

A photograph of a possum climbing a tree trunk, positioned on the left side of the cover. The possum is grey with a white stripe on its face and is reaching upwards with its front paws. The tree bark is rough and textured.

Travers

bushfire & ecology

Vegetation Management Plan

Lot 5 DP 222736
14-30 Violet St., Katoomba

February 2018
(REF: A16026V)



Vegetation Management Plan (Katoomba Christian Convention)

Lot A DP 403033
Violet St,
Katoomba

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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.

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Attachment 1	Recommended Planting List
Attachment 2	Target Weed Species

Schedules

Schedule 1 - Vegetation Management Works
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List of abbreviations

APZ	asset protection zone
BPA	bushfire protection assessment
CLUMP	conservation land use management plan
DCP	Development Control Plan
CPW	Cumberland Plain Woodland
DEC	NSW Department of Environment and Conservation (superseded by DECC from 4/07)
DECC	NSW Department of Environment and Climate Change (superseded by DECCW from 10/09)
DECCW	NSW Department of Environment, Climate Change and Water (superseded by OEHS from 4/11)
DoEE	Federal Department of Environment and Energy (formerly SEWPAC)
EEC	endangered ecological community
EPA	Environmental Protection Agency
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESMP	ecological site management plan
FF	flora and fauna assessment
FM Act	<i>Fisheries Management Act 1994</i>
FMP	fuel management plan
HTA	habitat tree assessment
IPA	inner protection area
LEP	Local Environment Plan
LGA	local government area
NES	national environmental significance
NPWS	NSW National Parks and Wildlife Service
NSW DPI	NSW Department of Industry and Investment
OEHS	Office of Environment and Heritage (Part of the NSW Department of Premier and Cabinet)
OPA	outer protection area
PBP	<i>Planning for Bush Fire Protection 2006: A Guide for Councils, Planners, Fire Authorities and Developers</i>
POM	plan of management
RF Act	<i>Rural Fires Act</i>
RFS	NSW Rural Fire Service
ROTAP	rare or threatened Australian plants
SEPP 44	<i>State Environmental Protection Policy No 44 – Koala Habitat Protection</i>

SEWPAC	Federal Department of Sustainability, Environment, Water, Population and Communities
SSTF	Shale-Sandstone Transition Forest
SIS	species impact statement
SULE	safe useful life expectancy
TPO	tree preservation order
TPZ	tree preservation zone
TRRP	tree retention and removal plan
TSC Act	<i>Threatened Species Conservation Act 1995</i>
VMP	vegetation management plan



Introduction

1

Travers bushfire & ecology has been engaged to prepare a vegetation management plan (VMP) for proposed extensions to Katoomba Christian Convention at Lot 5 DP 222736 14-30 Violet St., Katoomba located in the Blue Mountains local government area. The entire area of the subject site (Figure 1) will hereafter be referred to as the 'study area'.

Ecological survey and assessment, bushfire and flora and fauna reports and VMP for proposed works have been undertaken in for the purposes for a previously approved development application (DA) and have been updated for the purposes of the masterplan DA.

1.1 Proposed development

Proposed works under the previous DA included extensions to administration buildings and additional dining and seminar rooms. Vegetation works as approved under the previous development application are shown in Figure 2.

Approved works have as yet, not been undertaken. Design changes have been incorporated into the current DA, the overview of which is shown in Figure 3.



Figure 1 – Site overview (Google Earth, June 2017)



Figure 2 – Vegetation works as approved under the previous development application

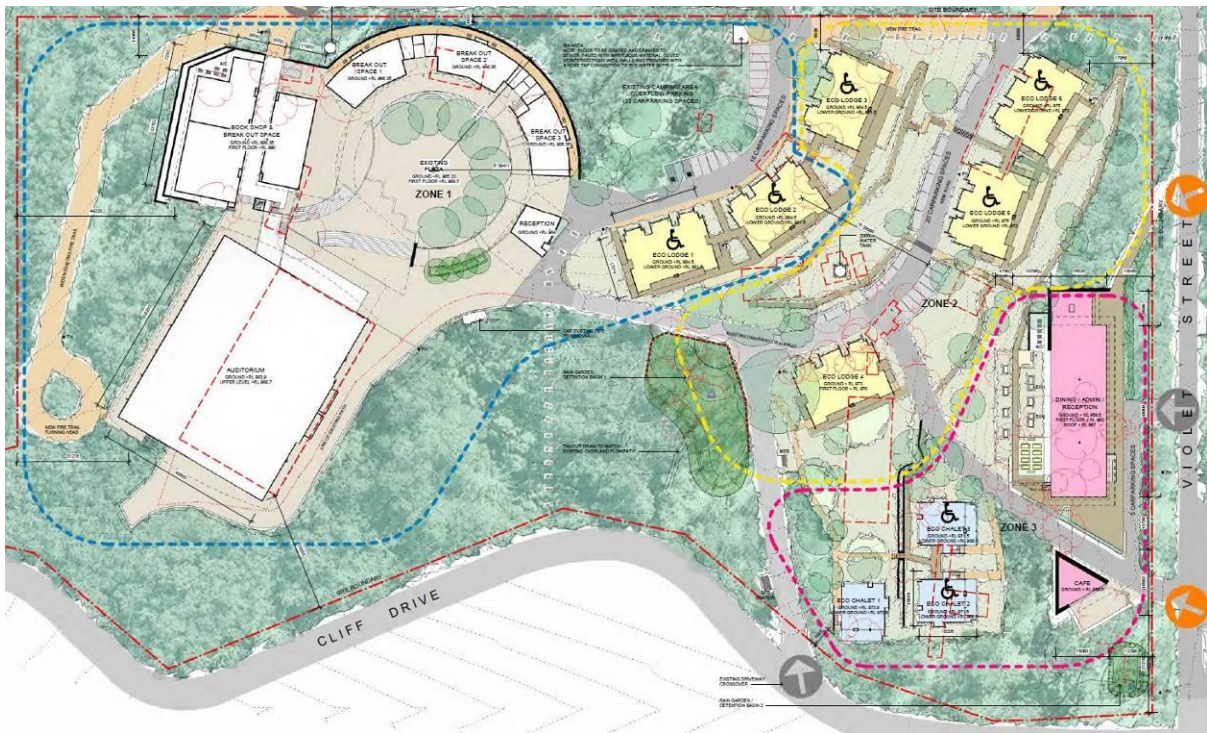


Figure 3 – Proposed Masterplan (NBR Architecture, February 2018)

1.2 Aims of the VMP

The following aims for management of retained bushland include:

- Bush regeneration of retained native vegetation - Dry Open Forest (*Eucalyptus piperita* and *E. sieberi*) and Moist Gully Forest (*E. dalrympleana*, *E. piperita*, *E. sieberi* and *E. oreades*).
- Weed control and eradication of noxious and environmental weeds including but not limited to *Pinus elliotii* (Slash Pine), *Cytisus scoparius* subsp. *scoparius* (Scotch Broom), *Rubus anglocandicans* (Blackberry) and *Ligustrum sinense* (Small-leaved Privet).
- Regeneration of medium to good condition Dry Open Forest vegetation to maintain or improve stable and fully structured vegetation within the Eastern Pygmy Possum (EPP) Habitat Zone.
- To undertake monitoring, auditing and maintenance activities to ensure an effective and a stable restoration outcome over a five (5) year period
- To ensure compliance with the conditions of consent and this VMP.

Schedules 1 of this VMP provides a plan of restoration works and the performance targets to be achieved by contractors undertaking restoration works. Schedules 1 have been prepared to be issued to potential contractors undertaking the restoration works. The VMP provides guidelines for how the restoration works are to be undertaken and is subject to compliance certification.



Management Context

2

The following sections provide a brief description of site.

2.1 Site description

Table 1 provides a summary of the planning, cadastral, topographical, and disturbance details of the subject site.

Table 1 – Site features

Location	Lot 5 DP 222736 14-30 Violet Street, Katoomba
Local government area	Blue Mountains
Grid reference	249550E and 6264450N
Elevation	Approximately 850m AHD
Topography	Situated on gentle slopes. Subject site situated on a cliff top that gently slopes in a north-east direction with gradients generally between 5-15%
Geology and soils	Medlow Bath Soils – soils moderately deep, well drained Lithosols / siliceous sands
Catchment and drainage	Catchment - Kedumba River The subject site has one ephemeral drainage line which runs in an easterly direction across Cliff Drive
Vegetation	Open Forest, Moist Open Forest and Disturbed land with Scattered Trees and Garden Beds.
Existing land use	Place of public worship and tourist and visitor accommodation
Clearing	Clearing has occurred within portions of the site. Some areas of bushland are represented by canopy only. Approximately 20% of the Study Area contains relatively undisturbed native vegetation.

2.2 Vegetation description

The *Travers Flora and Fauna Report* (2018) notes the following vegetation communities within the subject site:

- Dry Open Forest (*Eucalyptus piperita* & *Eucalyptus sieberi*);
- Moist Open Forest; and
- Disturbed Land with Scattered Trees and Garden Beds.

2.2.1 Dry Open Forest (*Eucalyptus piperita* & *Eucalyptus sieberi*)

This is the dominant vegetation community throughout the site and covers approximately 50% of the subject site. The structure of this community is Open Forest with a canopy cover of approximately 25% to 45% and height of up to 25 metres. The understorey consists of a moderate shrub layer to 3 metres high and sparse to moderate groundcover of herbs, ferns and grasses.

The majority of this vegetation community has been highly disturbed by continued under scrubbing of the understorey vegetation, construction of numerous tracks and infrastructure associated with the existing development and moderate incursions by exotic weed species.

This community contains a number of minor variations throughout the site. Within the south-western portion of the site associated with the slightly higher elevation, the canopy is dominated by *Eucalyptus sieberi* (Silver-top Ash) with scattered occurrences of *Eucalyptus sclerophylla* (Scribbly Gum) rather than *Eucalyptus piperita* (Sydney Peppermint). Within the eastern extent of this community there is a gradual transition with the Moist Riparian Forest situated along the minor drainage lines, resulting in a predominantly ferny understorey and presence of a slightly higher proportion of moisture tolerant understorey species. There is also a relatively undisturbed variation of this community within the far south-east of the subject site.

Common canopy species include *Banksia serrata* (Old Man Banksia), *Eucalyptus piperita* (Sydney Peppermint), *Eucalyptus sieberi* (Silver-top Ash) and *Eucalyptus sparsifolia* (Narrow-leaved Stringybark).

Understorey species include *Acacia longifolia* (Sydney Golden Wattle), *Baeckea linifolia*, *Banksia spinulosa* (Hairpin Banksia), *Dillwynia retorta* (Eggs and Bacon), *Epacris pulchella*, *Isopogon Hibbertia aspera* (Rough Guinea Flower), *Hakea dactyloides* (Broad-leaved Hakea), *Lambertia formosa* (Mountain Devil), *Leptospermum polygalifolium* (Yellow Tea Tree), *Leptospermum trinervium* (Flaky-barked Tea Tree), *Persoonia levis* (Broad-leaved Geebung), *Persoonia mollis*, *Petrophile pulchella* (Conesticks), *Phyllanthus hirtellus* (Thyme Spurge), *Pittosporum undulatum* (Sweet Pittosporum), *Platysace linearifolia* (Narrow-leaved Platysace), *Polyscias sambucifolia* (Elderberry Panax) and *Podolobium ilicifolium* (Native Holly).

Common native groundcovers are *Austrostipa pubescens* (Tall Spear Grass), *Dianella caerulea* (Flax Lily), *Dianella prunina*, *Entolasia marginata* (Bordered Panic), *Gahnia microstachya*, *Goodenia bellidifolia*, *Goodenia heterophylla*, *Lepidosperma laterale* (Variable Sword-sedge), *Lomandra longifolia* (Spiky-headed Mat-rush), *Lomandra obliqua* (Twisted Mat-rush), *Pomax umbellata*, *Pteridium esculentum* (Bracken Fern), *Smilax glycyphylla* (Sarsparilla), *Stylidium graminifolium* (Trigger Plant) and *Xanthosia pilosa*.

2.2.2 Moist Open Forest

This vegetation community occurs along the central part of the eastern boundary of the subject site associated with two minor drainage lines and covers approximately 5% of the subject site. The structure of this community is Open Forest to Closed Forest with a canopy

cover of approximately 30% and height of approximately 15-25 metres, a sub-canopy / shrub layer with a canopy cover of up to 75% and height of approximately 5-10 metres and a dense groundcover of ferns, herbs and climbers.

This vegetation community has been moderately disturbed by past clearing, high levels of exotic weed invasion and erosion resulting from considerable runoff.

Common canopy species include *Eucalyptus piperita* (Sydney Peppermint) and *Eucalyptus oreades* (Blue Mountains Ash). Sub-canopy native species include *Acacia elata* (Cedar Wattle), *Callicoma serratifolia* (Black Wattle), *Cyathea australis* (Tree Fern), *Elaeocarpus reticulatus* (Blueberry Ash), *Hedycarya angustifolia* (Native Mulberry) and *Pittosporum undulatum* (Sweet Pittosporum).

Principle native understorey species include *Banksia ericifolia* (Heath-leaved Banksia), *Buddleja davidii* (Butterfly Bush), *Cytisus scoparius* (Scotch Broom), *Epacris pulchella*, *Leptospermum polygalifolium* (Yellow Tea Tree), *Leptospermum squarrosum* and *Persoonia mollis*.

Groundcover species include *Blechnum nudum*, *Cissus hypoglauca* (Water Vine), *Ehrharta erecta* (Panic Veldtgrass), *Empodisma minus*, *Gahnia sieberiana* (Red-fruited Saw-sedge), *Gleichenia* spp., *Histiopteris incisa* (Bat's Wing Fern), *Lonicera japonica* (Honeysuckle), *Lomandra longifolia* (Spiky-headed Mat-rush), *Rubus anglocandicans* (Blackberries), *Smilax glycyphylla* (Sarsparilla) and *Tetrastigma nitens* (Three-leaved Water Vine).

2.2.3 Disturbed Land with Scattered Trees and Garden Beds

This highly disturbed vegetation community occurs throughout the site and covers approximately 45% of the subject site. This community consists of Open Woodland to Woodland with a canopy cover of approximately <5% to 20% and height of up to 25 metres. The understorey consists of a sparse shrub-layer to 2 metres high and sparse groundcover of herbs, ferns and grasses.

The majority of this vegetation community has been highly disturbed by artificially created garden beds and lawn, continued under scrubbing of the understorey vegetation, construction of buildings and infrastructure associated with the existing development and high incursions by exotic weed species.

This community varies considerably in floristic assemblages and structure depending on the particular disturbances and position within the site.

Common canopy species include *Eucalyptus piperita* (Sydney Peppermint), *Eucalyptus mannifera* (Brittle Gum), *Eucalyptus sieberi* (Silvertop Ash) and *Pinus elliotii* (Slash Pine).

The shrub layer features *Acacia longifolia* (Sydney Golden Wattle), *Grevillea* spp. (cultivar) *Leptospermum polygalifolium* (Yellow Tea Tree), *Leptospermum trinervium* (Flaky-barked Tea Tree), *Persoonia levis* (Broad-leaved Geebung), *Petrophile pulchella* (Conesticks), *Phyllanthus hirtellus* (Thyme Spurge), *Pittosporum undulatum* (Sweet Pittosporum), *Platysace linearifolia* (Narrow-leaved Platysace) and *Rubus anglocandicans* (Blackberries).

Key groundcover species constitute *Agapanthus praecox* (Agapanthus), *Austrodanthonia* sp. (Wallaby Grass), *Austrostipa pubescens* (Tall Spear Grass), *Conyza bonariensis* (Flax-leaf Fleabane), *Cynodon dactylon* (couch), *Crocasmia X crocosmiiflora* (Montbretia) *Dianella caerulea* (Flax Lily), *Entolasia marginata* (Bordered Panic), *Holcus lanatus* (Yorkshire Fog), *Hypochaeris radicata* (Flatweed), *Lomandra longifolia* (Spiky-headed Mat-rush), *Lomandra obliqua* (Twisted Mat-rush), *Pomax umbellata*, *Pteridium esculentum* (Bracken Fern).

2.3 Threatened species, EECs and endangered populations

The flora and fauna assessment report (*Travers Feb 2018*) identified that the study area has known value for a number of threatened fauna species. Five (5) state listed threatened fauna species including Eastern Pygmy Possum (*Cercartetus nanus*), Gang-Gang Cockatoo (*Callocephalon fimbriatum*), Little Lorikeet (*Glossopsitta pusilla*), Grey-headed Flying-fox (*Pteropus poliocephalus*) and Eastern Falsistrelle (*Falsistrellus tasmaniensis*) were recorded within the study area during surveys.

In addition, a further twenty-three (23) threatened fauna species, inclusive of seven (7) migratory bird species, were considered to have varying potential to occur due to potential habitat on site and presence of local records in similar habitat.

No endangered ecological communities (EECs) were recorded within the subject site / proposed development area.

Two threatened flora species were considered to have Low potential habitat within the subject site (*Persoonia acerosa* and *Pultenaea glabra*). No threatened flora species were recorded and no endangered flora populations occur in the subject site / proposed development area.

2.4 Vegetation condition and connectivity

The majority of the subject site, including the vegetation along the ephemeral drainage line, contains incursions of a variety of weeds.

A vegetation condition assessment was undertaken in association with the *Travers bushfire & ecology* Vegetation Management Plan 2011, in accordance with the Ku-ring-gai Municipal Council *Bushland Weed Assessment Guidelines* (1995). A summary of the results of the vegetation condition assessment is provided in Table 2.

Table 2 – Vegetation condition

Adapted from Ku-ring-gai Municipal Council's Bushland Weed Assessment Guidelines (1995)

Dry Open Forest (<i>Eucalyptus piperita</i> & <i>Eucalyptus sieberi</i>)			
Structural division	Dominant weeds	Weed cover %	Scale
Canopy	White Poplar, Acer sp, Cherry Laurel and Slash Pine	0-5	1
Mid-storey	English Holly, Small-leaved privet, Blackberry, Scotch, Broom,	0-5	1
Understorey	Montbretia, Ivy, English Holly, Flax-leaf Fleabane	0-5	1
Overall Weed Class =			1
Moist Open Forest:			
Structural division	Dominant weeds	Weed cover %	Scale
Canopy	Cherry Laurel	5-10	1
Mid-storey	Montbretia, , Small-leaved privet, Blackberry	0-5	1
Understorey	Blackberry, Pampas, Scotch Broom, Ivy and Holy	0-5	1
Overall Weed Class =			1
Disturbed Land with Scattered Trees and Garden Beds:			
Structural division	Dominant weeds	Weed cover %	Scale
Canopy	Variety of Exotic and Cultivar species	5-10	1

Mid-storey	Small-leaved privet, Blackberry	0-5	1
Understorey	Pampas, Scotch Broom, Ivy and Holly	0-5	1
Overall Weed Class =			1

Remnant vegetation is rated as 'good condition' (0-10% weed coverage). The weed composition in the understorey, mid-storey and canopy layer is low and there is good vegetation resilience in many areas across the site and throughout all vegetation communities. The native vegetation on site is considered to be in good condition as there are native plants occupying all layers, and there are very few bare patches.

Vegetation condition mapping is shown in Figure 4.

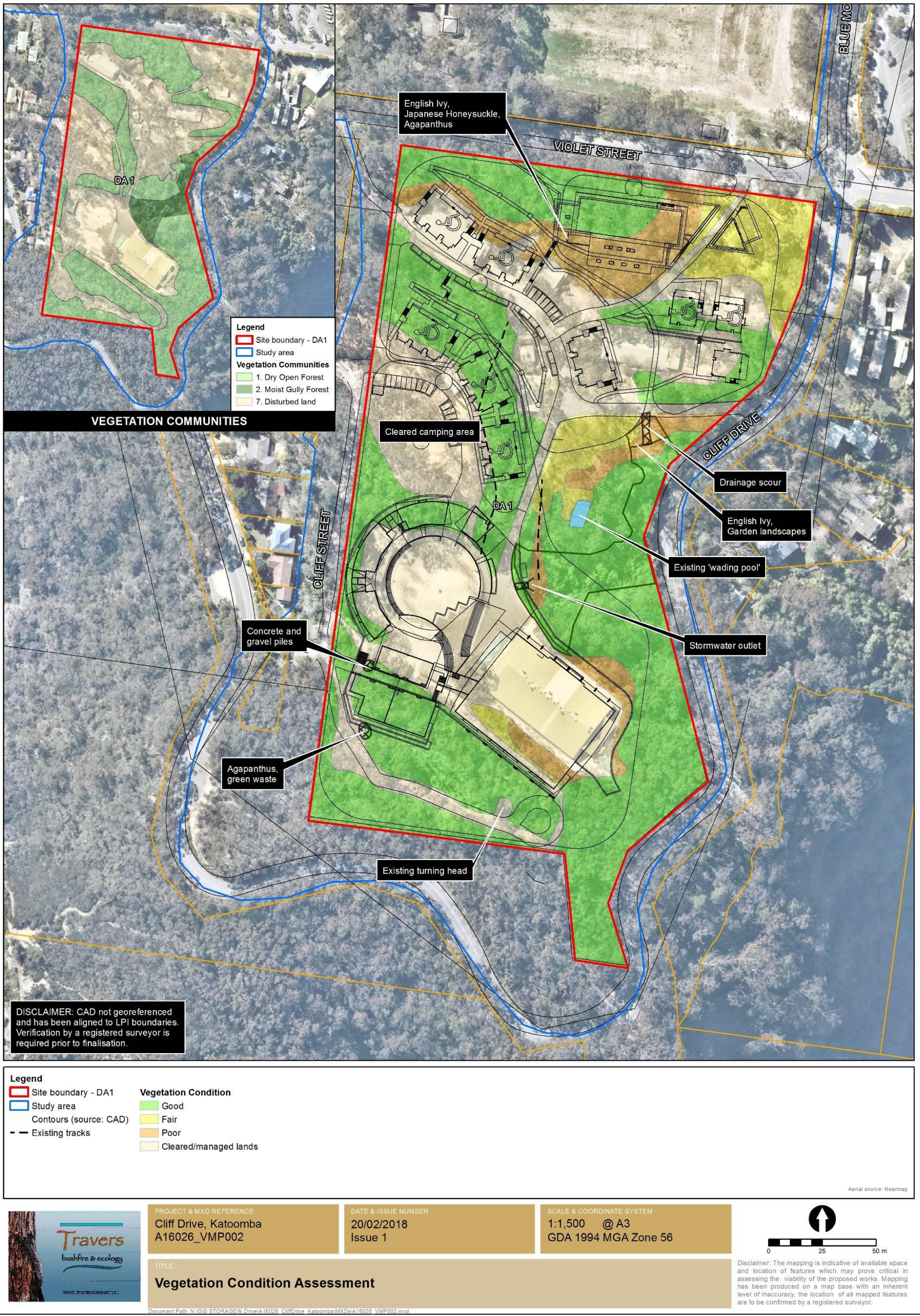


Figure 4 – Vegetation Condition Assessment



Restoration Strategy

3

The proposed developments have been designed to minimise impact on the existing native vegetation and associated habitat features.

This VMP has incorporated typical restoration and threatened species habitat conservation measures to maintain or improve the ecological value of the habitat and connectivity of the retained native bushland.

The following strategies and works include:

- To create an integrated Managed Ecological Zone (MEZ) to retain native vegetation where possible for ecological and bushfire protection purposes
- To provide arboreal connectivity, foraging and nesting resources within asset protection zones and the retained natural landscape
- Protection and enhancement of habitat resources including but not limited to tree hollows and foraging habitat for fauna in particular for EPP
- Protect and regenerate Dry Open Forest and Moist Gully Forest wherever possible
- Installation of permanent fencing designed to exclude unauthorised people from the bush regeneration (EPP Habitat) Zone
- Retention of bush rock areas
- Create or retain a visual screen along the eastern boundary of the site
- Maximise native vegetation cover and species diversity within the site
- Retention of all existing ground logs to maintain to improve terrestrial shelter habitat; and
- Retain and manage hollow-bearing trees

3.1 Site preparation

Prior to construction, the following works are to be undertaken to protect threatened species habitat and any ecologically sensitive vegetation:

- All vegetation, erosion control, waterway and habitat protection measures are to be installed under the direction of the Project Ecologist.
- Any on-ground refugia (logs including felled trees & rocks) from the impact zone is to be retained and relocated under the direction of the Project Ecologist;
- All hollow bearing or habitat trees to be removed are to be dismantled or felled under the supervision of a Project Ecologist (see Section 3.1.3);
- Conservation area signage is to be installed along the installed protective fencing.

3.1.1 Permanent protection fencing

Permanent protection fencing shall be constructed along the northern edge of the bush regeneration - EPP Habitat Zone (see Schedule 1). This protective fence is to consist of a 4 to 5 strand plain wire rural fence inclusive of star-picket or timber posts at a maximum separation of 5m as shown in Figure 5.

Fencing must also facilitate dispersion across the site for native species typical of the area including potential macropods.

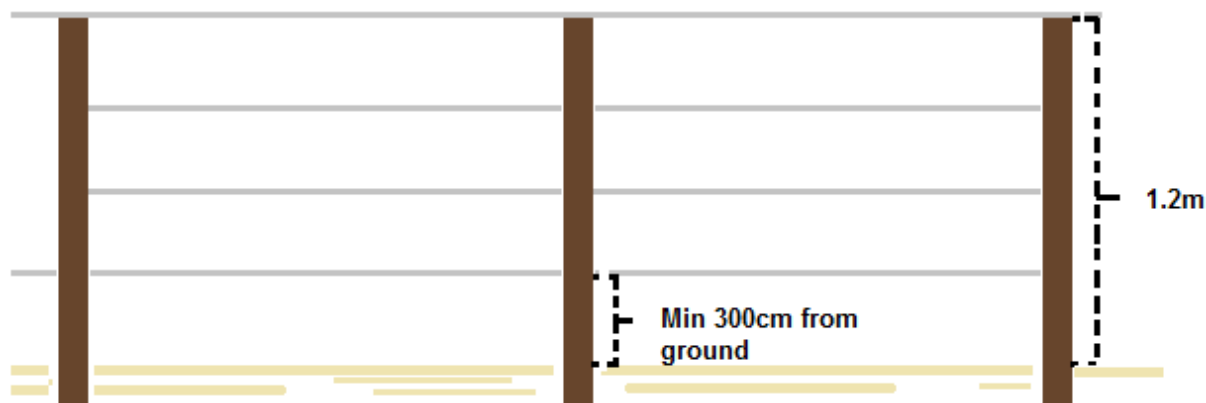


Figure 5 – Example of required fencing

3.1.2 Temporary protection fencing

Prior to commencement of construction works, construction proof fencing is to be installed to minimise the area of disturbance during construction of any structures. Sediment fencing is to be installed at the base of the construction fencing as a primary sediment collection measure. It is to be installed and maintained to prevent erosion along the fence and is to include sediment fence kickbacks on sloped lands to slow water directed along the fence. The sediment fence is to be reinforced at all low points with additional hay bales to support the fence against the weight of trapped sediment.

Prior to commencement of construction works, temporary tree protection fencing is to be installed for all trees in close proximity to any construction works. Tree protection fencing must be under the direction of the project ecologist or arborist.

3.1.3 Signage

Three (3) signs will be erected to raise community awareness in regards to the role of the protected area. Locations of signs are shown in Schedule 1 Vegetation Management Works. An example of signage is given in Figure 6.



Figure 6 – Environmental protection area Signage

3.1.4 Hollow-bearing trees

All hollow bearing trees to be retained that are in close proximity to development areas as shown on Schedule 1 Vegetation Management Works are to be fully protected with plastic bunting on the drip line of the tree. Any works within the drip line of a hollow bearing tree is to be supervised by a fauna ecologist or arborist so as to prevent any damage to its roots, branches or trunk. Should any damage to an existing tree be incurred then rectification of the damage is to be undertaken under the advice and direction of the appointed arborist.

All hollow-bearing trees proposed for removal within the potentially impacted areas shall be clearly marked with an 'H' symbol to indicate its hollow-bearing status. All contractors are to be managed such that all due care is taken to prevent damage to hollow-bearing trees to be retained and is not to remove any hollow-bearing tree without first receiving direction from the fauna ecologist. A fauna ecologist is to be present at the removal of each habitat or hollow-bearing tree. Refer to section 3.7 for details.

3.2 Installation of Stormwater Outlets

The stormwater outlet structures must:-

- Define the route and identification of the specific point of discharge;
- Select a stable section of the stream for the discharge point, preferably mid-way between bends or alternatively, incorporating outlet discharge points into disturbed/eroded areas which are to be stabilised or rehabilitated;
- Minimisation of construction footprint and proposed extent of disturbance to soil and vegetation within and adjacent to the watercourse;
- Demonstration that changes to the hydrology of the receiving waters have been assessed and there is no detrimental impact on discharge volumes and channel velocities;
- Ensure discharge from an outlet should not cause bed or bank instability;
- Protection of the bed of the drainage line below the outlet if not bedrock, and/or if bed scour is likely and scour protection installed;
- Aligning the outlet with the adjoining bank alignment;
- Rock rip-rap, as the preferred outlet material should extend for the full extent of the design scour apron and adjoining flanks/banks and must be appropriately keyed in to withstand the maximum velocities of runoff or discharge from the site and cut-off trenches should be provided where necessary;
- Rip-rap should consist of durable, angular run-of-quarry rock placed over a bedding layer of angular cobbles over geotextile. Where possible, incorporate vegetation such as sedges and rushes into scour management for further stability;
- Grade scour apron to bed level of the receiving drainage channel or just below any permanent water created by any stable feature such as a rock bar within the drainage line; and
- Stabilise and rehabilitate all disturbed areas including topsoiling, revegetation and regeneration, mulching, weed control and maintenance.

The location of the proposed outlets and creek protection works are shown in Schedule 1. These works may require hand digging and shaping to direct flow down a concave rock stabilised channel. Appropriate bedding and geotextile will be installed and riprap (rock armour) interlocked to protect any underlying soil and banks.

To protect the bed and banks, 500mm plus sized rock armour are to be placed around the banks and bed in the vicinity of the directed water flow as shown in Figure 8. The downstream banks are also to be stabilised with armour rock to prevent bank and bed erosion.

Access for drainage line works

Access to the stormwater outlet and scour protection works area near the main hall will be via an existing track through the vegetation to the north of the proposed outlet. Other stormwater infrastructure from the proposed detention basin will discharge into the bushland as shown in Schedule 1.

After construction works for the stormwater pipelines and outlet structures are completed, the disturbance area along the pipeline routes are expected to be re-vegetated groundcover species commensurate with Dry Open Forest or Moist Open forest as appropriate.

3.3 Weed management

The following weed management and maintenance works are to be undertaken within the site.

The objectives of weed management actions are to protect and rehabilitate the existing, regrowth or remnant Dry Open Forest or Moist Gully Forest and to protect and improve the extent and condition of these vegetation communities. This will primarily involve the removal of any weed infestations, bush regeneration, planting of suitable native endemic species and the ongoing maintenance of replanted or regenerating areas.

Invasive or environmental weeds observed on site are:

- *Populus alba* (White Poplar)
- *Pinus eliottii* (Slash Pine)
- *Buddleja davidii* (Butterfly Bush, Buddleja)
- *Cytisus scoparius* subsp. *scoparius* (Scotch or English Broom)
- *Ilex aquifolium* (English Holly)
- *Rubus anglocandicans* (Blackberry)
- *Ligustrum sinense* (Small-leaved Privet)
- *Agapanthus praecox* (Agapanthus)
- *Crocasmia x crocosmiiflora* (Montbretia)
- *Cyperus eragrostis* (Umbrella Sedge)
- *Ehrharta erecta* (Panic Veldtgrass)
- *Pennisetum clandestinum* (Kikuyu Grass)
- *Hedera* spp. (Ivy)
- *Lonicera japonica* (Japanese Honeysuckle)

These weeds and in particular any weeds listed within the NSW *Biosecurity Act* (2015) have significant implications to the success of revegetation works and will require intensive targeted weed control and ongoing eradication throughout the restoration and maintenance period. Refer to Appendix 2 for a more information about which weeds occur on site and the weed control priority.

3.3.1 Weed management strategy

Given the likely presence of invasive environmental and noxious weeds on site, a combination of selective spraying, hand removal and competitive planting techniques will be used to control weeds. The weed control priorities listed in Attachment 2 are based on the known “invasiveness” of each individual species and/or its resilience to weed control methods.

Weeding efforts will also be focussed generally across the whole of the subject site but will focus on the retained native vegetation areas. These efforts will provide a buffer against weed incursions from adjoining land uses and improve internal or core habitat for native flora and fauna.

Manual removal and appropriate disposal of invasive aquatic weeds from the water course is required.

Weeding works are to be carried out by an appropriately qualified and licensed bushland regeneration company under the direction of a consulting project ecologist. Bushland regeneration supervisors should possess a minimum of a Certificate II in Bushland regeneration or equivalent with at least three (3) years of field experience.

There are currently a number of low impact bush regeneration techniques used in bushland management for the removal of weeds. The bush regeneration process (Buchanan, 1989) involves:

- The *Bradley Method* of minimal soil disturbance during weed removal
- Clearing and stabilising techniques
- The use of herbicides
- The use of fire (pile burns)
- Biological controls

Employing the *Bradley Method* for regeneration requires the removal of weeds in phases. Stages of weed removal can be broken into three (3) components:

Primary weeding

All weeds will be stripped from the riparian corridor within the site. All weed materials need to be selectively isolated from native vegetation and disposed of separately to native brush which can be mulched. This involves removal of weeds through targeted herbicide use and hand removal.

Timing – 1 month

Secondary or follow-up weeding

Secondary or follow-up weeding involves intensive weeding in areas that have already received primary work to remove weed regrowth or overlooked weeds.

Timing – 1-3 months post primary weeding

Maintenance weeding

After primary and secondary weeding and natural regeneration of the bushland, the area should be able to resist most weeds. However, weeds will re-establish on the site from bird, wind, water transport and other seed or propagule dispersal mechanisms within the site. Maintenance weeding should be undertaken 4-6 times a year until such time as the resistance of the bushland to weeds increases, then only requiring hand weeding on an as

needs basis. Maintenance weeding is to be conducted for a minimum period of three (3) years subsequent to the primary and secondary weed control works.

Timing – 3 years post completion of primary restoration works

3.3.2 Herbicide use

The use of herbicides is needed where hand removal of weeds is impractical. The use of *Glyphosate* based herbicides is recommended in accordance with the manufacturers labels. Within 5m of a drainage line only *Roundup Bi-active*® or equivalent formulations can be used. It is recommended that *Roundup Bi-active*® or equivalent formulations shall be utilised within and up to 5m from the Drainage Corridor as shown in Schedule 1.

Other regularly used herbicides include *Garlon*®, *Brushoff*®, *Brush Killer*® and *Starane 200*®. These non-*Glyphosate* based herbicides are not to be used adjacent to water bodies.

Grazon DS is not considered a safe chemical to use within high soil moisture zones and that significant off target kill of woody species and aquatic fauna has been tentatively linked to *Grazon DS*. It is recommended that this herbicide is not to be used on site.

An advantage of herbicide use is the low time taken to spray weeds as compared to physically removing them, particularly for large infestations of weeds. The disadvantage is that no single herbicide is effective on all weed species, thus the herbicide used needs to achieve an effective kill.

In general, *Travers bushfire & ecology* supports that the use of herbicides in non-ecologically sensitive areas can be undertaken if:

- There are small areas of dense weeds with few or no native plants to protect;
- There are large areas of predominantly weed coverage;
- Application can be undertaken without the risk of spray drift or off target kills, and
- Weeds are growing too rapidly for physical removal.

The potential for destabilising soils and causing erosion on steep slopes as a result of spraying vegetation with herbicide needs to be considered prior to commencement of weed control works.

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 treatment of each species for each herbicide. Care must be taken when applying herbicides near water bodies due to the sensitivity of the waterways and resident flora and fauna to runoff containing these herbicides.

All herbicides must be applied according to the herbicide usage label and provisions of the *Protection of the Environmental Operations Act (NSW PEO Act)*.

All noxious and environmental weeds need to be eradicated and controlled across the entire site. Garden waste and weed propagules (seeds, tubers etc.) need to be periodically collected and disposed of at an approved waste transfer facility and shall not be dumped on adjacent bushland or allowed to be washed downstream.

3.4 Regeneration works

3.4.1 Overview regeneration

Regeneration works will focus primarily on the following:

- *Bush regeneration (EPP Habitat Zone) (0.51 ha)* – This area currently contains Dry Open Forest (*E. piperita* & *E. sieberi*) which is in good condition. Selective weed control methods will create space for native species to germinate and grow from existing propagules. This will maintain and enhance the habitat within this area for the Eastern Pygmy Possum (EPP).
- *Removal of weeds from the managed ecological zone (MEZ)*
- *Maximise the retained vegetation within the MEZ but maintain of the required fuels loads to be compliant with asset protection zones*

Natural regeneration of native vegetation is to be promoted by avoiding activities that limit the regrowth of native species or favour the establishment of weed species. Activities to avoid include:

- Spreading of mulch in areas of high resilience;
- Laying lawn in close proximity to bushland interfaces;
- Application of fertilisers (artificial or animal manures) within 40m to any drainage lines or 20m of any bushland edge;
- Planting of invasive landscape species - refer to the list of invasive or environmental weeds in Appendix 2;
- Trampling of plants and compaction of soil;
- Irrigation or stormwater drainage that promotes weed growth or exceeds the absorption capacity of the soil;
- Sedimentation or importation of soil that is high in inorganic or organic nutrients – it is preferable that Native Plant Soil Mix is used. Native Plant Soil Mix is available from all major landscape supplies;
- Grazing or keeping domestic animals that deliver high loads of manure e.g. large or many small deposits; and
- Application of grey waters or drainage from animal enclosures directly onto soil without treatment for removal of nutrients.

Native shrub species from Appendix 1 typical of Dry Open Forest are to be used for revegetation purposes. The location of the planted species will be determined by the revegetation contractors with consideration to any existing regeneration and suitable bed conditions.

3.4.2 Bush regeneration (EPP Habitat) Zone

The total area of Bush regeneration (EPP Habitat) zone is to be at least 0.51 ha as marked on Schedule 1. As this area is mostly native weed control and revegetation works are likely to be limited.

Where revegetation works are required to rectify any disturbance caused by construction, the following planting densities will be achieved or enriched to achieve the following densities:-

- One (1) large tree every 50m²; one (1) small tree every 30 m²; one (1) shrub per 10m²; and 4 groundcovers per 1m²;

The total number of plants to be established will certainly be lower because most of them will be provided by the existing native plants or if the native flora species are regenerating naturally within the retained area of Bush regeneration (EPP Habitat) zone.

Restoration areas are to be protected throughout the construction and maintenance period. Protection measures include:

- Protective fencing – to prevent unauthorised entry by the public or guests into the regenerating or conserved bushland;
- Signage – To inform the public or guests that the area is a conservation area and that certain activities are forbidden in that area;
- Gates – Locked gates provide a barrier to all persons except authorised persons engaged to undertake works within the regeneration area such as enrichment planting (if required), weed control and monitoring inspections;

Other protection measures could include works such as:

- Mulching – to reduce soil moisture loss (to be avoided in areas of medium to high resilience);
- Plant guards around plants – to minimise loss by grazing animals, frost protection and dehydration; and
- Baiting of rabbits (quarterly baiting over 2 years) – use of Pindone (1080) to minimise rabbit burrows and grazing.

3.4.3 Management of the Managed Ecological Zone

A managed ecological zone has been overlain with the asset protection zones to provide a degree of habitat retention within the proposed asset protection zones in a manner compliant with asset protection zones.

As a managed ecological zone with ecological protection, visual screening and asset protection objectives, a fuel management plan is to be prepared to stipulate the specific tree retention, fuel management and habitat enrichment works required within the MEZ.

The fuel management plan for the MEZ is to achieve the following objectives:-

- Maximise the retention of hollow bearing trees and to enhance the nesting opportunities with strategically placed nesting boxes adjacent to foraging resources
- Maximise canopy cover whilst providing strategic canopy breaks for asset protection purposes
- Provide a visual screen from all relevant aspects to filter views in to the proposed facilities
- Stipulate the minimum and maximum ground cover, canopy density, canopy cover and shrub coverage
- Protect the existing stormwater drainage line
- Provide for revegetation with less flammable species where additional vegetation screen may be required.
- Maintain arboreal connectivity across the landscape for foraging purposes.

A project ecologist is to certify that the fuel management plan for the MEZ is consistent with the above objectives prior to the issue of the construction certificate.

3.4.4 Mulching

Mulching will not be employed within vegetation regeneration areas as shown on Schedule 1, as this will impede regeneration of native species already present within the seed bank.

To protect waterways, mulching should not be undertaken within 10m of the top of bank. Mulching is an efficient method to impede the establishment of weed species, soil erosion, compaction and desiccation within revegetation areas such as stormwater outlets and

associated rock armour. The bush regeneration contractor should apply best practice to locate mulching in areas that has low natural resilience.

Mulch is to be placed at a depth of 50-75mm covering any areas of replanting that have low natural resilience. Alternatively mulch can be incorporated into the top 50mm of the ground surface to provide a stable soil structure and planting bed resilient to erosion.

Areas surrounding the stems/trunks of plants are to be kept free from mulch, thereby reducing the incidence of collar rot on retained or planted flora.

Mulch from exotic species such as White Poplar, Pines, Butterfly Bush, Scotch Broom, Blackberry, Asparagus Fern, Privet, Camphor Laurel or Pampas Grass, or other declared environmental weeds are not to be used. The Contractor shall ensure that any mulch used is properly composted before use and sufficient time has elapsed to allow nitrogen drawdown (up to 6 months).

3.5 Sediment and erosion control

It is expected that a sediment fence is to be installed surrounding the proposed construction areas and connecting road areas in accordance with Landcom '*Managing Urban Stormwater: Soils and Construction*' (2004). The sediment and erosion control fence is to be firmly trenched into the soil as shown in Figure 7.

Kick-backs are to be installed along all sections of sediment fencing that run downslope to slow down any waters being directed down the fence line. The sediment fence is to be supported by fixed hay bales in low sections of the fence where concentrated runoff is directed through the fence.

Sediment and erosion controls throughout the construction area must be installed in accordance with Landcom's '*Managing Urban Stormwater: Soils and Construction*' (2004). (Figures 7 and 8). Techniques and permanent or temporary infrastructure used for erosion and sediment control on site are to be adequately maintained and monitored at all times, particularly after periods of rain, and shall remain in proper operation until all development activities have been completed and the site is sufficiently stabilised with vegetation.

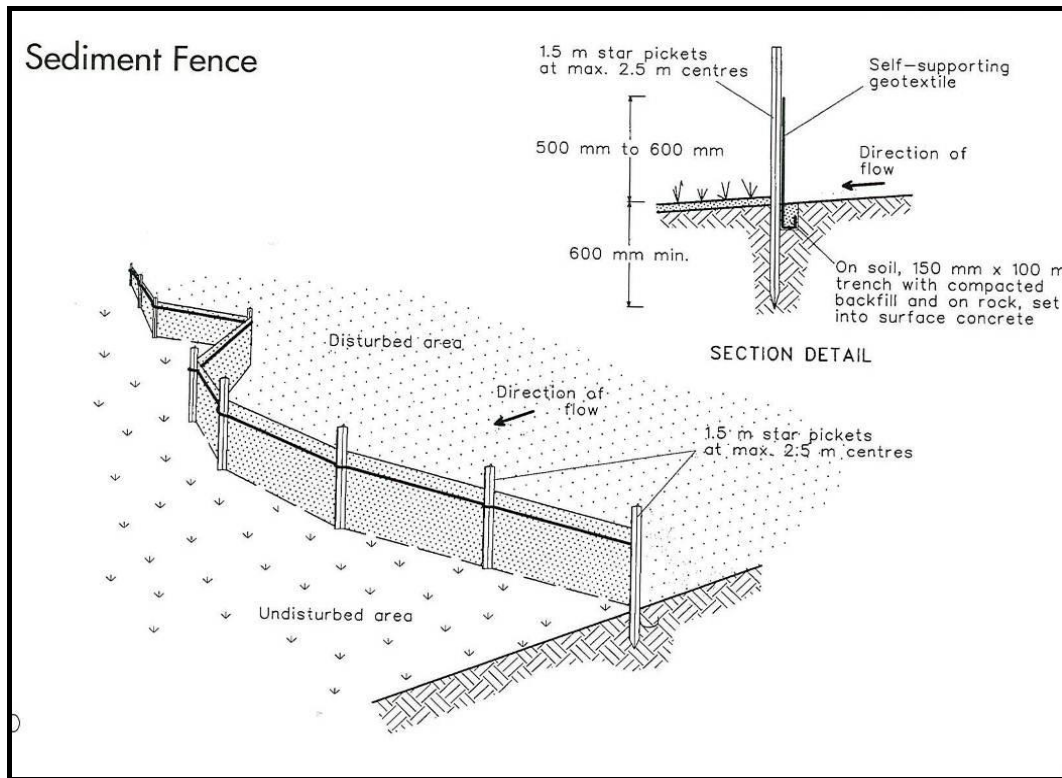


Figure 7 – Generic installation detail of geotextile filter fence

If outlet scour protection is required, it should be installed in accordance with Figure 8. The extent of scour protection is to be determined in consultation with the project ecologist but is to extend to the maximum extent of potential downstream scour. Additional plants are to be installed to assist in stabilisation of moist soils surrounding the outlet. If required, plants are to come from a local source and be typically present within the Dry Open Forest or the Moist Open Forest vegetation community as appropriate with the vegetation community mapping.

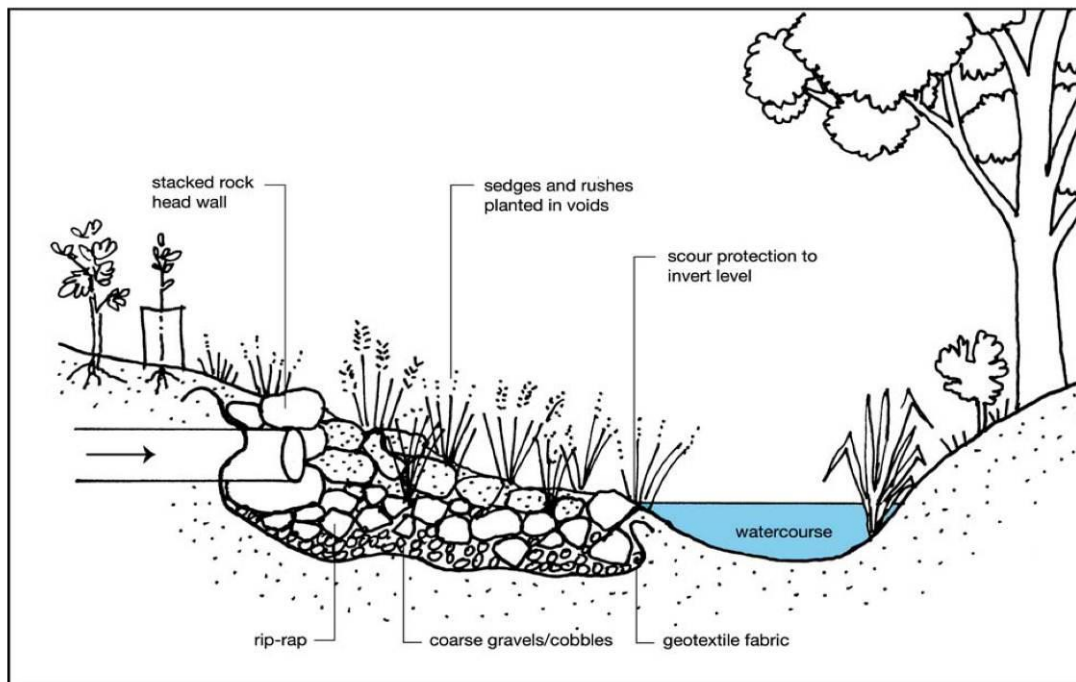


Figure 8 – Stormwater outlet scour protection

(Source – NSW DPI - Office of Water Guidelines for Controlled Activities on Waterfront Land – Guidelines for Outlet Structures 2012)

All earth embankments and banks surrounding stormwater outlets are to be fully stabilised in accordance with Figure 9, covered with open weave jute mesh and revegetated with a minimum of four (4) endemic native ground covers per m², with no identifiable bed or bank erosion.

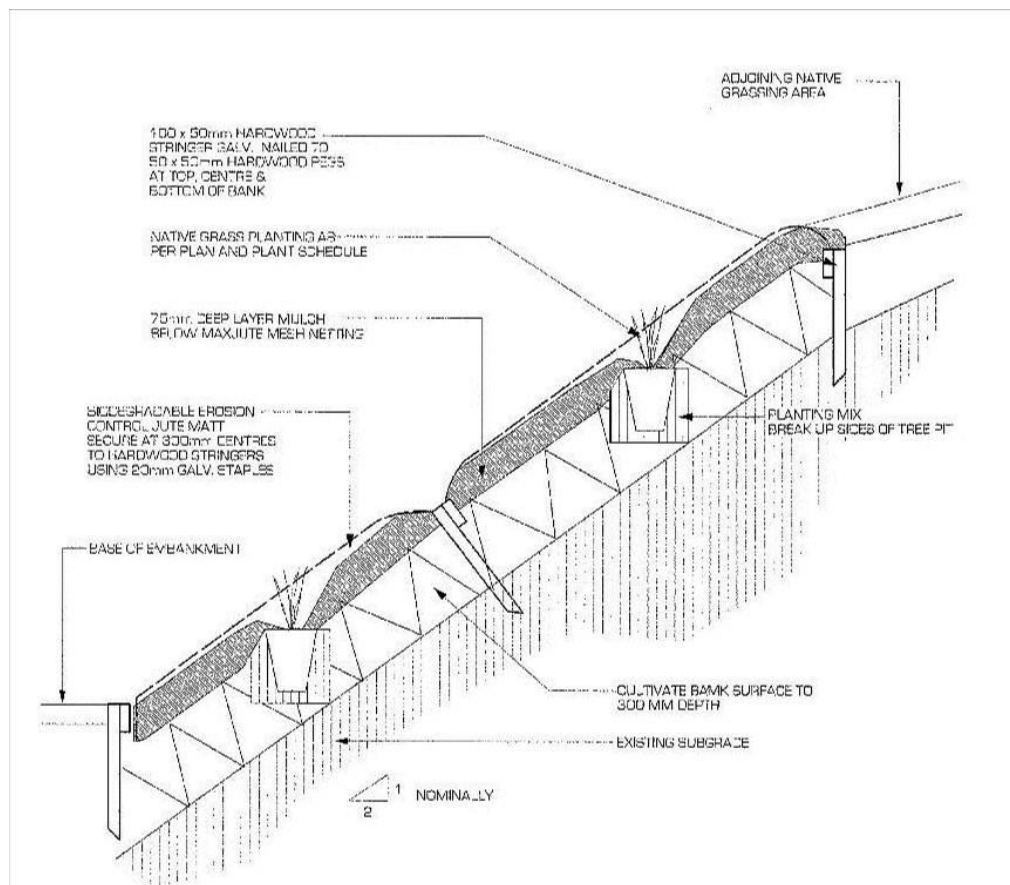


Figure 9 – Generic bank stabilisation

3.6 Hollow-bearing trees

Tree hollows provide critical roosting and overnight shelter for many fauna species. Provided the trees that contain hollows are in a healthy condition, they may be considered as “Ecologically Significant” and should be retained as a high priority wherever possible.

Re-locating existing hollows into nearby remaining trees can compensate for any hollow bearing trees that need to be removed for the proposed development.

If required, guidelines for ameliorating the loss of nesting hollows are as follows:

- I) Where possible and practical, hollow bearing limbs identified for removal should have the hollow sections collected and re-erected or installed into nearby retained trees.
- II) All collected hollow limbs are to be secured to retained trees at a minimum height of four metres above ground level facing the east to northeast direction. Re-erected limbs are not to be placed near locations where public access is planned along reserve areas. All re-erected limbs will be inspected annually and any damaged, or in danger of falling, are to be repaired or replaced.

A fauna ecologist is to locate appropriate trees and locations for installing collected hollow limbs.

The following guidelines are provided in the event of a hollow bearing tree that requires removal within the proposed development area.

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 require to allow for suitable daytime and night time inspections of hollow-bearing trees for use by fauna and to plan for the safe felling of the tree/removal of fauna if present.

Removal of all hollow-bearing trees will be under the supervision of a suitably qualified fauna ecologist to enable effective recovery and relocation of any residing fauna. Hollow-bearing trees identified for removal are to be dismantled by an arborist prior to felling the entire tree.

All hollow-bearing trees proposed for removal shall be clearly marked with a 'H' Symbol to indicate removal under supervision by a suitably qualified fauna ecologist. The contractor is to be managed such that all due care is taken to prevent damage to any trees to be retained and is not to remove the hollow-bearing trees without first receiving instruction from the fauna ecologist. A fauna ecologist is to be present at the felling or removal of each hollow-bearing tree.

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.

In some cases physical inspections of hollows by climbing trees may be required. This will be carried out by suitably qualified arborists under the direction and supervision of the fauna ecologist.

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.

In those trees that contain hollows and no fauna has been observed, the tree will be machine felled. Where machinery is required to fell hollow trees, the blade or bucket of the machinery will be tapped against the trunk of the tree to disturb any fauna present and provide time to leave the hollow. Several taps on the trunk and waiting periods between each set of taps may be required at the discretion of the fauna ecologist. The tree will then be felled as gently as possible. All hollow limbs will be inspected by the fauna ecologist 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 at a later date. Any fauna injured during clearing will be handed to WIRES for care and rehabilitation, taken to a local vet for appropriate treatment, or euthanased in accordance with Animal Ethics licencing held by the fauna ecologist.

3.6.1 Retention of hollow-bearing trees

A complete assessment of the location of habitat trees and the size of hollows within, was undertaken as part of the *Travers Flora and Fauna Report* (2018). Tables 3.1 and 3.2 below provides hollow-bearing tree data and Schedule 1 – Vegetation Management Works shows locations of habitat trees.

Significant habitat trees are generally defined as trees containing large hollows suitable for use by threatened owls or cockatoos and/or containing a number of good quality hollows typically consisting of more than one medium (10-30cm) sized hollow. A tree may also be considered significant if otherwise potentially important for a threatened species.

Some trees containing small to medium sized hollows have been included as a significant habitat tree based on their apparent good quality and given the relative low density of hollows present overall within the study area. Dominant tree species including Silvertop Ash and Sydney Peppermint are not species typically providing a high number of hollows.

Given the recording of Eastern Pygmy Possum a detailed habitat tree survey was undertaken through potential habitat areas of the subject site. The data for these trees containing potential EPP habitat are shown in **Table 4.4b**.

Table 3.1 – Significant habitat tree data

Tag No.	Tree Survey No.	Common Name	DBH (cm)	Basal diam. (cm)	Height (m)	Spread (m)	Vigour (%)	Hollows Recorded
SHT1		Sydney Peppermint	55	80	31	13	60	1x 20-30cm trunk (showing wear) ✓GGC
SHT2	284	Sydney Peppermint	45/55	100	17	15	70	1x 5-10cm trunk (good quality showing wear)

Tag No.	Tree Survey No.	Common Name	DBH (cm)	Basal diam. (cm)	Height (m)	Spread (m)	Vigour (%)	Hollows Recorded
SHT3a		Sydney Peppermint	45	75	26	12	70	1x 5-10cm trunk (good quality)
SHT3b	132	Sydney Peppermint	75	120	20	13	10	1x 10-15cm trunk, 2x 20-30cm trunk, all exposed. ?GGC
SHT4	749	Sydney Peppermint	90/23	145	25	9	30	1x 30-40cm low broken trunk ✓GGC
SHT5		Sydney Peppermint	60	80	24	12	60	1x 5-10cm branch spout, 1x 10-15cm trunk (good quality)
SHT6	12/T53	Sydney Peppermint	70	100	26	17	65	3x 15-20cm trunk (good quality) ?GGC
SHT7	14	Sydney Peppermint	85	120	25	19	75	1x 20-30cm trunk (good quality) ✓GGC
SHT8		Sydney Peppermint	85/25	120	24	13	30	1x 5-10cm trunk, 1x 15-20cm trunk ?GGC

✓GGC = suitable for Gang-gang Cockatoo

?GGC = low potential suitability for Gang-gang Cockatoo

Table 3.2 – Hollow-bearing tree data (EPP study area)

Tag No.	Common Name	DBH (cm)	Hollows Recorded
HT1	Silvertop Ash	50	1x 5-10cm trunk
HT2	dead stump	100	1x 5-10cm cut trunk
HT3	Sydney Peppermint	28/32	1x 0-5cm trunk (good)
HT4	Sydney Peppermint	45/45/17/12	1x 0-5cm trunk (good)
HT5	stag	15/9	1x 0-5cm vertical branch spout
HT6	Sydney Peppermint	14	1x 0-5cm trunk
HT7	Silvertop Ash	60	1x 0-5cm trunk crack
HT8	Sydney Peppermint	9/10	1x 5-10cm trunk
HT9	Silvertop Ash	35/30	1x 0-5cm trunk, 1x 0-5cm trunk
HT10	Sydney Peppermint	55	1x 0-5cm trunk open
HT11	Silvertop Ash	80	2x 5-10cm trunk, 1x 5-10cm broken trunk
HT12	Silvertop Ash	35	1x 5-10cm branch spout
HT13	Silvertop Ash	7	1x 0-5cm trunk
HT14	stag	8	1x 0-5cm broken trunk open
HT15	stag	45	1x 5-10cm trunk 1x 15-20cm broken trunk, 1x 20-30cm broken trunk
HT16	Sydney Peppermint	65/12	1x 0-5cm trunk, 1x 0-5cm branch spout, 2x 5-10cm trunk
HT17	Sydney Peppermint	17/17/17/12	1x 0-5cm trunk
HT18	stag	5	1x 0-5cm broken trunk (shelter open)
HT19	Sydney Peppermint	34/3450	1x 5-10cm trunk
HT20	Sydney Peppermint	11/13	1x 0-5cm trunk open
HT21	Sydney Peppermint	40/42	2x 0-5cm trunk
HT22	Sydney Peppermint	32	1x 0-5cm branch spout
HT23	stag	28	1x 0-5cm branch spout
HT24	Sydney Peppermint	65	1x 5-10cm trunk
HT25	Sydney Peppermint	10/20/15	1x 5-10cm trunk open
HT26	Sydney Peppermint	70	1x 0-5cm trunk split
HT27	Sydney Peppermint	35	1x 0-5cm trunk base
HT28	Sydney Peppermint	50	1x 0-5cm trunk, 1x 0-5cm trunk
HT29	Sydney Peppermint	30	1x 0-5cm branch spout
HT30	Sydney Peppermint	32	1x 0-5cm trunk open
HT31	Sydney Peppermint	33	1x 10-15cm trunk
HT32	Silver Wattle	10	1x 5-10cm trunk split
HT33	Sydney Peppermint	0	1x 0-5cm trunk, 1x 0-5cm trunk
HT34	Sydney Peppermint	62	1x 5-10cm branch
HT35	Sydney Peppermint	27	1x 0-5cm trunk
HT36	Silvertop Ash	60	1x 5-10cm trunk split
HT37	Silvertop Ash	55	2x 0-5cm branch spout, 1x 10-15cm branch spout
HT38	stag	34	2x 0-5cm branch spout
HT39	Sydney Peppermint	34	1x 5-10cm trunk
HT40	Sydney Peppermint	50	1x 0-5cm branch spout, 1x 5-10cm branch spout
HT41	Sydney Peppermint	55/25/25	1x 0-5cm branch spout
HT42	Sydney Peppermint	55/30	1x 0-5cm trunk crack
HT43	Sydney Peppermint	35	1x 0-5cm branch

Tag No.	Common Name	DBH (cm)	Hollows Recorded
HT44	Sydney Peppermint	80/34	1x 0-5cm branch, 1x 5-10 trunk, 1x 10-15cm trunk split
HT45	Sydney Peppermint	44	1x 0-5cm trunk 1x 5-10 trunk, 1x 5-10 branch 1x 10-15cm trunk
HT46	Sydney Peppermint	40	2x 0-5cm trunk
HT47	Sydney Peppermint	45	1x 5-10cm trunk split
HT48	Sydney Peppermint	44	1x 5-10cm broken trunk

The habitat trees recorded within the study area fall under one of three categories with respect to significance:

Category 1: Significant habitat trees (high):

- Large hollow suitable for cockatoos or large forest owls >30cm and/or
- Trees containing two (2) or more good quality medium hollows 10-30cm and/or
- >8 small hollows

Category 2: Significant habitat trees (moderate):

- Trees containing one medium hollow 10-30cm and/or
- 3-8 small hollows

Category 3: Remaining hollow bearing trees generally containing small or low numbers of hollows

3.7 Bushfire management & fuel reduction

A bushfire protection assessment has been prepared in order to identify the level of bushfire risk from vegetation within and surrounding the site and to define suitable APZs (*Travers bushfire and ecology*, 2018 Ref: A16026B).

The assessment has concluded that the proposed development will allow for an overall improved bushfire protection outcome with the proposed additions being provided with the same or increased setbacks from bushfire prone vegetation.

We note that a managed ecological zone has been overlain to provide a degree of habitat retention within the proposed asset protection zones in a manner compliant with asset protection zones.

The following APZ specification apply to the nominated asset protection zones however we advise that as a managed ecological zone with ecological protection, visual screening and asset protection objectives, a fuel management plan is to be prepared to stipulate the specific tree retention, fuel management and habitat enrichment works required within the MEZ.

Inner Protection Area (IPA - Recommended Fuel load 0-3t/ha)

- Retain 25-30% of the understorey and shrub layers in discontinuous clumps,
- The canopy layer should not exceed 15% cover,
- Ensure discontinuous canopy by creating clumps of trees, each clump separated by 2-10m canopy separation,

- Remove excessive ground layer litter on an annual basis (manual fuel reduction – subject to fuel accretion),
- Slash the IPA approximately 6 times a year to maintain low fuel levels (subject to regrowth rates).

Outer Protection Area (OPA – recommended fuel load 4-8 t/ha)

- Retain up to 50 % of the understorey and shrub layers in discontinuous clumps,
- No tree removal required except adjacent to firebreaks or fire trails,
- Remove excessive ground layer litter on a biannual basis (Manual or low intensity fuel reduction burn) & remove weeds (subject to fuel accretion).
- Slash the OPA once every 2-3 years to maintain reduced fuel levels (subject to regrowth rates).

As a general rule differing vegetation types have different natural fuel loads in different strata. Thus, hazard reduction within asset protection zones will be dependent on vegetation type and spatial arrangement and will require specialist onsite advice at the appropriate time.

Ecological burns

Ecological or bushfire hazard reduction burns require appropriate assessment, planning, permits and execution, and are only undertaken with the advice, direction and assistance of the RFS or NSW Fire Brigade, the Environmental Protection Agency (EPA) and Council. However, ecological burns are recommended for those vegetation communities and threatened species that depend on fire for regeneration. This can be undertaken as part of routine fuel reduction burns by the local RFS provided the burns do not exceed the preferred ecological fire return periods for the type of vegetation onsite (i.e. once every 10 to 20 years).

General APZ Maintenance Advice

The following general advice for maintaining an APZ is to be followed:

- *Mowing or grazing of grass:* Grass needs to be kept short (approximately 5cm in height) and green where adequate water supplies are available.
- *Raking or manual removal of fine fuels:* Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.
- *Removal or pruning of trees, shrubs and understorey:* The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation. Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by 2-5m. A canopy is not to overhang a dwelling unless specifically approved by the RFS. Native trees and shrubs should be retained as clumps in landscape beds and should not exceed a covering of more than 20% of the IPA.
- Trees or tall shrubs may require pruning upon dwelling completion in line with *PBP*. Notwithstanding this, the presence of shrubs and trees close to a dwelling in a bushfire prone landscape requires specific attention to day-to-day management and owners and / or occupiers should be made aware that whilst landscaping can contribute to a way of life and environmental amenity, the accumulated fuels must be regularly removed.
- Trees may remain within close proximity of a building where it can be demonstrated that the tree is not able to produce a build-up of fuel on the roof of a dwelling due to:

1. A roof pitch which self-sheds leaf litter;
 2. Ongoing roof maintenance by staff or contractors; and
 3. Adequate ember protection has been installed;
- Trees that are likely to be structurally unstable such that they could cause a limb to fall would require removal for the RFS to agree to a dwelling in proximity to the trees.

In addition, the following general APZ planning advice is to be followed:

- Ensure that vegetation does not provide a continuous ignition path to the house;
- Plant or clear vegetation into clumps rather than continuous rows;
- Prune low branches 2m from the ground to prevent a ground fire from spreading into trees;
- Locate vegetation far enough away from the proposed dwellings so that plants will not ignite the dwelling by direct flame contact or radiant heat emission; and
- Ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non-flammable ground cover such as pebbles and crushed tiles.



Management and Monitoring

4

4.1 Monitoring

Monitoring of the progress of weed removal, plant growth and natural regeneration is to be undertaken at regular intervals by the appointed project ecologist who will submit compliance statements to Council at the completion of each major item undertaken within the VMP. At the beginning of the contract, the project ecologist shall set up monitoring points at the approximate locations noted on Schedule 1 that include a photographic record prior to works being undertaken, then quadrat sampling to test the success of the works. Three (3) quadrats will be undertaken at a minimum. These are to be located as per Schedule 1 – Vegetation Management Works to measure the growth and density of revegetation, regeneration works, weed control and green waste removal.

Monitoring activities will include:

1. Three (3) flora quadrats to measure the growth and density of the various revegetation areas and to monitor weed densities at selected locations;
2. A photographic record for comparative purposes taken on an annual basis from the same two (2) points within the MEZ and 1 point within the Bush Regeneration/EPP Habitat Zone (as per Schedule 1). Photographs from these photo points will have the same view taken at each visit; and
3. An overall vegetation condition map based on standard bush regeneration vegetation condition assessment methodology produced and submitted to Council annually for a period of three (3) years after all construction works are completed.

Monitoring of the site is required to be set up prior to the commencement of the development clearing and construction works. This will allow the determination of pre and post condition of the vegetation and its habitat, and may include identification of any areas suffering from disturbance, sedimentation or in need of contingency rehabilitation, weed control, stabilisation or maintenance of rehabilitated or regenerating areas.

The monitoring and review process will focus on the presence / absence of exotic species, floristic diversity of the bushland, structural integrity of the bushland, regeneration progress and success, and monitoring of any sediment fencing or protective fencing.

Inspections of the site by the project ecologist should be undertaken prior to, during and post operations to ensure that vegetated areas designated for retention and exclusion zones are adequately marked and that other appropriate protection procedures (such as erection and maintenance of temporary and permanent protective fences) are being maintained.

An inspection is to be undertaken by the project ecologist every month during primary regeneration works, with the submission of a compliance certificate at the completion of the regeneration works. The regeneration area is to be maintained to a high standard, with no future encroachments of new landscaping beds, tree removal, installed or repaired services, driveways, fences or buildings except for that shown on Schedule 1 - Vegetation Management Works. The regeneration zone is to be maintained as an indigenous native vegetation area, supporting the surrounding Dry Open Forest (*Eucalyptus piperita*, *E.*

sieberi) or Moist Gully Forest (*E. dalrympleana*, *E. piperita*, *E. sieberi*, *E. oreades*) vegetation types as appropriate for the location and extent of these vegetation types shown in Schedule 1.

Following the completion of Year 5 of the maintenance period, the project ecologist is to determine whether any additional contingency works are required to satisfactorily achieve the performance targets. These works are to be managed by the land owners under the supervision of the project ecologist.

4.1.1 Compliance certification

Compliance certificates will be issued by the project ecologist for the following items:

- Engagement of a bush regeneration contractor and independent project ecologist;
- Installation of all temporary or permanent protective fencing and sediment and erosion control measures;
- Completion of regeneration works including supplemental or enrichment planting of shrub species at the required densities within the EPP Habitat Zone;
- Completion of primary weed control works;
- Completion of secondary weed control works and regeneration or revegetation maintenance; and
- Satisfactory achievement of restoration works as shown on Schedule 1 – Vegetation Management Works and the restoration performance targets (Section 4.2).
- Project ecologist and bushfire planner is to certify compliance with MEZ management requirements.

4.2 Restoration performance targets

The site audits are to assess the achievement of the following restoration performance targets:

1. Weed control and revegetation works are to be carried out by a qualified bushland regenerator to achieve the following weed control targets. The presence, abundance and cover of noxious and environmental weed species (maximum 10% weed coverage at the end of Year 1, progressively reducing to less than 1% at the end of Year 5).
2. Two (2) monitoring quadrats are to be installed within the Bush Regeneration (EPP Habitat) Zone prior to commencement of restoration works.
3. Invasive weeds as advised by the project ecologist are to be continuously suppressed and, if possible, eradicated from the whole of the subject site. Weed species known or likely to occur within the site are: *Populus alba* (White Poplar), Exotic Maple (*Acer* sp.), *Prunus laurocerasus* (Cherry Laurel), *Pinus elliotii* (Slash Pine), *Ilex aquifolium* (English Holly), *Ligustrum sinense* (Small-leaved Privet), *Rubus anglocandicans* (Blackberry), *Cytisus scoparius* (Scotch Broom), *Crocsmia X crocosmiiflora* (Montbretia), *Hedera* sp. (Ivy) and *Cortaderia selloana* (Pampas Grass).
4. All weed vegetation and propagules are to be disposed off-site at a suitable green waste facility.
5. All embankments are to be fully stabilised (see Figure 9) and revegetated with native vegetation planted with local provenance plant stock using species that typically occur within Dry Open Forest or Moist Open Forest as appropriate. Areas within the MEZ are to comply with requirements of an IPA.

6. A sediment and erosion control plan is to be prepared and generally carried out in accordance with *Soils and construction – Managing Urban Stormwater* (Landcom), *EPA Pollution Control Manual for Urban Stormwater* and Department of Housing manual *Urban Erosion and Sediment Control*.
7. Areas to be stabilised for scour protection which includes areas immediately surrounding and downstream of the stormwater outlet is to be constructed with geotextile overlain with interlocked sandstone rock boulders. Scour protection is to be covered with a minimum of 150mm of soil mix suitable for Australian native plants as illustrated on Figure 8. A minimum of 75 mm of mulch is to be laid over the placed soil, protected under a secured open weave jute mesh and planted to the following densities. A minimum of one (1) endemic native tree per 50m², one (1) sub-canopy species per 30 m², one (1) shrub per 5 m², and four (4) groundcovers or sedges per m² are to be planted in areas where fully structured BGHF vegetation is to be re-established.
8. All earth embankments and banks surrounding stormwater outlets are to be fully stabilised in accordance with Figure 9, covered with open weave jute mesh and revegetated with a minimum of four (4) endemic native ground covers per m², with no identifiable bed or bank erosion.
9. During construction, sediment and erosion control fences are to be installed as shown in Figure 7 in accordance with '*Soils and Construction, Managing Urban Stormwater*' (Landcom).
10. All stormwater outlets are to be stabilised with geotextile overlain with rock boulders in accordance with NSW Office of Water's Controlled Activity Guidelines (2012) for stormwater outlets.
11. The Bush Regeneration (EPP Habitat Zone), and Drainage Corridor, are to be fully maintained for a minimum of three (3) years following completion of construction and revegetation works to achieve a naturalised vegetation structure and composition (structure as expected for three (3) years growth).
12. The Managed Ecological Zone (MEZ) areas are to be maintained as a bushfire Inner Protection Area (IPA) in accordance with criteria specified within *Planning for Bushfire Protection* (RFS 2006) as per an approved fuel management plan.
13. A minimum of 0.51 ha of fully structured Bush Regeneration (EPP Habitat) and 0.24 ha of Visual Screening vegetation is to be established within the subject site as per Schedule 1. A minimum of thirty (30) endemic native species are to be established consisting of a broad mix of groundcover, shrub, vine, sub-canopy and canopy species commensurate with Dry Open Forest or Moist Open Forest as appropriate to the vegetation community mapping.
14. Erection of twenty-five (25) microchiropteran and twenty-five (25) medium sized bird nest boxes within the whole of the subject site to offset the loss of 22 hollow-bearing trees. Locations and types of nest boxes are to be determined by the project ecologist.
15. Within the full vegetation restoration areas (0.51 ha of Bush Regeneration - EPP Habitat and 0.14 ha of fully structured Drainage Corridor Vegetation) a target of 60% native vegetation cover applies at the end of Year 1, 75% native vegetation cover at the end of Year 2, and 95% native vegetation cover at the end of Year 5. Native vegetation cover is to be monitored every six (6) months.
16. Improved density and diversity of understorey endemic native vegetation for fauna species habitat.

17. The effectiveness and appropriateness of weed control and fuel reduction methods.
18. The effective control and removal of waste and litter from the whole of the subject site.
19. Monitoring to occur by the project ecologist with compliance certification reported to Council at the successful completion of each major item or group of items (section 5.1 of this report).



Program of Works

5

The program of works (Table 4) is aimed at providing a management framework for enacting revegetation, regeneration, maintenance, monitoring and review works reasonably required for the conservation of retained bushland and proposed restoration measures. Site rehabilitation, including weed control works is to be undertaken in accordance with Schedule 1 – Vegetation Management Works.

5.1 Program of works

For the purposes of the program of works, the listed tasks are divided into the following stages.

Pre-construction works

Pre-construction works refers to all site preparation activities prior to the commencement of any clearing or construction works on site and generally excludes any landscaping and planting works.

This stage will include the installation of protection fencing (temporary and permanent), tree protection zones and sediment fencing. It also includes the identification of hollow-bearing trees that may require removal and any proposed stag-watching or similar (if required), or protection if the hollow-bearing trees are to be retained.

Preparation of pest fauna management may be undertaken during this phase or prior to revegetation works commencing.

Construction works

Construction works refers to the period during which clearing, earthworks and construction of buildings, as well as roads and services being installed. It is during this period that the protection of remnant vegetation is critical to minimising accidental loss of trees or associated vegetation. It is also during this phase that primary restoration works are completed.

Primary restoration works, as defined under this VMP, include the supervised removal of hollow-bearing trees by the fauna ecologist, installation of collected hollows, completion of primary and secondary weed control, maintenance of protective measures and mulching / planting works if required.

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 regenerating or 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 construction works phase may be extended.

Post construction works

Post construction works essentially consist of maintenance activities, unless further contingency works are identified by the project ecologist for auditing purposes. Maintenance will be undertaken by a fully qualified bush regeneration crew for a minimum of five (5) years post completion of primary restoration works.

All bush regeneration crews working on site are required to have at a minimum TAFE Certificate Level II Bush Regeneration qualifications or equivalent to undertake weeding and revegetation works. All staff are to be supervised by a qualified bush regeneration Supervisor who should possess a minimum of a Certificate IV in Conservation and Land Management or a biological science degree, with at least five (5) years of field experience.

Prior to the release of the construction certificate, all protective measures must be completed, as well as primary weed control and initial revegetation works.

Table 4 – Program of works

Action	Responsibility
Stage 1 – Pre-construction works	
• Formation of site management team and establish supervision and consultation processes – minimum project ecologist, and site manager	• Site project manager
• Erection of temporary and permanent protection fencing, erosion control fencing and tree protection zones	• Site manager / bush regenerator contractor / project ecologist
• Rabbit baiting (if required)	• Contractor
• Marking of any hollow-bearing trees to be removed and undertake any required fauna survey prior to removal	• Fauna ecologist
• Commencement of seed collection and propagation contracts	• Bushland regenerator / project ecologist
• Set up monitoring points	• Project ecologist
• Provide certificates of compliance	• Project ecologist
Stage 2 – Construction works	
• Supervision of hollow-bearing tree removal	• Fauna ecologist / tree climber
• Commencement of primary weed control	• Suitably qualified bushland regenerator
• Monitor erosion control measures (monthly – especially after heavy rain) and replace if required	• Contractor with advice of project manager
• Complete regeneration / weed removal works	• Contractor / project manager
• Commencement of secondary weed control and maintenance weed control	• Contractor / project manager
• Maintenance of protective fencing	• Contractor / suitably qualified bushland regenerator

• Provide certificates of compliance	• Project ecologist
Stage 3 – Post Construction Works • Enrichment planting within revegetation areas (if required). • Continuation of regeneration and weed control maintenance. • Monitoring of quadrats, revegetation works, weed control works and protection devices • Conduct maintenance beyond five (5) years as required • Provide certificates of compliance	• Contractor with advice of project ecologist • Contractor / suitably qualified bushland regenerator • Project ecologist • Site manager with advice of project ecologist • Project ecologist

Schedule 1 identifies the location of the planned regeneration works in relation to the proposed development.

5.2 Typical timeline of restoration works

The following typical timeline (Figure 10) is provided to indicate the overall timing of restoration works. The commencement of the maintenance period of three (3) years is subject to the completion of primary restoration works as certified by the project ecologist. A certificate of completion will be required as evidence of satisfactory results.

The successful implementation of restoration works may affect the release of the occupation certificate or the release of any required bonds as required under the development consent. Therefore contingency restoration works may be required in order for a compliance certificate to be issued.

Upon engagement, contractors are expected to meet the following typical schedule of works.

Task Name		Duration	Year 1 - Primary Restoration Works												Year 2												Years 3-5															
			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	1 month																																								
2.0	SITE PREPARATION AND PROPAGATION																																									
2.1	Pre-commencement vegetation condition assessment & installation of monitoring plots	1 day																																								
2.1	Seed collection	12 months																																								
2.3	Plant propagation (initial & contingency)	8 months																																								
2.4	Installation of protective fencing and signage	2 weeks																																								
2.5	Install sediment and erosion control measures	2 weeks																																								
2.6	Permit to undertake pest (rabbit) control - Pindone baiting - if required	3 weeks																																								
	STAGE 2 DURING CONSTRUCTION WORKS																																									
3.0	WEED CONTROL																																									
3.1	Primary weed control	1-3 months																																								
3.2	Secondary weed control	3 months																																								
4.0	REVEGETATION ESTABLISHMENT	1-1.5yrs																																								
4.1	Site preparation - sediment and erosion control, removal of waste	1-5 days																																								
4.2	Construction works - regrading and stormwater outlet works	6-12 months																																								
4.3	Installation of irrigation system (as appropriate to site) (if required)	1 month																																								
4.4	Regeneration works	6 months																																								
4.5	Revegetation works (if required)	3 months																																								
4.6	Initial watering & maintenance	6 months																																								
	STAGE 3 - POST CONSTRUCTION WORKS																																									
5.0	BUSH REGENERATION & REVEGETATION MAINTENANCE																			</																						

Figure 10 – Typical restoration timeline (45 years maintenance after completion of construction and primary weed control and regeneration works)



Recommended Planting Lists

A1

The following locally occurring native plant species are to be established within the revegetation area. Further species will also be suitable provided that they are recognised as being typical or common species known or demonstrated to occur within the Dry Open Forest (*Eucalyptus piperita*, *E. sieberi*) or Moist Gully Forest (*E. dalrympleana*, *E. piperita*, *E. sieberi*, *E. oreades*). The appointed bush regeneration contractor may vary the number of plant species to be established provided 80% dominant species is retained as per this Attachment 1.

Table A1.1 – Recommended Species Planting List for Dry Open Forest

Dry Open Forest (<i>Eucalyptus piperita</i>, <i>E. sieberi</i>)	
Trees	
<i>Banksia serrata</i>	Old Man Banksia
<i>Eucalyptus piperita</i>	Sydney Peppermint
<i>Eucalyptus sieberi</i>	Silvertop Ash
<i>Eucalyptus sparsifolia</i>	Narrow-leaved Stringybark
Shrubs	
<i>Acacia longifolia</i>	Sydney Golden Wattle
<i>Baeckea linifolia</i>	Weeping Baeckea
<i>Banksia spinulosa</i>	Hairpin Banksia
<i>Dillwynia retorta</i>	Eggs and Bacon
<i>Epacris pulchella</i>	Wallum Heath
<i>Lambertia formosa</i>	Mountain Devil
<i>Leptospermum polygalifolium</i>	Yellow Tea Tree
<i>Leptospermum trinervium</i>	Flaky-barked Tea Tree
<i>Persoonia levis</i>	Broad-leaved Geebung
<i>Persoonia mollis</i>	Soft Geebung
<i>Petrophile pulchella</i>	Conesticks
<i>Pittosporum undulatum</i>	Sweet Pittosporum
<i>Podolobium ilicifolium</i>	Native Holly
Groundcovers and Vines	
<i>Austrostipa pubescens</i>	Tall Spear Grass
<i>Dianella caerulea</i> var. <i>producta</i>	Flax Lily
<i>Dianella prunina</i>	-
<i>Entolasia marginata</i>	Bordered Panic
<i>Gahnia microstachya</i>	-
<i>Goodenia bellidifolia</i>	Daisy-leaved Goodenia
<i>Goodenia heterophylla</i>	-
<i>Lepidosperma laterale</i>	Variable Sword-sedge
<i>Lomandra longifolia</i>	Spiky-headed Mat-rush
<i>Lomandra obliqua</i>	Twisted Mat-rush
<i>Pomax umbellata</i>	Pomax
<i>Pteridium esculentum</i>	Bracken Fern
<i>Smilax glycyphylla</i>	Sarsaparilla
<i>Stylidium graminifolium</i>	Trigger Plant

Table A1.2 – Recommended Species Planting List for Moist Gully Forest

Moist Gully Forest (<i>E. dalrympleana</i>, <i>E. piperita</i>, <i>E. sieberi</i>, <i>E. oreades</i>)	
Trees	
<i>Eucalyptus piperita</i>	Sydney Peppermint
<i>Eucalyptus oreades</i>	Blue Mountains Ash
<i>Acacia elata</i>	Cedar Wattle
<i>Callicoma serratifolia</i>	Black Wattle
<i>Cyathea australis</i>	Tree Fern
<i>Elaeocarpus reticulatus</i>	Blueberry Ash
<i>Hedycarya angustifolia</i>	Native Mulberry
<i>Pittosporum undulatum</i>	Sweet Pittosporum
<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>	Cheese Tree
<i>Notelaea longifolia</i>	Mock Olive
<i>Ceratopetalum gummiferum</i>	NSW Christmas Bush
Shrubs	
<i>Banksia ericifolia</i>	Heath-leaved Banksia
<i>Epacris pulchella</i>	Wallum Heath
<i>Leptospermum polygalifolium</i>	Yellow Tea Tree
<i>Leptospermum squarrosum</i>	-
<i>Persoonia mollis</i>	Soft Geebung
<i>Acacia suaveolens</i>	Sweet Scented Wattle
<i>Grevillea acanthifolia</i> subsp. <i>acanthifolia</i>	Bog Grevillea
<i>Lomatia myricoides</i>	River Lomatia
<i>Pittosporum spinescens</i>	Orange Thorn
<i>Polyscias sambucifolia</i>	Elderberry Panax
Groundcovers and Vines	
<i>Anthoxanthum avenaceus</i>	Oat Speargrass
<i>Austrostipa pubescens</i>	Tall Spear Grass
<i>Baumea rubiginosa</i>	Twig Rush
<i>Blechnum nudum</i>	Fishbone Water Fern
<i>Centella asiatica</i>	Swamp Pennywort
<i>Cissus hypoglauca</i>	Water Vine
<i>Cyperus gracilis</i>	Slender Flat Sedge
<i>Dianella caerulea</i> var. <i>producta</i>	Blue Flax Lily
<i>Empodisma minus</i>	-
<i>Entolasia marginata</i>	Bordered Panic
<i>Gahnia sieberiana</i>	Red-fruited Saw-sedge
<i>Gahnia sieberiana</i>	Red-fruited Saw-sedge
<i>Gleichenia dicarpa</i>	Pouched Coral Fern
<i>Gleichenia rupestris</i>	Coral Fern
<i>Histiopteris incisa</i>	Bat's Wing Fern
<i>Juncus usitatus</i>	Common Rush
<i>Lepyrodia scariosa</i>	Scale Rush
<i>Lindsaea microphylla</i>	Lacy Wedge-fern
<i>Lomandra longifolia</i>	Spiky-headed Mat-rush
<i>Lomandra longifolia</i>	Spiky-headed Mat-rush
<i>Pteridium esculentum</i>	Bracken Fern
<i>Smilax glycyphylla</i>	Sarsparilla
<i>Tetrastigma nitens</i>	Three-leaved Water Vine
<i>Todea barbara</i>	King Fern
<i>Viola hederacea</i>	Ivy-leaved Violet



Target Weed Species

A2

The following invasive and/or environmental weed species are known to occur or may possibly occur on site and are to be targeted on a priority basis subject to degree of invasiveness and implications for regeneration of native flora.

Table A2.1 - Target weed species for the site

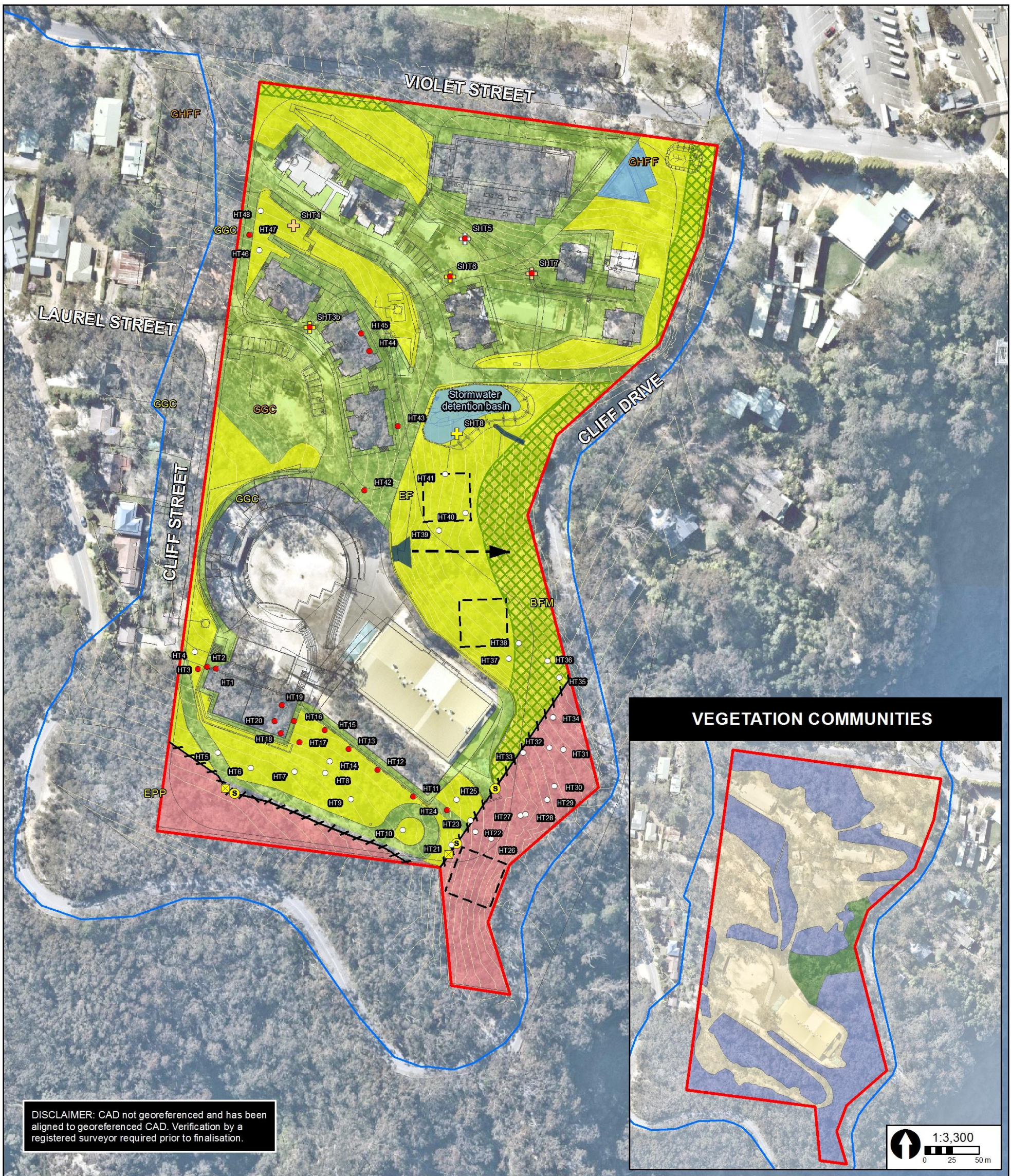
Species		Priority
Trees	<i>Pinus elliottii</i> (Slash Pine)	High
	<i>Populus alba</i> (White Poplar)	High
	<i>Acer</i> sp. (Exotic Maple)	Medium
	<i>Prunus laurocerasus</i> (Cherry Laurel)	Medium
Shrubs	<i>Ligustrum sinense</i> (Small-leaved Privet)	Very High
	<i>Cytisus scoparius</i> subsp. <i>scoparius</i> (Scotch Broom)	Very High
	<i>Rubus anglocandicans</i> (Blackberry)	Very High
	<i>Ilex aquifolium</i> (English Holly)	High
	<i>Buddleja davidii</i> (Butterfly Bush)	High
Groundcovers	<i>Cortaderia selloana</i> (Pampas Grass)	Very High
	<i>Lonicera japonica</i> (Japanese Honeysuckle)	High
	<i>Crocasmia x crocosmiiflora</i> (Montbretia)	Medium
	<i>Cyperus eragrostis</i> (Umbrella Sedge)	Medium
	<i>Ehrharta erecta</i> (Panic Veldtgrass)	Medium
	<i>Pennisetum clandestinum</i> (Kikuyu Grass)	Medium
	<i>Hedera</i> spp. (Ivy)	Medium
	<i>Agapanthus praecox</i> (Agapanthus)	Low

Invasive and environmental weeds that commonly occur within the Blue Mountains Local Government Areal also need to be targeted if found on site in accordance with their respective weed category and the 'best practice' methods identified for that noxious weed.

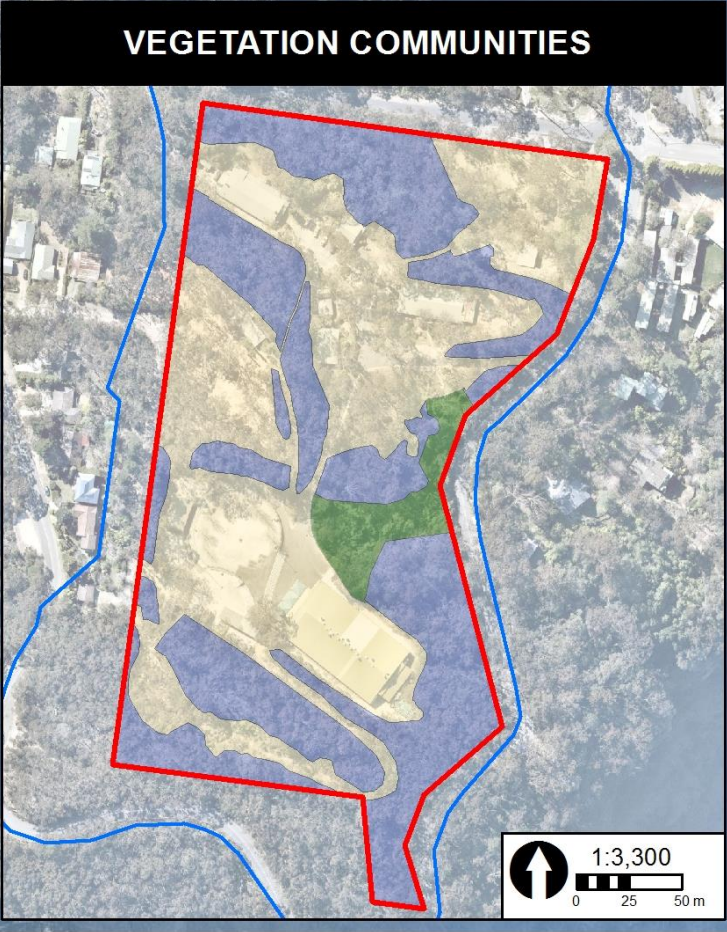


Vegetation Management Works

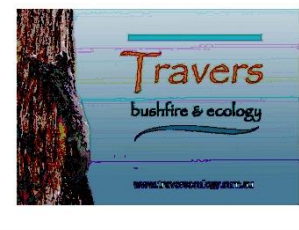
S1



DISCLAIMER: CAD not georeferenced and has been aligned to georeferenced CAD. Verification by a registered surveyor required prior to finalisation.



Legend - Site boundary - DA1 - Study area - Contours - 0.5m (source: CAD) - Bush regeneration (EPP Habitat Zone) (0.51ha) - Managed ecological zone (MEZ) (1.81ha) Asset Protection Zone (APZ) - Inner Protection Area (IPA - includes MEZ) - Outer Protection Area (OPA)	- Access gate - Environmental signage (x3) - Perimeter fence (213m) - Stormwater basin - Stormwater outlet - Monitoring quadrats (20x20m)	Vegetation Communities 1. Dry Open Forest 2. Moist Gully Forest 7. Disturbed land Fauna Survey Results TBE 2007 - GGC Gang-gang Cockatoo - GHFF Grey-headed Flying Fox	Fauna Survey Results TBE 2016 - BFM Black-faced Monarch - EF Eastern Falsistrelle - EPP Eastern Pygmy Possum - GGC Gang-gang Cockatoo	Significant habitat trees TBE 2016 - Large hollow suitable for GGC - Lg. hollow, unlikely suitable for GGC - Other good quality hollows - Habitat tree - Habitat tree (for removal)
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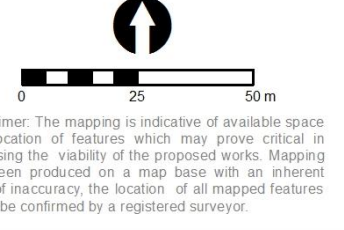
PROJECT & MXD REFERENCE
Cliff Drive, Katoomba
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Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.