



**LAKE
MACQUARIE
CITY**

VALUING OUR UNIQUE LANDSCAPE

LAKE MACQUARIE CITY DRAFT NATURAL AREAS MANAGEMENT GUIDELINES

DRAFT NATURAL AREAS MANAGEMENT GUIDELINES

NOTE:

These draft Guidelines are available until Sunday 31 January 2021.

**Please provide feedback on these draft Guidelines via
shape.lakemac.com.au/natural-areas or contact John Eaton,
Vegetation Establishment Officer, by email
jeaton@lakemac.nsw.gov.au or call 4921 0524.**

PART 1. Vegetation Management Plan Guideline

PART 2. Soil Translocation Guideline

PART 3. Natural Area Planting Specification

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Part 2.

Soil Translocation Guideline

Part 3.

Natural Area Planting Specification

NATURAL AREAS MANAGEMENT TRIAL DOCUMENTS OVERVIEW

Currently, there is a disconnect between the condition of vegetation at the end of restoration works detailed within a Vegetation Management Plan (VMP) and the intent of agreed outcomes and reporting requirements of an VMP. The end result is of variable quality, with the liability and risk inherited by Council.

The following documents are designed to provide the guidance to achieve high quality environmental outcomes while simplifying and streamlining the process for landowners and developers to submit, implement and report on the outcomes detailed within an VMP required by Council as part of the development application process.

The documents are intended and give developers certainty and consistency in their planning while allowing Council to audit, measure progress and outcomes of an VMP over time with scheduled reports linked to hold points and inspections. A successful outcome can be achieved through inclusive interaction between the landowner/developer and Council.

The document is in three parts.

- Part 1: is a guideline to prepare a VMP
- Part 2: is a guideline recognising soil as a non-renewable resource of high value
- Part 3: is a specification recognising natural area planting as a specific activity with expertise from within particular industries, including bush regeneration and natural area restoration, that is separate from landscaping.

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PART 1



1. INTRODUCTION

These guidelines are designed to assist developers and landowners in the preparation of a Vegetation Management Plan (VMP), which is often required as an avoid, mitigation or offset measure when a development application or landscape modification will have impacts on native vegetation or fauna habitat.

The guidelines specify the information and processes required by Council to adequately achieve, assess and report on rehabilitation, revegetation and management of natural areas in association with development applications or other land disturbance activities including: Voluntary Planning Agreements (VPAs), Conservation Offsets, rehabilitation works under Part 5 Environmental Planning and Act, works by Council and other authorities, rehabilitation of native vegetation on Council land, geotechnical investigation, change in land management, State Significant Development, services through native vegetation on Council land.

1.1 DEFINITIONS

Bush regeneration is defined by the Australian Association of Bush Regenerators (AABR) as the practice of restoring bushland by focusing on reinstating and reinforcing the systems' ongoing natural regeneration processes. It may also involve assisting the recovery of ecosystems' that have been degraded, damaged or destroyed. Regeneration can be divided into the following categories:

- Natural regeneration
- Assisted regeneration
- Reconstruction and fabrication

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, *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.

Natural Ecosystem - Natural ecosystems are communities of biotic and abiotic components in oceans, rivers and on land in which the components interact to form complex food webs, nutrient cycles and energy flows. The term 'ecosystem' describes an ecological community of any size or scale.

Management Zone – Management zones are areas that require different levels of management intervention or different restoration actions at different times. These actions can include maintenance and repair, measures to minimize impacts to flora and fauna during restoration works.

1.2 WHAT IS A VEGETATION MANAGEMENT PLAN?

A Vegetation Management Plan (VMP) is a map and action-based document intended to assist and guide property owners to rehabilitate, revegetate, manage and protect biodiversity values, ensuring these values are maintained and enhanced on a site.

An VMP must be of sufficient detail to indicate what specific management practice or treatment is going to happen where and when.

An VMP is specifically related to 'natural areas' or native bushland or areas that are to be rehabilitated to a natural/native ecosystem. In this context it replaces a Landscape Plan.

A Landscape Plan is primarily concerned with constructed landscapes' which would include designed landscaping, streetscapes and public open space. While each document may compliment the other, they are about different processes and activities.

1.3 WHEN AND WHY ARE VMP's REQUIRED?

An VMP is required to be submitted and approved prior to the issuing of either development consent or a Construction Certificate. An VMP can be required to be prepared and implemented for a range of activities including:

- proposed development applications,
- proposed activities by a public authority,
- proposed rezoning of land,
- Voluntary Planning Agreements (VPAs),
- land dedications to Council,
- conservation areas,
- biodiversity offset lands,
- restoration of cleared lands,
- bush regeneration contractors working on Council-owned or managed land
- management of bush fire threats and Asset Protection Zones (APZs) providing separation distances under the Bush Fire Environment Assessment Code.

1.4 WHAT IS THE TIMEFRAME OF AN VMP?

An VMP is to be implemented over a minimum of five years, however, it can also occur in perpetuity, depending on the individual circumstances of the project.

Such circumstances include (but not limited to) the:

- staging, type and size of the development and/or activities,
- impacts on native vegetation, threatened ecological communities, threatened flora and fauna, and their habitats and,

-
- ecosystem/native vegetation condition and management requirements (such as APZ management).

1.5 WHO CAN PREPARE AN VMP?

An Environmental Consultant or Bush Regenerator with relevant tertiary qualifications, demonstrated theoretical and practical experience in native flora and fauna identification and bushland restoration and weed control can prepare an VMP.

To ensure practicality of implementation, the VMP requires input from those with experience in native bush regeneration, restoration and environmental weed control.

1.6 WHO CAN IMPLEMENT WORKS REQUIRED UNDER AN VMP?

All contractors working on bushland in Lake Macquarie City, must submit qualifications for acceptance by Council.

Suitably qualified personnel

Requirements for personnel working within bushland in the Lake Macquarie City:

- **Preferred** – Australian Association of Bush Regenerators (AABR) accredited bush regenerators and companies. This accreditation provides Council with the opportunity for high-level quality assurance of VMP works.
- Bush regeneration contractors not accredited under AABR but have relevant on-ground experience of 10 years or more in bush regeneration and rehabilitation may be considered.
- Other companies not accredited under AABR with less than ten years on-ground experience in bush regeneration and rehabilitation may be considered.

1.6.1 Minimum qualification requirements

Qualified Bush Regenerators

- **Site Supervisor** - Demonstrated minimum of two years' experience as a supervisor in the bush regeneration or related field, including experience at a supervisory level in providing training, supervision and technical advice to staff, clients, volunteers and members of the public.

Site Supervisor qualifications are to include the following:

- completed the Bush Regeneration Level IV Certificate or equivalent, or
- the equivalent of a certificate
- diploma or degree in a field relating to natural resource management, or have at least three years' experience relevant to the position.

It is preferred that the Site Supervisor holds a current AQF3 or higher qualification.

Those who predominantly undertake landscaping works are not regarded as possessing acceptable expertise to implement vegetation management plans unless it has been demonstrated in the submitted qualifications that bush regeneration works have been undertaken by the individual for a minimum 10-year period prior to and/or concurrently with landscaping.

- **Experienced Bush Regenerator** - Demonstrated minimum of 1000 hours experience in bush regeneration over a period of at least six months or two years under supervision.
 - Experienced Bush Regenerators should also have completed a Bush Regeneration Level II Certificate or equivalent, and will preferably hold a current AQF3 qualification.

1.6.2 Approach

The principle of minimum intervention should be adopted, that is, intervention should be what is necessary to deal with the degree of damage on the site, and to achieve restoration goals. As a general rule, efforts involving minimal intervention over two growing seasons is warranted before revegetation is considered.

Council applies elements of adaptive management principles for ecological restoration and management. The requirements of the VMP allow these principles to be applied.

Key principles which should underpin an VMP are outlined below:

- clear objectives of the VMP,
- clear actions to achieve objectives,
- implementation of actions,
- monitoring for effectiveness of actions,
- willingness to change or modify actions.

Flora

- **Retain and protect** remnant native vegetation on site by, for example, controlling soil erosion, access, preventing rubbish dumping and preventing weed invasion.
- Where there is site resilience and native vegetation remains but is degraded, **regeneration** should be the main goal. This can be achieved, for example, using the insitu soil seed bank, removing and suppressing weeds, removing rubbish and restabilising degraded areas.
- Where natural processes or assisted regeneration techniques are not appropriate, or where there is no potential, then **revegetation** is an option. This can be achieved, for example by actively resurfacing and replanting areas.
- **Prioritise** rehabilitation works that contains spread of transformer weeds or target new invaders before they become established.

Fauna

- **A Site assessment** should capture habitat and species likely to use the site, current and future impacts, past land use, resilience and the needs of native fauna populations. This information should be gathered under an Impact Assessment as part of a Development Application or Review of Environmental Factors for an activity. However, if survey information presented in an Impact Assessment is five years or older, new surveys are to be conducted by a suitably qualified Ecologist. Results are to be submitted to Council to confirm changes in condition, presence/absence of fauna species and populations.
- **Undertake rehabilitation works** that may generate some disturbance but are required to mitigate impacts and provide most benefit for native fauna using the site first. For example, relocation of felled tree hollows, installation of nest boxes, relocation of coarse woody debris, relocation of native bee hives present at the time of felling.

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

2. CONTENTS OF AN VMP

Vegetation Management Plans are to include sections 2.1 – 2.9.

2.1 AIMS OF THE VMP

1. To provide a means by which it can be demonstrated to Council's satisfaction that the development of land containing native vegetation and habitat complies with (including but not limited to), objectives of relevant development consent conditions, activity approval conditions or other agreement for avoiding, minimising biodiversity impacts and/or offsetting residual impacts.
2. To provide a simple, concise practical working document for use that contains achievable rehabilitation aims and objectives that consider future maintenance activities for a site.

2.2 OBJECTIVES OF THE VMP

In determining objectives, the following should be considered:

- 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. In other words, the intervention should only be that necessary to deal with the level of disturbance on the site, and to achieve restoration goals.
- As a general rule, efforts involving minimal intervention over a significant period is warranted before revegetation is considered.

The objective of the VMP should include as a minimum the following:

1. establishment of a weed-free self-maintaining ecosystem matching the Lake Macquarie vegetation community map unit and fauna assemblage that was likely present prior to disturbance, or
2. establishment of a weed-free self-maintaining ecosystem matching the Lake Macquarie vegetation community map unit and fauna assemblage that is likely to be present given any changed physical conditions (such as changes in hydrology and climate) since 1788.

The second objective should only be used where the first would not be achievable over a period of 10 years.

The VMP must contain detail on how the management actions defined in the VMP can be achieved and enable biodiversity values of the site be improved, restored, maintained and protected mitigating decline.

2.3 MAPPING, SITE DESCRIPTION and CONTEXT

Define, in detail, the location, site characteristics and extent of area subject to the VMP, using the following maps. Maps must be clear, accurate and easy to read and consistent throughout the VMP. Map Scale should be at 1:4000 or more detailed.

NOTE: On submission, all maps included in the VMP must preferably be A3 size, supplied in digital form in Word and PDF formats.

- one or more site overview map(s)
- Baseline Map
- Management Zones Map
- Existing Vegetation Community Map (using Council's Map Units)
- Monitoring Location Map
- Fence Map - showing location and type of fence required and any fences to be removed.
- maps of trails to be rehabilitated and those that are to be maintained for ongoing management/bushfire access
- Weed Distribution Map
- Weed Assessment Map (National Trust Method)

Weed density to be stratified as follows:

Mapped weed density to follow National Trust Method (**see Appendix 2**).

COLOUR CODE	CONDITION OF BUSH
Green	Good
Blue	Fair
Orange	Poor
Red	Very poor

Related text describing site resilience, management zones, management issues, tasks and timeframes will append the maps.

2.4 DEFINITION OF MANAGEMENT ZONES, TASKS AND TIMEFRAMES.

Define Management Zones on a map, which is linked to an associated works schedule identifying tasks prescribing the most appropriate restoration methodology and actions for each zone, including but not limited to the following:

- seed collection location(s) (model reference community) where seed will be collected,
- seed collection as per Flora Bank Guidelines 1-10 (See References and Resources)
- regeneration -technique(s) required,
- reconstruction using model reference community,
- weed control – control techniques,
- Bushfire Asset Protection Zones (where appropriate),
- access control management,
- maintenance into the future,
- threats,
- impacts, including timeframes for work tasks identifying who is responsible for each task and the outcome expected for each zone (see appendix 4 for example templates) and
- preparing an appropriate work schedule indicating timeframes required for the completion of each task presenting the tasks in a logical sequence for implementation.

The management zone map needs to be of sufficient scale and detail for implementation of works on site. It must show the location of works listed above. Scales of 1:10000 or more detailed are likely to be required.

Please refer to and use templates in Appendices 3 and 4.

2.4.1 Fencing

Specify the type of fencing type to be used, for example, temporary, permanent or barrier and the location it is to be installed or used.

Include timeframe fencing will be in place.

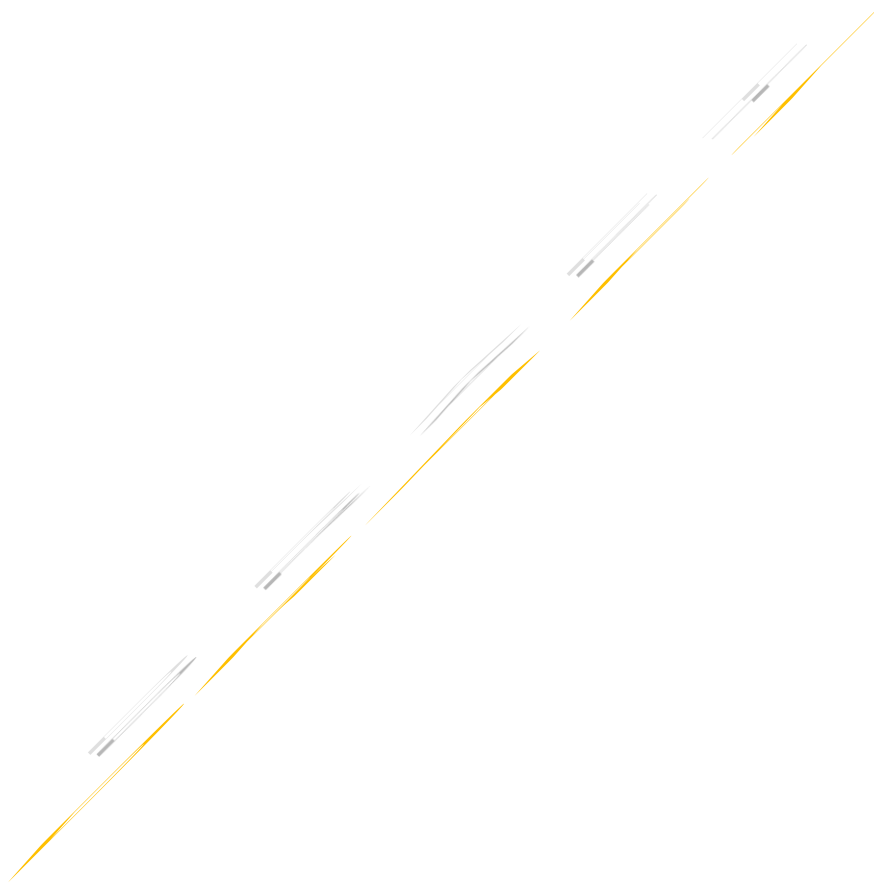
All boundaries between the development and the VMP area must be fenced. Native vegetation must be fenced to protect it from potential degradation from unauthorised access or use.

2.4.2 Trails

Management of retained trails (e.g. fire trails) – must be specified including measures to manage uncontrolled access during rehabilitation. This may include the installation of fencing, barriers or gates.

2.4.3 Other Identified areas

Specify where exclusions for machines will apply, for example, native vegetation, threatened ecological communities, species or populations, Riparian zones, slopes more than 18°.



2.5 BASELINE MONITORING, ONGOING MONITORING, MAPPING AND REPORTING

The recording of site conditions before any restoration or rehabilitation works are conducted is critical in measuring if the aims/outcomes of an VMP are being achieved. Council requires baseline monitoring to be undertaken prior to commencement of works to provide a basis for ongoing monitoring, future reporting and for all parties (including Council) to assess whether the on-ground works are achieving the aims/objectives of the VMP.

This is not a biodiversity survey. It is a site condition survey comparing site condition at specified points relevant to the reporting cycle of the VMP. (see Appendix 1 - Hold Points).

Although biodiversity surveys may have been undertaken prior as part of an Impact Assessment, they cannot be relied upon for baseline data. This is due to differences in data required to be collected for the VMP and the potential for data collected under the Impact Assessment to be considered historic (five years or older).

Data from an Impact Assessment may be useful in describing the difference in the condition of vegetation if a considerable time (more than 12 months) has passed since surveys under the Impact Assessment were undertaken.

For the data to be useful and meaningful for monitoring, it needs to be applied and recorded in a consistent manner.

Note: Eco Acoustic monitoring may be included.

Fauna is the basis of the monitoring, which can then be used to identify the health of an ecosystem.

It can be used as both a short-term and long-term monitoring application for conservation and management of a subject site.

Data is collected and analysed by a suitably qualified Ecologist and recorded within an VMP.

The proponent must provide in the form of a Baseline Monitoring Report:

- Collected data
- Monitoring Locations Map(s)
- Photo points from a specific orientation showing locations of following:
 - 100m transect or meander-all flora species,
 - 20x20 plots – weed presence/absence,
 - photo points

Transect or meander data is to provide an indication of all flora species present and indicate the percent cover of all species with a focus on exotic species. This will provide Council with a gauge of the disturbance and level of management required.

Methodology

- 100m transect or meander
- Using line of best-fit place transect to capture all vegetation communities
- Record all species >1m in height along transect, recording location on transect, height, species, canopy distance
- Provide a vegetation profile (schematic) of the transect data
- Place a 1 x 1m quadrat every 10 meters (starting at the 0 point) on alternating sides along the transect recording all species < 1m in height. Record % canopy cover at each of these points using Specht (**see Appendix 1**).
- Record location of transect with GPS
- 20mx20m plots
- Place quadrat(s) where highest density of weeds occur (this may require more than one quadrat)
- Use stakes and/or flagging tape to mark out plot corners
- Orient plots north south
- Survey using meander method recording all weed species within the quadrat
- Record location of quadrats using GPS
- Record densities of all plant species (including weeds) in each distinct layer present within the quadrat. Treat each vegetation layer (if present) as follows:
 - **Canopy layer > 5m** –Record all the canopy species within the 20x20m quadrat and estimate the relative density/percentage cover
 - **Tall shrub layer 2 -5m** - Record all the tall shrub layer species within the 20x20m quadrat and estimate the relative density/percentage cover
 - **Small shrub layer 0.5m – 2m** - Record all small shrub layer species within the 20x20m quadrat and estimate the relative density/percentage
 - **Ground cover layer < 0.5 m** - Record all ground cover layer species within the 20x20m quadrat and estimate the relative density percentage

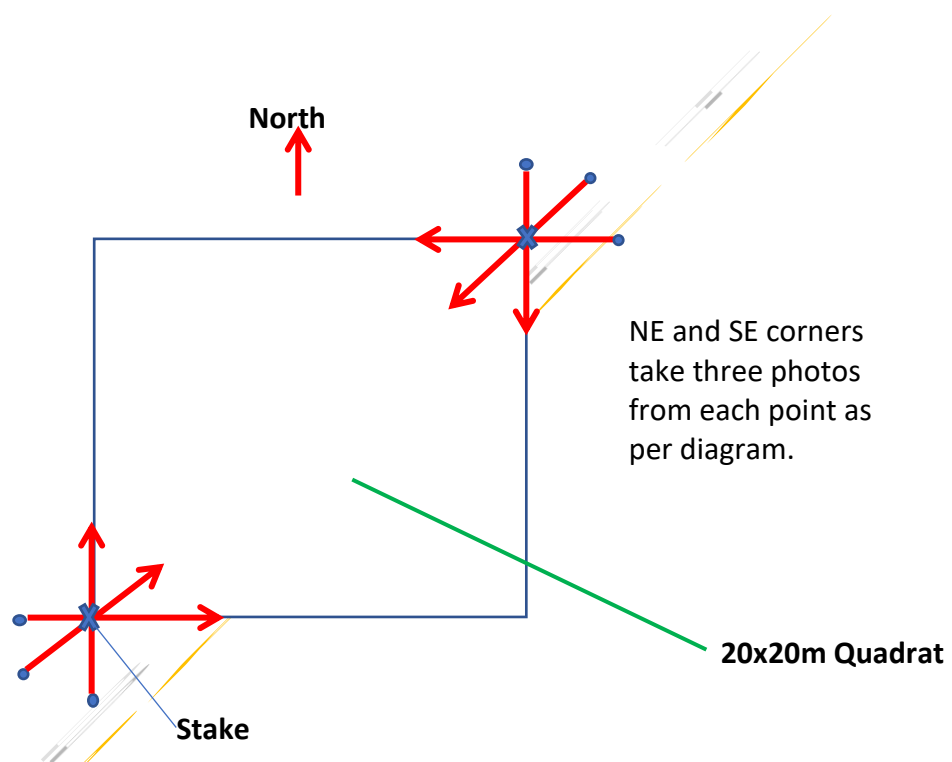
Photo monitoring

Using NE and SE corners of the quadrat take three photos as detailed in Photo Monitoring Point Setup diagram below.

- All monitoring photos are to be taken at approximately 10.00am to ensure similar lighting conditions. All efforts should be made to ensure excessive sunlight is not affecting the image quality and that image framing for subsequent photos matches the baseline image.
- Star picket/wooden stakes to be installed to mark the NE and SE corners of quadrat.
- As per diagram, photos to be taken setback at a minimum of 2m from stake.
- Yellow safety caps to be placed on star pickets.
- Photo to include photo point number. e.g. NE - PP1a,PP1b,PP1c
- Photos taken at a consistent height using the established reference point.
- Record photo point location with GPS.
- Show location on Monitoring Locations Map.

-
- Photo points are to be established prior to any VMP works being carried out. Monitoring will be continued bi-annually in spring and autumn for the duration of the VMP.

Photo Monitoring Point Setup Diagram



Monitoring sites to be representative

It is anticipated that monitoring sites are representative of the condition of the whole Management Zone, so if an inspection were undertaken anywhere in a Management Zone it would be the same or better than the native vegetation condition reported for the monitoring site.

Number of quadrats/survey points

- One 20x20m quadrat and a further
- 20m x 20m quadrat per 10 hectares, where the management site is greater than 1 hectare.

Baseline Monitoring Report

- Provide a written Baseline Monitoring Report with all details and maps required in Methodology (points 1 to 3).
- This report will be incorporated as part of the approved VMP.

Annual monitoring and reporting

- Replication of baseline (yearly from date of baseline) for life of VMP

2.6 REVEGETATION

All revegetation works to be in accordance with Natural Areas Planting Specification (Part 3 of this document), using the appropriate Map Unit(s) found in Vegetation Community Profiles Lake Macquarie LGA as a benchmark reference (Bell S, (2016). (see References and Resources page).

Any supplementary planting will be determined by:

- site assessment and determination of the most appropriate restoration approach prior to development or impacts,
- supplementary planting should be detailed on approved Bushland Restoration Plans and Bushland Planting Specifications,
- level of disturbance,
- structural changes,
- weed presence, and
- type of weed present.

Density and arrangement of planting will be assessed and determined using the following criteria

- Plantings to be random – replicating the natural area (LMCC Map Unit – Bell S, 2016) to be replanted. (see References and Resources for link).

Planting density as follows for all Sclerophyll Forest types.

- One tree per 10 square metres
- One mid story per square metre
- Four ground cover per square metre

Following for ground layer only

- If hiko in place of tube stock - six per square metre
- If cells in place of tube stock – eight per square metre

Final planting density

Tube stock per hectare:

- 1,000 trees
- 10,000 mid story
- 40,000 ground layer

Planting density as follows for the following plant community types:

Grassland, Saltmarsh and Riparian

Eight plants per square metre

Rainforest

One canopy tree and Four understory plants per square metre

2.6.1 Seed collection

Seed collection for revegetation is to be carried out in accordance with the Flora bank Guidelines. (see Resources and References link).

In collection, consideration of fragmentation and the effects of climate change needs to be exercised. (reference Appendix 3 OF Reference 6).

Licences to collect seed are always required when collecting from:

- threatened species, populations and ecological communities listed under the *NSW Biodiversity Conservation Act 2016*, and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*, and
- protected native plants under the *NSW Biodiversity Conservation Act 2016*,
- More information available in following link.

Scientific licences for seed collection and bush regeneration - threatened species, communities or protected plants are available at environment.nsw.gov.au/licences-and-permits/scientific-licences

2.6.2 Fire

The use of fire for weed control or another component of ecosystem management would be considered by Council if submitted as an action of an VMP. Conducting a hazard reduction or ecological burn has many complexities within the urban environment. Prior to submission, it is advised to liaise with Council's Senior Bushfire Officer who will be able to provide advice regarding **Council, Rural Fire Service, National Parks and Wildlife Service and NSW Fire and Rescue** approvals and permits.

The VMP should specify the optimal fire regime for each native vegetation community, considering the minimum fire regime threshold documented in *NSW RFS Bushfire Environmental Assessment code 2007*. This is required for long-term ongoing management of the site which includes bushfire hazard reduction and emergency management.

2.6.3 Habitat materials

Through consultation with the developer and approved by any of the following Council representatives (City Projects – Project Officer, Ecologists, Arborist, Vegetation Establishment Officer, Natural Areas Project Co-ordinator), any tree, tree hollow or rock material that will be removed for construction and not required by the developer and is considered to be useful as habitat, to be harvested from the construction area for use and placement within the VMP area. This material is to be stockpiled in an agreed location or taken offsite by council and stockpiled for later use.

The Lake Macquarie Landcare Resource Office would also be interested in salvaging/collecting native plants and propagules that would otherwise be destroyed in the construction stage.

For more detail on habitat materials and fauna management, refer to Council's Flora and Fauna Survey guidelines Section 8.

2.6.4 Soil translocation

This process is detailed in Part 2 of the Guideline.

2.6.5 Soil and water management

Refer to References 20 and 21

2.7 PERFORMANCE CRITERIA

Council will measure the progress of the project at identified (Hold Points). See Appendix 1 for details.

2.8 PROVIDE MITIGATION MEASURES FOR EXISTING AND POTENTIAL THREATS TO THE VMP AREA.

Identify any existing or potential threats or impacts incorporating the information into the VMP. For example, illegal dumping, encroachment, erosion, under scrubbing etc.

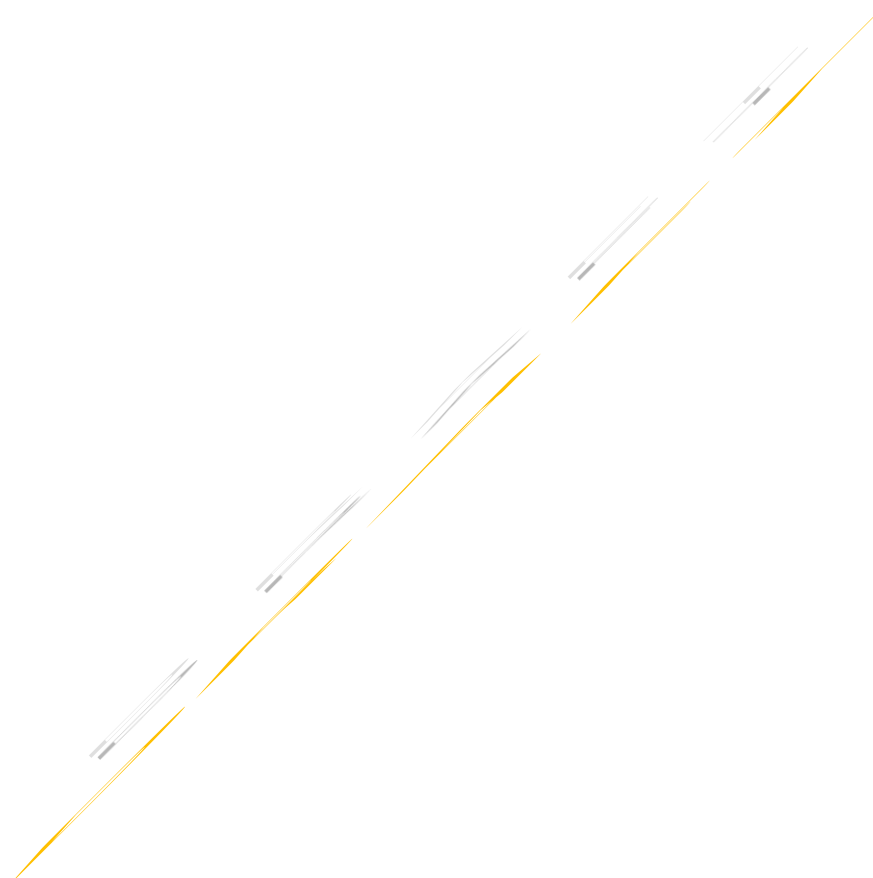
2.9 REPORTING

- A reporting and onsite meeting review schedule will be determined and agreed upon at the initial site meeting (see Hold Points)
- Onsite meetings with Council's Native Vegetation Officer, Environmental Planner or Flora and Fauna Officer every 12 months during the implementation of the VMP post progress reports.
- Progress reports and monitoring need to relate directly to baseline monitoring, works, and outcomes of the VMP.
- Submission of progress reports to Council's Ecologists and Vegetation Establishment Officer will trigger follow-up site meeting for review with Council.

-
- Final report at the end of the VMP implementation period that brings together all previous assessments, documents and final site condition prior to release of bond or hand over of site to Council.
 - In some instances, a revised VMP is required to be prepared for ongoing maintenance in perpetuity.

2.9.1 Reportable issues

Any unauthorised activity affecting the implementation of the VMP, known to occur during the timeframe of the VMP, must be reported to Council's Vegetation Establishment Officer by the developer or developer's representative within 48 hours. This includes unauthorised access and unauthorised development.



3.0 OTHER INFORMATION

3.1 BONDS

- A cash bond or bank guarantee will be calculated and set by Council
- Council's bond calculation is our estimated VMP implementation cost.
- For in perpetuity bond payments, the DPIE Total Deposit Fund calculator under the *Biodiversity Conservation Act 2016* will be used
- The cash bond or bank guarantee will be paid or lodged with Council before the associated development commences i.e. when a Subdivision Works Certificate (SWC) or Construction Certificate (CC) is issued.
- The bond will be returned or retained by Council based upon final inspection confirming satisfactory site condition and completion of works and at the end of the VMP, as specified in a Planning Agreement, Development Consent or Activity approval.
- Staged release of bonds may be considered (e.g. if 50 per cent of total works are completed to Council's satisfaction, a refund representing those works may be considered).

3.2 HOLD POINTS

An initial onsite meeting prior to approval of an VMP to discuss a draft VMP and any issues including

- Council's contact for advice on commencement of VMP works, and
- developer advice to Council about who is in charge of the rehabilitation and the site (i.e. who Council's will liaise with on site).

2.The VMP and any related drawings to the VMP are stamped and approved by Council's Development Planner Flora and Fauna.

3. Submission and acceptance /approval of contractor supervisor and staff qualifications required by Council prior to Subdivision Works Certificate or Construction Certificate that authorises the implementation of on ground works. - points 1.5 and 1.6 of this document.

4. Council will recognise VMP works commencement date as the date the development or Subdivision Works Certificate or Construction Certificate is issued.

5. Council to be given at least 48 hours' notice of commencement of VMP works.

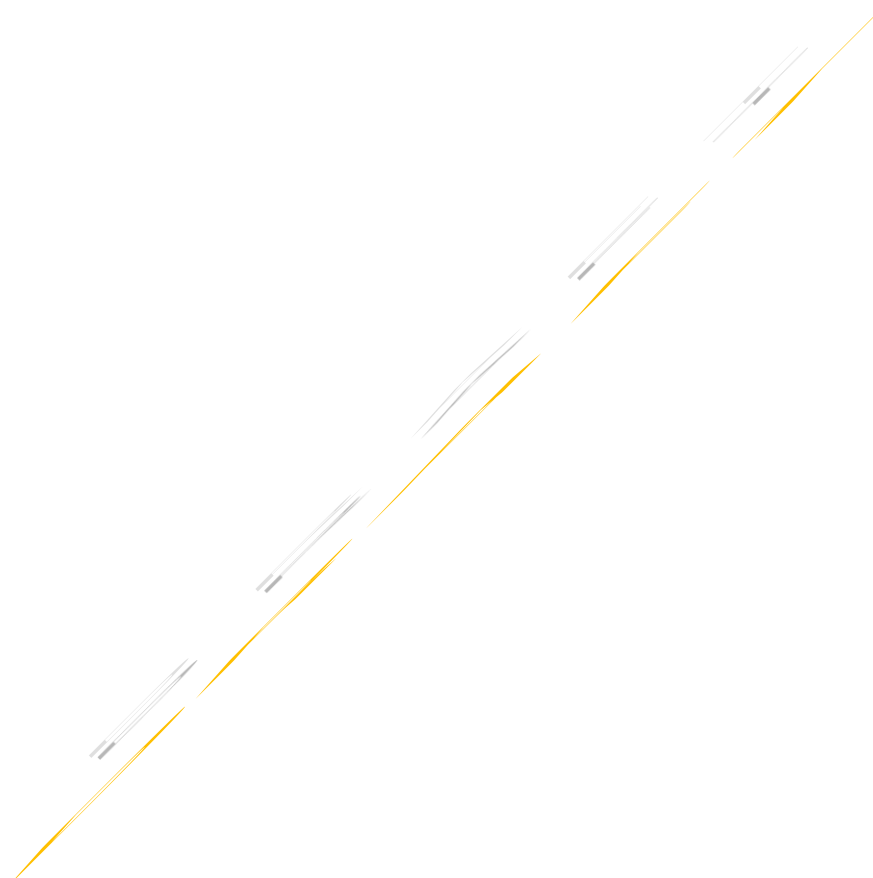
6.Progress meetings every 12 months from commencement date of staged works on receipt of progress reports from developer.

7. When staged works are completed, a site walkover meeting required for Council's approval prior to move into the following stage.

8. A bond or bank guarantee taken by Council when a Construction Certificate or Subdivision Works Certificate issued.

9. Bond returned on approval and acceptance of satisfactory VMP implementation, after final progress meeting.

Council will integrate the implementation of the VMP as much as possible with the development/subdivision process, however, it must be acknowledged that given the nature of bush regeneration works and differing time frames involved, staging these works with the subdivision works may not lead to the best outcomes.



4.0 REFERENCES AND RESOURCES

1. LMCC Flora and Fauna Guidelines

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2. Bell S, Driscoll C and LMCC (2019) Lake Macquarie Working draft Vegetation Community Map (December 2019)

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3. Bell S (2016) Volume 2: Vegetation Community Profiles, Working draft version 2. Unpublished Report prepared by Eastcoast Flora Surveys for Lake Macquarie City Council March 2016.

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4. Estuarine Creekbank Stabilisation and Rehabilitation Guideline

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5. Foreshore Stabilisation Guidelines

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6. 'Standards Reference Group SERA (2017) National Standards for the Practice of Ecological Restoration in Australia. Second Edition. Society for Ecological Restoration Australasia. seraustralasia.com/standards/home.html

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8. Flora Bank Guidelines

lakemac.com.au/development/guidelines-and-standard-drawings

9. Bush Fire Environmental Assessment Code

rfs.nsw.gov.au/resources/publications/hazard-reduction/bush-fire-environmental-assessment-code

10. Feral Animal Control – DPI NSW

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11. Phytophthora Management

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12. NSW Invasive Species Plan

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13. Adaptive Management

environment.nsw.gov.au/research/adaptive-management.htm

14. Biodiversity Assessment Calculator – excel spreadsheets

lmbc.nsw.gov.au/bamcalc

15. Biodiversity Conservation Act 2016

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16. Scientific Licences for Seed Collection and Bush regeneration - threatened species, communities or protected plants.

environment.nsw.gov.au/licences-and-permits/scientific-licences

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18. Development Control Guidelines – Preparation of Rehabilitation Plans for Degraded Watercourses or Water Bodies

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19. Land and Soil Information

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20. Soil and Water Management

environment.nsw.gov.au/research-and-publications/publications-search/resource-guide-for-local-councils-erosion-and-sediment-control

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22. Hunter Regional Strategic Weed Management Plan

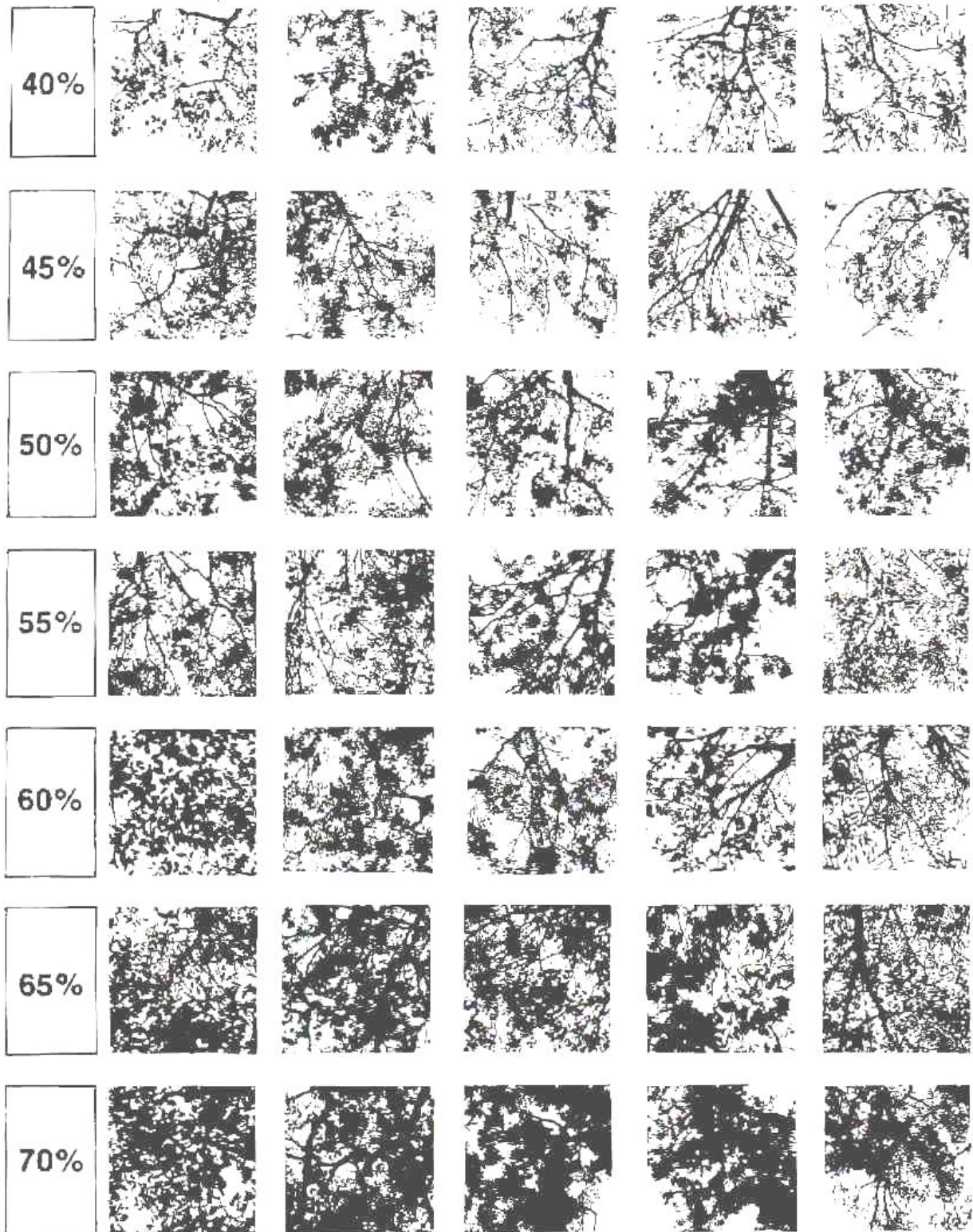
https://www.nsw.gov.au/data/assets/pdf_file/0010/806509/Hunter_RSWMP_FINAL.pdf

23. High Threat Weeds Link - environment.nsw.gov.au/topics/animals-and-plants/biodiversity/accredited-assessors/assessor-resources

APPENDIX 1

SPECHT – PERCENTAGE CROWN COVER

McDonald, RC et al. 1990, *Australian Soil and Land Survey Field Handbook* 2nd Edn.



APPENDIX 2

NATIONAL TRUST METHOD

National Trust of Australia (NSW) 1999. *Bush Regenerators' Handbook*. National Trust, Sydney.

This method needs to be undertaken by colour coding a simple sketch map.

Colour Code	% Native Range	% Weed Range	Condition of Bushland	Description	Intervention required
Green	75 > 100	0 > 25	Good	Virtually weed free, a healthy native community	Minimal Prevention of future impacts. Removal of possible scattered weed.
Blue	50 > 75	25 > 50	Fair	Minor infestations of weeds, natives dominate the site	Low Requires removal of minor impact (e.g. overuse) and of low level weed invasion.
Orange	25 > 50	50 > 75	Poor	serely infested, Regeneration of native species is being suppressed.	Medium Removal of impacts required. Removal of weeds. Additional 'kick start' to promote natural regeneration, e.g. fire, physical disturbance.
Red	0 > 25	75 > 100	Very Poor	Bushland replaced by exotic species OR only mature specimens of highest stratum remain – no seedlings or saplings due to infestation of understory with exotics	Medium or high Ability of system to recover is lost or seriously limited. Definitely needs a "kick-start" or may need reconstruction to approximate original system.

APPENDIX 3 – EXAMPLE TEMPLATES
SITE ISSUES

ZONE NAME	ISSUE	IMPACT	REQUIRED ACTION	PRIORITY RATING (high 1 to low 3)	

APPENDIX 4

MANAGEMENT ACTIONS TABLE

Zone Name	ACTION NUMBER	ACTION REQUIRED	PRIORITY RATING	DETAILED DESCRIPTION OF ACTION	TIMEFRAME/ COMPLETION DATE	RESPONSIBILITY
	1					
	2					
	3					
	4					

PART 2

Lake Macquarie City Council

SOIL TRANSLOCATION GUIDELINE

The guidelines are designed to match suitability of donor and recipient sites and to minimise disturbance at the donor site and the soil seed bank, as well as to ensure optimum results on the recipient site and effectively carry out ongoing monitoring

This Guideline provides developers and consultants working with Council on the process for the translocation of topsoil within or between development sites by setting out a detailed methodology for the preparation, establishment and monitoring required.

Soils within vegetation types contain seed banks that are an underutilized yet valuable source of native plant species and genetics. Soil translocation provides a valuable resource for native vegetation management and a practical alternate solution for developers to reduce costs for plantings and associated rehabilitation works, reduce the amount of soil to be transported offsite while achieving high quality results for vegetation establishment.

NOTE: While the whole document is seen as important the sections in bold blue are considered critical points to be understood.

This seed bank must be viewed by all workers on the site as a non-renewable resource, and must be seen as valuable.

The tasks are ordered chronologically and must be performed in the order and manner stated using the specified equipment.

Any changes to the order or method of these specifications must be authorised by LMCC Council via the Translocation Project Manager.

The tasks have been allocated to different positions as described below:

Project Managers: LMCC Council Translocation Project Manager to supervise the variety of works to be undertaken at the donor and recipient sites. The project manager should ensure that the tasks are done to specification, in the appropriate order and in a timely manner. Tasks such as the co-ordinating pre-translocation works at both the recipient and donor sites can happen concurrently, if applicable.

Bush Regeneration internal staff/contractor: Person(s) suitably qualified to carry out seed collection, weed control and bush regeneration works at both the recipient and donor sites. Preferably with AABR accreditation.

Flora expert: suitably qualified person/s, with experience working in local ecological communities, to undertake pre and post flora surveys, monitoring and evaluation of translocation program.

1. Donor site selection

Translocation material will specifically be removed from within the identified healthy remnant. The soil profile and seed bank located within the area of the donor strip has remained undisturbed from fire and physical disturbance and has surpassed or is nearing the seed banks recommended threshold interval. The donor site needs to be a minimum size of 50% of the proposed recipient area to be rehabilitated.

2. Recipient site selection

Selection criteria:

- within the same LMCC Map Unit (Bell.S) 2016, locality and habitat as the donor site
- has low or nil potential for natural or assisted regeneration;
- has secure tenure for conservation purposes; and
- appropriate approval to translocate to the recipient site can be gained for the site within a timely manner.

Site preparation works at recipient site:

This stage **must** be carried out before any vegetation clearing work begins at the donor site. The recipient sites must be fully prepared to eliminate stockpiling and reduce costs of machinery hire.

2. Recipient Site Preparation Tasks	Responsibility	Other
2.1 Confirm the site is free from contaminants such as acid sulphate soil, slag, lead, asbestos etc. Testing required.		Hold Point- no works to commence until completed
2.1 Eradicate all weeds from site and adjacent bushland.	Bush regeneration internal staff	
2.2 Assess subsoil suitability and prepare site soil in consultation with LMCC staff or their representatives. This will include an assessment of the subsoil to support future plant growth and the need for subsoil removal from the donor site. Other activities may involve removal of unsuitable material, levelling, ripping, capping and/or remediation of drainage issues.	Bush regeneration / earthworks contractor	
2.3 Erect fencing and signs to prevent public access as directed by LMCC staff or their representatives.	Bush regeneration internal staff	
2.4 Install silt fence or other erosion control devices where necessary. Silt fences must be installed with 4 strands of strained wire, one at the top of the fence post, one at 600mm above ground for attachment of the top of the silt fence, one at 300mm mid sediment fence and one 50mm above ground level, to maximise the life of the fence. All-star picket posts are to be capped with safety caps. Sediment control on site is required to be monitored for the life of the project.	Bush regeneration internal staff	
2.5 Preparation will involve removal of the organic layer and A horizon i.e. the top 100mm of the soil profile to remove weed seedbank competition. The A horizon containing weed seed must not be mixed in with the subsoils of the recipient site.	Bushland internal staff	
2.6 This will then be followed by de-compacting and scarifying the top 100mm of the exposed subsoil profile (B Soil horizon) in order to provide suitable conditions for translocated soil material and to insure the successful establishment of the donor material's seed bank after initial stimulation. Using machinery such as Excavator, Backhoe and Rotary Hoe remove <ul style="list-style-type: none"> • Contaminants – (typically - concrete, general rubbish, weeds, highly nutrified soils etc.). 		

<ul style="list-style-type: none"> • Undertake any decompaction /scarification. • Avoid damage to canopy tree root system by establishing a protection zone excluding machinery within drip line. • All works within dripline to be done manually. 		
<p>2.7 Following soil preparation of the recipient site 2 successive weed removal treatments (at a minimum 3-week interval) are to be undertaken on the disturbed areas and the surrounding edges, up to 1m outside of the silt fence boundary. This is to minimize weed growth competition and the impact on post translocation germination.</p>	<p>Bush regeneration internal staff</p>	
<p>2.8 The laying and pinning of Geotech fibre in strips of 0.5 meters surrounding the recipient site to minimize the impact of edge effects.</p>	<p>Bush regeneration internal staff</p>	
<p>2.9 Permanent labelling of individual quadrats is to be undertaken on the outer southern and northern edges of the quadrat locations.</p>	<p>Bush regeneration internal staff</p>	
<p>2.10 Long-term photo monitoring points are to be located, installed and documented. Photo records are to be undertaken in the initial stage as a baseline and long-term monitoring is to be carried out as outlined in point 6.</p>	<p>Flora expert /Project managers</p>	

3. Site preparation works at donor site:

This stage **must** be carried out before any vegetation clearing work begins at the donor site to minimise the translocation of weeds and to take a record of the species diversity at the donor site prior to translocation.

3. Donor Site Preparation Tasks	Responsibility
3.1 Following liaison with Project Manager to determine recipient site location, identify and mark boundary of site for salvage.	Flora expert /Project managers
3.2 Confirm the site is free from contaminants such as acid sulphate soil, slag, lead, asbestos etc. Testing required.	
3.3 Photo monitoring points are to be located, installed and documented. Photo records are to be undertaken in the initial stage as a baseline and for future reference. Monitoring is to be carried out as outlined in point 6.	Flora expert /Project managers
3.4 Map and GPS all site features.	Flora expert /Project managers
<p>3.5 Conduct general vegetation survey within soil excavation area.</p> <p>Vegetation surveys within the excavation area are to be completed to identify the following:</p> <ul style="list-style-type: none"> - All flora species counted and identified within donor site area. - Record each species present and the abundance of each species. The abundance of each species may be recorded via the Braun-Blanquet scale or similar. <p>For example, NPWS (2000) used:</p> <ul style="list-style-type: none"> 1 = rare, few individuals present and cover < 5%; 2 = Uncommon and cover <5%; 3 = common and cover < 5%; 4 = (Very abundant and cover < 5%) OR (5% <= Cover < 20%); 5 = (20% <= Cover < 50%); 6 = (50% <= Cover < 75%); 7 = (75% <= Cover < 100%). <p>NPWS (2000) The native vegetation of the Cumberland Plain, Western Sydney – Technical Report, NSW National Parks and Wildlife Service.</p>	<p>Flora expert / Bush regeneration internal staff</p>
3.6 Undertake levy pole assessment within the donor site to assess pre-translocation vegetation structure. A maximum 100m transect across the gradient of the site is to be undertaken with vegetation height of all structure recorded at 10m intervals	Bush regeneration internal staff
3.7 Salvage all available viable seed from understory and canopy species. Include collection of all seeds stored in woody fruits on plants (including eucalypt trees) with loppers. Seed collected must be clearly labelled with scientific name, date of collection, collectors' name and location and site identifier.	Bush regeneration internal staff

NOTE: High value plants including- cycads, grass trees, Gymea etc. may require translocation which will be determined by LMCC project officer following initial assessment of donor site.	
3.8 Eradicate all weeds from soil excavation area.	Bush regeneration internal staff

4. **Removing material from donor site.**

4. Removal from donor site tasks	Responsibility
4.1 Undertake inspection for fauna likely to be disturbed by translocation project works and if required relocate fauna from site to suitable habitat.	LMCC Ecologist
4.2 Cut all standing shrubbery with brush cutters. While ensuring soil horizon and vegetation up to 100mm is left undisturbed.	Bush regeneration internal staff
4.3 Remove cut brush material from site and dispose appropriately. Material can be mulched and used elsewhere if suitable. While removing ensure minimal disturbance to the soil horizon and vegetation up to 100mm. All shrubs with up to 300 DBH are included in removal.	Bush regeneration internal staff
4.4 Scrape topsoil including the leaf litter and O soil horizon - minimum depth 200mm – max 300mm	Bush regeneration (supervising) machine and plant operator
4.5 Leaf litter layer O and A horizon from donor site is to be loaded, thoroughly mixed and transported immediately to the recipient sites. Donor material must not be stockpiled and stored. Mixing of the donor material will occur when donor material is being loaded onto trucks for transport and during spread across the recipient site.	Bush regeneration (supervising) machine and plant operator
4.6 Donor material must be spread evenly at the recipient site to a depth of approximately 100mm – 200mm (effectively at a ratio between 1:1 and 1:2) Translocated material is to be spread across the recipient site with the use of an excavator or back-hoe. Material must be spread in a manner that ensures machinery does not drive over and compact any laid donor material.	Bush regeneration internal staff/ Internal plant operator
4.7 Bush regeneration staff are to be on site while material is being spread to ensure that any suitable propagules such as lignotubers, stolons, rhizomes, bulbs etc. that have been left lying above ground are correctly planted and fauna can be rescued.	Bush regeneration internal staff
4.8 Logs collected from the donor site will be placed at 10m intervals across the contour lines of the recipient site to minimise erosion, create suitable habitat and site microclimate's and provide site access for future monitoring and weed control works.	Bush regeneration internal staff/ Internal plant operator

Notes:

- Erosion control at the donor site must be carried out in accordance with LMCC specifications for building sites.
- It is important to ensure that none of the translocated material is contaminated by weed seed or other propagules, or soil material from other sites. Therefore, all machinery and vehicles must be cleaned prior to arrival at the site.
- Hosing down of machinery or vehicles is not permitted in the vicinity of the donor site.

- Machinery or persons with weed seed or other propagules, or soil material from other sites are not permitted to enter the recipient site. This provision will be enforced by LMCC officers or their representatives.
- Disturbance to the topsoil should be minimised prior to its translocation, therefore removal of vegetative material should be done by hand and trees are not to be removed until the topsoil has been excavated unless otherwise directed by the project manager.

5. Site establishment at Recipient Site

5. Site Establishment – Watering and Weed control	Responsibility
<p>5.1 Watering; Dependent upon environmental conditions watering of translocated material may be required to ensure successful establishment of vegetation. Watering would be required when germination of the soil seed bank is triggered through a natural rain event however follow up rainfall events are unlikely or not received. In this instance it is important to assist establishment of the triggered seedbank by implementing a watering regime during establishment. A minimum of one weekly watering across the entire site for a period of 3 months would be required.</p>	<p>Bush regeneration internal staff with water supply cart</p>
<p>5.2 Weed control; At regular intervals the recipient site shall be monitored for weed invasion, In the event of weed invasion, control action using appropriate weed control techniques shall be undertaken. The use of herbicides will be kept to an absolute minimum. Timing for these actions are required at a minimum of 3 months, 6 months, 12 months, 18 months, 24 months and then annually for at least 5 years. Every care shall be taken at the site to minimise disturbance to seedlings while weeding works are carried out. Required frequency of site visits will be dependent on the size and location of the recipient site and health of the donor material. An onsite assessment will be carried out prior to project commencement by the project officer to determine the required weed control frequency during recipient site establishment.</p>	<p>Project manager, Bush regeneration internal staff</p>

Monitoring and on-going adaptive management

This stage will be implemented for at least 5 years.

6. Monitoring Tasks		Responsibility															
<p>Pre-translocation monitoring at Donor and Recipient sites will include:</p> <ul style="list-style-type: none"> - Photo point set up as per LMCC VMP guidelines - NE and SW corners of 20 x 20 quadrat. - Specific vegetation survey within donor strips including species abundance, species richness and percentage foliage cover - Levy pole surveys are to be undertaken along the transect as per 3.5 of this document. 		Project manager/Flora expert															
<p>6.1 Quadrat Surveys</p> <p>Quadrat surveys must be undertaken at the following time frames; 3, 6, 9, 12, 18, 24 months then yearly for at least 3 years. Survey data is to be recorded and forwarded to LMCC Ecologist Flora/Fauna.</p> <table border="1" data-bbox="204 1003 1066 1391"> <thead> <tr> <th>Steps</th> <th>Tasks</th> <th>Record Document</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Photo monitoring as per VMP guidelines.</td> <td></td> </tr> <tr> <td>2</td> <td>Species abundance/richness counts</td> <td>Plot Monitoring</td> </tr> <tr> <td>3</td> <td>Native and exotic species % cover abundance</td> <td>Plot Monitoring Sheet</td> </tr> <tr> <td>4</td> <td>Levy pole assessment as per guidelines - from 6 months</td> <td>Levy pole assessment sheet - Hard drive and back up disc</td> </tr> </tbody> </table> <p>Quadrats shall be surveyed for the following; species diversity and abundance where by every species is identified and counted, including stem counts and stem heights.</p> <p>Percentage cover abundance taken for each quadrat in the following increments <10%, 10 - 20%, 30-40%, 40-50%, 60-70%, 80-90%, 90-100%.</p>		Steps	Tasks	Record Document	1	Photo monitoring as per VMP guidelines.		2	Species abundance/richness counts	Plot Monitoring	3	Native and exotic species % cover abundance	Plot Monitoring Sheet	4	Levy pole assessment as per guidelines - from 6 months	Levy pole assessment sheet - Hard drive and back up disc	Project manager/Flora expert
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4	Levy pole assessment as per guidelines - from 6 months	Levy pole assessment sheet - Hard drive and back up disc															
<p>6.2 Levy Pole assessments</p> <p>Quadrat Levy pole assessments are to be carried out in conjunction with all monitoring timeframes outlined in point 6 and as per 3.5 of this document.</p>		Project manager/Flora expert															

PART 3
NATURAL AREAS PLANTING SPECIFICATION

NATURAL AREA PLANTING SPECIFICATION

All Bushland regeneration/restoration works within the public domain shall be co-ordinated with LMCC 's nominated Natural Assets officer within the period of the VMP.

LMCC Natural Assets Co-ordinator - 4921 0056
VEGETATION MANAGEMENT PLAN (VMP) and BUSHLAND RESTORATION SPECIFICATION

1.0 GENERAL

Discrepancies within the planting schedule and the drawing should be referred to LMCC Development Planner Flora and Fauna. Make no substitutions unless approved.

Substitutions shall not be approved unless the contractor complies with this specification.

2.0 WORK NEAR TREES

Protection: Protect trees to be retained from damage from ground works as per AS 4970 Protection of Trees on Development Sites. Take necessary precautions, including the following: -

Harmful Materials: Do not store or otherwise place bulk materials and harmful materials under or near trees. Do not place spoil from excavations against tree trunks, even for short periods. Prevent wind-blown materials from materials such as cement from harming trees and plants.

Damage: prevent damage to tree bark. Do not attach stays, guys and the like to trees.

Work under trees: Do not add or remove topsoil within the drip line, use hand methods so root systems are preserved intact and undamaged. Open up excavations under tree canopies for as short a period as possible.

Roots: Where it is necessary to cut tree roots, use means such that the cutting does not unduly disturb the remaining root system. Work to be supervised and inspected by the project arborist prior to covering.

Compacted Ground: Prevent compaction of the ground under trees.

Machines – **no vehicles** within TPZ.

3.0 SOILS

3.1 DEFINITIONS

Source Soil:

Soil for the works shall be free from noxious weeds etc. Soil shall be assumed to be placed to all revegetated areas and backfill to all plantings. Unless otherwise directed by site supervisor, the Bush Regeneration Contractor is responsible for the removal and or disposal of all spoil or excess soil excavated in the process of implementing the Bushland Restoration works.

3.2 SOIL LEVELS

Finished soil levels shall allow mulch to be finished to top of kerb, gravel pavement, existing levels or as otherwise shown on drawings.

Consolidation

Compact lightly and uniformly in 100 mm layers. Avoid differential subsidence and excess compaction and produce a finished topsoil surface which has the following characteristics:

- Finished to design levels.
- Smooth and free from stones or lumps of soil.
- Graded to drain freely, without ponding, to catchment points.
- Graded evenly into adjoining ground surfaces.
- Ready for planting.

4.0 PLANT MATERIAL

Plants shall be of the species, sizes and quantities as shown on the drawing. Plants shall be vigorous, well established, of good form, not soft or forced, free from disease and insect pests. Plants shall have large healthy root systems, not root bound and all trees with a single leading shoot.

NOTE 1: Plant sources must be of local provenance stock where possible.

NOTE 2: when advanced tree stock is required Refer to AS2303: 2018.

4.1 TREE SUPPLY SPECIFICATION

True to type

Type: Supply plant stock which are true to type. Plants sources must be of local provenance stock where possible.

Species List – contractor to supply species list to LMCC before any planting commences. This list will be from the relevant LMCC Map Unit (Bell S)2016

Health and vigour

Health: Supply trees with foliage size, texture and colour consistent with that shown in healthy specimens of the species.

Vigour: Supply trees with extension growth consistent with that shown in vigorous specimens of the species.

Freedom from pests and disease

Foliage: Restrict attack by pests and disease to < 10% of the foliage, such that potential for long term success of the trees is not affected.

Root division

Root systems: Fibrous with repeated and sequential division.

Root direction

Roots growing out or down: > 90% of roots within root ball at every stage of development.

For trees in pots > 45L

Balance of crown

Maximum variation in crown bulk on opposite sides of stem axis: ± 20%.

Uniformity of growth

Stem taper

Support: Supply trees which are self-supporting unstaked.

Other than tube stock or small trees:

Calliper: At least 1.2 x calliper at 1 m above ground.

Pruning history

General: Comply with the recommendations of AS 4373.

Pruning wounds: Confine fresh pruning wounds to < 25% of the clean stem height.

Wound diameter: < 33% of stem diameter immediately above point of pruning.

Pruning location: Clean cut at branch collar.

Included bark

Bark ridge: Convex (outwardly pointing) at junctions between co-dominant stems, and stems and branches.

Apical dominance

Apical bud: If appropriate for the species, supply trees which have a defined central leader and intact apical bud.

5.0 PLANTING

Use LMCC Map Unit (Bell S) (as specified) as a reference for planting arrangement.

No planting in rows.

Planting to replicate the Map Unit species composition.

6.0 MULCH

Use mulch, which is free of deleterious and extraneous matter such as soil, weeds and sticks. Place mulch to the required depth (75mm), clear of plant stems, and rake to an even surface flush with surrounding finished levels.

Mulch type shall be: 'Forest Blend' (Coarse 20-40mm) delivered by an approved supplier.

7.0 PLANT ESTABLISHMENT

7.1 SCOPE

All rubbish related to Bushland Restoration works shall be removed by the Developer or Bush Regeneration contractor at each site visit.

Period: The Planting Establishment Period commences at the end of the approved planting program. It is acceptable the planting program will be across the duration of the VMP.

NOTE: excluding the last year of the VMP.

Recurrent Works: Throughout the Planting Establishment Period, continue to carry out recurrent works including, watering, weeding, rubbish removal, fertilising, pest and disease control, staking and tying, replanting, mulching and keeping the site neat and tidy.

Replacements: Continue to replace failed, damaged or stolen plants for the extent of the Planting Establishment Period.

Mulched Surfaces: Maintain the surface in a clean and tidy condition and reinstate the mulch as necessary.

Turfed Areas: there are no turfed areas within VMPS.

Stakes and Ties: If required - Adjust or replace as required. Remove stakes and ties if they are not required.

Site Water: The contractor shall assume there is no site water available other than that which is provided as part of the works. The contractor shall be responsible for supplying water and/or paying for water for the duration of the works.

APZs. –

Exceptions may occur where it is a requirement of the RFS code and the APZ will be managed as native grassland with any shrubs or trees removed to meet RFS requirement. There will be no mowing.

8.0 WEED MANAGEMENT

8.1 GENERALLY

Identify and map all weeds on site and effectively remove them. There are three stages in the management of weed removal and management; these are primary weed removal, secondary treatment and ongoing maintenance. Weed infestations that threaten the integrity of existing native bushland generally occur on the edge of bushland, creek lines and in areas of disturbed or cleared land.

Weeds pose a threat to the native plants as they compete for light and nutrients.

Invasive species pose particular issues along drainage lines where seeds can be transported from upstream infestations.

As a guide, management priorities for weeds will be based on the status of the weed e.g. WON'S or Priority Weeds for the Hunter Biosecurity duty. Other factors such as infestation size, viability of control and location will also need consideration.

8.2 KEY PRINCIPLES

The key principles when undertaking weed management are:

- Confirm the extent of the infestation
- Protection of the existing native vegetation
- Thorough weed and rubbish removal
- Effective management of drainage and nutrients

- If required - supplementary planting to assist in ground stabilisation and revegetation
- Ongoing monitoring and maintenance

8.3 WEED REMOVAL AND MANAGEMENT

8.3.1 Weed Removal

The principles related to the protection of valued vegetation in the process of removing unwanted vegetation whether it be by hand, machine or herbicide are applicable for all situations. The methodologies outlined below can be adapted to suit the management of both large and small weed infestations.

Acceptable methods for the removal of weeds may include:

- On larger woody weeds, cutting the trunk and poisoning the remaining stump with concentrated glyphosate herbicide.
- Spraying actively growing leaves with glyphosate herbicide.
- Splatter gun for use on high-density weed
- Hand removal of the entire plant taking care not to leave plant material or dislodge seeds.

8.4 DISPOSAL OF WEED MATERIAL

Displaced weed material is to be disposed of off site where there is no potential of seed dispersal. Where areas of ground are disturbed from the weed removal the soil shall be tamped into place and covered with site leaf litter or site mulch (free from weed seed) to avoid erosion. Follow up weeding is essential to ensure the success of the initial weeding activities and should be carried out at regular intervals throughout the maintenance period.

Weed germination may occur in areas to be planted. This can be controlled by light scarification.

8.5 HERBICIDE

Herbicide application shall only be used where there is no possibility of damage to native vegetation from overspray or wind drift. Particular care should be taken in riparian zones and creek lines. Herbicide should be used in accordance with the manufacturers' recommended rates or Off Label Permit. A follow up treatment, two weeks after the initial sprays required to kill any regrowth of seed. Any use of herbicide is to be according to the label and conducted in a responsible manner.

People using herbicide shall be properly attired, suitably trained and able to recognise the different plant species in the treatment zone prior to using herbicide. Use only approved herbicide: as per the VMP

NOTE: excluding the last year of the VMP.

9.0 HABITAT MATERIALS

Any habitat materials identified in consultation and approved by any of the following LMCC representatives – (Ecologists, Arborist, Vegetation Establishment Officer, Natural Areas Project Co-ordinator) to be harvested from the construction area for use and placement within the VMP area to be stockpiled keeping with current thoughts on provenance. The SER Australia National Standards Appendix 3 should be used as a reference. For use in an agreed location. tree barrels > 300mm dbh, large stumps.

10.0 THREATENED SPECIES

Any identified threatened species or TEC needs to be flagged and protected from encroachment/disturbance or damage. See Section 2.5 of TEMPLATE DOC

11.0 SOIL TRANSLOCATION: refer to Part 2 of Trial Natural Areas Management Document.

12.0 HOLD POINTS / WITNESS POINTS

• All Bushland regeneration /restoration and public domain works as approved in the VMP shall be coordinated with nominated LMCC Natural Assets Officer during the period of the VMP.

• The following hold point/witness point inspections (where applicable) are to be carried out by a nominated LMCC Natural Assets Officer:

HOLD POINT	COMPLETED	DUE
Before planting commences - Pre ordered – Species list of plants supplied for restoration to be submitted to LMCC Natural Assets Officer. This list will be the relevant LMCC Vegetation Community Map Unit - Bell. S. 2016 or part thereof.	Yes/No	
If required - Site meeting to discuss any specific onsite issues before works commence	Yes/No	
Plantings shall be maintained for a minimum of 52 weeks	Yes/No	
Soil Translocation and plant materials completed	Yes/No	
Tree Protection Plan		Prior to onsite works
WITNESS POINT		
Completion of ANY nominated spreading or placement of habitat timbers, rocks and mulch in accordance with the VMP	Yes/No	
All Drawings referred to for on ground works are stamped and approved by LMCC	Yes/No	
Species list submitted	Yes/No	

10. LOCAL PROVENANCE STOCK

Plant species native to the particular (VMP) area and LMCC Map Unit are to be used. Refer to the VMP and drawings to clarify which LMCC Map Unit is being referenced.

Wherever possible always use seed stock or plant material of local provenance. This is most important with trees and shrubs.

All native bushland stock is to be sourced from documented local provenance preferably within 10km of a VMP area wherever possible. When local provenance sourcing is not available seed can be collected from a larger geographic area, including the Lake Macquarie Catchment Region and beyond if necessary. This will be subject to discussion with LMCC ecologist.

