

8.17. Kurraba Point Reserve - Vegetation Management Plan

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ATTACHMENTS:

1. VMP Kurraba Point Narla Environmental [8.17.1 - 15 pages]

PURPOSE:

The purpose of this report is to provide Council details on a proposed Vegetation Management Plan (VMP) at Kurraba Point Reserve.

EXECUTIVE SUMMARY:

The report has been prepared for Council's consideration. The proposed Vegetation Management Plan has been submitted by Thirdi Group of whom are the developers of 147-153 Kurraba Road.

The proposed VMP will facilitate weed removal and the subsequent revegetation of a degraded and difficult to access section of cliffside vegetation at Kurraba Reserve. This VMP will be implemented by an appropriate environmental restoration contractor on behalf of the proponent for 6.75 years, before the sites maintenance is returned to the management of North Sydney Council.

FINANCIAL IMPLICATIONS:

The Proposed VMP will be funded in full by the developers of 147-153 Kurraba Road for the 6.75-year period. The sites maintenance would then be returned to Council for it to be completed under ongoing operational budgets.

RECOMMENDATION:

1. THAT Council approve this agreement to have the VMP implemented by Thirdi Group for 6.75 years to improve the steep and degraded cliff line at Kurraba Reserve.

LINK TO COMMUNITY STRATEGIC PLAN

The relationship with the Community Strategic Plan is as follows:

1. Our Living Environment
 - 1.3 Quality urban greenspaces
 - 1.4 Public open space and recreation facilities and services meet community needs

BACKGROUND

A Development Application (DA) on the land located at 147-153 Kurraba Road, Kurraba Point Lot No. 0, SP: 22851 was submitted to Council on 26 August 2019. The details of the DA included the demolition of existing buildings and construction of part 4, part 6 storey residential flat building comprising 25 apartments with basement parking for 41 parking spaces. The DA area is highlighted in red Figure 1 below:



Figure 1

At its meeting of 11 March 2020, the Sydney North Planning Panel (SNPP), as the consent authority, considered the above Development Application under No. 255/19 and approval was granted subject to conditions in the notice of determination.

In August of this year Council officers in the Open Space and Environmental Services Division were contacted by representatives of Thirdi Group via email. A discussion took place around the current condition of the Open Space that fronts the development at 147-153 Kurraba Road. The parcel of land is highlighted in Figure 2 below:



Figure 2

The developers are interested in an opportunity to sponsor or support a clearing and restoration program on the site through Council.

Initially the request was placed with Streets Alive officers but unfortunately the subject site poses too many risks to be a run under a volunteer program. This is mainly due to the topography that would require rock climbing and rope work skills required to maintain a site such as this.

The site contains an invasive and significant range of weed species such as Privet, Lantana and Crofton weed. The area is very steep terrain situated on the top of the Cliff above Kurraba Reserve. Due to the nature of the terrain, the working at heights access requirements and costs of undertaking this maintenance Council currently undertakes minimal maintenance at this location.

Staff from Parks and Reserves met with representatives from the developers to discuss what they wished to achieve through the proposal. Following this meeting the proponent was advised that for Council to consider such a proposal they would need to provide a detailed Vegetation Management Plan (VMP) that covers the following:

- The area in front of the development as well as continuing to the south to complete the embankment.
- Be a mutually beneficial outcome for the Kurraba Point community and Council.
- At least a 5-year plan in recognition of the time it takes to effectively exhaust (or seriously deplete) weed resilience in heavily degraded sites.
- Include a Gantt chart style program of implementation that details the stepped-out rehabilitation activities over time.
- Stage weed control progressively and favour control techniques that minimise erosion potential.
- Commit to a frequency of site maintenance visits.
- Achieve a 5 plants per m², being 3x grass/ground covers: 1-2 shrubs and/or a canopy tree or vine/scrambler.
- The requirement to have an AABR-accredited site supervisor working on the site as work will need to be undertaken by Ropes-access-trained personnel.

CONSULTATION REQUIREMENTS

Community engagement will be undertaken in accordance with Council's Community Engagement Protocol.

DETAIL

Council officers have received the proposed VMP which has met all the requirements outlined above. The VMP will seek to clear, maintain and restore the top of the embankment (comprising part of a heritage item):

- By removing the multiple invasive species invading the area; and
- Replanting native vegetation forming part of the native vegetation community which would have historically occupied this headland.

Location

The VMP proposes that the site area runs from the northern boundary of the development site at 147-153 Kurraba Road then south to the beginning of the depression era concrete fencing on the top section of the Reserve. The subject site is highlighted in Figure 3 below:



Figure 3

The subject site will be divided into the following two (2) management zones (Figure 1) to account for the different management objectives and actions to be implemented:

- Zone 1: Steep Terrain; and
- Zone 2: Cliffside Terrain.

Objectives

- Active removal of environmental and priority weeds that occur within each zone.
- To revegetate both zones with locally occurring native species representative of the surrounding vegetation community (Coastal Sandstone Foreshore Forest) by predominately planting groundcovers and shrubs to stabilise the zone, prevent erosion and establish native understory cover.
- To reduce environmental and priority weeds and prevent further colonisation of these within the zone.
- Improve the overall visual amenity of Kurraba Reserve.
- Improve the harbour views from the development site

Weed Removal and Management

Weed control will be undertaken using a staged approach incorporating three levels of treatment:

1. primary weed removal;
2. secondary treatment; and
3. maintenance weeding.

Weed management is to be undertaken throughout all management zones targeting weed infestations and ensuring no weed encroachment into the surrounding properties and bushland.

The objective of the VMP is to achieve less than 5% priority weeds present within Management Zones by the end of the VMP with annual and environmental weeds maintained to low levels. This will allow Council staff and Contractors to continue to maintain the site in an acceptable condition into the future

Established trees within the subject site will not be removed

Recommended Species for Planting

Active revegetation through planting to achieve species richness and densities would see 4 categories of plantings and are as follows:

1. Large Trees;
2. Small Tree/Shrub;
3. Groundcovers; and
4. Vines and Climbers.

The choice of species is based from occurrences of the surrounding vegetation community

It is proposed that there will be 6-10 Canopy Trees planted across the subject site. The selected trees types would include Angophora, Banksia and Eucalyptus species and the placement of these trees would be determined by Council in consultation with neighbouring properties.

Small Trees, Shrubs, Groundcovers, Vines and Climbers will be planted at 5 plants per m². These plantings will consist of 3 x groundcovers, 1 -2 shrubs and a vine or climber. Typical species types would include Acacia, Elaeocarpus, Dianella, Lomandra, Themeda and Pandorea.

Time Frame

This VMP will be managed over a 6.75-year period from December 2020 through to September 2027. Upon satisfactory completion of the VMP the site will be returned for the ongoing maintenance of North Sydney Council.

Project Costs

The estimated costs for this project include:

- Initial weed control including all herbaceous, vine and woody shrub and small tree weeds.
- Erosion control installation consisting of log and coir logs staked to the soil on contour as terraces.
- Plant installation of 1,500 native plants. All plants will be installed with Terraform, a product containing water crystals, soil conditioner and nutrients suitable for native plants. All plants will be thoroughly watered in at installation.
- Irrigation and weed control maintenance for five years after completion of planting.

Initial Works		
Scope of Work	Price	Comments
Admin	\$ 300.00	WHS requirements
Weed Control	\$ 31,660.00	Includes Palm removal
Waste	\$ 6,376.00	approx. 4 tonnes
Planting	\$ 5,552.00	Installed at 5/m ²
Plant supply	\$ 2,100.00	1500 plants supplied
Sub Total	\$ 45,988.00	

Maintenance Works		
Scope of Work	Price	Comments
Reporting	\$ 2,100.00	7 annual reports
Weed Control	\$ 101,663.84	9 annual visits
Irrigation	\$ 11,383.20	Watering of new plants
Erosion Control	\$ 7,612.16	Installed at 5/m ²
Sub Total	\$ 122,759.20	
Total Ex GST	\$ 168,747.20	

Project Benefits

It is important to note that if this proposal is adopted that the developers of 147-153 Kurraba Road will potentially receive increased sale prices through improved landscape quality and harbour views. It is clear that this is the sole objective with the implementation of this VMP.

Currently Council maintenance allocations at this site are minimal due to the difficulties in accessing the site. Council does not have any budget or resource allocation for improvements to this site at present or into the foreseeable future.

If the VMP is implemented, it will effectively enable Council staff to allocate resources to the ongoing maintenance of the site through its recurrent budget allocations.




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Vegetation Management Plan

Kurraba Reserve, Kurraba Point NSW 2089

Report prepared by Narla Environmental Pty Ltd

For Toolijooa Environmental Restoration

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Prepared for:	Toolijooa Environmental Restoration
Prepared by:	Narla Environmental Pty Ltd
Project no:	Tool68
Date:	November 2020
Version:	Final v2.0

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1. Vegetation Management Plan

1.1 Project Background

This Vegetation Management Plan (VMP) will accompany construction works at 147-153 Kurraba Road, Kurraba Point and has been commissioned by Thirdi Group (the Proponent) voluntarily in order to facilitate weed removal and the subsequent revegetation of a degraded section of cliffside vegetation at Kurraba Reserve, Kurraba Point NSW 2089 (Lot 1/DP616462, the 'Subject Site'; **Figure 1**). This VMP will be managed by Toolijooa Environmental Restoration (Toolijooa) on behalf of the Proponent for 6.75 years, before the Subject Site is returned to the management of North Sydney Council.

As noted in the North Sydney Development Control Plan 2013:

Pursuant to Part 2 Authority to clear vegetation in non-rural areas and Part 3- Council permits for clearing of vegetation in non-rural areas under SEPP (Vegetation in Non-Rural Areas) 2017, Development Consent or a Tree Management Permit is not required for removal or pruning any of the following:

- (c) pruning of deadwood from a tree or vegetation, including dead palm fronds;
- (g) trees or vegetation that are being maintained or removed by North Sydney Council staff (or their sub-contractors) on land under Council's ownership or care
- (j) the following tree and vegetation species:
 - (i) African Olive Trees (*Olea Africana*);
 - (ii) Bamboo (*Bambusa* species);
 - (viii) Privet species (*Ligustrum* sp.) – except on land identified as a heritage item under cl.5.10 of NSLEP 2013;

Established trees will not be removed as part of this VMP. Given the Heritage listing of Kurraba Reserve, *Ligustrum* species will not be removed unless approved by North Sydney Council. The steep terrain of the Subject Site will require any removal of large trees to be conducted by specialist tree removal arborists.

1.2 Objectives

The VMP will seek to clear, maintain and restore the top of the embankment (comprising part of a heritage item):

- By removing the multiple invasive species invading the area; and
- Replanting native vegetation forming part of the native vegetation community which would have historically occupied this headland.

1.3 Management Zones

The following vegetation communities were present within the Subject Site:

- Urban Native/Exotic

Based on historical mapping of the locality (OEH 2016), the Subject Site is likely to have reflected Coastal Sandstone Foreshore Forest (PCT 1778). As such, it is recommended that revegetation aim to reflect the Coastal Sandstone Foreshore Forest through planting of species locally indigenous to the vegetation community.

The Subject Site has been divided into the following two (2) management zones (**Figure 1**) to account for the different management objectives and actions to be implemented:

- Zone 1: Steep Terrain; and
- Zone 2: Cliffside Terrain

The details of these zones are outlined in the table below.



Figure 1. Components of the Subject Site.

Zone 1: Steep Terrain**Total area: 0.02 ha****Description**

Vegetation within this zone was largely comprised of exotic species including: *Arundo donax* (Giant Reed), *Asparagus aethiopicus* (Asparagus Fern), *Ageratina adenophora* (Crofton Weed), *Bambusa* spp. (Bamboo), *Ehrharta erecta* (Panic Veldtgrass), *Ficus pumila* (Creeping Fig), *Lantana camara* (Lantana), *Ligustrum lucidum* (Large-leaved Privet), *Nephrolepis cordifolia* (Fishbone Fern), *Ochna serrulata* (Mickey Mouse Plant) and *Olea europaea* subsp. *cuspidata* (African Olive).

Asparagus aethiopicus, *Lantana camara* and *Olea europaea* subsp. *cuspidata* are listed as priority weeds under the Biosecurity Act 2015. Priority weeds should be prioritised for removal within the Subject Site.

Objectives

- Active removal of environmental and priority weeds that occur within the zone.
- To revegetate the zone with locally occurring native species representative of the surrounding vegetation community (Coastal Sandstone Foreshore Forest [PCT 1778]) by predominately planting groundcovers and shrubs to stabilise the zone, prevent erosion and establish native understory cover.
- To reduce environmental and priority weeds and prevent further colonisation of priority weeds within the zone.
- Improve the visual amenity of Kurraba Reserve.

Management Requirements**Weed Removal & Management**

- Active removal of environmental and priority weeds that occur within the zone using a staged approach (**Appendix C**).
- Prevent further establishment and encroachment of priority weeds within this zone and to other areas.
- This zone is situated on steep terrain however bush regeneration works within this zone will most likely not require rope works.

Revegetation

- Active revegetation through planting to achieve species richness and densities expected in natural occurrences of the surrounding vegetation community.
- See **Table 1** for recommended species list for planting and associated planting densities.

Erosion Control

- Adequate erosion and sediment measures must be ready to be installed immediately following any weed removal from this zone to avoid sediment run off and stabilise the embankment.
- Preceding construction works, the 'Blue Book' (Landcom 2004) should be consulted to ensure any additional necessary erosion controls are adequately installed.
- A combination of coir logs and horizontal log palisades (using logs taken from woody weed removal) to create terraces to help reduce erosion is recommended.

Monitoring and Reporting

- See **Section 1.6.2** for details on monitoring and reporting obligations.

Zone 2: Cliffside Terrain**Total area: 0.07 ha****Description**

Vegetation within this zone was largely comprised of exotic species including: *Asparagus aethiopicus* (Asparagus Fern), *Ageratina adenophora* (Crofton Weed), *Chrysanthemoides monilifera* (Bitou Bush), *Ehrharta erecta* (Panic Veldtgrass), *Ligustrum lucidum* (Large-leaved Privet), *Ochna serrulata* (Mickey Mouse Plant), *Pinus* spp. and *Tradescantia fluminensis* (Trad). Native species included *Ficus rubiginosa* (Port Jackson Fig) in the canopy and *Kunzea ambigua* (Tick Bush), *Lomandra longifolia* (Spiny-headed Mat-rush) and *Westringia fruticosa* (Coastal Rosemary) in the mid and understory.

Asparagus aethiopicus and *Chrysanthemoides monilifera* are listed as priority weeds under the Biosecurity Act 2015. Priority weeds should be prioritised for removal within the Subject Site.

Objectives

- Active removal of environmental and priority weeds that occur within the zone.
- To revegetate the zone with locally occurring native species representative of the surrounding vegetation community (Coastal Sandstone Foreshore Forest [PCT 1778]) by predominately planting groundcovers and shrubs to stabilise the zone, prevent erosion and establish native understory cover.
- To reduce environmental and priority weeds and prevent further colonisation of priority weeds within the zone.
- Improve the visual amenity of Kurraba Reserve.

Management Requirements**Weed Removal & Management**

- Active removal of environmental and priority weeds that occur within the zone using a staged approach (**Appendix C**).
- Prevent further establishment and encroachment of priority weeds within this zone and to other areas.
- This zone is situated on steep terrain near a cliffs edge. Bush regeneration within this zone will require rope works.

Revegetation

- Active revegetation through planting to achieve species richness and densities expected in natural occurrences of the surrounding vegetation community.
- See **Table 1** for recommended species list for planting and associated planting densities.

Erosion Control

- Adequate erosion and sediment measures will be in place at all times during construction activities in case of sediment run off and/or disruption to soil profiles, particularly near the cliff's edge.
- Preceding construction works, the 'Blue Book' (Landcom 2004) should be consulted to ensure any additional necessary erosion controls are adequately installed.
- A combination of coir logs and horizontal log palisades (using logs taken from woody weed removal) to create terraces to help reduce erosion is recommended.

Monitoring and Reporting

- See **Section 1.6.2** for details on monitoring and reporting obligations.

Table 1. Recommended species for planting, based on Coastal Sandstone Foreshores Forest (PCT 1778; OEH 2016).

Strata	Density	Scientific Name	Common Name		
Tree	6-10 Canopy trees across the Subject Site	<i>Angophora costata</i>	Sydney Red Gum		
		<i>Banksia integrifolia</i>	Coast Banksia		
		<i>Eucalyptus botryoides</i>	Bangalay		
		<i>Eucalyptus pilularis</i>	Blackbutt		
		<i>Eucalyptus piperita</i>	Sydney Peppermint		
Small Tree / Shrub		<i>Acacia longifolia</i>	Golden Wattle		
		<i>Allocasuarina littoralis</i>	Black She-oak		
		<i>Breynia oblongifolia</i>	Coffee Bush		
		<i>Dodonaea triquetra</i>	Large-leaf Hop-bush		
		<i>Elaeocarpus reticulatus</i>	Blueberry Ash		
		<i>Glochidion ferdinandi</i>	Cheese Tree		
		<i>Myrsine variabilis</i>	Brush Muttonwood		
		<i>Notelaea longifolia</i>	Large Mock-olive		
		<i>Pittosporum undulatum</i>	Native Daphne		
		<i>Polyscias sambucifolia</i>	Elderberry Panax		
		Groundcovers (grasses, forbs and ferns)	5 plants per m ² , being 3x grass/ground covers; 1-2 shrubs and/or a vine/scrambler	<i>Dianella caerulea</i>	Blue Flax-lily
<i>Entolasia stricta</i>	Wiry Panic				
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass				
<i>Lepidosperma laterale</i>	Variable Sword-sedge				
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush				
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass				
<i>Poa affinis</i>	Tussock Grass				
<i>Lobelia purpurascens</i>	Whiteroot				
<i>Pteridium esculentum</i>	Common Bracken				
<i>Themeda australis</i>	Kangaroo Grass				
<i>Xanthorrhoea arborea</i>	Broad-leafed Grass Tree.				
Vines & Climbers				<i>Billardiera scandens</i>	Hairy Apple Berry
				<i>Glycine clandestina</i>	Twining Glycine
		<i>Pandorea pandorana</i>	Wonga Wonga Vine		
		<i>Smilax glyciphylla</i>	Sweet Sarsaparilla		



Figure 2. Vegetation and steep slope within the Subject Site.

1.4 Work Schedule / Timing

Task	Process for Completion	Time Required (estimate)	Responsibility	Scheduling							
				Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
Appointment of relevant contractors	<ul style="list-style-type: none"> Appointment of a Qualified Project Ecologist to undertake annual monitoring. 	By the end of the first year.	Proponent or Project Manager acting on behalf of the Proponent	✓							
	<ul style="list-style-type: none"> Appointment of a Qualified Bushland Regenerator Contractor to undertake weed removal and planting for revegetation. 	At commencement of construction works.		✓							
Implement Hygiene Protocol	<ul style="list-style-type: none"> Phytophthora and Myrtle Rust are pathogens which can be spread through infected soil, with potentially large detrimental impact. The risk to biodiversity related to each pathogen has resulted in them being listed as 'Key Threatening Processes' under the BC Act 2016. The report, 'Arrive Clean, Leave Clean' (Commonwealth of Australia 2015) provides further information and best practice methods to reduce spread of these pathogens between work Subject Sites. Basic Phytophthora prevention measures include: Ensuring that all tools, shoes, vehicles (including tyres) and machinery are clean and made free of attached soil or mud prior to arrival at the site. 	Required at all stages of construction, weed management, erosion control, revegetation and annual monitoring.	Contractor, Project Ecologist, Bush Regeneration Contractors, Land Owner	✓	✓	✓	✓	✓	✓	✓	
Erosion Control	<ul style="list-style-type: none"> Adequate erosion and sediment measures must be in place at all times during construction activities in case of minor sediment run off and/or disruption to soil profiles. Preceding construction works, the 'Blue Book' (Landcom 2004) should be consulted to ensure any additional necessary erosion controls are adequately installed. Appropriate sediment control should be installed around the construction area prior to any excavation works being undertaken, where possible. A combination of coir logs and horizontal log palisades (using logs taken from woody weed removal) to create terraces to help reduce erosion is recommended (2 days rope team \$3,664.00 + 2 person days \$944 + stakes and coir logs ~\$2,000). 	Refer to Appendix B.	Bush Regeneration Contractors	✓	✓						
Primary Weeding	<ul style="list-style-type: none"> Weeding to be staged following Appendix B and Appendix C to avoid potential erosion. All exotic vegetation removed must be taken from site and disposed of at an appropriate green waste facility. Scrape and paint method should be used to treat any exotic vines. Periodic removal of woody weeds to be conducted using the cut and paint and scrape and paint methods, as to not displace any fauna species. <i>Ochna serrulata</i> to be removed using Vigilant II herbicide. <i>Asparagus aethiopicus</i> to be removed by crowning large specimens. Regrowth or seedlings to be carefully spot sprayed with herbicide. Perform careful mosaic spraying using enviro-friendly Roundup Bioactive to target pockets of weeds where minimal native collateral damage is likely to occur to promote natural regeneration. 	Refer to Appendix B.	Bush Regeneration Contractors	✓	✓						
Secondary Weeding	<ul style="list-style-type: none"> Continue periodic removal of all woody weeds. Continue careful mosaic spraying method to target large pockets of weeds remaining to promote natural regeneration. Follow up spraying or digging out of any remaining <i>Asparagus aethiopicus</i> cut and paint any remaining <i>Lantana camara</i> and <i>Chrysanthemoides monilifera</i>. 	Refer to Appendix B.	Bush Regeneration Contractors		✓	✓					
Maintenance Weeding	<ul style="list-style-type: none"> Bush regenerators to sweep through the site targeting any regrowth of <i>Asparagus aethiopicus</i>, <i>Chrysanthemoides monilifera</i>, <i>Lantana camara</i> and <i>Olea europaea</i> 	Refer to Appendix B.	Bush Regeneration Contractors			✓	✓	✓	✓	✓	

Task	Process for Completion	Time Required (estimate)	Responsibility	Scheduling						
				Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
	subsp. <i>cuspidata</i> species using hand weeding, spot spraying or the cut and paint method.									
Native Vegetation Replanting	<ul style="list-style-type: none"> All replanting efforts are to be focused equally into Management Zones 1 and 2. Plantings should be conducted in areas that has been previously cleared of weeds to reduce the risk of smothering and increase survival potential. Hiko cells are the preferred method of revegetation for tree and shrub species. Planting should be carried out using hand tree planting tools and should be conducted in the following method: <ul style="list-style-type: none"> Dig a hole at least twice the size of the tube / pot (min 300 x 300 x 200mm deep); Disturb the surrounding substrate up to 100mm to avoid leaving 'clean' sides and base of the hole, particularly when an auger has been used to dig the hole; Add a slow release fertiliser and soil-wetting agent to the base of the well and cover with a small amount of existing soil, or mix in with the soil to be placed back around the plant. Avoid any contact of the fertiliser and soil-wetting agent with the plant roots; Plant the seedling slightly below the soil level and back-fill the hole with existing soil, covering the top of the potting mix. Create a small well to the catch water; Water each plant thoroughly within 1 hour of planting. 	Refer to Appendix B.	Bush Regeneration Contractors			✓				
On-going Maintenance	<ul style="list-style-type: none"> Watering of plantings, 6-8 weekly during winter; Plantings to be replaced if observed to be dead within 6 months of planting. 	Refer to Appendix B.	Bush Regeneration Contractors/Landscape Gardener			✓	✓	✓	✓	✓
Formal Monitoring and Reporting	<ul style="list-style-type: none"> Assess progress of revegetation, weed removal and erosion control through annual monitoring including photo monitoring plots. 	<p>General monitoring done annually (spring): 1 person/1-day Project Site visit, 2 days for monitoring report preparation. Reporting will be undertaken yearly following the commencement of the VMP. Monitoring reports provided to Council upon completion.</p>	Project Ecologist	✓	✓	✓	✓	✓	✓	✓

For further detail regarding the works program see **Appendix B**

1.5 Performance Criteria

Objective	Applicable Management Zones	Key Performance Indicator (KPI)	How will this KPI be Assessed?	Designated time to meet KPI	If KPI cannot be met by designated time
Native replanting	All Zones	Revegetation within Zones 1 and 2 should follow the timeframe outline in Appendix B . Planting will be undertaken to fulfil the remaining required density for each stratum. Species selection should largely reflect the list in Table 1 . Additional native species not listed in Table 1 may be necessary following primary weed removal for soil stabilisation.	Determined by the Project Ecologist through a site assessment to review species selection, as well as assessment of the planting schedule provided by the Bush Regenerator.	Refer to Appendix B .	Proponent to increase Bush Regeneration Contractors visits to install new plantings until KPI is met.
Achieve proposed planting densities	All Zones	Planting densities should aim to achieve: <ul style="list-style-type: none"> 5 plants per m² (3x grass/ground covers; 1-2 shrubs and/or vine/scrambler) Canopy: 6-10 trees across the Subject Site 	Determined by the Project Ecologist through a site assessment, as well as assessment of the planting schedule provided by the Bush Regenerator.	Within three (3) months after secondary weeding has been completed.	Proponent to increase Bush Regeneration Contractors visits to install new plantings until KPI is met.
On-going survival of native tree and shrub plantings.	All Zones	Native tubestock and mature stock survival to be maintained at 80% of the initial planting effort. This will be assessed through an abundance count of living plantings within each zone.	This is determined by the Project Ecologist permanent photo points within the Subject Site, as well as assessment of the planting schedule provided by the Bush Regenerator.	On-going basis for life of this VMP	Purchase and install the required number of plants in order to bring the total percentage survival rate (of the initial plantings) to 80%.
Control priority weeds	All Zones	It is recommended that a reduction in priority weeds by a minimum of 90% per year across all management zones over the life of the VMP.	Determined by the Project Ecologist through a site assessment and subsequent weed mapping.	By the completion of this VMP.	Land owner to increase Bush Regeneration Contractors visits to install new plantings until KPI is met.
Control environmental weeds	All Zones	Environmental weeds (with the exception of canopy species) to be reduced by a minimum of 50% per year across all management zones over the life of the VMP.	Determined by the Project Ecologist through a site assessment and subsequent weed mapping.	By the completion of this VMP.	Land owner to increase Bush Regeneration Contractors visits to install new plantings until KPI is met.
Review of the VMP Document	All	This VMP document is reviewed by a qualified Ecologist with experience in preparing VMPs.	An Ecologist will review this VMP by the date that is exactly 6.75 years from the adoption of this VMP. An ecologist may undertake a site survey and photograph all photo monitoring points and produce a report that compares all of the data from the previous years before reviewing the VMP. This may include preparation of a weed density map. The review will allow the VMP to be updated to best reflect the condition and requirements of the site.	6.75 years from the date of adoption of this VMP.	N/A

1.6 Additional Management Actions and Details Applicable to all Management Zones:

1.6.1 Management Requirements

Weed Removal & Management

- Weed control should be undertaken using a staged approach incorporating three levels of treatment: primary weed removal; followed by secondary treatment and from thereon maintenance weeding;
- Weed management is to be undertaken throughout all management zones targeting weed infestations and ensuring no weed encroachment into the surrounding properties and bushland;
- Weeding techniques, such as scrape and paint, cut and paint or hand removal, should be used within the Subject Site. Herbicide spraying may be required to control larger weed infestations (see table below);
- All weeds removed are to be bagged, removed from site and disposed of in green waste bins or at a registered waste facility.
- Performance criteria:
 - Specified weed densities achieved and maintained;
 - Less than 5% priority weeds present within Management Zones by the end of the VMP; and,
 - Annual and environmental weeds maintained to low levels (not spreading or impacting native plant species growth or regeneration).

Technique	Method
Cut and Paint	Woody weeds (such as <i>Olea europaea</i> subsp. <i>cuspidata</i> and <i>Lantana camara</i>) are to be treated using the cut and paint method, which involves the cutting of the stem approximately 3cm off the ground and applying herbicide to the freshly exposed stem. <i>Ochna serrulata</i> to be treated with the Vigilant II herbicide using the cut stump/stem injection application.
Scrape and Paint	Weeds with a deep tap root will need to be treated using the cut and paint method which involves taking a knife and scrapping up the stem from the base to as high as possible and then applying herbicide to the exposed section of the stem.
Manual Removal	Weeds such as <i>Asparagus aethiopicus</i> will be required to be dug out with a trowel or shovel. Trying not to remove too much soil you must dig to expose and remove the crown.
Herbicide Usage	Perform careful mosaic spraying using enviro-friendly Roundup Bioactive to target pockets of weeds where minimal native collateral damage is likely to occur to promote natural regeneration.

• 1.6.2 Monitoring Specifications

Annual Monitoring Details

- Vegetation monitoring is to be completed on an annual basis (in spring time) by a suitably qualified Ecologist.
- The following data should be recorded within each zone during the site assessment:
 - Weed map and associated weed list; and,
 - Photographic monitoring at each of the proposed photo point locations (Table 2, Appendix 2).

1.6.2 Reporting and Review

- Reporting is required after each monitoring event in the form of a concise report including key observations and supporting photographic evidence.
- Monitoring reports are to be produced annually following monitoring events (Spring). These are to be produced by a suitably qualified Ecologist.
- Monitoring reports are to include the following:
 - A site assessment based on performance targets;
 - Presentation of photographic evidence in relation to designated photo points;
 - Any management issues/recommendations required to meet performance targets;
 - Updated work specifications as required to meet performance targets; and
 - Management/maintenance requirements or recommendations to inform any subsequent management of the site (beyond the 1st year maintenance period).
- This VMP should be reviewed by a qualified Ecologist at least every two (2) years from the date of its adoption.

Table 2. Photo Point Monitoring Locations.

Management Zone	Photo Point	Coordinates		Bearing
		Latitude	Longitude	
1	1	-33.845490°	151.223386°	225
2	2	-33.845825°	151.223459°	335
2	3	-33.845111°	151.223262°	140

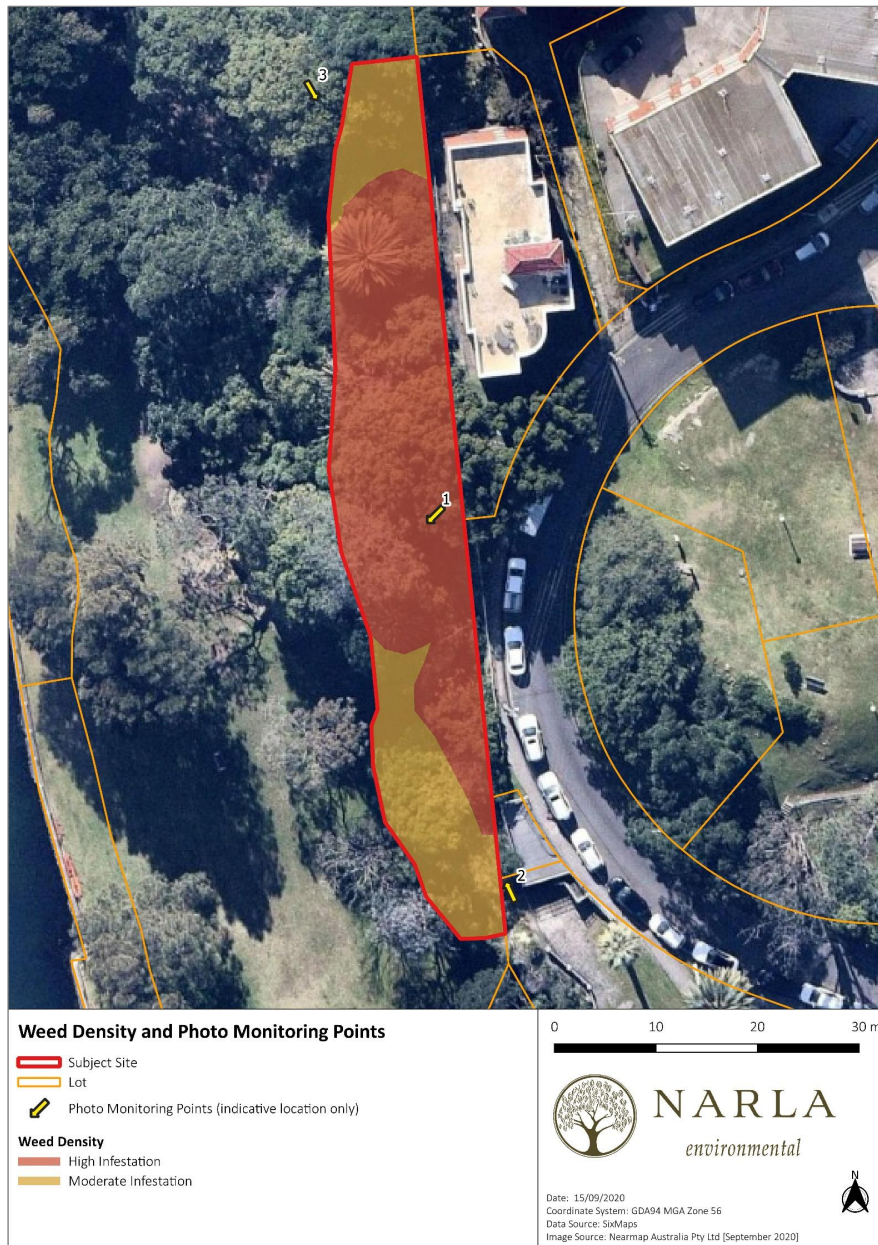


Figure 3. Weed Density Map.

Table 3. Weed Species Identified in the Subject Site.

Scientific Name	Common Name	Priority	Biosecurity Duty
<i>Ageratina adenophora</i>	Crofton Weed		
<i>Arundo donax</i>	Giant Reed		
<i>Asparagus aethiopicus</i>	Asparagus Fern	x	Prohibition on dealings – must not be imported into the State or sold
<i>Bambusa spp.</i>	Bamboo		
<i>Bidens pilosa</i>	Cobblers Pegs		
<i>Chrysanthemoides monilifera</i>	Bitou Bush	x	Prohibition on dealings – must not be imported into the State or sold
<i>Ehrharta erecta</i>	Panic Veldtgrass		
<i>Ficus pumila</i>	Creeping Fig		
<i>Jacaranda mimosifolia</i>	Blue Jacaranda		
<i>Lantana camara</i>	Lantana	x	Prohibition on dealings – must not be imported into the State or sold
<i>Ligustrum lucidum</i>	Large-leaved Privet		
<i>Nephrolepis cordifolia</i>	Fishbone Fern		
<i>Ochna serrulata</i>	Mickey Mouse Plant		
<i>Olea europaea subsp. cuspidata</i>	African Olive	x	The plant or parts of the plant are not traded, carried, grown or released into the environment.
<i>Parietaria judaica</i>	Pellitory		
<i>Pinus spp.</i>	Pine		
<i>Tradescantia fluminensis</i>	Trad		

References

- Landcom (2004) Managing Urban Stormwater: Soils and Construction 'The Blue Book', Volume 1, Fourth Edition, New South Wales Government, ISBN 0-9752030-3-7
- North Sydney Council (2013) North Sydney Development Control Plan. https://www.northsydney.nsw.gov.au/Building_Development/LEP_DCP/Development_Control_Plan#1
- NSW Department of Primary Industries (2020) NSW WeedWise <https://weeds.dpi.nsw.gov.au/>
- Office of Environment and Heritage (OEH) (2016) Native Vegetation of the Sydney Metropolitan Area. Volume 2: Vegetation Community Profiles. Version 3.0. NSW office of Environment and Heritage, Sydney.

1.7 Appendices

Appendix A. Photos of the Subject Site.



Appendix B. Staged Works Gantt Chart.

Quarter ending	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22	Mar-23	Jun-23	Sep-23
Quarter	1	2	3	4	5	6	7	8	9	10	11	12
Section 1												
Primary weeding	█											
Erosion control	█											
Secondary Planting		█	█	█	█	█						
Maintenance						0	1	2	3	4	5	6
Section 2												
Primary weeding		█										
Erosion control		█										
Secondary Planting			█	█	█	█	█					
Maintenance							0	1	2	3	4	5
Section 3												
Primary weeding			█									
Erosion control			█									
Secondary Planting				█	█	█	█	█				
Maintenance								0	1	2	3	4

Quarter ending	Dec-23	Mar-24	Jun-24	Sep-24	Dec-24	Mar-25	Jun-25	Sep-25	Dec-25	Mar-26	Jun-26	Sep-26
Quarter	13	14	15	16	17	18	19	20	21	22	23	24
Section 1												
Primary weeding												
Erosion control												
Secondary Planting												
Maintenance	7	8	9	10	11	12	13	14	15	16	17	18
Section 2												
Primary weeding												
Erosion control												
Secondary Planting												
Maintenance	6	7	8	9	10	11	12	13	14	15	16	17
Section 3												
Primary weeding												
Erosion control												
Secondary Planting												
Maintenance	5	6	7	8	9	10	11	12	13	14	15	16

Quarter ending	Dec-26	Mar-27	Jun-27	Sep-27								
Quarter	25	26	27	28								
Section 1												
Primary weeding												
Erosion control												
Secondary												
Planting												
Maintenance	19	20										
Section 2												
Primary weeding												
Erosion control												
Secondary												
Planting												
Maintenance	18	19	20									
Section 3												
Primary weeding												
Erosion control												
Secondary												
Planting												
Maintenance	17	18	19	20								

Appendix C. Areas of Staged Works Within the Subject Site.





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