 2 - Example of specific management issues

Issue	Examples of management issues	Examples of relevant works or actions	Comments and references
Bushfires	Fire frequency for specific vegetation types, maintenance of trails, species selection for rehabilitation, impacts of fire on threatened species	Thinning of native ground vegetation, weed management following fires, clearing along power lines	Rural Fire Service, 2006, Planning for Bush Fire Protection
Weeds	Presence of noxious and environmental weeds, weed control techniques	Methods of weed control (eg manual, chemical, mechanical, biological & fire), monitoring of weed distribution	Hunter Regional Weeds Strategy
Tracks and trails	Excessive number of tracks, trail erosion, impact on weeds and feral animals	Consider closure of unnecessary tracks, methods of rehabilitating closed tracks, maintaining fire trails	
Sourcing plants	Availability of local provenance seeds	Seed collection and propagation guidelines, identification of acceptable source plants	
Feral animals	Impact of feral animals on native vegetation (eg rabbits or goats)	Feral animal control requirements, fencing	

5 OBJECTIVES AND STRATEGY

Goals of ecological restoration (which can include both assisted natural regeneration and reconstruction through revegetation) is ultimately the self perpetuation of a plant community, in this case one which approximates the available understanding of the pre 1788 structure. (NSW Department of Infrastructure, Planning and Natural Resources, 2003).

In determining objectives, the following should be taken into account:

- The intent is to carry out restoration to the highest extent practicable, recognising that there are significant constraints to be faced in practice.
- The principle of minimum intervention should be adopted, ie the intervention should only be that necessary to deal with the degree of damage on the site, and to achieve restoration goals.
- As a general rule, an accent on efforts involving minimal intervention over a significant period is warranted before revegetation is considered.

Key approaches which should underpin a management plan are outlined below in order of priority:

1. Retain and protect remnant vegetation on site (eg control access, prevent rubbish dumping, prevent weed invasion).
2. Regenerate native vegetation. Where there is site resilience and native vegetation remains but is degraded, regeneration should be the main goal (eg remove and suppress weeds, remove rubbish, restabilise degraded areas).
3. Revegetate. Where natural processes or assisted regeneration techniques are not appropriate, or where there is no potential, then revegetation is an option (eg actively resurface and replant areas).

These actions start from minimal intervention building up to high levels of intervention. Minimal interventions are more efficient and cost effective.

The plan must include clearly stated objectives which are quantitative statements of what the plan is trying to achieve. Sample management plan objectives are included in Appendix 1.

6 MANAGEMENT GUIDELINES

The plan should include guidelines for the key management issues that need to be considered in achieving the plan objectives. In addition, there will be guidelines that apply to specific management areas within a site which need to be identified and where specific approaches and actions need to be identified.

Guidelines should direct tasks that can be implemented. They should be as specific and quantitative as possible.

Guidelines for identified management issues must be included, and could include:

- Measures for controlling access and encroachments
- Vegetation species composition, planting layout and densities (eg a table showing number and species type of tubestock)
- Seed/plant sources
- Details of planting priorities, rehabilitation methods and staging (eg frequency of water, pesticide and fertiliser applications)
- Maintenance requirements (eg “maintenance should extend for a minimum of 2 years after completion of works or until such time as a minimum 80% survival rate for all plantings and a maximum 5% weed cover for the treated riparian corridor is achieved” – From DWE 2008)
- Habitat augmentation (eg type and location of nest boxes to be installed)
- Threatened species and endangered ecological communities
- Flora and fauna monitoring program
- Fire management
- Neighbour relations and community education
- Weed removal and management (eg whether mechanical or hand methods will be used, weed disposal location, managing spread of pathogens such as *Phytophthora*, etc)
- Feral animal management
- Donor topsoil areas
- Use of machinery (eg where machinery is not to be used)

Guidelines that could be necessary to specific areas or landscape types occurring in Lake Macquarie City are outlined in Table 3.

Table 3 - Guidelines for specific areas or landscape types

Landscape type	Examples of management issues	Examples of relevant works or actions	Comments and references
Wetlands	Retaining water levels, and a natural hydrological regime, managing buffers	Restoring or enhancing plant communities, water levels, surface water flow, groundwater flow, soil composition, acid sulphate soil remediation, improving water quality	DUAP 1999
Riparian corridors	Reducing erosion of banks channels, protecting water quality, maintaining riparian habitat and corridors	Removing stock or other disturbance from river banks. Fencing of riparian vegetation	DWE 2008

Landscape type	Examples of management issues	Examples of relevant works or actions	Comments and references
Lake foreshores	Foreshore erosion or inappropriate track location, impacts of vegetation on views	Rerouting of tracks, rehabilitation of areas, limiting access, signage	
Remnant bushland	Protection of listed threatened species, reducing stormwater impact adjacent properties, weed invasion as a result of site disturbance	Field survey of listed species, stormwater management devices, weed control, neighbour consultation	
Coastal and dunes	Erosion, walking tracks, vehicle access protection of aboriginal middens	Fencing of eroded areas, weed removal	
Disturbed areas	Rehabilitation and restriction of access	Restricting access, fencing, establishment of planting program, seed collection and propagation for planting	
Buffers	Maintaining managed vegetation buffers around high value vegetation	Maintaining adequate bush fire asset protection zones on adjacent land, preventing weed invasion	
Listed endangered ecological communities or other high value areas	Protection of listed vegetation communities	Weed monitoring and removal, bush fire management	
Roadsides	Mowing frequency, spread of weed seeds, disturbance by machinery during road maintenance	Staff training, washing of machinery	

7 IMPLEMENTATION

Management tasks should be identified for each management issue and associated objective. Information provided for each task should be prescriptive enough for a bush regenerator to implement. Tasks should be identified in order of priority and timing. Plans must include a schedule of works, an example of which is shown in Appendix 2.

The ability to successfully implement the management plan is essential. It must be clearly written, be realistic, and provide a suitable foundation for land owners and contractors. The plan should allow adequate time for vegetation management to achieve the plan objectives with a minimum period of 3 years. It should also allow for the occurrence of unexpected events such as bushfires or seasonal conditions (eg frosts or drought).

Where the management plan is a requirement of a development consent or a legal agreement such as a planning agreement, it is a legally binding document and should be written to reflect this.

An essential element of implementation is a program of monitoring. This should include quantitative measurement and annual reporting (eg vegetation quadrats, weed distributions, regular photos, etc). The format for bush regeneration monitoring information to be provided for Lake Macquarie City Council projects is included at Appendix 3.

8 PLAN ADMINISTRATION

Where a plan is a requirement of development approval, or a legal agreement it is legally enforceable. During the preparation and implementation of a plan, it will usually be necessary to consult with a number of specialist council staff regarding particular issues as outlined in the checklist in Table 4. It may also be necessary to consult with neighbouring landowners or relevant government agencies, and to take into account other plans (eg property vegetation plans prepared under the *Native Vegetation Act*).

Table 4 - Council consultation checklist

Subject	Who should be consulted
Plan content and approval	Person responsible for commissioning the plan
Weeds	Noxious Weeds Officer
Bushfire hazard reduction	
Council land	Community Planning Department
Biodiversity and threatened species	Environmental planner, DAC Ecologist
Waterways and riparian vegetation	

Ongoing consultation or annual inspection with specialist council officers may be required during the implementation of the plan. The plan may also require periodic audits to determine compliance with required actions and monitoring reports may be required. Monitoring and auditing requirements will apply where a legal agreement with Council provides for a bond to ensure compliance with the agreement.

9 REFERENCES

- Davies P & Dixon P 2003, Bush Regeneration: A Practical Guide to Contract Management, Environment Protection Authority (NSW).
- Department of Urban Affairs and Planning, 1991, Guidelines for preparing management plans for urban bushland.
- Department of Urban Affairs and Planning, 1999, Guidelines – Wetland Restoration Plans.
- Department of Infrastructure, Planning and Natural Resources, 2004, Guideline for the Preparation of Environmental Management Plans.
- Department of Lands brief for preparing plans of management <http://www.lands.nsw.gov.au/crownland/trusts/trusthandbook/appendicies> (accessed 17 October 2008)
- Fallding M, Kelly A H H, Bateson P & Donovan I, 2001, Biodiversity Planning Guide for NSW Local Government, NSW National Parks and Wildlife Service (Section 10.5). <http://www.environment.gov.au/biodiversity/toolbox/templates/pubs/dpg-man-plan-example.pdf>
- Hornsby Shire Council, 2008, Guidelines for the preparation of vegetation management and restoration plans 2008.
- NSW Department of Infrastructure, Planning and Natural Resources, 2003, Bringing Back the Bush in Western Sydney: Best Practice Guidelines for Bush Regeneration on the Cumberland Plain.
- NSW Department of Water and Energy, 2008, Guidelines for Controlled Activities, Water Management Act 2000 – Vegetation Management Plans

Relevant links

- Australian Association of Bush Regenerators <http://www.aabr.org.au/>
- Ecological Consultants Association of NSW <http://www.ecansw.org.au/>

10 APPENDICES

10.1 LAKE MACQUARIE CITY COUNCIL VEGETATION MANAGEMENT PLAN TEMPLATE

The vegetation management plan template is not complete at this stage. The format will follow the required structure of a management plan as outlined in Table 1. It will also link with the Lake Macquarie bush regeneration monitoring framework included in Appendix 3.

Sample management plan definitions:

Bush regeneration is defined by the Australian Association of Bush Regenerators (AABR) as the practice of restoring bushland by focussing on reinstating and reinforcing the systems' ongoing natural regeneration processes.

Ecological restoration aims to restore pre-existing indigenous ecosystems and ecological processes, maintaining and developing the capacity of a natural system to self-perpetuate. (Perkins 1999, cited in NSW Department of Infrastructure, Planning and Natural Resources, 2003.

Resilience refers to the ability of an ecosystem to regenerate naturally and to withstand, or recover from, disturbances such as weed invasion, clearing or fire.

Sample management plan objectives:

The management plan objectives must take into account site conditions. Some examples of the types of objectives that could be included in a management plan are outlined below.

Project management –

- To formulate and implement vegetation management actions
- To clearly identify objectives, methods and reporting lines
- To inform all relevant participants of their responsibilities
- To engage and supervise bush regenerators to implement the plan

Vegetation protection –

- To protect vegetation during construction and operational phases

Rehabilitation and maintenance –

- To restore and enhance areas in post construction phase
- To maximise survival opportunities for areas of retained vegetation in newly rehabilitated areas
- To reduce weeds to less than 10% cover within Year 1 and to less than 5% by Year 3
- To achieve 90% survival rate of all tubestock planted
- To achieve a species diversity target that is 75% compatible with each naturally existing vegetation strata
- “To provide for a stable watercourse and riparian corridor which emulates the native vegetation communities in the area” (from NSW Department of Water and Energy, 2008)
- “To achieve weed free resilient self-maintaining native ecosystem on the environmental corridors” (from LMCC 2008 – VPA for North Cooranbong)

Monitoring and compliance –

- To ensure compliance with the works schedule, including reporting requirements

10.2 EXAMPLE OF A WORKS SCHEDULE

The following is an example of a works schedule that should be included in the implementation section of a management plan.

Management area	Action	Timing of actions (years and/or months)												Responsibility
		1	2	3	4	5	6	7	8	9	10	11	12	
Area 1	Construct exclusion fencing													Owner
	Select and order seed supply													Bush regenerator
	Undertake flora and fauna survey													Ecological consultant
Area 2	Primary weeding of x species													Contractor with bush regeneration experience
	Secondary weeding													
	Follow up weeding													
	Monitor and review													
Area 3	Remove weeds													Contractor with bush regeneration experience
	Scarify soil													
	Tubestock planting													
	Maintenance													
	Replacement plantings													
	Monitor, review and report													
Area 4	Plant native trees at completion of building works													Landscaping contractor

10.3 LAKE MACQUARIE CITY COUNCIL BUSH REGENERATION MONITORING FRAMEWORK

Lake Macquarie City Council has developed a standard digital framework for project management and reporting of bush regeneration works. This is a spatially based framework in MapInfo and Excel for recording the progress of bush regeneration projects over time, and for organising images and quadrat data.

(include further summary information of key elements with print outs of data presentation)