Biodiversity Management Plan

39 Cabbage Tree Road, Bayview, NSW 2104

Report prepared by Narla Environmental Pty Ltd

for Turnbull Planning International Pty Ltd

October 2019

Issued By	Position	Role
Narla Environmental	Ecologist	Report Compilation
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CLIENT

Turnbull Planning International Pty Ltd
Biodiversity Management Plan
39 Cabbage Tree Road, Bayview, NSW 2140

NARLA

environmental

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Prepared by:	Narla Environmental Pty Ltd
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Biodiversity Management Plan

Management Zone 1 – Weed infested Coastal Flats Swamp Mahogany Forest (PCT 1795). Swamp Sclerophyll Forest EEC

Total proposed area: 568m²

Description

This zone encompasses the entirety of the Subject Site outside of the development footprint.

Vegetation within this zone was primarily compromised of weed infested PCT 1795: *Coastal Flats Swamp Mahogany Forest – Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* with scattered planted natives on its margins.

The aim of this management zone is to revegetate and rehabilitate the area with locally indigenous, native vegetation representative of the endangered ecological community, '*Coastal Flats Swamp Mahogany Forest – Swamp Sclerophyll Forest on Coastal Floodplains*'. The successful implementation of this BMP will result in enhancement and conservation of native vegetation representative of PCT 1795. Vegetative species and planting densities will be in accordance with the landscape plans and plant schedule developed by Pamela Fletcher 2019 with the support of Narla Environmental.

Management Requirements

Weed Control

- Remove and control of priority weeds that exist within the zone using manual removal and spot herbicide application; and
- Prevent further encroachment of weeds into the zone from adjoining areas.

Landscaping and Vegetation Rehabilitation

- All landscaping and revegetation efforts within the zone are to consist entirely of locally indigenous, native nursery stock representative of the endemic vegetation community PCT 1795.
- A list of suitable flora species is listed Error! Reference source not found.
- Plantings to be overseen by a Qualified Bush Regenerator.
- After planting, undertake at least 8 maintenance/watering visits for the first three months

Legend

- Subject Site
- Development Footprint
- Vegetation Management Zone

0 5 10 20 Metres

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Date: 23/08/2019

Coordinate System: GDA 1994 MGA Zone 56

ONGOING MANAGEMENT ACTIONS

Performance Criteria

Objective		Key Performance Indicator (KPI)	How will this KPI be Assessed?	Designated time to meet KPI	If KPI cannot be met by designated time
1	Installation of provisional fauna habitat (nest boxes)	Three (3) Nest boxes must be installed within the subject site in order to enhance local habitat for hollow-nesting fauna. Install at least 1 microbat, 1 small mammal and 1 parrot/hollow nesting bird box in trees that remain within the Subject Site. Nest boxes must be placed at least four meters high and be orientated to avoid the hot afternoon sun and prevailing storms. Where possible, nest boxes must be positioned away from buildings and roads in order to reduce light and sound exposure.	A letter report detailing the installation including, photographs, GPS location and mapping will be provided to Northern Beaches Council.	Prior to any removal of hollow bearing trees.	Refer to Northern Beaches Council biodiversity officer and install required nest boxes
2	Eradicate priority weeds across management zone 1	Priority weeds must be eradicated from the entire Subject Site within management Zone 1 (defined as the subject lot, as marked by a Surveyor) prior to Construction Certification.	This is determined by the Project Ecologist through a site assessment and randomised monitoring plots within the Subject Property.	Prior to construction certification.	Must be completed before Construction Certification.
3	Control all other (environmental) weeds and prevent encroachment by priority weeds.	After the initial eradication of priority weeds, ensure the subject lot remains covered by less than 5% weed species by the end of each maintenance period. A maintenance period equates a one-day site visit for a team of four Bush Regenerators every 6 months.	This is determined by the Project Ecologist who will confirm the removal of all environmental weeds within the management zone.	Within 12 months of bush regeneration works commission.	Double the number of site visits by Bush Regeneration team for the next 6 months or until KPI is met.
4	Control of vertebrate pests.	Control and management of vertebrate pests (e.g. Foxes and Rabbits) that are present on the Subject Site	Identification of any pest species relevant to the Northern Beaches Council Invasive Species Team.	Immediately report the positive identification of an invasive species relevant to the Northern beaches Council Invasive Species Team or equivalent.	Contact Northern Beaches Council Invasive Species Team in relation to further control methods.
5	Complete revegetation/planting effort	Landscaping of Coastal Flats Swamp Mahogany Forest – Swamp Sclerophyll Forest EEC vegetation within Management Zone 1 to be supervised by a qualified Bush Regeneration Contractor within 24 months of the Construction Certification.	By the Project Ecologist who will confirm the installation of the plants to the densities listed in **Error! Reference source not found.**.	Within 24 months of the Construction Certification.	A team of eight Bush Regeneration Contractors must be contacted immediately and plants must be installed within one month.
6	Survival of majority of tree and shrub plantings.	95% survival rate of all tree and shrub plantings installed within management Zone 1 over the life of the BMP.	This is determined by the Project Ecologist through undertaking monitoring and a count of individual plantings installed within management Zone 1.	By the end of each calendar year for the 5 years following the removal of the demountable structures.	A Bush Regeneration Contractor must be contacted in order to replace all plants that have not survived the initial establishment phase of the BMP. The owner must commission double the number of site visits commissioned for the following year, unless planting is completed before this time.

WORK SCHEDULE / TIMING

Task	Process for Completion	Time Required (estimate)	Responsibility	Scheduling					
				Year 1	Year 2	Year 3	Year 4	Year 5	Ongoing
Appointment of relevant Environmental Contractors	Appointment of a Qualified Project Ecologist	N/A	Proponent						
	Appointment of a Qualified Bushland Regenerator Contractor (minimum certificate three in Natural Area Restoration or equivalent).								
Installation of Nest Boxes and Monitoring	Commission Project Ecologist to supply and install three nest boxes.	Within 12 months of Construction Certification.	Project Ecologist						
Installation of Sediment Fencing and Controls	Installation of Sediment control surrounding the proposed construction area must be completed prior to any excavation or modification of vegetation for construction. Install fencing and signage at either end of Zones 1 to delineate the area to be conserved.	Once, prior to any excavation or tree clearing for construction works.	Environmental Engineer or Bush Regeneration Contractor						
Pre-clearing Survey & Clearing Supervision	Ecologist to conduct a pre-clearing survey no more than one week and no less than 8 hours prior to any required tree removal/lopping/felling or shrub slashing in order to capture, treat and relocate any native fauna that may be impacted by this process.	Once, prior to tree clearing/ vegetation modification and during tree/vegetation modification works.	Project Ecologist						
Installation of Signage	Install permanent, metal, educational signage on the boundaries of Management Zone 1 that identifies the conservation significant vegetation and how to protect it. Information within should be prepared by an Ecologist.	Within 12 months of Construction Certification.	Contractor Project Ecologist						
Active Regeneration (planting)	Revegetate Management Zone1with locally indigenous, native plants representative of the naturally occurring vegetation community *Coastal Flats Swamp Mahogany Forest – Swamp Sclerophyll Forest EEC vegetation* (**Error! Reference source not found.**).	Within 24 months of Construction Certification.	Landscaper supervised by a Qualified Bush Regeneration Contractor						
Assisted natural regeneration	Active removal of all Priority Weeds from management zone 1.	Within 24 months of Construction Certification.	Bush Regeneration Contractors						
Long term maintenance	Removal of weeds from management zone 1 to a level that comprises less than 5% of the total area of the Subject Site. Any repair or maintenance of signage or fences (incl. sediment fence)	As advised by Bush Regenerator or Ecologist. One visit for a team of four ever 6 months, or more/less in order to achieve KPI.	Bush Regeneration Contractors assessed by Project Ecologist	As required					
Formal Monitoring and Reporting	Assess progress of remediation and ongoing assisted natural regeneration works. Map any weeds. Provide recommendations for improvement of habitat, native vegetation or control of weeds.	Annually: 1 person/1-day site assessment visit, two-page report with GIS map.	Project Ecologist						
Control of Vertebrate pests	Active removal and monitoring of vertebrate pests from management zone 1 in accordance with Northern Beaches Council Invasive Species Team	As required	Project Manager / Proponent						

1. Management Actions applicable Management Zone 1:

1.1 Assigning a Project Ecologist

- Prior to commencement of any vegetation clearing/ modification, weed removal or construction works on the Subject Site, a Project Ecologist must be assigned to oversee relevant works and ensure all relevant parties are adhering to the recommendations of the Flora and Fauna Impact Assessment (Narla Environmental 2019). The Project Ecologist must as a minimum:
    - A relevant tertiary degree in Science, Biology, Ecology, Environmental Science, Environmental Management or Natural Resource Management,
    - be fully licensed under the Biodiversity Conservation Act 2016 (or equivalent) and,
    - be fully licensed with a NSW Animal Research Authority (or equivalent) permitting the handling, relocation and humane euthanasia of all terrestrial fauna

1.2 Assigning a Bush Regeneration Contractor

- All works associated with native vegetation and or flora providing habitat, including weed management works are to be implemented by a fully qualified and experienced Bush Regeneration Contractor with familiarity with the flora of the New South Wales North Coast, in particular, the floristics of the PCT 1795: Coastal Flats Swamp Mahogany Forest – Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. This person must have a minimum of a TAFE Certification in Conservation & Land Management or equivalent tertiary degree.

1.3 Weed Management

- Within 24 months of Construction Certification all 'priority weeds' are to be eradicated from the Subject Site by earthwork contractors or landscapers under the supervision of a qualified bush regenerator.
- From the date of Construction Certification onward, weeds must comprise less than 5% of the total area of the Subject Site
- All weeds removed are to be bagged, removed from site and disposed of at a registered waste facility.
- Weed infested topsoil must be treated under the guidance of a Bush Regenerator before replying to site. Stockpile site-sourced topsoil for a minimum of 12 months under cover to aid in controlling weed propagules, or else dispose of topsoil and reapply clean topsoil that is certified free of weeds.

1.3.1 Performance Criteria

- Specified weed densities per management zone achieved and maintained;
- Specified site visit frequency fulfilled;
- No priority weeds present within Management Zones; and
- Annual and environmental weeds maintained below 5% cover

1.4 Stormwater Management

- Sedimentary and erosion controls measure should be put in place for the entirety of the development process in accordance with B5.12 Stormwater Drainage Systems and natural Watercourses of the Pittwater DCP.

1.5 Erosion Control

- In pre-emptive action, adequate erosion and sediment measures will 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 traps should be installed around the construction area prior to any excavation works being undertaken.

1.6 Hygiene Protocol

- 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.
- As a precautionary measure, hygiene procedures are essential across the site.
- Such hygiene protocols have the additional benefit of limiting the potential to facilitate the introduction or spread of weed propagules to the subject site, which can be costly to manage later.
- Basic principles include avoiding transport of sediment onto and off site by cleaning all work clothing, gloves, tools and machinery. In some cases, a solution of 70% ethanol or methylated spirits in 30% water may be sufficient to disinfect equipment prior to use.
- 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.
- It is recommended that all future plantings considered within either zone be tested for Myrtle Rust prior to installation within the site.

1.7 Pre-Clearing Survey and Fauna Management

- A qualified Project Ecologist with experience in handling wildlife should be present on the Subject Site to conduct a pre-clearing survey prior to the removal or modification of any shrubs and/or trees to check for the presence of fauna that may be utilising vegetation as habitat.
- Pre-clearing survey must be undertaken no less than 8 hours prior to clearing to identify any nesting birds or sheltering fauna that require relocation
- An Ecologist must be on site during all tree/vegetation clearing/ modification to advise best practice tree felling protocol and capture, treat and/or relocate any fauna that have been displaced during tree/vegetation removal works.

2. Monitoring Specifications

2.1 Monitoring Quadrats

- Two randomised 5m x 5m monitoring quadrats are to be assessed by an Ecologist per, to record all indigenous and exotic species and abundance cover as a percentage of the plot.
- Photographs are to be taken from the southeast corner of the plot as a reference to the regeneration and maintenance of the Subject Site and included in annual monitoring reports.
- Monitor planted trees and shrubs to assess their condition and survival rate. Count stems of each size class. If plant survival rate in the designated area is less than 100% after 1-year, dead plants are to be replaced with healthy ones to the extent that the densities and types of plants are restored to at least 80% of the original planting density.
- Monitor the percentage of native ground cover across the Subject Site and track its regeneration against key performance criteria.

2.2 Monitoring Details

- Vegetation monitoring is to be completed on an annual basis (during Spring) by a suitably qualified Ecologist or Bush Regeneration Professional throughout Phase 3;
- General site-specific photographs should be collected within each zone;
- Monitoring plots are to be monitored as per the methodology listed within this Vegetation Management Plan;
- Vegetation condition within each monitoring plot is to be monitored against performance criteria;
- Floristic data to be collected within each quadrat are to include:
    - weed densities within each vegetation layer (ground, mid-strata, canopy);
    - full flora species list including native and weed species; and,
    - one photograph per plot to be collected of the groundcovers within the quadrat.

3. Reporting and Review

- Annual vegetation management reports are to be produced annually (late Winter – Spring) by a qualified Ecologist and is to include;
    - A summary of annual weed management works;
    - A site assessment based on performance targets;
    - Presentation of a map and photographic evidence to illustrate progress of weed management and native regeneration
    - Any management issues/recommendations required to meet performance targets
    - Update work specifications as required to meet performance targets
    - Management/maintenance requirements or recommendations to inform any subsequent management of the Site (beyond the 1st year maintenance period).
- This Vegetation Management Plan should be reviewed by a qualified Ecologist at least every five years from the date of its adoption

4. Nest Boxes

- In accordance with the Biodiversity Management Plan (Warringah Council 2014), the removal of any hollow bearing trees will be followed by the installation of artificial hollows (nest boxes).
- Three (3) Nest boxes must be installed within the subject site in order to offset the removal of One (1) hollow bearing tree. Nest boxes must include 1 microbat, 1 small mammal and 1 parrot/hollow nesting bird box.
- Nest boxes must be placed at least 6 meters high and be orientate between northwest and east to avoid the hot afternoon sun and dominant direction of storms.
- Where possible, nest boxes must be position away for buildings and roads in order to reduce light and sound exposure.

5. References

- Blue Sky Building Designs (2019) project number 2019031
- Department of Primary Industries (DPI) (2019) Priority Weeds for the Greater Sydney, NSW Weeds Wise https://weeds.dpi.nsw.gov.au/WeedBiosecurities?AreaId=102
- Narla Environmental (2019) Flora and Fauna Impact Assessment 39 Cabbage Tree Rd, Bayview, NSW, 2104 (Lot 2/-/DP531960)
- Northern Beaches Council (2016) Swamp Sclerophyll Forest on Coastal Floodplains profile https://www.northernbeaches.nsw.gov.au/environment/native-flora/swamp-sclerophyll-forest-on-coastal-floodplains [August 2018
- Office of Environment and Heritage (2019) Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological listing, NSW Scientific Committee- Final determination https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2004-2007/swamp-sclerophyll-forest-coastal-floodplains-endangered-ecological-listing
- Pamela Fletcher (2019) Landscape Plan for 39 Cabbage Tree Road, Bayview
- PlantNET (2019) The NSW Plant Information Network System, Royal Botanic Gardens and Domain Trust, Sydney. http://plantnet.rbgsyd.nsw.gov.au
- Sydney Water (2014), Stormwater connections to natural waterways, Eucalyptus Forest on Coastal Floodplains, https://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdcw/~edisp/dd_070246.pdf
- Warringah Council Biodiversity Management Plan Report Guidelines (2014) https://www.northernbeaches.nsw.gov.au/sites/default/files/Guideline_Preparing_Biodiversity_Management_Plan_0.pdf

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