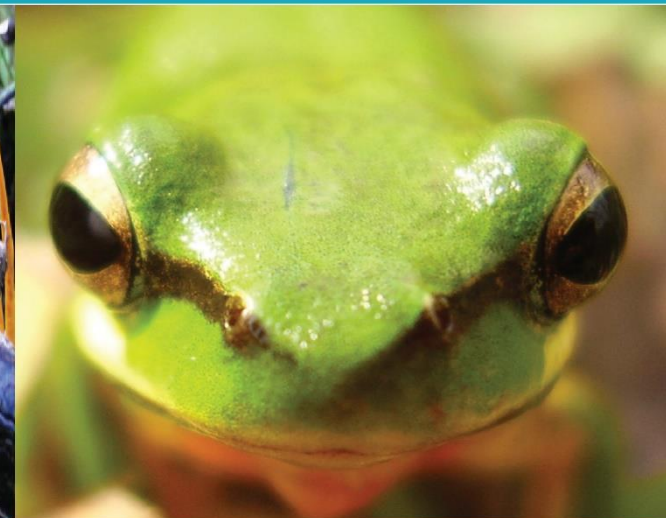




**TRIVERS
BUSHFIRE
& ECOLOGY**

A TBE ENVIRONMENTAL COMPANY



VEGETATION MANAGEMENT PLAN

Proposed Development

Lot 3, DP 584287

97-115 River Road,

GREENWICH

17 May 2022

(REF: 18TSA08VMP)

VEGETATION MANAGEMENT PLAN

**Project Name,
Greenwich Hospital**

Lot 3, DP 584287, 97-115 River Road, GREENWICH

Prepared for: TSA Management
 Prepared by: Travers bushfire & ecology
 Michael Sheather-Reid (B. Nat. Res. Hons.) – Managing Director – BAM accredited
 assessor
 Authors: Robert Sansom (B. Sc. Hons.) – Botanist / Ecologist
 Date: 7 March 2022

Contents

Vegetation Management Specifications	3
Site Preparation & Protection of Native Vegetation	3
Fencing	3
Weed Control	3
Herbicide Use	3
Revegetation Specifications	3
Project Management, Reporting & Auditing.....	3
Restoration Performance Targets	3
Program of Works	5
Hollow-bearing trees	6
Tree removal & hollow relocation strategy.....	6
Nest boxes	6

Tables

Table 1– Species List for Planting PCT 1828 (+Notes)	4
Table 2 - Program of Works	5
Table 3 - Data for Hollow-bearing trees to be removed.....	6
Table 4 - Recommended Dimensions for nest boxes.....	6

Figures

Figure 1 - Site Location (Source: SIX Maps)	2
Figure 2 – Typical Restoration Works Timeline (3 years maintenance)	5



Figure 1 - Site Location (Source: SIX Maps)



Lot 3, DP 584287, 97-115 River Rd.
GREENWICH

17 May 2022
Ref: 18TSA08VMP

Page 2 of 7

Vegetation Management Plan

VEGETATION MANAGEMENT SPECIFICATIONS

The purpose of this Vegetation Management Plan, is to define and document the actions required to fully restore 0.06 ha of Plant Community Type (PCT) 1841 – Coastal enriched sandstone moist forest – Smooth-barked Apple – Turpentine – Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region, partially revegetate 0.02ha of APZ lands, and to also manage 0.15ha of PCT 1821 and 0.03ha of PCT1828 - Coastal sandstone gallery rainforest within Lot 3 DP 584287. These PCTs are not directly commensurate with any Threatened Ecological Community (TEC) listed under the NSW *Biodiversity Conservation Act* (2016) or listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999). However, PCT 1828 is associated as habitat for the *Hygrocybae community of Lane Cove Bushland Park* which is listed within the *NSW BC Act* (2016). It must be noted that PCT 1828 is not located in or near any proposed development areas and will be wholly retained and managed under this VMP.

The aims of this VMP include:

- Installation of permanent protection fencing and erosion control fencing;
- Engagement of a Project Ecologist to undertake ongoing monitoring, compliance inspections and certifications
- Engagement of a suitably qualified bushland regeneration team.
- Weed control and maintenance of replanted and managed areas for a period of not less than 5 years in accordance with the *Weed Eradication Management Plan* (WEMP) produced by *Travers bushfire and ecology*, Nov 2020);
- Restoration of PCT 1841 vegetation within the fully structured revegetation zones to create 0.06ha (600m²) of fully structured and diverse vegetation;
- Restoration of PCT 1841 disturbed vegetation within the APZ zones to create 0.02 ha (200m²) of vegetation to comply with OPA standards; and
- Management of the restored vegetation, protective fencing and 14x installed nest boxes for a period of 5 years, with regular inspections by the Project Ecologist and compliance certificates sent to Council.

SITE PREPARATION & PROTECTION OF NATIVE VEGETATION

The following site preparation must be undertaken:

- Install permanent protection fencing with three (3) locked access gates and fourteen (14) nest boxes as shown on Schedule 1 - Vegetation Management Plan. The restoration area boundary needs to be delineated in perpetuity;
- Sediment fencing is to be installed immediately adjacent or in conjunction with the permanent protection fencing for the duration of the maintenance period;
- Commence weed control within each section of the revegetation, in accordance with Enrichment planting and existing vegetation management areas prior to commencing planting / enrichment works.

FENCING

Permanent fencing has been installed on the north-eastern boundary of the restoration area and consists of 1.2-metre-high chain-link wire fencing with steel posts as shown in Schedule 1 - Vegetation Management Plan. This fencing shall contain three locked gates as shown in Schedule 1, and shall remain in place for the 5-year maintenance period and beyond.

WEED CONTROL

Primary (initial) weed control is to be undertaken prior to any site works to remove highly invasive weed propagules and the bulk of exotic ground layer grasses. All ground and shrub layer weed control works are to be undertaken by qualified personnel from an experienced bushland regeneration company utilising best practice restoration, revegetation and regeneration methods in accordance with the *Weed Eradication Management Plan* (WEMP) produced by (*Travers bushfire and ecology* Nov 2020).

HERBICIDE USE

The use of low residue and low toxicity herbicides is recommended in accordance with the manufacturer's labels. Only operators with Chemcert or equivalent training must undertake the spraying of weeds. The operator must evaluate the success of each treatment after a set period of time according to the labelled effective method of treatment of each species for each herbicide. Care must be taken when applying herbicides near water bodies due to the sensitivity of waterways and resident flora and fauna. All herbicides must be applied according to the herbicide usage label and provisions of the Protection of the Environmental Operations Act (NSW). Weeding within the permanently fenced restoration areas is to be undertaken by hand or via spot spraying and without the use of heavy machinery.

REVEGETATION SPECIFICATIONS

Table 1 provides a recommended revegetation species list. Only plant species typically occurring within PCT 1841 are to be utilised for revegetation purposes, any variation from Table 1 is to be approved by the Project Ecologist. All plants utilised for restoration are to be sourced from the local area, preferably within the Lane Cove local government area. A minimum of 20 native species shall be used as part of the revegetation works.

Revegetation planting is to be undertaken preferably in March / April or September / October to avoid mid-summer heat and potential frosts. Revegetation works shall include the planting of native tree, shrub and groundcover species commensurate with PCT 1841 as indicated in Table 1. The following densities and planting numbers are to be achieved within the fully structured revegetation zone:

- Trees – 1 tree per 50m² (12);
- Sub-Canopy – 1 per 30m² (20)
- Shrubs – 1 shrub per 10m² (60);
- Groundcovers – 3 groundcovers per 1m² (1,800);

NOTE: the above densities are for full restoration planting areas. Numbers of plants required are calculated within Table 1. As a minimum, holes for tree planting are to be twice the depth and twice the width of the pot size of the plant.

Maintenance:

All installed plantings are to be protected with a 2L cardboard box or corflute guards with small supporting stakes to protect from frost and grazing animals such as rabbits. Where necessary, Pindone rabbit baiting is to be undertaken 4 weeks prior to revegetation and throughout the entire maintenance period, (subject to Local Government guidelines).

Weed control works, bush regeneration and restoration are to be undertaken over a minimum maintenance period of five (5) years post construction. These works are to be monitored and audited by an appointed Project Ecologist to achieve the restoration performance targets.

It is expected that at least 95% of plantings will survive and will be progressively replaced if any plants are observed to die or be destroyed. If the success rate is less than this, contingency planting is to be undertaken to establish the performance targets required. Revegetation maintenance including weed control and replacement planting is to be undertaken over a 5-year minimum period. Watering of all revegetated areas is to be undertaken a minimum of once a week for the first six to eight weeks post planting, or as required in the event of a dry spell. A contingency revegetation component is to be undertaken equivalent to 15% losses of all installed plants which is approximately 1 tree, 3 sub-canopy, 9 shrubs and 270 groundcovers.

PROJECT MANAGEMENT, REPORTING & AUDITING

The following project management tasks are to be undertaken:

1. Engagement of qualified and experienced bushland regeneration contractors to undertake all restoration works;
2. All plant stock is to be certified as local provenance from the supplier, with preference for seeds collected from similar community types;
3. Engagement of a Project Ecologist to undertake auditing, reporting and compliance certification;
4. Photo points and monitoring quadrats are to be set up at the beginning of contract work to be monitored at least annually for 5 years; and
5. A compliance statement is to be submitted to Council upon completion of the revegetation works (practical completion) and at the end of each year for 5 years maintenance period assessing compliance with the stipulated restoration performance targets.

RESTORATION PERFORMANCE TARGETS

The following restoration performance targets are to be audited and compliance certificate issued by the project ecologist demonstrating satisfactory completion of the works in the Vegetation Management Plan and as shown on Schedule 1.

1. A 1.2-metre-high permanent chain-link wire protective fence with steel posts is to be installed between the proposed development and the native vegetation restoration area as shown in Schedule 1 – Vegetation Management Plan.
2. Three (3) locked access gates are to be installed within the fence as shown in Schedule 1 – Vegetation Management Plan.

3. Final weed coverage will not exceed more than 5% coverage at the end of Year 1 and 3% at the end of Year 2 and is to be free of invasive environmental weed species listed for the Greater Sydney Region within the NSW *Biosecurity Act* (2015);
4. Native vegetation within the fully structured restoration area is to comply with the minimum of 1 tree every 50m², 1 Sub-canopy every 30m², 1 shrub per 10m² and 3 groundcovers per 1m².
5. A minimum of 20 locally occurring native species commensurate with PCT-1841 as specified in Table 1 are to be utilised in the revegetation works within the restoration area.
6. There is to be no evidence of bare patches or areas of potential soil erosion.
7. A minimum of 95% plant survival is to be achieved, and natural growth rates and plant cover is to be typical of the PCT-1841 vegetation type after 5 years.
8. Fourteen (14) nest boxes will be installed within the restoration area prior to the felling of any hollow bearing trees. These nest boxes will consist of three (3x) small bird, 3x medium bird, 4x large bird/owl and 4x Microbat boxes which are to be inspected and maintained for the whole of the maintenance period of 5 years.



Lot 3, DP 584287, 97-115 River Rd,
GREENWICH

17 May 2022
Ref: 18TSA08VMP

Page 3 of 7

Vegetation Management Plan

MANAGEMENT OF THE APZ AREA

APZs are required to be managed in accordance with RFS guidelines *Standards for Asset Protection Zones* (RFS, 2005), with landscaping design to comply with Appendix 4 of *PBP*.

It is recommended that the entire site be managed as an Inner Protection Area (IPA), with the exception of the currently vegetated area to be managed under the Vegetation Management Plan (VMP). The area managed under the VMP will be managed as an Outer Protection Area (OPA)

The specifications required for an OPA are as follows:

Fuel loads within the OPA are to be maintained so it does not exceed 8t/ha.

Trees are to be maintained to ensure;

- Canopy cover does not exceed 30%; and
- Canopies should be separated by 2 to 5m:

Shrubs are to be maintained to ensure;

- They do not form a continuous canopy; and
- Shrubs should be no more than 20% of ground cover.

Grass is to be maintained to ensure:

- Grass should be kept mown to a height of less than 100mm; and
- Leaves and debris should be removed.

General advice for landscaping is provided below:

- Suitable impervious areas being provided immediately surrounding the building such as courtyards, paths and driveways;
- Restrict planting in the immediate vicinity of the building which may over time and if not properly maintained come into contact with the building;
- When considering landscape species consideration needs to be given to estimated size of the plant at maturity;
- Avoid species with rough fibrous bark, or which retain/shed bark in long strips or retain dead material in their canopies;
- Use smooth bark species of trees species which generally do not carry a fire up the bark into the crown;
- Avoid planting of deciduous species that may increase fuel at surface / ground level (i.e. leaf litter);
- Avoid climbing species to walls and pergolas;
- Locate combustible materials such as woodchips / mulch, flammable fuel stores away from the building;
- Locate combustible structures such as garden sheds, pergolas and materials such timber garden furniture away from the building; and
- Use of low flammability vegetation species.

Table 1– Species List for Planting PCT 1841 (+Notes)

RESTORATION SPECIES LIST _ PCT 1841				
Scientific Name	Common Name	No.	Sub Total	Total
Canopy species Full Revegetation (0.06ha = 600m ²) - 1 per 50m ²			12	
Canopy species shrubs & groundcovers only (0m ²) - 1 / 100m ²			0	
Angophora costata	Sydney Red Gum	4		
Eucalyptus pilularis	Blackbutt	2		
Eucalyptus piperita	Sydney Peppermint	4		
Eucalyptus saligna	Sydney Blue Gum	2		
				12
Sub-canopy species Full Revegetation (0.06ha = 600m ²) - 1 / 30m ²			20	
Sub-canopy species shrub & groundcovers only (0m ²) - 1 per 60m ²			0	
Allocasuarina torulosa	Forest Oak	2		
Ceratopetalum apetalum	Coachwood	2		
Elaeocarpus reticulatus	Blueberry Ash	4		
Glochidion ferdinandi	Cheese Tree	6		
Pittosporum undulatum	Sweet Pittosporum	6		
				20
Shrubs Full Revegetation (600m ²) - 1 per 10m ²			60	
APZ Shrubs & Groundcovers only (0.02ha = 200m ²) - 1 per 20m ²			10	
Acacia longifolia	Sydney Golden Wattle	17		
Dodonaea triquetra	Hop-bush	12		
Polyscias sambucifolia	Elderberry Panax	12		
Notelaea longifolia	Large Mock-olive	12		
Breynia oblongifolia	Coffee Bush	17		
				70
Groundcovers Full Revegetation (600m ²) - 3 per 1m ²			1,800	
APZ Shrubs & Groundcovers only (0.02ha = 200m ²) - 3 per 2m ²			600	
Calochlaena dubia	Rainbow Fern	160		
Dianella caerulea	Blue Flax-lily	50		
Entolasia marginata	Bordered Panic	400		
Entolasia stricta	Wiry Panic	600		
Gonocarpus teucroides	Germander Raspwort	50		
Lepidosperma laterale	Variable Sword Sedge	60		
Lomandra longifolia	Spiky-headed Mat-rush	40		
Microlaena stipoides	Weeping Grass	500		
Poa affinis	-	540		
Total No. of plants for Full revegetation 600m ²				1,892
Total No of plants for Shrub and Groundlayer planting 200m ²				610
Total No. of plants				2,502
Note: In instances where species are unavailable, different species from the same family may be substituted upon approval from the project ecologist				



Lot 3, DP 584287, 97-115 River Rd,
GREENWICH

17 May 2022
Ref: 18TSA08VMP

Page 4 of 7

Vegetation Management Plan

PROGRAM OF WORKS

The program of works (Table 2) is aimed at providing a management framework for enacting works such as undertaking revegetation, maintenance, monitoring and review works required for the site. Site rehabilitation, including weed control works is to be undertaken in accordance with the Schedule 1 – Vegetation Management Works. A typical timeline of works is shown on Figure 2. For the purposes of the program of works, the listed tasks are divided into the following stages.

Pre-restoration Works (prior to vegetation restoration works) - All site preparation activities prior to the commencement of vegetation restoration works on site and generally excludes any landscaping and planting works.

Restoration Works - Period during which primary restoration works are completed. *Primary Restoration Works*, as defined under this VMP, include the completion of primary and secondary weed control, protective fencing and planting works. Practical completion of the primary restoration phase is determined by the project ecologist at which point all primary restoration actions need to have been completed and the installed plants are well established only requiring periodic maintenance or watering. Should there be a delay in the completion of works, for any reason, then the vegetation restoration works phase may be extended.

Post Restoration Works - Consist of maintenance activities, unless further contingency works are identified by the project ecologist for auditing, fulfilment of the performance targets, or other purposes. Maintenance will be undertaken by a fully qualified bush regeneration crew for a minimum of three (3) years post completion of primary restoration works.

Table 2 - Program of Works

Action	Responsibility
Stage 1 – Pre-restoration works	
<ul style="list-style-type: none"> Formation of site management team and establish supervision and consultation processes – minimum Project Ecologist, qualified bushland restoration contractor and site manager Erection of erosion control fencing Installation of primary exclusion / protection fencing and access gates Commencement of primary weed control Commencement of seed collection and propagation contracts Provide certificates of compliance 	<ul style="list-style-type: none"> Site project manager Site manager / project ecologist Project manager Suitably qualified bushland restoration contractor Bushland restoration contractor / project ecologist Project ecologist Project Ecologist
Stage 2 – Restoration works	
<ul style="list-style-type: none"> Supervision of any vegetation and management works Monitor erosion control measures (monthly – especially after heavy rain) and replace if required Waste removal and soil amelioration works to control weed infestations and provide suitable restoration soil base. Complete revegetation works Commencement of secondary weed control and maintenance weed control Maintenance of fencing and signage around protected vegetation Continuation of primary restoration and revegetation works Provide certificates of compliance at practical completion 	<ul style="list-style-type: none"> Site project manager in association with the project ecologist Contractor with advice of project manager suitably qualified bushland restoration contractor Bushland restoration contractor / project manager Contractor / suitably qualified bushland restoration contractor Contractor Contractor / suitably qualified bushland regenerator Project ecologist
Stage 3 – Post Restoration Works	
<ul style="list-style-type: none"> Enrichment planting within revegetation areas if required. Continuation of regeneration and weed control maintenance Monitoring of retained vegetation at six (6) months, twelve (12) months and annually for five (5) years post construction stage. Conduct maintenance beyond five (5) years as required Provide certificates of compliance at end of each year during the 5-year maintenance period 	<ul style="list-style-type: none"> Qualified bushland restoration contractor with advice of project ecologist Contractor / suitably qualified bushland regenerator Project ecologist Site manager with advice of project ecologist Project ecologist

The following typical timeline (Figure 2) is provided to indicate the overall timing of tasks required for the restoration works. The commencement of the maintenance period of five (5) years is subject to the completion of primary restoration works as certified by the project ecologist. A certificate of practical completion will be required as evidence of satisfactory completion prior to the commencement of the maintenance period.

The successful implementation of restoration works may affect the release of any required bonds as required. Upon engagement, contractors are expected to meet the following typical schedule of works.

Figure 2 – Typical Restoration Works Timeline (5 years maintenance)

ID	Task Name	Duration	Primary Restoration Works												Year 1 Maintenance												Years 2-5 Maintenance													
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
STAGE 1 - PRECOMMENCEMENT																																								
1.0	PROJECT INITIATION	1 month																																						
1.1	Confirm funding	1 month																																						
1.2	Preparation of contract schedules	1 month																																						
1.3	Submission of fee proposals	1 month																																						
1.4	Contractor approvals, engagement of project ecologist & bushland restoration contractor	1 month																																						
STAGE 2 DURING - CONSTRUCTION WORKS																																								
2.0	SITE PREPARATION AND PROPAGATION																																							
2.1	Pre-commencement vegetation condition assessment & installation of monitoring plots	1 day																																						
2.2	Install markers to delineate apz area	1 week																																						
2.3	Source Planting stock	3-6 months																																						
2.4	Installation of protective fencing and signage	2 weeks																																						
2.5	Install sediment and erosion control measures	2 weeks																																						
STAGE 3 - POST CONSTRUCTION WORKS																																								
3.0	WEED CONTROL																																							
3.1	Primary weed control	3-6 months																																						
3.2	Secondary weed control	3-4 months																																						
4.0	REVEGETATION WORKS	1-1.5yrs																																						
4.1	Site preparation - sediment and erosion control, removal of waste	1-5 days																																						
4.2	Construction works	6-12 months																																						
4.3	Revegetation works	1 months																																						
4.4	Regeneration works (if required)	3 months																																						
4.5	Initial watering & maintenance	9 months																																						
STAGE 3 - POST CONSTRUCTION WORKS																																								
5.0	BUSH REGENERATION & REVEGETATION MAINTENANCE																																							
5.1	Watering, maintenance, weed control and repairs	5 years																																						
5.2	Ongoing regeneration of existing bushland areas	5 years																																						
6.0	MANAGEMENT AUDITING AND MONITORING																																							
6.1	Contractor supervision / monitoring	5 years																																						
6.2	Ongoing supervision/auditing/monitoring	5 years																																						
6.3	Submission of annual reporting	5 years																																						
STAGE 3 - POST CONSTRUCTION WORKS																																								
7.0	CONTINGENCY & MAINTENANCE WORKS (Subject to Audits)																																							
7.1	Target noxious weeds	2 weeks																																						
7.2	Replacement planting	1 month																																						
7.3	Watering & maintenance	3-6 months																																						
7.4	Medium term maintenance	6 months																																						
7.5	Submission of compliance certification (to 5 yrs)	As required																																						

HOLLOW-BEARING TREES

A total of one (1) tree containing six (6) hollows is located within the allotment (*Travers bushfire & ecology*, Biodiversity Development Assessment Report, March 2021) (Table 3). This tree will be required to be removed by the proposed development.

Table 3 - Data for Hollow-bearing trees to be removed

Tag No.	Common Name	DBH (cm)	Spread (m)	Height (m)	Vigour (%)	Hollows recorded
HT001	Stag	60	6	8	0	2x 10-15cm spout hollow 2x 15-20cm branch spout 1x 20-30cm trunk hollow 1x 30-40cm trunk hollow

TREE REMOVAL & HOLLOW RELOCATION STRATEGY

The aim of the hollow relocation strategy is to protect and provide habitat for hollow-dependent threatened fauna species with most potential to occur. Where the felling of hollow-bearing trees is required, this is to be conducted under the supervision of a fauna ecologist to ensure appropriate animal welfare procedures are taken, particularly for threatened species.

Pre-clearing

At least one (1) weeks' notice will be needed prior to the planned date for clearing of any hollow bearing trees. This is required so as to allow for suitable time for inspections of trees for use by fauna and to plan for the safe felling of the tree/removal of fauna if present. After notice is given of the planned removal of trees a fauna ecologist will inspect the trees for use by fauna. This may include inspection of trees at sunset (stag watching) that allows for the detection of diurnal fauna returning to hollows or nocturnal fauna leaving, for the night. Inspections may also require camera probe inspection. All hollow-bearing trees proposed for removal shall be clearly marked with a 'H' Symbol to indicate removal under supervision by a fauna ecologist. A fauna ecologist is to be present at the removal of each habitat tree.

Hollows of high quality or with fauna recorded residing within are to be sectionally dismantled for relocation and all hollows are to be inspected for occupation, signs of previous activity and potential for reuse.

Subsequent hollows of retention value are to be relocated within remaining bushland areas within the study area. After modification for reinstallation the hollow section is to be reattached to a recipient tree within the nearby conservation areas as selected and directed by the fauna ecologist. The welfare and temporary holding of the residing animal(s) is at the discretion of the fauna ecologist. The hollow section should be well secured in the recipient tree in a manner that will not compromise the current or future health of that tree.

Where retained hollows are placed as on ground habitat and are not reattached to a new recipient tree then they are to be replaced with appropriately sized, high quality, long-life nest boxes.

During clearing

Where fauna is identified within a hollow and the risk of death or injury as a result of machine felling of the tree is high, the tree may need to be felled in sections. This will involve the removal of hollow limbs or sections by chainsaw with the hollow limb lowered to the ground for removal/relocation of fauna. These works are to be carried out by a suitably qualified arborist under the direction of the fauna ecologist.

All hollow limbs will be inspected after felling for occupation by fauna. Any fauna will be removed and relocated to adjoining bushland.

Where young fauna are identified within a hollow whose survival will be at risk as a result of the removal of the hollow or the felling of the tree, then clearing will not be carried out until those young are old enough to leave the hollow and the care of the parents. It is suggested therefore that clearing is not carried out during breeding times when young are likely to be present within hollows (spring-early summer).

Where possible, hollow limbs removed from trees will be collected by the fauna ecologist for re-erection in retained bushland on site. Any fauna injured during clearing will be handed to WIRES or veterinarian for care and rehabilitation.

NEST BOXES

Fourteen (14) nest boxes will be installed within the native vegetation restoration area under the guidance of a fauna ecologist. These nest boxes will replace any hollows that may be removed at a minimum ratio of 5 installed for every 1 removed. Nest boxes should be designed as follows:

- Four (4) nest boxes with 30cm entry suitable for forest owls
- Three (3) nest boxes with 15-20cm sized entry, suitable for large birds;
- Three (3) nest boxes with 60mm entries, suitable for lorikeets; and
- Four (4) nest boxes with 15-20mm slit entries, suitable for micro-chiropteran bats

Nest box design

- Timber is to be of high-grade ply 17+ mm thick (MDF, particle board and low-grade ply are not acceptable).
- The lid is to be hinged at the rear side of the box that is affixed to the tree to allow internal inspections from the front side. Lids are to be well sloped to the front to allow runoff by rain. Hinges are to be robust (not small) and made of brass, stainless steel or galvanised. Lids are to be larger than the overall cross-sectional size of the box and placed so that a small eave exists on all sides to prevent entry of rain.
- Two vertical timber supports (approximately 30x30mm timber strips 150 mm apart) are to be attached down the rear face of the box so that there are two points of attachment to the trunk on a curved surface and the box does not rock in the wind. This will also provide easy attachment points to the trees without having to screw through the inside of the box. These are to be made of treated pine and any screws into this (for hinges etc.) should be treated pine or stainless. Holes at both ends of both supports are to be predrilled for easy attachment to trees. Timber supports should not be placed directly onto the box but with small timber spacers so that an eave is permissible along this side of the roof.
- Joints are to be glued and screwed for strength. Glue should be labelled as non-toxic wood glue.
- All fasteners used are to be weather resistant stainless steel, galvanised or other. Screws into the treated pine supports are to be stainless steel or treated pine screws.
- All fasteners for tree attachment are to be supplied (stainless steel or treated pine coach screws). These are to be a suitable gauge depending the size of bow and suitable length to pass through the vertical timber supports, through the bark and cambium, and into a sufficient extent of heartwood. Heartwood penetration will depend on the size of the box. Screws for small boxes should extend a minimum of 20mm into the heartwood of hardwood eucalypts and medium boxes ~40mm. All boxes are to be screwed so that a small distance for growth exists between the timber supports and the trunk. This can be achieved with a small stainless sleeve over the screw.
- 5 mm drainage holes are to be drilled in each corner at the base.
- Exterior of the boxes (including treated pine supports) are to be painted with a primer and then a minimum of two coats of external non-alcohol based acrylic paint. The colour selected should be consistent with the colour of the recipient trunk and therefore recipient trees should ideally be prior selected.

Nest box placement

- Nest boxes are to be erected by a qualified arborist under the supervision of the project ecologist or fauna ecologist. A fauna ecologist is to locate appropriate trees and locations for installing the nest boxes. The specific locations of nest boxes within the locality are to be determined by the Project Ecologist within each of the designated locations.
- All replacement nest boxes are to be secured to trees at a minimum height of four metres above ground level facing the east to northeast direction. Place nest boxes as high as physically possible within a tree preferably using a cherry picker or tree climber - generally the higher the better for consideration to most species.
- Nest boxes and re-erected limbs are not to be placed near locations where public access is planned.
- The larger and more mature the recipient tree are to be selected where available. This will comparatively reduce the weighted stress on the tree, make the box less visible and result in less change in growth ratio affecting the selected attachment method. Boxes are preferably to be placed on the trunk for structural stability and protection from falling branches.
- Place nest boxes away from continual direct mid-day summer sun.
- Place nest boxes with large entry holes away from any prevailing winds when close to open water-bodies. E.g. protect from strong southerly winds close to the ocean and contrastingly cool-hot westerly winds in different seasons
- Attach nest boxes securely so that they do not shift or shake in response to strong winds or being knocked by the movements of heavier animals, e.g. Possums and goannas.
- To ensure nest boxes are inaccessible to cats and rats or to also assist target species by exclusion of possums, the base of the trunk or

branches may also require the installation of tree guards or exclusion collars.

- Nest boxes should ideally be placed in such a way that they are accessible for management but concealed from interference.

These artificial structures must be accessible for maintenance purposes with an expected life span of 20 years.

Nest box attachment

Nest boxes are to be appropriately affixed to a recipient tree under the guidance of a fauna ecologist. Different methods of attachment to the tree are available. *Travers bushfire & ecology* generally recommends that the boxes should be fixed with robust stainless steel or treated pine coach screws that penetrate through the cambium and into the heartwood of the tree to ensure a very secure attachment. Provided that any cambium damage to a tree is not left as an open wound then the chance of fungal infection or insect attack is significantly reduced and the tree will grow around the screw. Any other method of attachment selected should also ensure the box is secured to prevent movement or fall and allows for the future growth of the tree without any cambium constriction over the complete life of the nest box.

Nest box maintenance

- All nest boxes and re-erected limbs will be inspected annually for a minimum of five (5) years and any damaged, or in danger of falling, are to be repaired or replaced.
- Detering Mynas and Starlings from re-nesting is not easy; these pests are very persistent, and constant vigilance is necessary. This also means that you must have convenient regular access to the nest-box, and that you must be aware of what creatures are using it for what purposes.
- Nest boxes found to be utilised by threatened or otherwise significant fauna may be prioritised for ongoing management to ensure their longevity and replicate their design/placement characteristics.

Table 4 - Recommended dimensions for nest boxes

SPECIES	Internal Diam	Depth/Length	Entry Diameter	Vertical/Horizontal	Height	REF
Bat sp.	70-100 x 150-240 mm	200-250 mm	15-20 mm slit	v	-	BFNC (n.d.)
Bat, Chocolate Waddled	-	-	10 mm slit	v	-	Trainor (1995)
Bat, Gould's Waddled	-	-	10 mm slit	v	-	Trainor (1995)
Bat, Lesser Long-eared	-	-	10 mm slit	v	-	Trainor (1995)
Little Lorikeet	120 mm	600 mm	60 mm	h	5m	
Large bird	200 mm	650 mm	60 mm	v	6 m	
Medium - Large Owls	450x 450 mm	1000 mm	300 mm	v	10m	

Hollow modification for relocation

Hollows that have been selected for relocation are to be modified to provide a dry, enclosed nest. Modifications include:

- Attaching a 17+ millimetre thick marine ply/structural ply at the base which has been cut to provide a good seal and fixing with construction glue and galvanised screws.
- Attaching metal brackets or hardwood timber support batten to allow hollows to be screwed into a suitable branch or trunk
- Entrance hollows to be positioned on installation to minimise water entry, located as per the 'nest box specifications'
- Hollow to be painted externally with a non-toxic wood preservative or external paint

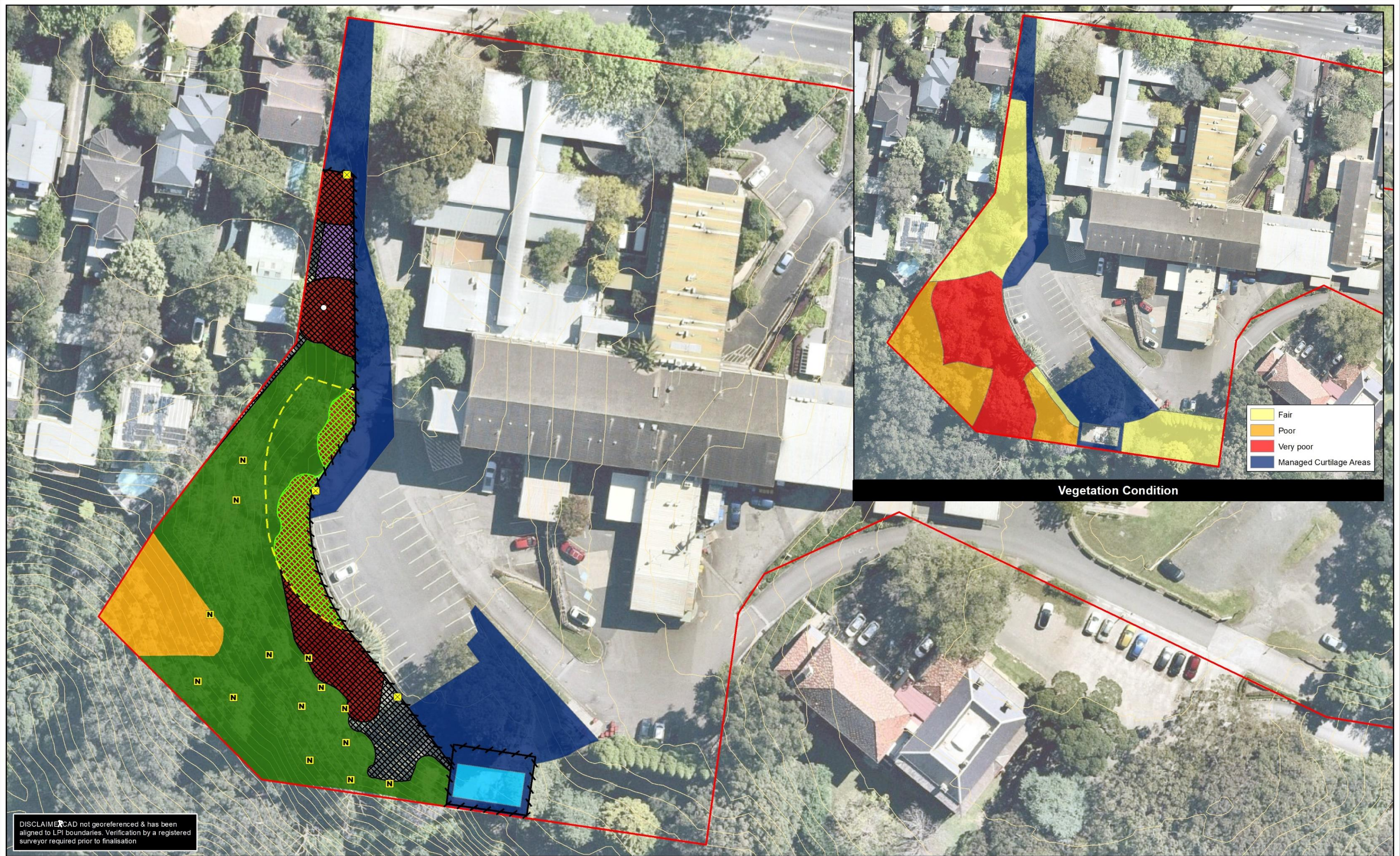


Lot 3, DP 584287, 97-115 River Rd,
GREENWICH

17 May 2022
Ref: 18TSA08VMP

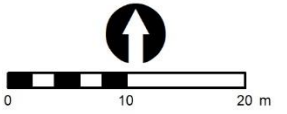
Page 6 of 7

Vegetation Management Plan



DISCLAIMER CAD not georeferenced & has been aligned to LPI boundaries. Verification by a registered surveyor required prior to finalisation

Legend		Plant Community Types (PCTs)	
Site Boundary (Source: LPI)	Existing fence	PCT 1828 - Coastal sandstone gallery rainforest (0.03ha)	PCT 1841 Coastal enriched sandstone moist forest (managed/planted) (0.006ha)
Contour 1m (source: LiDAR)	Existing managed curtilage area	PCT 1841 Coastal enriched sandstone moist forest (remnant/unmanaged)(0.15ha)	Non native trees and shrubs (0.05ha)
<i>Syzygium paniculatum</i>	Pool	Restoration shrubs and groundcovers only (0.02ha)	
Access gate (3)	Full restoration to PCT 1841 (0.06ha)		
Nest box (14)			



Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.

PROJECT & MXD REFERENCE
 97 - 115 River Road,
 Greenwich
 18TSA08INT_VMP001

DATE & ISSUE NUMBER
 4/03/2022
 Issue 1

SCALE & COORDINATE SYSTEM
 1:600 @A3
 GDA 1994 MGA Zone 56

TITLE
Schedule 1 - Vegetation Management Plan

Document Path: N:\GIS STORAGE\W Drive\18TSA08INT - GreenwichHospital - Greenwich\MXD\18TSA08INT_VMP001.mxd

