Light to Light Walking Track Upgrade Biodiversity Management Plan – Revised: Includes campgrounds at Mowarry Point and Hegartys Bay

Prepared for: NSW NPWS – South Coast Branch

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Template 2.8.1

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Abbreviations

Abbreviation	Description
AABR	Australian Association of Bush Regenerators
APVMA	Australian Pesticides and Veterinary Medicines Authority
BA Act	NSW *Biosecurity Act 2015*
BAR	Biodiversity Assessment Report
BC Act	NSW *Biodiversity Conservation Act 2016*
BMP	Biodiversity Management Plan
BVSC	Bega Valley Shire Council
EPBC	*Environmental Protection and Biodiversity Conservation Act 1999*
CEMP	Construction Environmental Management Plan
ELA	Eco Logical Australia Pty Ltd
EPBC Act	Commonwealth of Australia *Environment Protection and Biodiversity Conservation Act 1999*
LGA	Local Government Area
LLS	Local Land Services
LNP	Long Nosed Poteroo
NPWS	National Parks and Wildlife Service
OEH	Office of Environment and Heritage
PCT	Plant Community Type
REF	Review of Environmental Factors
SBB	Southern Brown Bandicoot
TEC	Threatened Ecological Community
WoNS	Weeds of National Significance

1. Introduction

This revised Biodiversity Management Plan (BMP) has been prepared by Eco Logical Australia Pty Ltd (ELA) on behalf of NSW NPWS for the Light to Light Walkway Upgrade located between Boyds Tower and Green Cape, NSW. This revised BMP incorporates the Mowarry Point and Hegartys Bay Accommodation Precincts (Campgrounds). The site is located in the Bega Valley Shire Council (BVSC) Local Government Area (LGA).

This BMP considered information (where relevant) from the following reports:

- Conditions of Determination – Review of Environmental Factors – Light to Light Walk Upgrade (BCD 8 June 2022)
- Review of Environmental Factors (REF) – Light to Light Walk Upgrade (NGH February 2022)
- Biodiversity Assessment Report (BAR) – Light to Light Walk Upgrade (NGH February 2022)

The conditions of determination listed in the REF, which outline the mitigation measures that have been addressed in this BMP, are set out in the Table 1 below.

Activity-based mitigation strategies and measures were developed from the species-specific recommendations delivered in the BAR (NGH 2022) and have been adopted by this BMP. The objectives of the mitigation measures in the REF are listed in Table 2.

The upgrade works for the Light to Light Walk Upgrade consists of three separate activities.

- Activity 1 - Walking Track
- Activity 2 - Accommodation and Facilities
- Activity 3 - Vehicle and Site Access

The Light to Light Walk will be constructed in stages to minimise disruption to visitors.
Activities 1 and 2 are the first stage and are expected to be completed in late 2023. Activity 3 will be constructed when funding becomes available.
This BMP focusses on:

Activity 1 - Walking Track

- Realignment of existing Light to Light Walk from Boyds Tower to Green Cape Light station.
- Reinstate bushfire impacted sections of track that are not identified for realignment.
- Maintenance of existing sections of track that were not bushfire impacted or are not identified for realignment.
- Rehabilitation and revegetation of redundant sections of the track that would be closed.
- Installation of wayfinding, directional and interpretative signs.

Activity 2 – Accommodation Precincts / Campground facilities

Mowarry Point

- Construction of 10 x hardwood camp platforms (4.8 m x 3.6 m)
- Construction of 4 x gravel camp pads (5.4 m x 3.6 m)

- Construction of 12 x two person tents spaces
- Construction of Double stall timber pump-out toilet facilities
- Vegetation removal
- Landscaping works including grassed pathways

Hegartys Bay

- Construction of 10 x hardwood camp platforms (4.8 m x 3.6 m)
- Construction of floating boardwalk pathway
- Construction of a remote toilet facility
- Vegetation removal
- Landscaping works including grassed pathways

With effective implementation of safeguards and mitigation measures identified above, risk of impacts to biodiversity can be minimised to negligible levels.

A subsequent BMP will be prepared to address the recommendations of the REF (table 8.1) for Activity 3. This plan must be approved prior to construction commencing and allow sufficient time for preparation of Construction management plans (CEMP and OEMP) that satisfy the REF (timing of construction works to avoid impacts during breeding/nesting periods of threatened fauna known and highly likely to occur within the subject site). At the time of writing this BMP, a timeframe for Activity 3 has not yet been confirmed.

1.1. Background

The subject site is located within the Beowa National Park (formerly Ben Boyd NP) along the New South Wales South Coast, between Boyds Tower and Green Cape. Proposed works for the Light to Light track including upgrade of existing tracks and construction of new tracks will occur at locations indicated in Figure 1 and Figure 2 ; Boyds Tower, Red Rock Bay/Red Sands Bay, Leather Jacket Bay, Mowarry Point, Mowarry Beach, Saltwater Creek, Woodburn Creek, Hegartys Bay, Bittangabee Bay, Pulpit Rock and Green Cape.

Construction of campground facilities will occur at the accommodation precincts located at Mowarry Point and Hegartys Bay shown in Figure 3, Figure 4 and Figure 5.

The REF Light to Light Walk Upgrade 21-945 Schedule 1: Conditions of Determination issued on 8 June 2022 has provided consent conditions relevant to this plan (See Table 1).

Table 1: Conditions of Determination and relevant report sections

REF Safeguard and Mitigation Measures	Relevant section
Pre-clearing protocol	Appendix G – Preclearance Survey Protocols
Exclusion zones	5
Re-establishment of native vegetation	4.4 & 6.4
Clearing of native vegetation and removal of bush rock	Appendix H – Construction and Maintenance Protocols for Contractors
Unexpected threatened species finds	Appendix G – Preclearance Survey Protocols

REF Safeguard and Mitigation Measures	Relevant section
Protection of native vegetation, aquatic habitats and riparian zones	6.1.4, 6.1.5 & Appendix H – Construction and Maintenance Protocols for Contractors
Weed and pathogen management	Appendix D
Pest management actions and procedures	Table 2, Appendix M – Priority weeds within the Bega Valley Shire& Appendix N – Weed Control Techniques
Best practice removal and disposal of vegetation	6.2.4, Appendix M – Priority weeds within the Bega Valley Shire& Appendix N – Weed Control Techniques
Rehabilitation of disturbed areas and discontinued tracks	6, 4.4
Develop pre and post predator monitoring program	7.3
Develop ongoing monitoring program for various threatened species	7.4
Clearing protocols identifying vegetation to retain, prevent damage/disturbance	Appendix H – Construction and Maintenance Protocols for Contractors
Detailed design and construction planning	– Location of *Acacia constablei*

A total of 31 threatened species were identified as likely to occur within the subject site, or with a potential to be impacted, by the proposed activities. Each species was addressed in a Test of Significance (BC Act listed species) or Assessment of Significance (EPBC Act listed species) in the BAR (NGH 2020). NGH's assessments concluded that significant impacts are not considered likely to occur considering; the measures accounted for in the detailed design and construction planning of the proposal, the recommended mitigation measures, and the small area of clearing compared to the larger areas of vegetation present within the study area. The BAR (NGH 2020) also found that no threatened species were considered to be at risk of significant impacts, and potential impacts to migratory species were also assessed. NGH concluded in the BAR that significant impacts are deemed unlikely for any EPBC listed migratory species.

1.2. Objectives of the Biodiversity Management Plan

The overall objective of the BMP is to provide a management framework to minimise direct and indirect impacts to biodiversity values across the subject site. This BMP will ensure all recommendations of the REF, and all conditions of the activity approval are upheld. The BMP will also ensure that impacts to biodiversity do not exceed those assessed in the REF.

This BMP covers the construction period, or until the objectives and performance criteria outlined in this BMP are met.

This BMP will provide details of the necessary conservation management actions, timeframes, responsibilities, and performance measures to address REF recommendations (Table 8.1) including for the long-term protection, threat abatement and monitoring of the Southern Brown Bandicoot and Long-nosed Potoroo populations known to occur in the areas surrounding the accommodation precincts. The BMP requirements for threat abatement and performance criteria are incorporated into the Construction Environmental Management Plan and the Operational Environmental Management Plan.

The objectives for the BMP are summarised in Table 2.

Table 2: BMP Objectives

Objectives	Approach
Minimise impacts of habitat removal on native flora and fauna and their habitat	• Pre-clearing surveys will be carried out by an ecologist to identify any threatened flora and fauna species, and specific habitat features that may be impacted by construction works. • Habitat features of threatened species will be targeted during pre-clearing surveys so that they can be avoided during construction.
Limit edge effects	• Use existing tracks where possible to limit the extent of clearing. • Utilise areas already impacted by previous clearing or disturbance.
Prevent inadvertent clearing of vegetation outside the development footprint	• Condition five - Activity approval: The walking track will be constructed 1.2 m wide and trimming of vegetation around the track is to be up to 5 m wide. • Vegetation outside the 5 m trimming zone will be protected from damage by clearly demarcating the 5 m exclusion zone with highly visible marking tape. • If a sensitive area of vegetation is encountered which may be at risk of damage by trimming works, an exclusion fence is to be erected with a 10 m protective buffer zone between the track and the vegetation. • If clearing of vegetation is required outside the development footprint, these areas will need to be assessed as an addendum to this REF.
Prevent over-clearing to ensure there are no indirect impacts to native vegetation and habitat during construction	• Use existing tracks where possible to limit the extent of clearing. • Utilise areas already impacted by previous clearing or disturbance.
Prepare a vegetation management plan to regulate activities in vegetation and habitat adjacent to the proposed development	• Provide protocols for the protection of native vegetation and habitat features to be avoided (including micro siting requirements) and best practices for the removal and disposal of vegetation.

Objectives	Approach
Control feral predators (Activities 2 & 3).	• Project-specific pest management actions for Activities 2 & 3 based on the principles of adaptive management. Includes provisions for monitoring (e.g., camera traps to detect feral Predator densities), evaluation and the use control strategies through baiting, signage at the accommodation precincts or other means. where appropriate. This is particularly important for LNP and SBB. • Fox and cat control during construction and operation, in a manner that will not further endanger native species, in particular the Spotted-tail Quoll and small mammals
Minimise damage to native fauna and their habitat	• Use existing tracks where possible to limit the extent of clearing. • Utilise areas already impacted by previous clearing or disturbance.
Prevent indirect impacts to native vegetation and habitat during operation due to an increase in human access	NPWS staff training and public signs must communicate the importance of remaining on existing tracks and leaving no trace while in the national park. • Ensure all stockpiles and machinery parking bays are confined to the areas previously cleared/disturbed or area directly impacted by works.
Prevent erosion and sedimentation impacts during construction	• A Soil and Water Management Plan (SWMP) will be prepared by the work contractor(s) as part of their CEMP and approved by NPWS. The SWMP will be adapted as works progress and a number of plans prepared to manage the discrete sections and types of works. • All works to conform to OEH (2010) Erosion and Sediment Control on Unsealed Roads standards.
Prevent the introduction and spread of noxious weeds and pathogens	• Weed and Pathogen Management procedures will be followed for all activities. See – Hygiene Procedures for vehicles and machinery to control the introduction and spread of weeds and pathogens
Maintain aquatic habitat	• No concrete wash out will occur onsite unless in a purpose-built washout facility. • Dust suppression techniques to be implemented if required. • Temporary watercourse crossings will be designed to minimise impacts on hydrology, aquatic habitat, and fauna. • Resource management hierarchy principles are to be followed. • Contractors will have, and be competent in the use of, petrochemical spill kits for use of any spillage during construction. The NPWS will be notified of any spills and the action taken to contain them. • Emergency spill kits are to be always kept on site. All staff are to be made aware of the location of the spill kit and trained in its use.
Minimise disturbance to marine mammals (i.e., seals)	Ensure all staff and visitors to the park are aware of laws re. approaching marine mammals (in this case seals). In accordance with the Biodiversity Conservation Regulation 2017 (Clause 2.3).

1.3. Preparation and implementation of this plan

This BMP has been prepared by Ecologists with over 5 years' experience in environmental consultancy and a relevant Bachelor of Science degree.

A suitably qualified and experience bush regeneration contractor is required to implement this BMP. They should be a member of the Australian Association of Bush Regenerators (AABR) or should possess

the required qualifications and experience for membership. In addition to this, team leaders should have, as a minimum, a *Certificate III in Conservation & Land Management* or equivalent. The contractor will need to carry out best practice bush regeneration techniques as described by Buchanan (2009).

1.4. Key Terms

For the purpose of this BMP, the following terminology has been adopted:

- **BMP area**: The entire subject site (30 m corridor) is covered by this BMP until such time as the extent of vegetation clearing has been completed See – BMP Area: Management Zones.
- **Activity 1 - Walking Track:** Realign existing track, reinstate bushfire impacted sections of track not identified for realignment, maintenance of existing sections of track that were not bushfire impacted or are not identified for realignment, rehabilitation, and revegetation of redundant sections of track that would be closed, and installation of signage.
- **Activity 2 - Accommodation/facilities precinct**: new accommodation/facilities at Mowarry Point, formalisation of existing campground at Mowarry Point, new accommodation/facilities at Hegartys Bay.
- **Activity 3 - Vehicle and site access:** Maintenance of Hegartys Bay vehicle access trail, upgrade Hegartys Bay Access Track to accommodation area and upgrade Pulpit Rock car. *Activity three works are not addressed in this BMP; however, they will be addressed in a subsequent BMP.*
- **Development footprint**: Area of site to undergo Activity 1 and Activity 2works. See impact areas in – BMP Area: Management Zones

Photograph 1. Fire affected remnant canopy vegetation above a mid-layer of regrowth

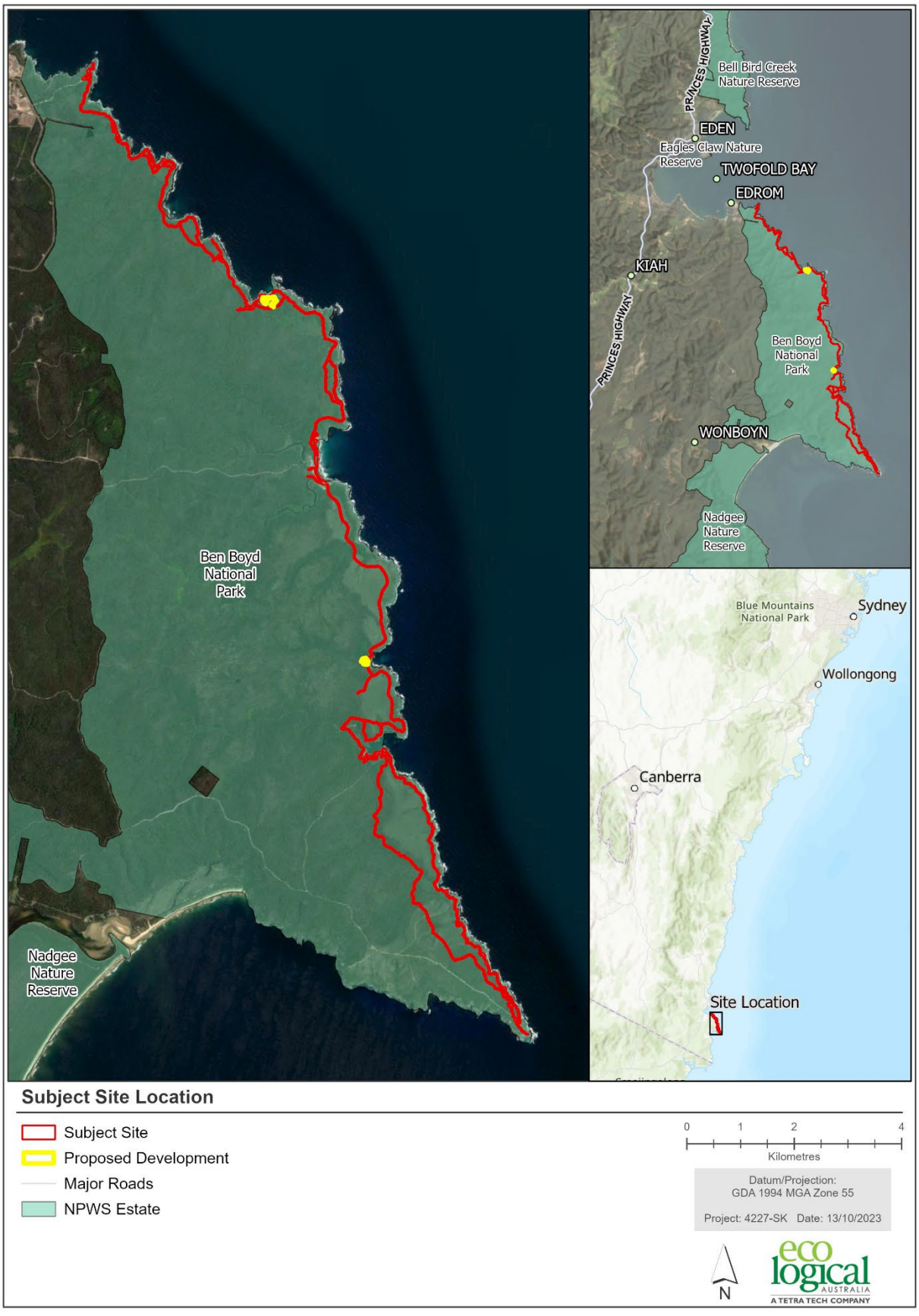

Figure 1 Subject Site Location

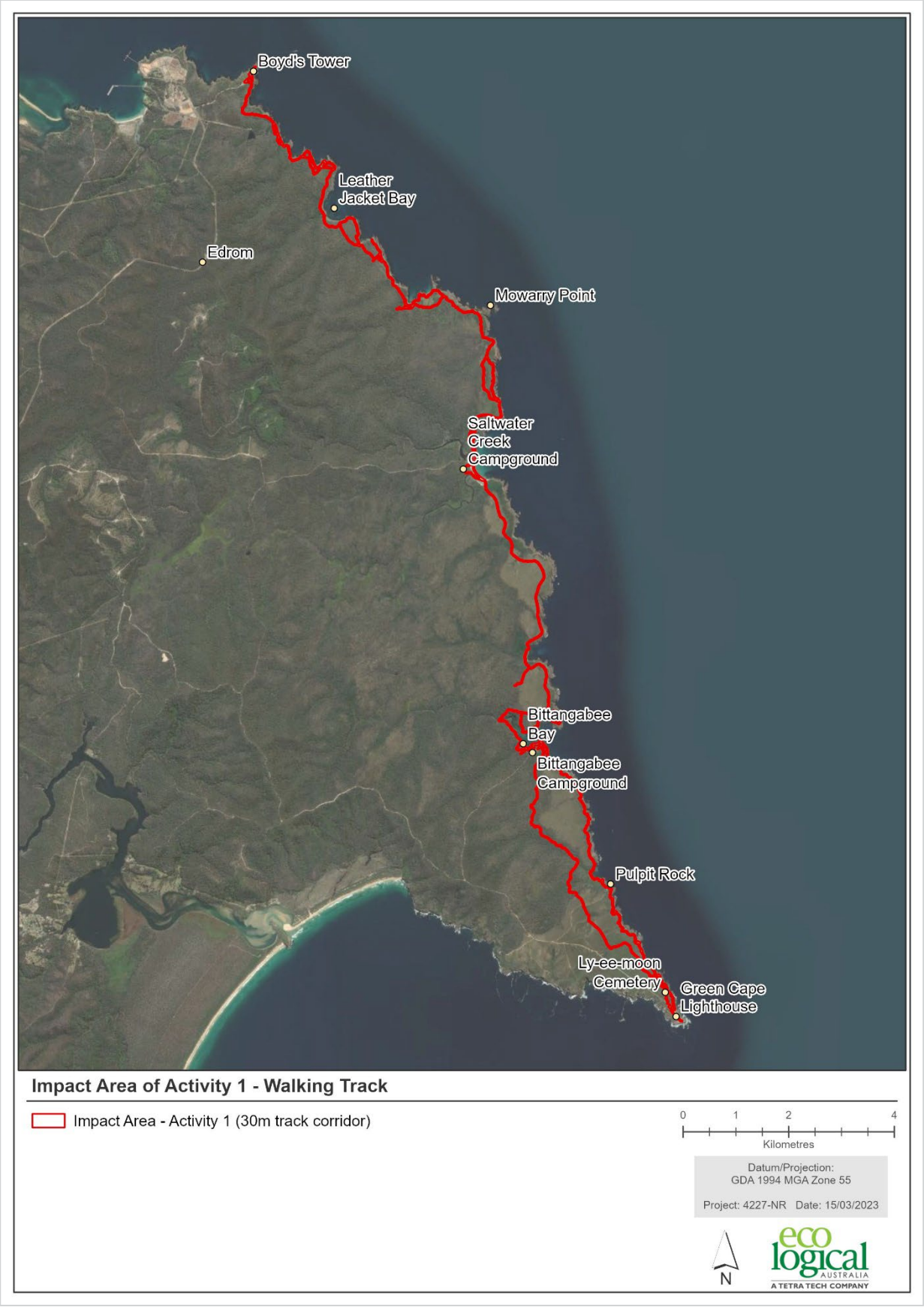

Figure 2: Impact Area of Activity 1 – Walking Track

Figure 3: Impact Area of Activity 2 – Accommodation Precincts

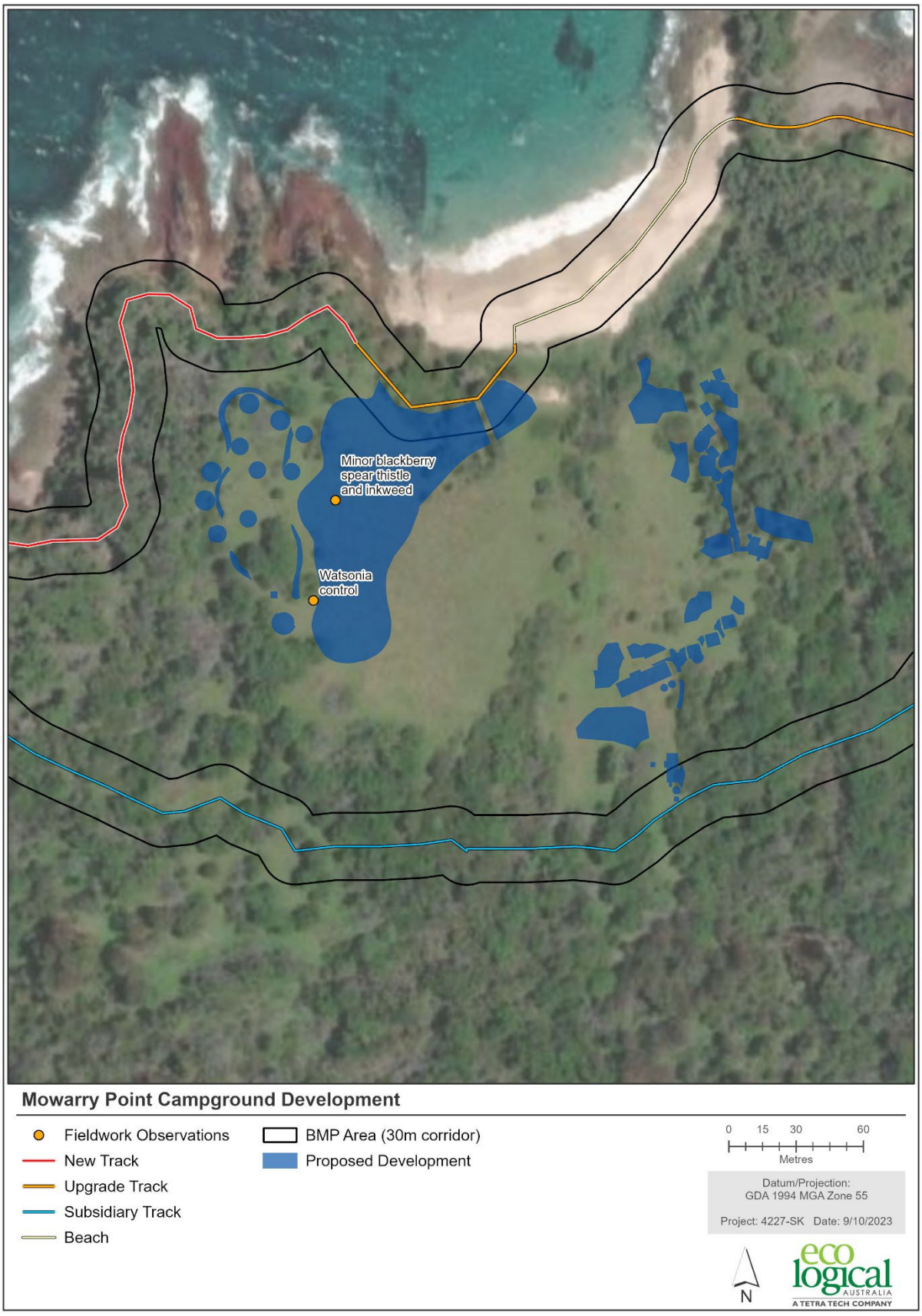

Figure 4: Mowarry Point Accommodation precinct development area

Figure 5: Hegartys Bay Accommodation precinct development area

2. Description of the environment

2.1. Location

The subject site is located in the Beowa National Park, 5 km south of the township of Eden, within the Bega Valley Local Government Area. The main access road to the subject site is via Edrom Road, off Princes Highway to the west of the study area. The subject site is located on the coastline with the south Pacific Ocean to the east and native bushland to the west. The subject site covers an area approximately 20 km long stretching southeast from Boyds tower to Green Cape lighthouse. The subject site consists of a 5m wide corridor which follows the coastline south and covers both existing tracks and areas of uncleared native and exotic vegetation.

2.2. Topography and hydrology

Numerous ephemeral streams, small unnamed creeks and three large creeks run in an easterly direction through bushland west of the subject site. These waterways run from higher ground to the coast. The larger creeks include Saltwater Creek, Woodburn Creek and Bittangabee Creek.

2.3. Vegetation Community

Validation of the vegetation undertaken during the preparation of the BAR (NGH 2022) identified that seven plant community types (PCT's) occur within the subject site (Table 3).

Table 3. Plant community types present within the BMP.

PCT ID	PCT Name	Condition	BC Act listing	EPBC Act listing
721	Bracelet Honey-myrtle – Coast Tea tree tall shrubland on headlands, South East Corner bioregion	Partially Burnt	Not listed	Not listed
772	Coast Banksia – Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion	Good	Not listed	Not listed
777	Coast Grey Box – Mountain Grey Gum - stringybark moist shrubby open forest in coastal gullies, southern South East Corner Bioregion	Good	Not listed	Not listed
891	Ironbark – Woollybutt – White Stringybark open forest on coastal hills, South East Corner Bioregion	Good	Not listed	Not listed
1157	Silvertop Ash – Rough-barked Apple shrubby open forest on the hinterland hills, far southern South East Corner Bioregion	Burnt	Not listed	Not listed
1084	Red Bloodwood – Silvertop Ash – White Stringybark heathy open forest on coastal foothills, southern South East Corner Bioregion	Burnt	Not listed	Not listed
1141	Scrub She-oak – Swamp Banksia coastal lowland heath, southern South East Corner Bioregion	Burnt	Not listed	Not listed

2.3.1. PCT 721: Bracelet Honey-myrtle – Coast Tea tree tall shrubland on headlands, South East Corner bioregion

PCT 721 *Bracelet Honey-myrtle – Coast Tea tree tall shrubland on headlands, South East Corner bioregion*, occurs as a patchy shrub stratum, generally around 2m tall in exposed locations but often developing to the stature of small trees (6-10m) when protected from coastal winds. Occur on rocky headlands south from Jervis Bay. This vegetation community grows in the form of heathland. Dominant mid stratum species are *Acacia longifolia, Allocasuarina verticillate, Banksia integrifolia subsp. Integrifolia, Leptospermum laevigatum, Melaleuca armillaris* subsp*. armillaris, Monotoca elliptica* and *Westringia fruticose*. The dominant ground stratum species are *Billardiera scandens*, *Dichondra repens*, *Glycine clandestine* and *Lepidosperma concavum*. PCT 721 was recently replaced by PCT 3792. Not associated with a Threatened Ecological Community (TEC).

2.3.2. PCT 772: Coast Banksia – Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion

PCT 772 *Coast Banksia – Coast Wattle dune scrub of the Sydney Basin Bioregion and South East Corner Bioregion*, is a low dense scrub is found on coastal sand mass frontal dunes and beach ridges along the eastern coastline of New South Wales. Its coast tea-tree (*Leptospermum laevigatum*) and coastal wattle (*Acacia longifolia*) are pruned by the prevailing winds that buffet these exposed scarped dunes. Some of the small patches that remain are derived from native plantings as part of dune stabilisation works and bush regeneration. As a result, some scrubs are species poor. More diverse remnants include salt-tolerant succulent herbs and grasses, several of which are unique to these environments. The dominant species in the upper stratum are *Banksia integrifolia subsp. Integrifolia* and *Leptospermum laevigatum*. The dominant species in the mid stratum are *Acacia longifolia subsp. Sophorae, Leucopogon parviflorus, Rhagodia candolleana subsp. Candolleana, Breynia oblongifolia* and *Monotoca elliptica.* The dominant species in the ground stratum are *Actites megalocarpa, Carpobrotus glaucescens, Isolepis nodosa, Lomandra longifolia, Muehlenbeckia adpressa, Oxalis perennans, Spinifex sericeus, Zoysia macrantha* and *Pteridium esculentum.* PCT 772 recently underwent a single split to PCT 3640 and a complex split to PCT 3788. Not associated with a Threatened Ecological Community (TEC).

2.3.3. PCT 777: Coast Grey Box – Mountain Grey Gum - stringybark moist shrubby open forest in coastal gullies, southern South East Corner Bioregion

PCT 777 Coast Grey Box – Mountain Grey Gum - stringybark moist shrubby open forest in coastal gullies, southern South East Corner Bioregion, is restricted to metasediments below 200m elevation. It occurs in steep gullies on the coastal range mainly between Merimbula and Narooma. The dominant species in the upper stratum are *Eucalyptus muelleriana, Eucalyptus bosistoana, Eucalyptus cypellocarpa*, *Eucalyptus globoidea and Eucalyptus longifolia*. Dominant species in the mid layer is *Acacia falciformis, Acacia mearnsii, Allocasuarina littoralis, Billardiera scandens, Breynia oblongifolia, Clematis aristate, Eustrephus latifolius, Geitonoplesium cymosum, Hibbertia aspera, Marsdenia rostrata, Notelaea venosa, Ozothamnus diosmifolius, Pandorea pandorana, Pittosporum revolutum, Pittosporum undulatum,* and *Platysace lanceolata.* Dominant species in the ground layer is *Desmodium varians, Dianella caerulea, Doodia aspera, Entolasia stricta, Gahnia melanocarpa, Goodenia ovata, Lepidosperma laterale, Lomandra longifolia, Microlaena stipoides var. stipoides, Notodanthonia longifolia, Oplismenus imbecillis, Poa meionectes, Pteridium esculentum* and *Viola hederacea.* PCT 777 recently underwent a single split to PCT 3189 and a complex split to PCT 3663. Not associated with a Threatened Ecological Community (TEC).

2.3.4. PCT 891: Ironbark – Woollybutt – White Stringybark open forest on coastal hills, South East Corner Bioregion

PCT 891 *Ironbark – Woollybutt – White Stringybark open forest on coastal hills, South East Corner Bioregion*, occurs on steep slopes and ridges at 50-250m elevation on the coastal foothills from Bermagui to Eden. The dominant species in the upper stratum are *Eucalyptus tricarpa, Eucalyptus longifolia, Eucalyptus globoidea* and *Eucalyptus muelleriana.* Dominant species in the mid layer is *Acacia falciformis, Allocasuarina littoralis, Daviesia mimosoides, Hibbertia aspera, Ozothamnus Diosmifolius, Persoonia linearis* and *Platysace lanceolata.* Dominant species in the ground layer is *Dianella caerulea, Entolasia stricta, Hardenbergia violacea, Joycea pallida, Lepidosperma laterale, Lomandra longifolia and Lomandra.* PCT 891 recently underwent a complex split to PCT 3663 and PCT 3664. Not associated with a Threatened Ecological Community (TEC).

2.3.5. PCT 1157: Silvertop Ash – Rough-barked Apple shrubby open forest on the hinterland hills, far southern South East Corner Bioregion

PCT 1157 *Silvertop Ash – Rough-barked Apple shrubby open forest on the hinterland hills, far southern South East Corner Bioregion*, occurs as open forest with an open shrub layer and groundcover comprising a mixture of grasses, graminoids, herbs and Bracken. Occurs on coastal mountain ridges and coastal plateaux up to 800m elevation on metasediments between Nadgee and Mt Imlay. The dominant species in the upper stratum are *Eucalyptus sieberi, Angophora floribunda* and *Allocasuarina littoralis.* Dominant species in the mid layer is *Acacia terminalis, Billardiera scandens, Epacris impressa, Leucopogon lanceolatus, Persoonia linearis, Platysace lanceolata* and *Pultenaea daphnoides.* Dominant species in the ground layer is *Dianella caerulea, Gahnia radula, Gonocarpus teucrioides, Lomandra longifolia, Pteridium esculentum, Tetrarrhena juncea* and *Xanthosia pilosa.* PCT 1157 recently underwent a complex split to PCT 3666, PCT 3646 and PCT 3196. Not associated with a Threatened Ecological Community (TEC).

2.3.6. PCT 1084: Red Bloodwood – Silvertop Ash – White Stringybark heathy open forest on coastal foothills, southern South East Corner Bioregion

PCT 1084 *Red Bloodwood – Silvertop Ash – White Stringybark heathy open forest on coastal foothills, southern South East Corner Bioregion* is composed of open forest with a well-developed shrub layer and open ground layer. Some sites on deep sandy soils support relatively tall forest dominated by Blackbutt (Eucalyptus pilularis). Occurs on low ridges and dry slopes in the coastal foothills and plains usually below 150m elevation on metasediments or Tertiary alluvium. The dominant species in the upper stratum are *Corymbia Gummifera, Eucalyptus sieberi, Eucalyptus globoidea, Eucalyptus pilularis, Allocasuarina Littoralis* and *Banksia serrata*. Dominant species in the mid layer is *Acacia suaveolens, Acacia terminalis, Aotus ericoides, Banksia spinulosa, Bossiaea obcordate, Correa reflexa, Epacris impressa, Leptospermum trinervium, Lomatia ilicifolia, Monotoca scoparia, Persoonia levis, Persoonia linearis, Pimelea linifolia subsp. Linifolia* and *Platysace lanceolata.* Dominant species in the ground layer is *Amperea xiphoclada, Anisopogon avenaceus, Dianella caerulea, Entolasia stricta, Gonocarpus Teucrioides, Joycea pallida, Lepidosperma concavum, Lomandra longifolia, Patersonia glabrata, Pteridium esculentum* and *Xanthosia pilosa.* PCT 1084 recently underwent a complex split into new PCTs 3662 and 3646. Not associated with a Threatened Ecological Community (TEC).

2.3.7. PCT 1141: Scrub She-oak – Swamp Banksia coastal lowland heath, southern South East Corner Bioregion

PCT 1141 *Scrub She-oak – Swamp Banksia coastal lowland heath, southern South East Corner Bioregion*, is an open shrub canopy up to 1m tall with occasional eucalypts up to 5m tall with a relatively dense and diverse groundcover is dominated by sedges. Restricted to gentle slopes on coastal deposits of Tertiary alluvium and recent sands below 100m elevation south from Pambula. The dominant species in the upper stratum are *Allocasuarina littoralis* and *Banksia serrata.* Dominant species in the mid layer is *Acacia suaveolens, Allocasuarina paludosa, Banksia paludosa, Correa reflexa, Dillwynia glaberrima, Epacris impressa, Gompholobium huegelii, Hibbertia empetrifolia subsp. Empetrifolia and Leptospermum continentale and Pimelea linifolia subsp. Linifolia*. Dominant species in the ground layer is *Anisopogon avenaceus, Bossiaea ensata, Burchardia umbellata, Dampiera stricta, Entolasia stricta, Gonocarpus teucrioides, Hypolaena fastigiata, Lepidosperma neesii, Lindsaea linearis, Lomandra glauca, Mitrasacme polymorpha, Patersonia glabrata, Phyllanthus hirtellus, Scaevola ramosissima, Schoenus brevifolius* and *Selaginella uliginosa.* PCT 1141 was recently amalgamated into PCT 3816. Not associated with a Threatened Ecological Community (TEC).

Photograph 2: Area of existing track adjacent to fire affected grass and shrub regrowth.

2.4. Weeds

The *Biosecurity Act 2015* (BA Act) and regulations provide specific legal requirements for the state level priority weeds (Table 4). Under the BA Act all plants are regulated with a general biosecurity duty to prevent, eliminate, or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as reasonably practicable.

Specific legal requirements apply to State determine priorities under the *Greater Sydney Regional Strategic Weed Management Plan 2017-2022*, while regional priorities include outcomes to demonstrate compliance with the general biosecurity duty and strategical responses in the region to achieve relevant management objectives (Greater Sydney LLS 2017). Weeds listed as 'other weeds of regional concern' under the plan warrant resources for local control or management programs and are a priority to keep out of the region. Inclusion in this list may assist Local Control Authorities and/or land managers to prioritise action in certain circumstances where it can be demonstrated the weed poses a threat to the environment, human health, agriculture etc.

Two Weed species identified during the field survey for this BMP are listed as State level priority weeds, and also as other weeds of regional concern. The weed information including presence on site, priority listing under the BA Act, associated asset/value at risk status, and whether they are Weeds of National Significance (WoNS), are shown in Table 4. A full list of weeds targeted by the Bega Valley Shire council Weed Management Plan is provided in Appendix M – Priority weeds within the Bega Valley Shire.

Table 4. Priority weeds and Weeds of National Significance (WoNS) identified within the BMP area.

Scientific Name	Common Name	WoNS	Management Actions	Biosecurity Act 2015
State level priority weeds (Whole of State)				
Rubus fruiticosus sp. aggregate	Blackberry	Yes	Appendix N – Weed Control Techniques, Page 71	Asset Protection/Environment
Anredera cordifolia	Madeira Vine	Yes	Appendix N – Weed Control Techniques,, Page 71-72	Asset Protection/Environment

Photograph 3. Small infestation of *Anredera cordifolia* below a low canopy of *Pittosporum undulatum* (Sweet Pittosporum).

3. Preclearance surveys, clearance supervision & fauna management

3.1. Site induction

All personnel working at, or visiting the site are required to be inducted for site safety and environmental management requirements.

This induction will include a component on protection of biodiversity at the site including:

- Location of the site impact boundaries — Location of *Acacia constablei*
- Hygiene protocols – Hygiene Procedures for vehicles and machinery to control the introduction and spread of weeds and pathogens
- Construction and maintenance specific inductions
- What to do if fauna is found on site – capture, handling, reporting and transfer
- Unexpected finds
- Laws regarding approaching marine mammals (in this case seals), in accordance with the Biodiversity Conservation Regulation 2017 (Clause 2.3).

– Site environmental induction training contains further site environmental induction information. A copy of the site induction material should remain on site as a reminder and procedure if injured or displaced fauna are located on site. Importance of daily toolbox talks, prestart checks, and unexpected finds procedures will also be covered in the inductions.

3.2. Pre-clearing survey

Prior to construction works taking place, the development footprint must be searched and cleared of any terrestrial wildlife. This will include the following tasks:

- Engagement of a suitably qualified and licensed ecological consultant with wildlife handling experience, or a suitably experienced and skilled NPWS staff member, to perform pre-clearing surveys and supervise the clearing work, as well as the protection of environmental features on the site where required.
- Searches will involve looking under rocks, raking debris, rubbish, turning over dumped tyres, thick plant litter, and in the crowns of tussock grasses.
- Removal of vegetation should be conducted as per the following sequence to limit the potential for fauna kills:

    1. The ecologist or suitably experienced and skilled NPWS staff member will search for, capture, and move on all fauna species within the development footprint.
    2. The ecologist or suitably experienced and skilled NPWS staff member will be on hand through the demolition to manage any fauna that becomes evident during the demolition.
    3. Repeat these steps until the entire site has been searched and cleared of fauna.

- If any fauna requires capture and relocation this will only be done by the approved site ecologist or suitably experienced and skilled NPWS staff member.
- Should any fauna be detected on site by staff or visitors (a chance or unexpected find), works in the immediate vicinity of the animal will stop and site management will arrange removal by the

approved site ecologist, or by or a suitably experienced and skilled NPWS staff member as advised by the site ecologist, see per Appendix G – Preclearance Survey Protocols.

- Any injured fauna will be assessed by the site ecologist or suitably experienced and skilled NPWS staff member, who will determine if fauna is to be released or if it requires the care of a veterinarian or carer. If specialist care is required, they will make arrangements for care to be given to the fauna.
- Preclearance surveys must be undertaken immediately prior to construction works. If construction works are not undertaken on the same day as the preclearance survey is conducted, the survey must then be repeated prior to any construction.

The ecological consultant and NPWS staff member (suitably experienced and skilled in animal handling) must have demonstrated experience in and knowledge of the handling and relocation of fauna. The site ecologist will be covered by appropriate licenses to 'handle' fauna under the *National Parks and Wildlife Act 1974*.

3.3. What to do if fauna is found on site

If fauna of any kind is found on site:

- Do not attempt to touch, capture, or handle the animal.
- Inform others in the area of the presence of the animal and immediately stop works in the vicinity of the find.
- Inform the project manager of the presence and location of the animal.
- Project manager is to take photograph of animal and contact the on-call ecologist for advice and, if the animal is not a frog and can be safely moved, it can be moved on to alternative habitat created on site, if available, or to the nearest other suitable habitat that is not to be cleared.
- Spotter to remain with a frog, or any other animal not clearly able to be moved, to ensure others are aware of its location and for easy location when the ecologist arrives on site.
- Fauna to be removed in accordance with the advice of the site ecologist or in accordance with Appendix I – Animal Handling Protocols.

The relocation area for captured native fauna needs to be predetermined by the approved site ecologist or skilled NPWS staff member. The area will likely be dependent on the species located and the conditions at the time of capture. The designated primary release areas for native terrestrial and aquatic fauna are the dams and remnant bushland in the western portion of the BMP area. Fauna detected in the subject site will be captured and placed in a suitable container/calico bag/plastic bag with a small amount of moistened grass/leaves and then moved to the designated relocation site by the project ecologist.

Native frogs detected in the subject site will be captured and placed in a suitable container/plastic bag with a small amount of distilled water or small handful of moistened grass/leaves.

Fauna will be released as soon as it is safe to do so in conditions that are safe for release. Nocturnal fauna will not be released until after dusk. Aquatic fauna must be released into a water body and given at least 30 minutes to acclimate to the water temperature (release container placed into water) before release into the water body. Fauna will not be released where there is a clear threat from predators. Fauna will not be released during poor weather conditions when their welfare may be put at risk (e.g.,

middle of a very hot day into an area with little shade). It is the duty of the approved site ecologist or skilled NPWS staff member to ensure that the release of animals is undertaken ethically with the minimal risk possible to the welfare of the animal.

4. Management zones

The sections below are a description of site conditions observed during field surveys conducted from 30 January to 2 March 2023 (walking track from Boyds Tower to Green Cape Light house), and on 12 September 2023 (Campgrounds at Mowarry Point and Hegartys Bay). The east coast of NSW experienced substantial rainfall and flooding in the year prior to the surveys. Site conditions may be further impacted if the same weather conditions continue. The BMP covers an area of 9.68 ha, and is divided into three management zones, shown in Table 5.

4.1. BMP Area - Development footprint

The development footprint consists of the portion of the site to be developed as part of activity 1 - Walking track, and activity 2 - Accommodation precinct works. The walking track footprint consists of 7.86 ha of area to undergo vegetation clearance, construction, maintenance, and revegetation. The Mowarry Point (Figure 4) and Hegartys Bay (Figure 5) accommodation precincts footprint consists of 1.82 ha of area to undergo vegetation clearance and construction.

Figure 8 in – BMP Area: Management Zones shows the BMP area and the management zones, which are the focus of this BMP - Activity 1 & 2 works.

4.2. Zone 1: Construction (4.17 ha)

Zone 1 is an area of 4.17ha containing both the areas of new tracks and the accommodation precincts. Further detail on those subsections is provided in the following sections.

Weed management throughout this zone should focus on the post construction treatment of exotic groundcovers using a combination of hand weeding and spot spraying using a non-selective herbicide (e.g., Roundup Biactive®). For more information on specific weed control techniques, see 6.2 and Appendices M & N.

It is not expected that Zone 1 will require intensive revegetation works given the minimal level of planned impact, however it may require some planting post construction works.

4.2.1. New Track

The new track within Zone 1 is an area of 2.35 ha which consists of a 30 m corridor located west of the coastline. This zone contains both burnt and unburnt patches of native vegetation with occasional small outbreaks of exotic weeds in several locations. A new 1.5-2 m wide track will be aligned within the 30 m corridor to avoid all habitat. The alignment of the track will be predetermined by NPWS staff and guided by field data collected by ELA ecologists prior to the track construction works commencing within the corridor (See Figure 9).

4.2.2. Accommodation Precincts

4.2.2.1. Mowarry point

The Mowarry Point campground facilities construction within Zone 1 is an area of 0.98 ha consisting of vegetation clearance, landscaping for tent spaces and grassed pathways, construction of hardwood camp platforms and gravel camp pads, and the construction of toilet facilities. Limited vehicle access

during operation would primarily be via the existing service track and then walking, ATV, trolley, or e-bike throughout the precinct.

During field surveys a number of mature Melaleuca trees were observed and recorded within the Mowarry point accommodation precinct. Prior to construction activities commencing at the Mowarry Point campground area, micro-siting would be conducted to minimise the removal of mature native plant species, particularly mature *Melaleuca armillaris* subsp*. armillaris* but also other smaller trees and shrubs. Micro-siting is the process of investigating a specific area within an ecosystem containing unique features, conditions or characteristics.

It is the intention of the NPWS staff to avoid all mature native trees and shrubs in this area, however micro-siting will help to avoid and minimise impacts to biodiversity.

4.2.2.2. Hegartys Bay

The Hegarty's Bay campground facilities construction within Zone 1 is an area of 0.84 ha consisting of vegetation clearance, construction of a floating boardwalk pathway, construction of hardwood camp platforms, the construction of a remote toilet facility and landscaping for grassed pathways. Limited vehicle access during operation would primarily be via the existing service track and then walking, ATV, trolley or e-bike along the proposed access trail to and throughout the precinct.

Micro-siting would be carried out at the Hegartys Bay accommodation precinct where necessary.

4.3. Zone 2: Maintenance – Upgrade existing track (3.74 ha)

Zone 2 is an area of 3.74 ha consisting of existing tracks ranging from 1-2 m wide, which require varying levels of maintenance, including trimming of vegetation along the track edge, repair of erosion-damaged sections of track, reinstatement of bushfire affected sections of track, and replacement of track surface, stairs, and drains. A buffer zone of 5m should be observed for Zone 2 tracks.

It is not expected that Zone 2 will require intensive revegetation works given the minimal level of planned impact, however it may require some post maintenance works planting.

4.4. Zone 3: Revegetation - Redundant track (1.77 ha)

Zone 3 is a 1.77 ha area of disused redundant track, requiring revegetation and rehabilitation with planting in some areas. Works required in Zone 3 include removal of the old track infrastructure and stabilization works to disturbed areas. Sections of the redundant track require relocation of logs and woody debris to block public access to the rehabilitated areas.

Some tracks have identified as 'other track' or 'subsidiary track' on maps provided of the area are disused and will not be upgraded or revegetated.

Rehabilitation works, including planting and weed control are discussed further in section 7.

Table 5. BMP Area Management Zones.

Zone	Description	Area
1. Construction	Alight and built new track and accommodation areas within the corridor	4.17 ha
2. Maintenance	Upgrade existing track	3.74 ha

Zone	Description	Area
3. Revegetation	Area of disused redundant track, requiring revegetation and rehabilitation	1.77 ha
	Total Area of Management covered by BMP	**9.68 ha**

Photograph 4. Area of disused redundant track requiring revegetation and rehabilitation

5. Construction and preliminary works

The NSW NPWS appointed construction contractor shall be responsible for the following works.

5.1. Temporary fencing and signage

Where necessary, areas where threatened native flora and fauna species and their habitat occur, which have previously been identified and recorded during surveys, is to be protected with temporary exclusion fencing. This measure will prevent construction machinery from entering the protected land and impacting the threatened species. Sediment fencing may also be required to prevent sediment movement into the protected areas. Any threatened species detected during pre-clearing surveys (Section 3.2) must follow the protocols for unexpected finds detailed in Appendix G – Preclearance Survey Protocols. All threatened species mapped habitat features shown in Appendix B must be avoided by all works. Specifications for protection of threatened species known to occur within close proximity to the new track alignment are detailed in Section 6.1 and Appendix H. Informational signage must be installed on the fencing stating that no entry is permitted into the protected land.

Prior to construction at the accommodation precinct, signage is required in areas where camera traps and baiting has been deployed as part of the pest management plan to control predation on native animals. Signage is also required on tracks that provide access to the site during construction works and installation of temporary barriers around construction areas. The accommodation precincts will also include directional signs and interpretative elements for users of the accommodation areas.

5.2. Soil and water management

An Erosion and Sediment Control Plan, preferably as part of a Construction Environmental Management Plan, must be developed and implemented prior to the commencement of any on-ground works. These plans should be in accordance with best management practices as described in Landcom's 'Blue Book' (2004).

Installation of sediment fencing is required at both accommodation precincts to minimise erosion and sedimentation. The Hegartys Bay campground requires sediment fencing to be installed between the proposed construction areas of the campsite and the adjacent creek downslope. Mulch created from the clearing trimming works may be utilised for the sediment fence and or erosion and sediment control more generally.

5.3. Fauna habitat enhancement

Any vegetation removed within the development area should be used as habitat structures within the adjacent land where possible. This includes the use of fallen woody debris as habitat. Woody material provides microhabitat for fauna species, soil stability and nutrients cycling. Exotic vegetation will be taken off-site and should not be used in habitat enhancement. The placement of fauna habitat augmentation/relocation is to be guided by the instructions of a qualified ecologist.

5.4. Retention of mature trees

All mature trees encountered within the walking track construction corridor and accommodation precinct construction footprints will be avoided and retained.

5.5. Hollow-bearing trees

To comply with the safeguards/mitigation measures listed for biodiversity in the conditions of determination, all mature trees, hollow bearing trees, and trees with stick nests present are to be avoided by the works.

A hollow bearing tree (HBT) was recorded during field surveys conducted by ELA on 12 September 2023 at the Hegartys Bay accommodation precinct (see– BMP Area: Field Survey Data). The HBT is located near the proposed remote toilet construction area. This tree should be retained in place if possible. However, if NPWS deems it necessary to remove the tree, the protocols outlined in Appendix G – Preclearance Survey Protocols Appendix I – Animal Handling Protocols must be followed.

In the event of an unexpected find of a threatened species, works must stop immediately and NPWS must assess whether additional assessment is required (refer Appendix G – Preclearance Survey Protocols).

5.6. Receival, storage and on-site management of construction materials

The compound site at Green Cape Quarry would serve as the primary storage area for building modules and building materials such as sand, concrete, steel, FRP mesh, timber, stone and gravel, which will be sling loaded via helicopter.

Photograph 5. Area of fallen trees providing habitat for native birds and mammals.

Table 6. Statement of commitments to mitigate and manage biodiversity impacts

Biodiversity Issue	Description	Mitigation Measures	Timing	Responsibility
Displacement, injury or death to native fauna from vegetation clearing	Construction activities resulting in the removal of native vegetation leading to fauna moving out of the area or being injured or killed.	1. Instigate clearing protocols including pre-clearing surveys to check for any nests in the canopy of trees to be removed. If present a trained ecological or NPWS staff to be present during clearing events if any nests are located in the canopy of trees to be removed	Prior to and during construction Prior to and during felling of any trees containing nests in the canopy	Suitably experienced and skilled NPWS staff or qualified ecologist (if required)
Damage to native vegetation marked for retention	Construction activities may damage or kill native vegetation marked for retention through accidental clearing.	1. clearly demarcate areas for retention with fencing or flagging. Install no-go signage around areas to be retained to prevent unauthorised access. Implementation of BMP in areas of native vegetation to be retained 2. Maps showing no go areas to be placed in site offices, all staff briefed during tool box talk or pre-work briefing on the location of important environmental features and control measures in place to protect this area. 3. If native vegetation on or adjacent to the site is damaged, implement ecological restoration, rehabilitation and ongoing maintenance.	Prior to, during and following construction	Contractor and all site workers to be aware of no-go areas. NPWS to implement the BMP.
Pollution of waterways	Pollution and spread of weeds, rubbish, sediment and/or nutrient runoff into the surrounding environment via drainage lines during high rainfall events.	1. Install and regularly inspect sediment barriers to control the quality of water released from the site into the receiving environment. 2. Develop an erosion and sediment control plan.	During construction	Contractor and all site workers.

Biodiversity Issue	Description	Mitigation Measures	Timing	Responsibility
Noise disturbance to fauna and neighbouring communities	Noise generated by construction activities can displace native fauna and impact quality of life of communities	1. Only conduct clearing and operation of machinery inside of typical work hours (Monday - Friday 7 am - 5 pm and Saturday 8 am - 1 pm). 2. Noisy machinery should only be used outside of the breeding season for species involved to minimise impacts on the life cycle of the species.	During construction	Contractor
Light disturbance to nocturnal fauna	Light at night can impact nocturnal fauna's feeding behaviours resulting in displacement from the area	1. Conduct works during daylight hours	During construction	Contractor
Dust generation	intermittent disturbance to neighbouring communities and native fauna from dust	1. Adaptive dust monitoring programs to control air quality 2. Stage construction and maintenance works to prevent extent of bare ground. Use a water truck to wet areas of bare ground. Conduct works outside of hot periods when rainfall is typically lower.	During construction	Contractor
Weed invasion into uninfected areas of native vegetation	Vehicle traffic can spread weeds into areas of uninfected native vegetation.	1. Hygiene protocols (e.g., wash down facilities) to prevent the spread of weeds or pathogens between infected areas and uninfected areas 2. Prohibit use of any invasive species in any landscaping	Prior to and during construction	Contractor and all workers
Vehicle strike	Construction machinery colliding with wildlife and/or people causing injury or death	1. Temporary site fencing to protect significant environmental features such as remnant vegetation close to track alignment and prevent access by people. 2. A trained ecological or licensed wildlife handler to be present during sensitive clearing events. Any fauna injured/separated during construction shall be promptly transported to a veterinarian for treatment.	During and following construction	Contractor, NPWS staff and suitably qualified ecologist/ wildlife handler

Biodiversity Issue	Description	Mitigation Measures	Timing	Responsibility
Trampling of threatened flora species	Construction machinery and food traffic resulting in the trampling and death of threatened flora species	1. Native vegetation to be retained clearly demarcated for retention. Install "no-go" signage around areas to be retained to prevent unauthorised access	During and following construction	Contractor
Increase in pests and risk of disease	Impacts to adjacent native vegetation associated with edge effects including increased competition and predation, increased risk of disease and invasion by exotic species.	1. The development site is in a relatively untouched area surrounded by native bushland. The presence of pest species such as Feral Deer, Rabbits and Foxes are present on the site. The proposed development is unlikely to substantially increase their presence. Removing woody weeds would remove harbour for rabbits and other pests.	During and following construction	Contractor
Rubbish dumping	Dumping of rubbish in native vegetation - post construction	1. Development control measures to regulate activity in vegetation and habitat, including controls on rubbish disposal, wood collection, fire management and disturbance to nests and other niche habitats, Post construction measures should be addressed under a CEMP.	During and following construction	NPWS
Bushfire	Bushfire causing damage and injury or death to wildlife and people	1. Smoke-free policy during construction. No construction activities on Total Fire Ban days. 2. Development control measures to regulate activity in vegetation and habitat including wood collection and fire management	During and following construction	Contractor

6. Vegetation management works

The purpose of the vegetation management works described in this chapter are to act as interim management measures to protect areas of habitat within the 30m corridor which are not approved for clearing, to provide protective fencing buffers to known threatened flora populations, to manage the areas of approved vegetation clearing and any indirect impacts likely to occur during the construction phase and to prevent disturbance outside the development footprint. It is anticipated that successful long term management of the BMP area would be achieved through integration into the ongoing management of the Beowa NP by NPWS

6.1. Threatened Flora Species

6.1.1. Acacia constablei

Acacia constablei (Narrabarba Wattle) is currently listed as critically endangered and is difficult to distinguish from *Acacia mearnsii* (Black Wattle), which is very common and widespread in the Beowa national Park.

Acacia constablei individuals have been recorded at locations around the coastal walking track. It is likely that occurrences of *A. constablei* are located within the subject site. Some of the recorded cases of *A constablei* in the area close to the coastal walking track were checked during the 2023 preclearing surveys and are most likely young, misidentified *Acacia mearnsii* individuals, which are very similar to *A. constablei*, and are often mistaken for *A. constablei.*

In 2022, eight larger plants were observed, near Pulpit Rock, displaying *A. constablei*-like characteristics, and another approximately 20 smaller plants observed throughout the area were not assessed due to being immature and very unlikely to be able to be identified. The occurrences of these individuals can be seen in Figure 10 in – Location of *Acacia constablei*.

Although the alignment of the walking track will avoid direct impact with known populations of *A. constablei*, a buffer area must be maintained between the walking track and the plants shown in – Location of *Acacia constablei*. The locations of each individual plant or groups/ clusters of smaller plants must be marked on site so that their proximity to the final location of the walking track can be confirmed during micro-siting. >5m must be maintained from the track edge to the marked plant locations. Protective (temporary) exclusion fencing must be installed for any plants/ clusters of individuals that are between 10-5m of final determined track location. This will be determined during final track micro-siting with NPWS project manager. Appropriate induction and education must be conducted by all staff working in these areas.

A more permanent perimeter fence/protection measures in high traffic areas may be used to ensure future maintenance works or visitor trampling do not impact the population this would be determined by NPWS project manager following track /project audit checks and evaluation.

6.1.2. *Viola cleistogamoides*

A few small occurrences of *Viola cleistogamoides* were found, along edges of animal tracks in unburnt Melaleuca scrub along the coastal walking track. *V. cleistogamoides* is listed as Endangered in NSW, based on an original single record from near Wonboyn in the 1950s. There are numerous records from heath and heathy forest edges in the south of the region, and it is also common in Victoria. *V.*

cleistogamoides is a very small plant tending to be suppressed by larger plants. It proliferates after disturbance such as fire or roadworks, however it occurs mainly along e walking track edges. It has become more abundant in heath plots after the Green Cape fire in 2014 fire.

6.1.3. *Pultenaea pedunculata*

Pultenaea pedunculata (Matted Bush Pea) has been recorded along edges of drainage lines, access roads and on the existing Light to Light walking track. Previous targeted searches within the vicinity of the proposed construction corridor identified and recorded the species in the Leather Jacket Bay area. It is known that the species still persists at a number of locations along the walking track edges.

6.1.4. Recommended mitigation measures – Threatened Species

Recommended Mitigation measures to minimise impacts on *Acacia constablei, Viola cleistogamoides, Pultenaea pedunculata* and its potential habitat:

- Preclearing surveys will be conducted prior to construction to further identify any plants that may be impacted by the proposed works. The track will then be micro sited to avoid these plants allowing a minimum buffer of 5m between the plants and the walking track construction footprint. The walking track will always stay within the REF corridor.
- To prevent plants being trampled and unwanted browsing, tree guards will be placed around small, isolated plants until established. In areas where there are clusters, it may be more practical to fence the area.
- Management of weeds will be undertaken to ensure invasive species are not able to establish in the study area.
- Measures will be incorporated during construction to ensure that *Phytophthora cinnamomi* it is not introduced or spread. These measures will include the development of a weed and pathogen management plan that will ensure strict hygiene protocols are followed during construction, maintenance, and operation of the walking track
- Key threats identified in the recovery plan will be managed in the study area. It is therefore unlikely that the proposal will interfere with the recovery of this species.

6.1.5. Recommended mitigation measures – Aquatic and Riparian areas

Recommended Mitigation measures to minimise impacts to aquatic vegetation and riparian zones:

- The alignment of the walking path will be positioned to avoid areas containing riparian zones and aquatic habitat.
- Where the alignment of the track is positioned near a riparian zone or an aquatic habitat, staff will be inducted and aware of the nearby ecological sensitivities, including the location of all riparian zones and all aquatic habitat.
- To ensure no clearing occurs within aquatic habitat or riparian zones, the sensitive areas are to be clearly marked and if necessary fenced.
- All hazardous material, including hydrocarbons (fuels) will be securely stored in designated storage areas away from aquatic habitat and riparian zones.
- No disturbance to or clearing of any vegetation/ habitat beyond the approved project footprint as a result of construction activity
- No oil, fuel or chemicals to be taken near aquatic habitat or riparian areas

- No pollution (including sedimentation) of water bodies and riparian areas as a result of construction activity

Photograph 6. Areas of heath are known to provide sheltered habitat for *Viola cleistogamoides.*

6.2. Weed control

6.2.1. Primary and secondary weed control

All weeds, including herbaceous weeds and exotic grasses in the understorey across the development footprint will require treatment. Some secondary weed treatments may be required if clearing is delayed or staged. During these weed control activities, care must be taken to avoid impacting on retained biodiversity values.

Primary and secondary weed control will include herbaceous weeds and exotic grasses, specifically the control of the priority weed, *Rubus fruiticosus sp. aggregate* (Blackberry) and *Anredera cordifolia* (Madeira Vine). Follow up treatment of weed regrowth may be required.

Primary control of the *Anredera cordifolia* has been completed to a satisfactory standard at the time of revising the BMP to include Activity 2.

For more information on specific weed control techniques, see Appendices M & N.

6.2.2. Maintenance

Following primary and secondary weed removal within the walking path development footprint, ongoing maintenance to control weed regrowth from the soil seed bank will be required for at least one year. Maintenance work is to be undertaken by NPWS as per specifications provided in Appendix H – Construction and Maintenance Protocols for Contractors. Maintenance will be undertaken on a regular basis in the peak growing seasons (spring and summer), with less frequent visits in cooler periods (autumn and winter). Ongoing weed control will ensure that any weeds that become established within the disturbed areas do not encroach within adjacent bushland. Additional weed control beyond the one-year period prescribed in this BMP may be required depending on the construction program.

6.2.3. Weed management strategy

Weed management within the subject site should be undertaken post construction. This will need to be undertaken by a suitably qualified person holding a minimum qualification of TAFE Cert II in Conservation & Land Management. In addition to this, team leaders should have, as a minimum, a Certificate III in Conservation & Land Management or equivalent and an AQF 3 Chemical user's certificate. All herbicides are to be used as per the Australian Pesticides and Veterinary Medicines Authority (APVMA) approved chemical label and at the associated dilution and application rates.

WoNS and Priority weeds were recorded on site (BAR - NGH 2020) and are required to be controlled as outlined in Appendices M & N. If WoNS and/or Priority weeds appear on site in the future, or if weeds present on site not currently listed as WoNS or Priority Weeds become a declared WoNS or Priority Weeds, they will need to be managed in accordance with their Biosecurity and regional strategic requirements.

As part of the development some areas will be cleared, and earth works undertaken to prepare the land. This may include removing the topsoil and stockpiling on site. As such weed control is focused on processes to reduce the likelihood of transport of weeds to and from the site on vehicles and in soil. This has been broken up into three stages, prior to, during and after construction works as shown in Table 7. Vegetation management. These controls will need to be implemented throughout the relevant stages of the project.

Table 7. Vegetation management

Stage	Management actions
Prior to construction works	Given the seasonal nature of weed germination and growth, and the potential delay between approval and implementation of this plan, it is recommended that a qualified ecologist, suitably experienced/skilled NPWS staff or bush regenerator be onsite immediately prior to any vegetation clearance or weed eradication to identify any additional significant weeds on site and provide recommendations for management. A site inspection has been undertaken by a qualified bush regenerator. If there is a significant delay in construction a further site inspection is required.
	Control of woody weeds should be undertaken via the 'cut and paint' method.
	Control of woody weed regrowth or significant environmental weeds (e.g., WoNS) should be undertaken by herbicide spraying.
	Vegetative material generated and weed propagules, including from woody weeds, should be disposed of at a nearby green waste facility.
	Machinery and/or tools are to be washed down before entering and leaving the site. Wash down areas are to be inspected periodically to control any potential weeds prior to flower or seed production.

Stage	Management actions
During construction works	Mitigation measures, including erosion control, should be put in place to prevent the movement of weed seeds.
	Topsoil should be removed as part of earthworks only where there is minimal weed invasion. If significant weeds are present, then management of weeds as per above must be undertaken. Topsoil may be stockpiled on-site.
	Any fill used on-site must be 'clean' fill free of weed propagules. The site supplying the fill (either onsite or off site) is to be inspected prior to the transportation of any fill material. This includes the inspection of any topsoil on site that is to be stockpiled. If invasive weeds are present within the fill material, the weeds are to be treated prior to fill transportation. Treatment must take into consideration the likelihood of seed being present in the soil and include measures to reduce the potential for transported seed to germinate (e.g., through stockpiling time or through the use of pre-emergent herbicides). The inspection is to be undertaken by a qualified and experienced person holding a minimum qualification of TAFE Cert III in CLM. Written certification that the fill is 'clean' from weeds is required prior to transportation.
	The area receiving fill, including stockpiles, must have sediment fences installed around the perimeter of the fill placement areas.
After construction works	NPWS to undertake regular maintenance inspections to ensure weeds do not re-establish and set seed. If weeds are recorded on site, they must be treated within five days.
	Undertake ongoing management of the BMP area for a period of one (1) year.

6.2.4. Annual weed management program

An annual weed management program will be required during all stages of the construction works, especially in the peak growing seasons. The frequency of maintenance required will depend on the persistence of exotic species and seasonal changes (e.g., less frequent in the cooler months). It is expected that maintenance works following will be required at least bi-monthly during the peak growing seasons and quarterly in the cooler periods.

Ongoing management actions required include:

- Treatment of any regrowth from primary treated weed species
- Control of subsequent growth of other weed species
- Reduction of the potential for the spread of weeds to and from the site.

Weed management actions are required to be implemented through all stages of the construction works by NPWS staff. These processes include, but are not limited to:

- The BMP area is monitored for high threat weed occurrence regularly by NPWS. Any weeds are to be eradicated in an appropriate manner within five days of their presence been reported.
- Where weed management requires spraying of herbicides near waterways, only those herbicides formulated specifically for this purpose (e.g., Roundup© Bioactive™) are to be used and care is to be taken to avoid damage to native species.
- In areas where the remains of WoNS and priority weeds, weed material and soil contaminated with weed material is found onsite, it must be removed from the site in sealed plastic bags, destroyed and disposed of offsite at an appropriately licensed waste disposal facility.
- Regular monthly surveys and treatment of disturbed edges of pathways, access roads and urban interfaces.

Photograph 7. Occurrence of *Ageratina adenophora* (Crofton Weed).

6.3. Pruning or trimming

Pruning or trimming of any trees to be retained must be undertaken in accordance with *AS 4373 Pruning of amenity trees*.

6.4. Rehabilitation works

Landscape plantings will occur within Management Zone 3 (see section 4.4 Page 23, Figure 8, – BMP Area: Management Zones), which is approximately 1.77 ha of disused redundant track, and will be comprised of local indigenous species that represent the PCT mapped onsite. If seed can be obtained and propagated locally it may assist in growing endemic populations of plants and contribute towards using locally native species for regeneration. Appendix O – Landscape Planting Species List contains a landscape planting species list (arranged by PCT) to guide species selection for each of the areas of track requiring revegetation within management Zone 3.

Ongoing monitoring by NPWS is required to track progress and identify potential issues. Management in Zone 3 should be as follows:

1) All foreign material (i.e., rubbish, discarded machinery) within the Revegetation Zone will be removed prior to weed control or revegetation works.

2) Vegetation and habitat features within the Revegetation Zone will be recovered primarily through the combination of regeneration, revegetation, ongoing weed control, and the reduction of unauthorised disturbances.

3) Plantings of tree species characteristic of the vegetation communities identified will be undertaken where appropriate within the Revegetation Zone to achieve a long-term projective foliage cover (PFC) of approximately 60 - 70%.

4) The Revegetation Zone will be actively revegetated with native understorey and groundcover vegetation characteristic of the PCTs listed in this BMP (Section 2.3) and should be local to the Bega valley Shire Local Government Area (Appendix O – Landscape Planting Species List). Plantings are to be chosen to maximise, as far as practicable, the diversity of local characteristic species and will be selected at the discretion of the landscape coordinator or project manager.

5) Revegetation will be undertaken in accordance with the specifications and management strategies of this BMP.

6) The final extent and density of revegetation required will be governed by the amount of native species actively regenerating at the time the BMP is implemented and will be at the discretion of the landscape coordinator or project manager.

7) Revegetation techniques should facilitate sediment control through the encouragement of native groundcovers.

8) Rehabilitation of the Regeneration Zone should encompass the placement of logs and large branches of native tree species to mitigate erosion, but these should not be placed in areas that will adversely affect drainage through the site.

6.4.1. Weed control

1) Weed control activities within the Revegetation Zone will be consistent with the bush regeneration principle of initially prioritising works in less disturbed areas and in accordance with the Bradley Method and other techniques described in Buchanan (2000).

2) Although there were several exotic plant species identified within the revegetation area only a subset of these species is considered a threat to the restoration and long-term viability of the vegetation within and adjacent to the revegetation area and should be targeted as priority (Appendix M – Priority weeds within the Bega Valley Shire).

3) The minor and annual weeds that occur within the revegetation area pose little threat to the objectives of the BMP and are generally considered a much lower priority than the species identified specifically in Appendix M – Priority weeds within the Bega Valley Shire.

4) Minor and annual weeds should only be controlled where they;
    a. are considered to pose a threat to the BMP objectives generally; or
    b. more specifically threatened the success of a particular restoration, weed management or revegetation strategy; or
    c. are easily and cost effectively controlled in conjunction with other weed management actions.

5) The species targeted and extent of weed management required should complement the condition of the vegetation at the time this BMP is implemented.

6) Weed control methods should incorporate techniques outlined in Appendix N – Weed Control Techniques.

6.4.2. Planting guidelines

1) Planting will be undertaken at appropriate times of the year to maximise establishment success.
2) To facilitate the establishment of plants and to increase the success of vegetation rehabilitation, the following techniques and guidelines will be employed:
    - Disturbances for planting will be kept to the minimum required to provide an opening in the substrate to accept the seedling.
    - Planting will be undertaken by hand with appropriate hand tools.
    - Planting will be avoided during very dry conditions.
    - When first planted, plants are to be drench watered rather than lightly watered to encourage a deep root system.
    - If very dry conditions are experienced immediately after planting, then the watering of recently planted seedlings is to be undertaken every week up until 6 weeks post planting.
    - Jutemate and tree guards are to be used around tree and shrub plantings in revegetation areas where they are likely to improve plant growth, minimise mortality and inhibit weed regrowth.
    - Mulch is to be applied directly around each seedling to control water loss, soil temperature fluctuations and weeds.
    - Revegetation is to be timed to complement weed control strategies.
    - Follow-up weed management is to occur around all plantings.

6.4.3. Revegetation maintenance

1) During the establishment phase of the BMP (approximately 2 years after the final plants are in place) the plantings are to be inspected at least once every 3 months (i.e., every season) by qualified bush regenerators. During inspections the following works will be undertaken when required:
    - Replacement of dead seedlings
    - Watering (if necessary)
    - The control of weeds immediately surrounding each seedling
2) To ensure plantings persist after the establishment period, inspections should continue to be undertaken at appropriate intervals.
3) The revegetation area will be inspected for new weed incursions and appropriate control will be applied, as required.

7. Monitoring and reporting

7.1. Compliance checklist

To ensure that the actions within this plan are implemented on site, the NPWS project manager will record details of works undertaken and maintain a checklist of tasks completed. These compliance checklists will include a description of the task undertaken, the date, key personnel, methodology, results and any important maps and photographs. Priority tasks that require compliance checks include (but should not be limited to) the following:

- Exclusion fencing installation as per habitat maps and buffer requirements
- Pre-clearance surveys
- Clearing extent
- Clearance supervision (to include details of habitat retention and fauna relocation) (Project Manager)
- Weed monitoring (as per Section 7.2) (to be undertaken by NPWS).

A commitment will be undertaken by NPWS to audit the implementation of the BMP and evaluate whether additional works are required.

7.2. Weed monitoring

Weed management and monitoring will be required at the completion of each stage (prior to, during and after construction works), continuing until signed off at the practical completion of construction works and two years of maintenance weed control works. Ongoing weed control will be undertaken by NPWS field staff. An annual review of works will be undertaken to evaluate success of measures and /or any issues that require increased management.

Monthly site walkovers will be required by NPWS (Project Manager) to monitor the progress. A brief annual report will be prepared outlining compliance with weed management processes and reporting on the performance criteria (see below).

7.3. Ongoing monitoring

7.3.1. Pest management

There is potential for an increase in feral predator (cats and foxes) activity on native fauna species resulting from the construction of accommodation precincts located at Mowarry Point and Hegartys Bay. An ongoing pest management and monitoring program will be undertaken within these areas as part of the project. Mitigation strategies, include camera traps to detect feral predators, fox baiting programs, monitoring and evaluation of results. Construction specific pest control should be conducted for the duration of the construction. Ongoing pest management beyond the construction phase of the project should be considered and implemented in response to the presence of pest animals and in consultation with local NPWS staff.

7.3.2. Threatened Species monitoring

The BAR (NGH 2022) recommends that results of the targeted small mammal surveys completed as part of this assessment be used to plan monitoring and management activities. The results obtained from the BAR's assessment of impact are a valuable and useful base line study which should be used to guide future decision-making regarding these conservation issues. Additionally, the research paper investigating use of camera traps in Nadgee Nature Reserve (Claridge *et al* 2019) is an important resource for future monitoring efforts.

The focus of the monitoring programs should be those threatened fauna recorded within the BAR (NGH 2022) study area during field surveys. These species include:

- Southern Brown Bandicoot (*Isoodon obesulus obesulus*)
- Long-nosed Potoroo (*Potorous tridactylus*)
- Spotted-tail Quoll (*Dasyurus maculatus*)

It is recommended that monitoring of Southern Brown Bandicoot (SBB) and Long-nosed Potoroo (LNP) is undertaken in each of the accommodation precinct areas to gain an understanding of the status of each species within each precinct.

For a detailed description of the methods for monitoring SBB and LNP see *Assessment of trends in Southern Brown Bandicoot occupancy in the southern forests of New South Wales* (2009-2019) (Gonsalves & Law 2021).

It is recommended that threatened species monitoring be conducted at both accommodation precincts within the first year. After data has been collected and results analysed, monitoring plan can be reassessed and potentially continue for four more years, depending on the outcome of the analysis. Ongoing threatened species monitoring beyond the construction phase of the project should be implemented in consultation with local NPWS staff.

7.4. Existing Monitoring

NPWS in partnership with DPI undertake extensive fauna monitoring in Beowa NP as part of a feral cat program. This ongoing project has monitoring sites close to the Light to Light Walking track and accommodation precinct footprints and will capture impacts of the proposal on threatened species, native mammals and predator populations as recommended by the BAR (NGH 2022). Details of camera setup is detailed below and mapped in Figure 6 and Figure 7.

The South Coast Region of the Feral Cat Project consists of three study areas:

(i) Beowa National Park (formerly Ben Boyd NP);
(ii) Nullica (South East Forests NP - Yowaka Section and surrounding State Forests); and
(iii) Nadgee Nature Reserve.

For the purposes of site labelling, the study areas are coded as follows:

1. Ben Boyd (BB)
2. Nullica (NU)
3. Nadgee (NA)

7.4.1. Prey monitoring

Across each study area a maximum 114-115 'prey' cameras are deployed twice annually (Autumn and Spring) for 40-day periods. These are typically located a minimum of 500 metres apart and at least 50 metres from the closest track. They are baited with an oat and peanut butter ball within a vent cowl secured into the ground by a tent peg, with an aim to detect native prey species. The set-up ordinarily comprises a star picket, camera bracket and two white posts which remains in-situ with only the camera and bait being removed when cameras are collected once they have been on site for 40 days.

Prey camera locations are indicated as green dots on Figure 6.

7.4.2. Predator monitoring

The layout of the predator cameras consists of 30 sets of paired cameras in each of the three study areas (60 predator cameras per study area). Paired camera sets are placed along the track network, ideally at an even spacing of 1 km between camera locations. Each camera pair consists of one on-trail camera (A) and one off-trail camera (B), the latter placed 20-50m from the on-trail camera. On-trail deployments are passive and do not include any form of lure or attractant while off-trail deployments include 50ml of fish oil placed approximately 3m in front of the camera.

Predator camera locations are indicated as blue circles on Figure 7.

7.5. Performance criteria

Progress and compliance with the BMP will be monitored, reviewed, and reported annually. Management and monitoring of the site will occur in three main stages; prior to, during and after construction works. NPWS will be responsible for ongoing monitoring and assessment of performance against the requirements of this BMP and criteria listed in Table 8.

The performance criteria outlined in Table 8 are to be achieved by the end of each period identified (e.g., 'Prior to construction works'). A checklist should be compiled following each site visit to summarise site conditions and provide recommendations for further action if required. Annual review of the BMP will be undertaken by NPWS against performance measures, with any recommendations made to Area Manager and a copy provided to the BCD.

Figure 6. Beowa National Park prey Camera locations

Figure 7. Beowa National Park predator camera locations

Table 8. Performance Criteria

Task	Criteria	Stage of construction works		
		Prior	During	Following
Pre-clearance Works	Pre-clearance survey conducted by qualified ecologist or suitably experienced and skilled NPWS staff member, and locations of all habitat recorded.			
	Pre-clearance survey data including locations of habitat trees delivered to NPWS staff, environment manager and construction manager.			
	Clearance supervision conducted by qualified ecologist or suitably experienced and skilled NPWS staff member.			
	Non-habitat vegetation cleared. Trees to be cleared must be felled into the development area carefully so as not to damage trees to be retained in or beyond the development footprint.			
Clearance and Habitat Retention	Ecologist is present to supervise clearance works with potential to impact habitat features. Any inhabiting fauna is handled by the onsite ecologist and relocated safely. WIRES called should any fauna be injured during clearing works.			
	Any habitat features requiring relocation under the supervision of the project ecologist. Hollows are to be retained and placed onsite for use of ground-dwelling fauna.			
	All significant weeds identified on-site by a qualified ecologist or bush regenerator prior to management.			
	Commencement of all tasks outlined in the BMP or evidence of planning for their implementation.			
	No woody weeds, WoNS or Priority weeds present on-site			
	Exotic material appropriately disposed off-site			
	Machinery/tools washed down before and after entering site			
Weed control (all zones)	Any soil and water management actions implemented			
	Fill used on site is ‘clean’ (i.e., free of weed seed and contamination)			
	Impact area including stockpiles and buffer areas monitored for weeds			
	Proportion of construction area and vegetation immediately adjacent no greater than 15% exotic cover			
	Weeds recorded on site are eradicated within five days			
	Ongoing maintenance for at least one year. Additional weed control beyond the one-year period prescribed in this BMP may be required depending on the construction program.			

Task	Criteria	Stage of construction works		
		Prior	During	Following
Rehabilitation and Revegetation	Rehabilitation and revegetation of redundant sections of the track that would be closed			
	Potential revegetation of areas at the accommodation precincts (TBC by NPSW staff)			
	Post construction planting at areas along track (TBC by NPSW staff)			
	Removal of foreign material within the revegetation zones prior to weed control			
	Recovery of vegetation and habitat features within the revegetation zone			
	Tree, shrub, and groundcover planting with species characteristic of local plant communities identified in Appendix O – Landscape Planting Species List. Includes use of planting protection tree guards.			
	Follow-up inspection to detect new weed incursions			

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The Bega Valley Shire Local Weed Management Plan – Bega Valley Shire Council.

Appendix A – BMP Area: Management Zones

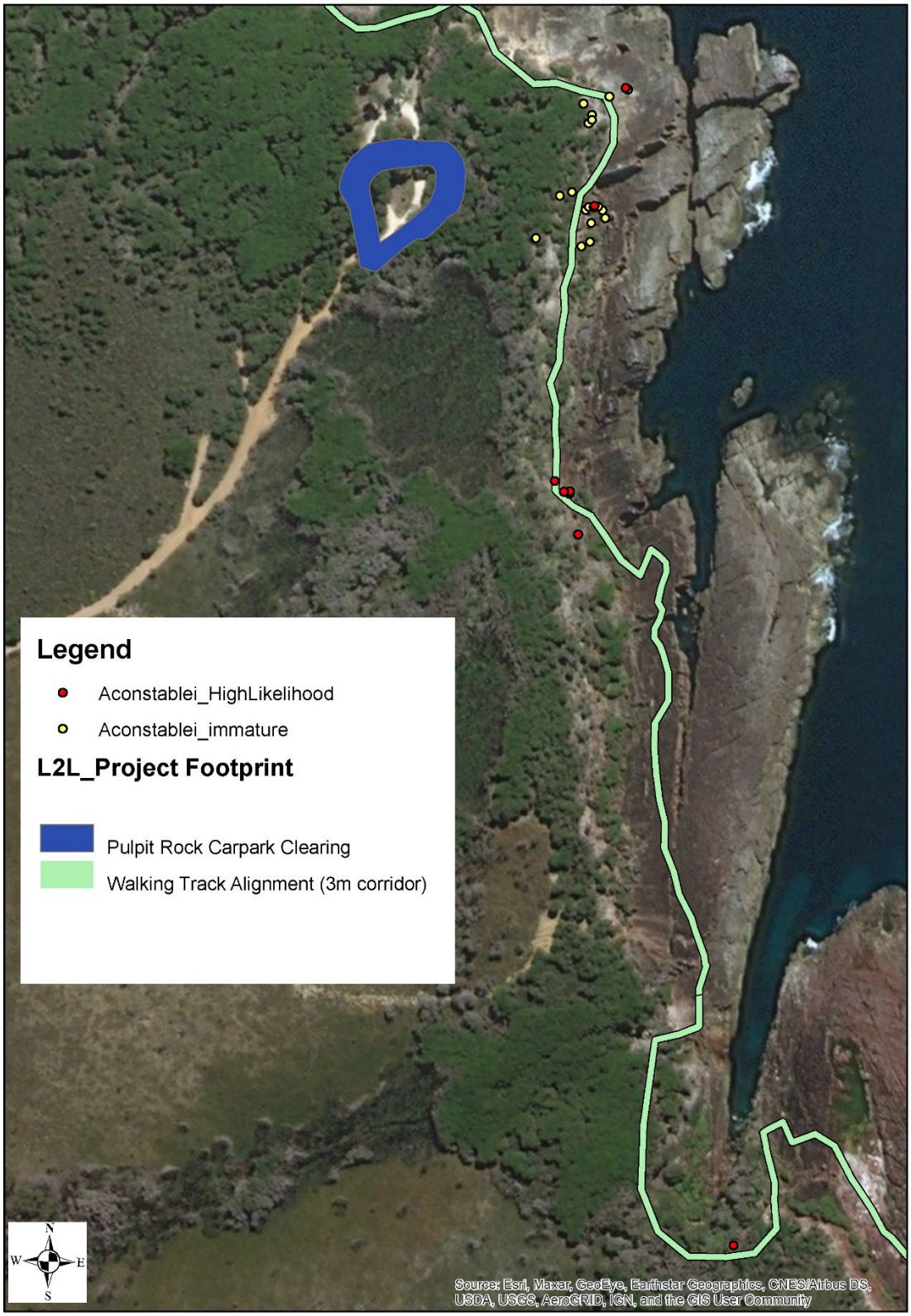
Figure 8. BMP Area - Management Zones (8 page Map)

Appendix B – BMP Area: Field Survey Data

Figure 9. BMP Area – Field Survey Data (8 page Map)

Appendix C – Location of *Acacia constablei*

Figure 10. Location of *Acacia constablei*



Appendix D – Hygiene Procedures for vehicles and machinery to control the introduction and spread of weeds and pathogens

Implementation of a strict weed and Pathogen hygiene management procedures which includes:

- Management of declared priority weeds under the Biosecurity Act 2015 during maintenance.
- Ensure weed hygiene protocol is applied for plant, machinery, and fill.
- Any occurrences of pathogens such as Myrtle Rust and Phytophthora to be monitored, treated, and reported.
- Avoid all use of foreign soil matter for landscaping/mulching. Always use matter from in situ.
- Install disinfecting facilities – wash-down bays, footbaths and/or scrubbing stations at primary entrance/exit points for both vehicles/machinery and foot traffic.
- In priority locations (heath habitat), install signage (e.g., 'Stay on marked tracks') to reduce off-track disturbance and elevate or divert walking tracks to minimise contact with soil, particularly in locations that have the potential to become muddy.

GUIDELINES TAKEN FROM "ARRIVE CLEAN, LEAVE CLEAN". COMMONWEALTH OF AUSTRALIA 2015

1. Undertake visual inspections to confirm that vehicles, plant and equipment and footwear, are free of clods of soil, slurry (water and soil mixture) and plant material.

2. Where necessary use facilities specifically designed for cleaning vehicles, plant and equipment and footwear.

VEHICLES, MACHINERY AND LARGE EQUIPMENT

1. Use a wash-down facility for vehicles and machinery pay particular attention to cleaning mud flaps and tyres and undercarriage.

2. Dispose of wash-down water so that it drains back into a low area away from waterways. If this is not possible, empty it into a waste container for responsible disposal offsite.

3. Do not allow mud and wash-down effluent to drain into bushland and surface waters, such as rivers, creeks, reservoirs, and dams.

4. Don't drive through wash-down water.

FOOTWEAR, SMALL EQUIPMENT AND HAND TOOLS

1. Set up a wash-down area for participants to wash and dry their face and hands and to clean their footwear before entering and exiting the site.

2. To clean footwear, first use a hard brush or stick to remove as much mud, soil and organic matter as possible before disinfecting with a solution of 70% ethanol or methylated spirits in 30% water—applied through a spray bottle or a footbath.

3. Collect all removed mud, soil and organic matter in a bag or bucket, and keep it out of clean bushland.

Appendix E – Site environmental induction training

CONSTRUCTION

1. A nominated 'Site Construction/Project Manager' is to be identified and undergo fauna related briefing.
2. An ecologist is to be appointed who is available on-call, aware of the sites circumstances and able to provide any required advice or attend the site as required.
3. Workers and visitors on the site are to undergo a site induction training program.
4. Site induction should include a synopsis of the measures outlined within this biodiversity Management Plan.
5. 'Toolbox Talks' undertaken under standard WHS requirements should include a section on the risks and requirements re Biodiversity.
6. Daily pre-start up checks for sheltering or trapped fauna should be made. It is possible that fauna could enter ex-situ overnight and may use stationary machinery or materials for shelter or become trapped in excavation pits and deep holes etc.
7. Site staff must know what the correct reporting and removal/transfer procedure is if fauna is detected during operations.
8. Ensure all staff and visitors to the park are aware of laws re. approaching marine mammals (in this case seals), in accordance with the Biodiversity Conservation Regulation 2017 (Clause 2.3).

MATTERS TO BE COVERED BY INDUCTION TRAINING

Hygiene Protocol Requirements: Topics Should Cover - the requirements for personnel and the equipment used as appropriate to individual activities and risk i.e., equipment; machinery, vehicles, imported products, materials, site operational personnel and maintenance as well as appropriate handling/reporting requirement and restriction for incidental finds of any fauna detected.

Fauna Capture, Holding, Reporting and Transfer Protocol: To protect individual fauna and prevent inadvertent mortality, the following steps should be followed.

4. Do not attempt to touch, capture, or handle the fauna.
5. Inform others in the area of the presence of the fauna and immediately stop works in the vicinity of the find.
6. Inform the project manager of the fauna.
7. Project manager is to contact professional to have fauna moved to the suitable identified release site.
8. Spotter to remain with the fauna to ensure others are aware of its location and for easy capture when the ecologist arrives on site.

If fauna is found on site and an ecologist is not present, a photo can be taken while someone watches the animal. This photo can be sent to the project ecologist to provide advice as to removing the fauna, including any required hygiene protocols and suitable release protocols. It is the responsibility of the project ecologist to determine when and where any fauna is to be released and to ensure that this is done in a safe and humane manner according to ethical guidelines.

Injured or sick fauna will be transferred to a vet for assessment and treatment. They can be released back at the predetermined or suitable release site if they have been declared well enough for release by the vet or qualified animal carer (e.g., WIRES member).

INDIVIDUAL RESPONSIBILITY

On-call Ecologist: Site inspections, general site fauna clearance, reporting of any fauna occurrence, collecting and collating any observations from other site personnel via Site Construction and Operational Managers as appropriate, makes a call/decision in discussion with original observer on release/transfer of fauna to the predetermined relocation area.

Site Construction/Project Manager: ensure capture/observation data is recorded, reports observations to on call ecologist.

Appendix F – Techniques and specifications

WEED CONTROL

Weed control involves a combination of mechanical, physical and chemical techniques to remove the weeds and prevent regrowth. Weed control will be undertaken across the entire zone. A selection of the best suited weed control method within the site depends on a number of factors including:

- the species or combination of weeds being targeted
- the density of the weeds
- resources available (time, labour, equipment and finances)
- weather conditions of the day

WEED CONTROL TECHNIQUES

Detail of specific weed control techniques to be used such as cut and paint, scrape and paint, herbicide spraying, and hand weeding are given in Brodie (1999). The principles of bush regeneration and techniques to trigger natural regeneration are to be in accordance with the Bradley Method and other techniques described in Buchanan (2000). Management techniques for different types of weeds are provided below.

Annual grasses

Annual grasses should be hand removed or spot sprayed where isolated or in low concentrations. Larger patches of annual grasses may be slashed/brush cut in late spring to early summer, after flowering, but prior to seed set. For most species, slashing/brush cutting prior to late spring through to early summer will promote vigorous growth and should not occur. However, some annual grasses can grow and produce seed at any time of the year dependent on climatic conditions such as high rainfall and warm temperatures. Monitoring of annual species should be undertaken and if new growth occurs, the same treatment will be applied to the new growth to prevent seed production. Individual plants should be hand removed, bagged and disposed of appropriately offsite.

Perennial grasses

Perennial grasses, such as *Ehrharta erecta* (Panic Veldt Grass) will be hand removed where isolated or in low concentrations. Larger patches may be slashed prior to seed production in spring or summer (depending on the growth cycle of the species) and the regrowth spot-sprayed 2-3 weeks later when it is actively growing and approximately 10 cm in length. Monitoring of these species will occur and if new seed production occurs, the same treatment will be applied again as required. However, slashing will not reduce the presence of exotic grasses on its own and must always be combined with targeted removal to reduce densities and allow for native regeneration. Individual plants should be hand removed, bagged and disposed of appropriately offsite.

Woody weeds

Follow up treatment of woody weeds, including *Sida rhombifolia* (Sida) and *Lantana camara* (Lantana) will be controlled by the cut and paint or drill and fill method using a non-selective herbicide.

The most appropriate method to be used depends on the size of the individual to be removed and will be determined by the bush regeneration contractor. Primary weed control should use techniques that will not encourage flushes of secondary weed growth. All seedlings of woody weeds will be hand pulled or spot-sprayed with a non-selective herbicide.

Creepers and climbers

The control of creepers, including *Rubus fruiticosus* (Blackberry), varies depending on the species. For the most part, seedlings will be hand pulled, while mature plants can be controlled by the stem-scrape method or spot spraying using a non-selective herbicide. The precise method to be used will be determined by the bush regeneration contractor depending on the species, size and reproductive status of the individual. All vegetative material removed should be bagged, removed from site and disposed of appropriately.

Herbaceous weeds

Where individual plants of herbaceous weeds, including *Senecio madagascariensis* (Fireweed) and *Solanum* sp. are found, they will be hand pulled prior to flowering. Where large swaths of these species occur, they will be sprayed using a non-selective herbicide. If high densities of mature stands occur, weeds may be slashed first using a brush cutter and any subsequent regrowth sprayed. Regular monitoring of these species will be required to prevent seed production. *Cirsium vulgare* (Spear Thistle) will not be hand-pulled due to its thorns and instead will be treated using cut and paint methods or spot sprayed for larger infestations using a non-selective herbicide. All vegetative material that is pulled out and has the potential to regrow if deposited on ground will be bagged and removed from site.

Management of weed waste

All weed propagules, especially priority weeds, will be bagged and disposed of as directed by legislation at facility licensed to receive green waste. All weed waste without propagules will be composted onsite in small unobtrusive piles.

Herbicide use

The use of herbicide to control weeds should be carefully considered. Herbicide must only be used for the purpose described on the product label, as per the NSW *Pesticides Act 1999.* Herbicide use should assess potential long-term impacts of the technique, including whether the proposed works address the source of the weed infestation. However, herbicide application forms an important and useful component of an integrated weed management approach and can be the most appropriate method for the control and eventual eradications of some weed species.

Herbicide use should occur during the active growing season for plants to encourage the chemical uptake into the plant. The selection of herbicides should also consider the type of weed and the location. Where non-selective herbicides are required for use, glyphosate is the most suitable. A glyphosate-based herbicide, formulated for use near waterways, will be used if works require herbicide application near waterways, a (e.g., Roundup Biactive®).

Broad-leaf selective herbicide may be used as per the NSW Weed Control Handbook (DPI 2018). However, this type of herbicide is extremely toxic to aquatic life and must not be used in, or adjacent to, waterways.

Registration and records must be kept in accordance with the NSW *Pesticides Regulation 2017*.

BUSH REGENERATION CONTRACTORS

All vegetation management works in the establishment phase will be undertaken by suitably qualified and experienced bush regeneration contractors who are members of the Australian Association of Bush Regenerators (AABR) or fulfil the membership criteria. Additionally, team leaders should have, as a minimum, a Certificate III in Conservation & Land Management or equivalent. The contractor will need to carry out best practice bush regeneration techniques as described by Buchanan (2009). A flexible approach to this site is recommended since techniques may need to be changed or modified to suit site conditions. This approach is consistent with adaptive management and allows the contractor to develop and build on site knowledge whilst implementing this BMP. Monitoring will assist in the development of the BMP actions in subsequent years.

HYGIENE PROTOCOLS

To avoid introducing soil pathogens / diseases in particular *Phytophthora cinnamomi* (Root rot disease) onto site a hygiene protocol should be undertaken as per the guidelines developed by the Royal Botanic Gardens in '*Best Practice Management Guidelines for Phytophthora cinnamomi with the Sydney Metropolitan Catchment Management Authority'*.

For Bush Regenerators all tools and boots should be washed down and thoroughly cleaned of soil / mud using a solution of water and disinfectants prior to undertaking works onsite. All machinery should be thoroughly cleaned of all soil / mud / debris prior to working within the BMP area.

Appendix G – Preclearance Survey Protocols

ECOLOGISTS

Guidelines taken from the REF and BAR prepared by NGH in February 2022.

INTRODUCTION

This protocol provides methodologies to be followed by all ecologists conducting preclearance surveys within the 30 m wide proposed track construction corridor (the 'corridor'). Previous surveys were conducted by NGH within sections of the corridor and habitat features were recorded. New preclearance surveys are now required to identify, record, and physically mark habitat features within the corridor, to help guide alignment to avoid these habitat features and finalise the best location of the new track construction footprint (3m wide). Key habitat features threatened flora and fauna species, and unexpected finds encountered by ELA ecologist within the corridor will be recorded with a handheld GPS unit and marked using high visibility flagging tape.

OBJECTIVES

Surveys are undertaken prior to any clearance works on site to identify key fauna habitats. The surveys are designed to record and clearly mark out areas of habitat, as well as unexpected finds (middens or artifacts), threatened flora locations, and document fauna sightings. Survey data will then guide an experienced ecologist who will supervise clearing activities. This will enable the efficient, sensitive and humane capture and relocation of any resident fauna prior to works commencing, with minimal disruption to the clearance and construction activities.

METHODOLOGY

Habitat

Prior to all works commencing on site, pre-clearance surveys will be undertaken by suitably qualified ecologists to identify and mark key habitat features within the corridor. Habitat features include habitat trees, including hollow-bearing trees (HBT) and feed trees of the Yellow-bellied Glider (*Petaurus australis*) and Glossy Black Cockatoo (*Calyptorhynchus lathami*), areas with abundant or important woody debris habitat, nests, rocky outcrops, crevices, large boulders, stags, areas with evidence of fauna use such as burrows, diggings, or Spotted-tail Quoll scats/latrines (*Dasyurus maculatus*), Eastern Pygmy Possum shelter/denning habitat (woody debris, stumps, hollow logs and dense shrubs) and thick groundcover. Habitat trees were considered any tree with a hollow > 1 m above the ground that extended into the trunk, trees harbouring nests or containing decorticating bark. Habitat features will be inspected for signs of fauna use or fauna presence from the ground via visual inspections using binoculars for those above eye level and a torch for those features close the ground.

Habitat features will be photographed, the location recorded using a handheld GPS (accuracy of 5-15 m) and marked with high visibility flagging tape. Marked habitat features should be left undisturbed and the location of the new track is to be aligned to avoid and minimise direct impacts on the habitat features listed below.

During the survey the following details must be recorded:

- Species and location of all HBTs within the clearance footprint by GPS and with flagging tape
- Hollow number, size and species that may use the hollows
    - Small (S) = < 10 cm
    - Median (M) = 10-20 cm
    - Large (L) = 20-30 cm
    - Extra-large (XL) = >30 cm
- Other habitat features such as feed tree, important woody debris habitats, bird nests and dreys or burrows within the clearance footprint
- Any fauna present on site
- Threatened species or endangered ecological communities and populations

Historic records show four threatened flora and 30 Fauna species recorded in the general area surrounding the corridor. The species listed below have been sighted, recorded, or had evidence of their presence collected. These species are considered present in the area and may potentially be encountered during preclearance surveys; locations must be recorded and marked.

Threatened Fauna species include:

- Dusky Woodswallow (*Artamus cyanopterus*) in heath west of the Pulpit Rock carpark;
- Striated Fieldwren (*Calamanthus fuliginosus*);
- Gang-gang Cockatoo (Callocephalon fimbriatum);
- Glossy Black Cockatoo (Calyptorhynchus lathami) associated with Allocasarina littoralis;
- Varied Sittella (Daphoenositta chrysoptera);
- Eastern Bristlebird (*Dasyornis brachypterus*);
- Little Lorikeet (*Glossopsitta pusilla*);
- Turquoise Parrot (*Neophema pulchella*);
- Barking Owl (*Ninox connivens*);
- Powerful Owl (*Ninox strenua*) in woodland near the Pulpit Rock turnoff;
- White-bellied Sea Eagle (*Haliaeetus leucogaster*) pair sighted in flight;
- Wedge-tailed eagle (*Aquila audax*) near sea caves;
- Spotted-tail Quoll (*Dasyurus maculatus*) scat found on rocks near sea caves;
- Long-nosed Potoroo (*Potorous tridactylus*) 24 sightings;
- Long-footed Potoroo (*Potorous longipes*);
- Southern Brown Bandicoot (*Isoodon obesulus obesulus*) between Pulpit Rock & Green Cape;
- Long-Nosed Bandicoot (*Perameles nasuta*);
- Smoky Mouse, Konoom (*Pseudomys fumeus*);
- Eastern Chestnut Mouse (*Pseudomys gracilicaudatus*);
- Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*);
- White-footed Dunnart (*Sminthopsis leucopus*);
- Yellow-bellied Glider (*Petaurus australis*);
- Eastern Pygmy-possum (*Cercartetus nanus*);
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*);

- Southern Myotis (*Myotis macropus*);
- Flame Robin (*Petroica phoenicea*);
- Eastern Ground Parrot (*Pezoporus wallicus wallicus*) Observed south of Pulpit Rock in unburnt heathland;
- Masked Owl (*Tyto novaehollandiae*); and
- Sooty Owl (*Tyto tenebricosa*).

Pre-clearance surveys for Striated Fieldwren, Eastern Bristlebird and Eastern Ground Parrot must be conducted by a fauna ecologist or suitably experienced and skilled NPWS staff member one day prior to clearing.

Where pre-clearing surveys for the Eastern Ground Parrot cannot be undertaken due to site constraints or staff safety considerations, clearing must not occur during breeding season (September-December) in PCTs 1141, 721 and 891 which form Eastern Ground Parrot habitat.

If any Glossy Black Cockatoo feed trees are encountered during pre-clearing surveys, these will be retained.

If active nests of threatened bird species are encountered during pre-construction surveys, the site will be identified. Works within 200 m of the tree are to be avoided during the optimum breeding season for the species identified.

If an active threatened owl nest is detected, works within 200 m of the nest tree should only be undertaken outside the breeding season of the species to avoid impacting the life cycle of species involved.

Threatened Flora species include:

- Narrabarba wattle (*Acacia constablei*); Recorded near Pulpit Rock.
- Leafless tongue-orchid (*Cryptostylis hunteriana*) single plant found near Hegartys Bay access track;
- Hidden violet (*Viola cleistogamoides*) observed near Pulpit Rock in unburnt heathland; and
- Matted bush-pea (*Pultenaea pedunculata*).

The mitigation measures identified in section 6.1 should be adopted to minimise impacts on *Acacia constablei, Viola cleistogamoides, Pultenaea pedunculata* and their potential habitat.

Note: No PCTs were identified as meeting the criteria of Threatened Ecological Communities under the EPBC Act or BC Act.

Unexpected finds

If during the preclearance survey ecologists become aware of the presence of unexpected finds in the form of middens, artifacts, endangered ecological communities, threatened species or their habitats, that were not identified and assessed in the REF or BAR (which are likely to be affected by the activity), they are to be photographed, their location recorded and NPWS notified as soon as practical so that appropriate action can be taken.

CONSTRUCTION

This Protocol provides methodologies regarding fauna pre-clearance and potential relocation for implementation during the removal of Habitat Trees.

QUALIFICATIONS OF ECOLOGIST

A suitably qualified fauna ecologist with experience relating to micro bats and arboreal fauna will be required to be on-site to supervise the felling of any hollow-bearing trees or trees with nests on-site. The ecologist must have a current Lyssavirus vaccination and hold a scientific licence from NSW Office of Environment and Heritage (OEH) to conduct flora and fauna surveys, including being covered by appropriate licenses to 'handle' fauna under the *National Parks and Wildlife Act 1974*. They must also have demonstrated experience in and knowledge of the handling and relocation of fauna.

This licence requires that all survey and incidental records are submitted to the DPE for inclusion in their databases (primarily the Atlas of NSW Wildlife).

Fauna ecologist is to take all appropriate hygiene pre-cautions before handling any fauna to prevent spreading diseases such as Chytrid disease or Beak and Feather disease.

PRE-CLEARANCE SURVEY

Prior to clearing, all HBTs and trees with nests within the clearing footprint are to be clearly marked.

SOFT FELLING TECHNIQUE

Habitat trees should only be removed if they pose a safety risk to construction workers or bush walkers. If a HBT is to be removed a 'slow' or 'soft-drop' technique should be used during felling. This involves removal of non-habitat vegetation (including undergrowth, groundcover etc) only, and/or nudging and shaking each habitat tree prior to its removal, under the supervision of the fauna ecologist. Habitat trees should then be gently lowered to the ground.

ELA recommend that habitat features are cleared after all other vegetation to promote fauna to self-relocate, driven by the disturbance of surrounding vegetation clearance. This means that when it comes time to clear habitat features (such as hollow bearing trees), the residing fauna will have hopefully relocated away from the clearance area and cannot be injured during clearance. This is the most effective way of mitigating the potential for fauna to be injured during clearance.

The fauna qualified ecologist must be present on site while the vegetation is removed to provide advice to machine operators and rescue and relocate native fauna if encountered and/or injured during tree felling and vegetation clearing.

The fauna ecologist will need to work closely with the operators during the felling operations to make sure works are stopped if fauna species are spotted and require rescue. Prior to felling operations, the fauna ecologist shall prepare a site-specific Safe Work Method Statement (SWMS) outlining the risks and hazards of felling operations.

Once a tree has been felled, the fauna ecologist will undertake further searches for any animals that have not fled or are unable to flee. Where fauna has not fled or does not seem likely to flee from a hollow the fauna ecologist will advise on the potential to block hollow exits and move the section of the HBT with the fauna to the Biobank site where the exits can be unblocked, and the animal left to exit and

move on its own accords. Where this method of relocation is not considered acceptable by the fauna ecologist, the fauna ecologist will attempt to capture or encourage any un-injured fauna that is capable to move or relocate from the subject site. If it proves difficult to remove an animal from a hollow, these trees/logs must be left on the ground overnight to give these animals a chance to relocate before the tree is mulched or moved. Typically, most fauna in this situation will have multiple roosts throughout the region and will vacate the hollow and move away from the subject site.

Any small and nocturnal fauna that are unable to relocate themselves on their own accord, such as micro-bats, lactating females, will be captured, placed into an individual calico bag and then stored in cool location for released after dusk. Any captured fauna will be released into suitable habitat offsite.

If an animal is injured during these works, the fauna ecologist will ensure that they receive the appropriate levels of care. Depending on the level of injury and status of the injured fauna, WIRES and/or the nearest veterinary clinic are to be contacted to retrieve to take the animal into care or to determine whether the veterinary staff are capable of caring for injured native animals.

RETENTION OF TIMBER

Representative re-usable native timber will be retained on-site for use as habitat logs for ground dwelling reptiles and mammals adjacent to the corridor. Salvaged material is to be distributed randomly in areas adjacent to the corridor.

FAUNA PRE-CLEARING RECORDS

Records shall be kept by the fauna ecologist detailing the results of any fauna encountered during clearing. The fauna ecologist will record species and numbers of fauna, including details on injuries, treatment, and relocation.

Copies of pre-clearing records will be provided to NPWS.

Appendix H – Construction and Maintenance Protocols for Contractors

Guidelines taken from the REF and BAR prepared by NGH in February 2022.

INTRODUCTION

This protocol provides methodologies to be followed by all project personnel and relevant sub-contractors undertaking works on pre-existing sections and new sections of walking track. This document has been composed to mitigate risk of impact to flora and fauna habitats and other sensitive environmental features within the project area.

INDUCTION TO SITE

Training provided for all project personnel, including relevant subcontractors on site; training and site briefings conducted to communicate environmental features to be protected and measures to be implemented. Site inductions and toolbox talks must be conducted for all ecologically sensitive areas.

Maintenance induction requirements include:

1. A nominated 'Site manager/Environment Manager' to be identified and undergo flora and fauna related briefing.
2. An ecologist is to be appointed who is available on-call, aware of the sites circumstances and able to provide any required advice or attend the site as required.
3. All project personnel and relevant sub-contractors on the site are to undergo a site induction training program. This training and site briefing serves to communicate the environmental features to be protected, and the measures to be implemented. It also acts as a synopsis of the measures outlined within these protocols.
4. 'Toolbox Talks' undertaken under standard WHS requirements should include a section on the risks and requirements re Biodiversity.
5. Daily pre-start up checks for sheltering or trapped fauna should be made. It is possible that fauna could enter ex-situ overnight and may use stationary machinery or materials for shelter or become trapped in excavation pits and deep holes etc.
6. Site staff must know the correct reporting and removal/transfer procedure if fauna is detected during operations.
7. Ensure all staff and visitors to the park are aware of laws re. approaching marine mammals (in this case seals). In accordance with the Biodiversity Conservation Regulation 2017 (Clause 2.3).

MINIMISING AND AVOIDING IMPACTS DURING CONSTRUCTION AND MAINTYENEANCE WORKS

All project personnel and relevant sub-contractors must implement the following protocols to avoid and minimise impacts to breeding and foraging habitat for threatened species:

- Avoid the removal or disturbance of shelter/denning habitat such as woody debris, fallen logs, burrows in the ground, dense shrubs, rock crevices and bush rocks during the maintenance of the walking track.

- Any fallen timber and dead wood encountered within the development footprint will be left in situ wherever possible or would be relocated to adjacent areas (within the buffer area) of similar habitat to aid in habitat enhancement.
- If rock removal is unavoidable, it is to be removed with suitable machinery so as not to damage the underlying rock or result in excessive soil disturbance.
- Where active bird nests or mammal shelter/denning habitat is encountered in the maintenance area, works are to halt, and the site manager/ environment manager is to be contacted immediately. Information on the threatened species within the locality will be included in the induction process for applicable personnel.
- Where unexpected and threatened fauna or flora species are discovered, works will stop immediately, and the site manager/environment manager notified. An ecologist will be engaged to determine management actions to avoid or mitigate any potential impact.
- NPWS staff training and public signage (including multilingual messaging) must communicate the importance of all visitors and workers remaining on the existing track and leaving no trace while in the national park.
- All groundwork associated with construction and operation of the walking track elements of the proposed activity will be carried out by hand, handheld tools, and plant e.g., chainsaws and brush cutters, and a mini excavator if required and with prior approval by the NPWS.
- Utilise areas already impacted by previous clearing or disturbance for access purposes, stockpiles, or the establishment of compound sites. No stockpiling or storage within dripline of any mature trees.
- Trees to be retained, including trees adjacent but outside of the development footprint, require an adequate tree protection zone (TPZ) for the duration of works. Details for calculating TPZs are provided within Australian Standard 4970-2009 – Protection of trees on development sites.
- If the TPZ cannot be avoided during works, the Structural Root Zones (SRZ) of trees will be retained. Details for calculating the SRZs are provided within Australian Standard 4970-2009 – Protection of trees on development sites.
- If clearing of vegetation is required outside the development footprint, these areas will need to be assessed as an addendum to this REF.
- If any Yellow-bellied Glider feed trees are found during construction, these are to be retained.
- Contractors must minimise disturbance of ground cover vegetation during the maintenance of the walking track. Clearing of groundcover for Activity 1 will not exceed the 1-1.5m track width and drains.
- Ensure all stockpiles and machinery parking bays are identified prior to starting works and are confined to the areas directly impacted by works or within existing cleared/disturbed areas subject to approval by NPWS project manager. All machinery will be free from any fuel and other pollutant residues, with connections and hoses inspected regularly.
- Contractors will have, and be competent in the use of, petrochemical spill kits for use of any spillage during the construction. The NPWS will be notified of any spills and the action taken to contain them.
- Contractors must implement best practice for sediment management during maintenance works.
- Maintenance activities on Hegartys Bay Access Track must not be undertaken during *Cryptostylis hunteriana* flowing period (November-January).

- Temporary watercourse crossings will be designed to minimise impacts on hydrology, aquatic habitat, and fauna by:
    - Maintaining low-flow conditions
    - Being designed with consideration of the potential for flooding during construction
    - Be removed and the area rehabilitated following completion of construction.

These crossings will take into consideration the requirements of the FM Act and Policy and guidelines for fish habitat conservation and management (NSW Department of Primary Industries, 2013)

Where aquatic vegetation, habitat or riparian zones are encountered (see section 6.1.5), it is to be treated as sensitive habitat; aquatic vegetation, habitat or riparian zones is to be avoided. The alignment of the walking track must be positioned so that the construction works avoid the sensitive area. An exclusion buffer of 10 m should be implemented wherever sensitive areas are encountered.

Appendix I – Animal Handling Protocols

ANIMAL HANDLING PROTOCOLS - ECOLOGIST & WILDLIFE HANDLER

Any pre-clearance surveys or clearance supervision must be carried out by an experienced ecologist, suitably experienced and skilled NPWS staff member or qualified wildlife handler. Any injured animals must be given into the care of a qualified wildlife carer or veterinarian.

MICROBATS

Microbats will often fly off after their hollow is on the ground and have been disturbed. This exposes them to bird predation, and they will often fly around confused looking for shelter. For this reason, it is usually better to capture microbats if possible and hold them until dusk. It is also necessary to capture them for identification. If it is safe to do so, you may also seal them in a hollow (e.g., with a calico bag blocking the entrance), keeping them safe during the day and removing the bag to release them at night. Small calico bags are suitable. Always wear gloves when handling bats. Individuals from the same colony can be placed in a bag together if required, but no more than five small or two larger bats (e.g., *Falsistrelles*) per bag to avoid overheating. Avoid placing different species in the same bag. As with other fauna place bags in a safe, cool and dark spot and wait until dusk to release. If hot and dry, it may be necessary to dampen bags. A soft release box (a box with spots for bats to shelter in that is open at the bottom, e.g., Pizza Box) can be used in situations where it is not possible to wait until after dark. However, this is not preferable, and you must be certain that they will not be exposed to predation or fly off after you leave.

FROGS

Consider any frog hygiene protocols that may be in place at your site to prevent the spread of disease. Frogs can be captured by placing a freezer bag over your hand and grabbing them using a fast motion but with firm hands. The bag can then be inverted and inflated by blowing into the bag and tying off the bag firmly. Damp leaf litter must be placed in the bag to keep the frog hydrated and neutralise excreted body wastes. Bottled water can be used to provide moisture, but not tap water. One frog per bag must be used to avoid disease transmission and frogs should be released into suitable habitat nearby. This is recommended to be at a water body suitable for the species and the release completed at night to minimise exposure to predators and desiccation. As you can see into the bag, frogs can be weighed measured and identified in the bag if required.

SNAKES

Snakes are infrequently encountered during clearing supervision. Prior to clearing commencing a procedure should be agreed with PM and client upon on how to deal with snakes. Your safety is paramount, and it is always preferable to leave the snake alone rather than attempt to move it. Consider whether handling is necessary. It is sometimes possible to herd a snake to safety if in an open area, without putting yourself at high risk. You should not attempt to handle snakes unless trained, authorised by ELA to do so and have appropriate equipment (snake hook, pole and bag etc.). If, nearby urban areas, professional snake catchers are often available to capture and relocate snakes as necessary.

BIRDS

Birds will often fly away from clearing activities and nesting birds and their young are more likely to be encountered. Stick nests with young should be reattached to a tree outside of the clearing area (if possible and close) and monitored to see if parents return to the nest. If you find young birds in hollows, these should be removed and taken to a wildlife carer or qualified vet for attention. Transport will be similar to other fauna. Keeping the birds in a warm dark place (cardboard or fauna box lined with towels) will often calm them down and cause them less stress when being transported to care.

NOCTURNAL MAMMALS

Nocturnal mammals will often be slow to respond and to leave their hollow (or drey). This may make they more susceptible to predation as they try to seek shelter looking for shelter. For this reason, it is generally better to capture nocturnal mammals if possible and hold them until dusk. If the mammal does not leave the hollow during clearance, the hollow can alternatively be blocked and then cut from the tree (leaving approximately 1 m of the trunk either side of the hollow) and the hollow placed on site by machinery within vegetation that is to remain. Make sure the hollow is first closed off using towels or bags, so that the animal cannot escape during movement. These should be left in place to keep the hollow closed until dusk to prevent any predation or escape attempts. If a mammal is captured, place the holding bags/box in a safe, cool and dark spot and wait until dusk to release. If hot and dry, it may be necessary to dampen bags and/or provide water. If several individuals are found in the same hollow, keep these individuals together in a large bag or box, if possible.

Appendix J – Threatened Wildlife and Injury Procedure

The following procedure should be followed if any threatened fauna is observed near the maintenance works area:

1. Contact the site supervisor/environment manager.
2. The site supervisor/environment manager reviews if the animal is at risk of being harmed.
    a. If yes, all works in the vicinity of the animal (works in other areas may continue) should be halted and the project ecologist contacted to conduct a "catch and release" in order to safely remove the animal from risk.
    b. If the animal is not at risk of being harmed and can move on of its own accord, then works should be halted in the vicinity of the animal until it moves on (works may continue in other areas of the site). If the animal is not capable of moving on of its own accord, then the following steps should ensue.

If an animal is found within the study site that is injured the following procedure should be implemented:

3. Contact the site supervisor.
4. The site supervisor determines the most appropriate person to engage:
    a. Project ecologist for any non-aquatic fauna
    b. Aquatic ecologist for any aquatic fauna
    c. The Wildlife Information and Rescue Services (WIRES), who will respond to all sick, injured or orphaned native wildlife queries.
5. If the injuries are too great for the animal to be relocated, then the animal should be taken to a WIRES Wildlife Carer or Veterinary Clinic (Pambula & Eden Vet Clinic - (02) 6496 1252).

Appendix K – Erosion and Sedimentation Control Guidelines

GENERAL INSTRUCTIONS

The Construction Manager shall ensure that all soil and water management works are located as documented or as otherwise directed by the Environmental Manager. All work shall be generally carried out in accordance with NPWS and EPA requirements.

The Construction Manager shall maintain the erosion control devices to the satisfaction of the Environmental Manager and NPWS.

The Construction Manager is to ensure all erosion & sediment control devices are maintained in good working order and operate effectively. Repairs and or maintenance shall be undertaken as required, particularly following storm events.

LAND DISTURBANCE

Where practical, the soil erosion hazard on the site will be kept as low as possible. To this end, works should be undertaken in the following sequence:

- Install a sediment fence along the boundaries as shown on plan. Refer detail.
- Construct stabilised construction entrance to location as determined by superintendent/engineer. Refer detail.
- Install sediment basins as shown and install sediment traps as shown.
- Undertake site development works in accordance with the engineering plans. Where possible, phase development so that land disturbance is confined to areas of workable size.

EROSION CONTROL

During windy weather, large, unprotected areas will be kept moist (not wet) by sprinkling with water to keep dust under control.

Final site landscaping will be undertaken as soon as possible and within 20 working days from completion of construction activities.

SEDIMENT CONTROL

1. Stockpiles will not be located within 2 metres of hazard areas, including likely areas of concentrated or high velocity flows such as waterways. Where they are between 2 and 5 metres from such areas, special sediment control measures should be taken to minimise possible pollution to downslope waters, e.g., through installation of sediment fencing.
2. Any sand used in the concrete curing process (spread over the surface) will be removed as soon as possible and within 10 working days from placement.
3. Water will be prevented from entering the permanent drainage system unless it is relatively sediment free, i.e., the catchment area has been permanently landscaped and/or any likely sediment has been filtered through an approved structure.
4. Temporary soil and water management structures will be removed only after the lands they are protecting are stabilised.

5. Acceptable receptors will be provided for concrete and mortar slurries, paints, acid washings, light-weight waste materials and litter.
6. Any existing trees which form part of the final landscaping plan will be protected from construction activities by:

- Protecting them with barrier fencing or similar materials installed outside the canopy drip line
- Ensuring that nothing is nailed to them
- Prohibiting paving, grading, sediment wash or placing of stockpiles within the drip line except under the following conditions.

    - encroachment only occurs on one side and no closer to the trunk than either 1.5 metres or half the distance between the outer edge of the drip line and the trunk, whichever is the greater
    - a drainage system that allows air and water to circulate through the root zone (e.g., a gravel bed) is placed under all fill layers of more than 300 millimetres depth
    - care is taken not to cut roots unnecessarily nor to compact the soil around them.

Appendix L – Dust Management Control Guidelines

The following strategies are recommended to minimise dust generation during the construction stage:

- Optimise the haulage route on-site to minimise travel.
- Minimise the speed travelled along haul roads to 15km/hr on unsurfaced roads and 25km/hr on surfaced roads.
- Use water cart regularly along hauls roads and at stockpile locations
- Keep a daily site log observing wind, rain, dust leaving the site, dust on flora and any actions where relevant.
- Minimise the use of stockpiles and where required utilise physical barriers where practical
- Ensure all trucks moving on/off site are covered.

Appendix M – Priority weeds within the Bega Valley Shire

The following weeds are listed as Priority Weeds in the Bega Valley Shire Local Weed Management Plan.

Table 9. Priority Weeds

Common Name	Botanical name	Land owner / occupier requirements
Serrated tussock	*Nassella trichotoma*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. Serrated Tussock is a state priority weed subject to mandatory requirements. A person must not import into the State or sell parts of the plant. **Isolated infestations**: Objective: Prevent establishment Action: Eliminate infestations **Established infestations:** Objective: Containment. Reduce incidence in affected areas. Action: The growth of the plant must be controlled in a manner that continuously inhibits the ability of the plant to spread. Infestations may be managed in accordance with a staged control plan approved by Council. In situations where Council deems this requirement not reasonably practicable in accordance with Section 16 of the Biosecurity Act 2015, buffers and containment strategies may be introduced to protect priority assets. **Transportation:** The plant must not be sold, transported or knowingly distributed.
African Lovegrass	*Eragrostis curvular*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. African lovegrass is identified within the South East Regional Strategic Weed Management Plan 2017 – 2022. The plan specifies that African lovegrass is subject to a local management program. Bega Valley Shire Council's local management program imposes the following requirements: **Isolated infestations:** Objective: Prevent establishment Action: Eliminate infestations **Established infestations:** Objective: Containment. Reduce incidence in affected areas. Action: The growth of the plant must be controlled in a manner that continuously inhibits the ability of the plant to spread. Infestations may be managed in accordance with a staged control plan approved by Council. In situations where

Common Name	Botanical name	Land owner / occupier requirements
		Council deems this requirement not reasonably practicable in accordance with Section 16 of the Biosecurity Act 2015, buffers and containment strategies may be introduced to protect priority assets. **Transportation:** The plant must not be sold, transported or knowingly distributed
St John Wort	*Hypericum perforatum*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. St John's Wort is identified within the South East Regional Strategic Weed Management Plan 2017 – 2022. The plan specifies that St Johns Wort is subject to a local management program. Bega Valley Shire Council's local management program imposes the following requirements: **Isolated infestations:** Objective: Prevent establishment Action: Eliminate infestations **Established infestations:** Objective: Containment. Reduce incidence in affected areas. Action: The growth of the plant must be controlled in a manner that continuously inhibits the ability of the plant to spread. Infestations may be managed in accordance with a staged control plan approved by Council. In situations where Council deems this requirement not reasonably practicable in accordance with Section 16 of the Biosecurity Act 2015, buffers and containment strategies may be introduced to protect priority assets. **Transportation:** The plant must not be sold, transported or knowingly distributed.
Gorse	*Ulex europaeus*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. Gorse is a state priority weed subject to mandatory requirements. A person must not import into the State or sell parts of the plant. Gorse is a regional priority weed. The South East Regional Strategic Weed Management Plan 2017 – 2022 specifies that Gorse must be managed in accordance with a published local management plan. Bega Valley Shire Council's local management program imposes the following requirements: **All infestations:** Objective: Eradicate Action: Eliminate Infestations **Transportation:** The plant must not be sold, transported or knowingly distributed.

Common Name	Botanical name	Land owner / occupier requirements
Chilean needle grass	*Nassella neesiana*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. Chilean Needle Grass is a state priority weed subject to mandatory requirements. A person must not import into the State or sell parts of the plant. Chilean needle grass is identified within the South East Regional Strategic Weed Management Plan 2017 – 2022. The plan specifies that Chilean Needle Grass is subject to a local management program. Bega Valley Shire Council's local management program imposes the following requirements: **Isolated infestations:** Objective: Prevent establishment Action: Eliminate infestations **Established infestations:** Objective: Containment. Reduce incidence in affected areas. Action: The growth of the plant must be controlled in a manner that continuously inhibits the ability of the plant to spread. Infestations may be managed in accordance with a staged control plan approved by Council. In situations where Council deems this requirement not reasonably practicable in accordance with Section 16 of the Biosecurity Act 2015, buffers and containment strategies may be introduced to protect priority assets. **Transportation:** The plant must not be sold, transported or knowingly distributed.
Crofton Weed	*Ageratina adenophora*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. **Isolated infestations:** Objective: Prevent establishment Action: Eliminate infestations **Established infestations:** Objective: Containment. Reduce incidence in affected areas. Action: The growth of the plant must be controlled in a manner that continuously inhibits the ability of the plant to spread. Infestations may be managed in accordance with a staged control plan approved by Council. In situations where Council deems this requirement not reasonably practicable in accordance with Section 16 of the Biosecurity Act 2015, buffers and containment strategies may be introduced to protect priority assets.
Sagittaria	*Sagittaria platyphylla*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our

Common Name	Botanical name	Land owner / occupier requirements
		environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. Sagittaria platyphylla is a state priority weed subject to mandatory requirements. A person must not import into the State or sell parts of the plant. **Isolated infestations:** Objective: Prevent establishment Action: Eliminate infestations **Established infestations:** Objective: Containment. Reduce incidence in affected areas. Action: The growth of the plant must be controlled in a manner that continuously inhibits the ability of the plant to spread. Infestations may be managed in accordance with a staged control plan approved by Council. In situations where Council deems this requirement not reasonably practicable in accordance with Section 16 of the Biosecurity Act 2015, buffers and containment strategies may be introduced to protect priority assets. **Transportation:** The plant must not be sold, transported or knowingly distributed.
Blackberry	*Rubus fruticosus species aggregate*	All property managers have a responsibility to prevent, eliminate or minimize adverse effects on the economy, the environment and the community that arise from weeds. Where full control is feasible Council will enforce that requirement. Where widespread and established invasive species have become "naturalized" in our environment and full control is not deemed feasible by Council it will promote a strategy of minimization and containment. Blackberry is identified within the South East Regional Strategic Weed Management Plan 2017 – 2022. The plan specifies that Blackberry is subject to a local management program. Bega Valley Shire Council's local management program imposes the following requirements: **Isolated infestations:** Objective: Prevent establishment Action: Eliminate infestations **Established infestations:** Objective: Containment. Reduce incidence in affected areas. Action: The growth of the plant must be controlled in a manner that continuously inhibits the ability of the plant to spread. Infestations may be managed in accordance with a staged control plan approved by Council. In situations where Council deems this requirement not reasonably practicable in accordance with Section 16 of the Biosecurity Act 2015, buffers and containment strategies may be introduced to protect priority assets. **Transportation:** The plant must not be sold, transported or knowingly distributed.

Appendix N – Weed Control Techniques

Table 10. Weed control techniques

Scientific Name	Common Name	Best Practice Management – Weeds Australia
Rubus fruiticosus sp. aggregate	Blackberry	There are a number of options for control of European Blackberry, and these include physical and mechanical control, fire burning, grazing, and chemical methods. Biological control research has been carried out but has proved ineffective but whichever program is adopted it will need to be planned and sustained over a number of years to control infestations and prevent re-invasion. **Physical removal:** Physical control alone is rarely successful because it's hard to remove all the roots. Cultivation often spreads blackberry further. Slashing can help make access through infestations but promotes regrowth. After slashing, use a follow-up control. **Chemical control:** Herbicides are the most reliable blackberry control method and should be used with other control methods. However, while several herbicides are recommended for managing Rubus species, different blackberry species react differently to herbicides. There are many herbicides registered for use on blackberry. A mixture of triclopyr + picloram used with or without aminopyralid gives the best long-term control. (DPI NSW 2019). Spray healthy, actively growing plants with new leaves on the cane tips and apply to both the outer and inner leaves with the first year plants are easier to kill. (DPI NSW 2019). Well-established thickets may need more treatments like slashing or burning to access and promote fresh new growth that affectively adsorbs herbicide. The regrowth of plants that have attained up to 1 m can then be sprayed with herbicide (DPI NSW 2019). See the Australian Pesticides and Veterinary Medicines Authority for chemical information http://www.apvma.gov.au . **Non-chemical control:** Physical control: Physical control either by manual (hand) or mechanical (machine) means removes biomass, but alone is rarely successful because it's hard to remove all the roots and is normally used with a follow-up herbicide.
Anredera cordifolia	Madeira Vine	Madeira Vine is difficult to control with physical and chemical methods. Single chemical and /or physical control activities generally cause disturbance that results in vigorous regrowth and can worsen infestation levels, unless dedicated follow-up occurs. **Physical removal - By hand** Dig up tubers and collect all plant parts for smaller or immature infestation sites. Dispose of tubers, leaves and stems, as they will regrow when in contact with the soil or if they are exposed to any sunlight. If there is stress on the host plants, cut and pull the madeira vines from the canopy. When pulling the vines aerial tubers easily fall off the stems. Lay tarps or cloths on the ground to collect the aerial tubers to prevent the infestation from spreading. Cut vines can survive in the tree canopy and continue to drop tubers for up to two years. It is important to remove as much plant material as possible. **Chemical control:** Madeira Vine is hard to kill with chemicals due to its numerous tubers, succulent waxy leaves, and numerous roots. It has been recommended by some authors that all aerial bulbils are physically removed, and follow-up foliar spray is used on plants and bulbils as soon as green sprouts have two or four leaves on each sprout. Timing of follow-up spraying is important because if left too long, new underground tubers will form, prolonging control efforts. Some authors suggest that scraping stems at staggered intervals then applying a herbicide is the only recommended control method. Aerial stems should be cut at both ends and dipped in a herbicide (Invasive Species Specialist Group 2006). DPI NSW (2019) website list some herbicide options. **Non-chemical control:** Physical control of Madeira Vine is very difficult. All parts of the vine must be removed, including underground tubers (rhizomes), aerial tubers and vines climbing

Scientific Name	Common Name	Best Practice Management – Weeds Australia
		up trees to prevent them from resprouting. Smaller Madeira Vine plants can be grubbed out ensuring that all of the bulbils are removed. Larger infestations can be controlled by cutting back top growth and spraying the remaining 2 metres of stems (Invasive Species Specialist Group 2006). Carefully hand pulling and hanging up the root system away from the soil where the tubers and rhizomes cannot re-root is effective as it eventually causes death to the root system. Tubers / rhizomes can be killed by freezing, treating with foliar herbicides, or bagged and left in the sun (Land Protection 2006). As mentioned above in the chemical treatment section, the physical removal of any surviving bulbils that have fallen on the ground after chemical or any other control methods is required to prevent the establishment of new plants. It is important to not plant or spread plants to new areas. bulbils, rhizomes and other fleshy parts of the plant could be double bagged and thrown away in the trash or piled in one location on site. Precaution could be taken to not spread green waste to uninfected areas (ISSG 2006).

Appendix O – Landscape Planting Species List

Table 11. PCT Species planting List

PCT ID	PCT Name	Canopy	Shrub layer	Groundcover
721	Bracelet Honey-myrtle – Coast Tea tree tall shrubland	-	*Acacia longifolia, Allocasuarina verticillate, Banksia integrifolia subsp. Integrifolia, Leptospermum laevigatum, Melaleuca armillaris subsp. Armillaris, Monotoca elliptica* and *Westringia fruticose*.	*Billardiera scandens, Dichondra repens, Glycine clandestine* and *Lepidosperma concavum*.
772	Coast Banksia – Coast Wattle dune scrub	*Banksia integrifolia subsp. Integrifolia* and *Leptospermum laevigatum*.	*Acacia longifolia subsp. Sophorae, Leucopogon parviflorus, Rhagodia candolleana subsp. Candolleana, Breynia oblongifolia* and *Monotoca elliptica.*	*Actites megalocarpa, Carpobrotus glaucescens, Isolepis nodosa, Lomandra longifolia, Muehlenbeckia adpressa, Oxalis perennans, Spinifex sericeus, Zoysia macrantha* and *Pteridium esculentum.*
777	Coast Grey Box – Mountain Grey Gum - stringybark moist shrubby open forest	*Eucalyptus muelleriana, Eucalyptus bosistoana, Eucalyptus cypellocarpa, Eucalyptus globoidea and Eucalyptus longifolia*.	*Acacia falciformis, Acacia mearnsii, Allocasuarina littoralis, Billardiera scandens, Breynia oblongifolia, Clematis aristate, Eustrephus latifolius, Geitonoplesium cymosum, Hibbertia aspera, Marsdenia rostrata, Notelaea venosa, Ozothamnus diosmifolius, Pandorea pandorana, Pittosporum revolutum, Pittosporum undulatum,* and *Platysace lanceolata.*	*Desmodium varians, Dianella caerulea, Doodia aspera, Entolasia stricta, Gahnia melanocarpa, Goodenia ovata, Lepidosperma laterale, Lomandra longifolia, Microlaena stipoides var. stipoides, Notodanthonia longifolia, Oplismenus imbecillis, Poa meionectes, Pteridium esculentum* and *Viola hederacea.*
891	Ironbark – Woollybutt – White Stringybark open forest	*Eucalyptus tricarpa, Eucalyptus longifolia, Eucalyptus globoidea* and *Eucalyptus muelleriana.*	*Acacia falciformis, Allocasuarina littoralis, Daviesia mimosoides, Hibbertia aspera, Ozothamnus Diosmifolius, Persoonia linearis* and *Platysace lanceolata.*	*Dianella caerulea, Entolasia stricta, Hardenbergia violacea, Joycea pallida, Lepidosperma laterale, Lomandra longifolia and Lomandra.*

PCT ID	PCT Name	Canopy	Shrub layer	Groundcover
1157	Silvertop Ash – Rough-barked Apple shrubby open forest	*Eucalyptus sieberi, Angophora floribunda* and *Allocasuarina littoralis.*	*Acacia terminalis, Billardiera scandens, Epacris impressa, Leucopogon lanceolatus, Persoonia linearis, Platysace lanceolata* and *Pultenaea daphnoides.*	*Dianella caerulea, Gahnia radula, Gonocarpus teucrioides, Lomandra longifolia, Pteridium esculentum, Tetrarrhena juncea* and *Xanthosia pilosa.*
1084	Red Bloodwood – Silvertop Ash – White Stringybark heathy open forest	*Corymbia Gummifera, Eucalyptus sieberi, Eucalyptus globoidea, Eucalyptus pilularis, Allocasuarina Littoralis* and *Banksia serrata*	*Acacia suaveolens, Acacia terminalis, Aotus ericoides, Banksia spinulosa, Bossiaea obcordate, Correa Reflexa, Epacris impressa, Leptospermum trinervium, Lomatia ilicifolia, Monotoca scoparia, Persoonia levis, Persoonia linearis, Pimelea linifolia subsp. Linifolia* and *Platysace lanceolata.*	*Amperea xiphoclada, Anisopogon avenaceus, Dianella caerulea, Entolasia stricta, Gonocarpus Teucrioides, Joycea pallida, Lepidosperma concavum, Lomandra longifolia, Patersonia glabrata, Pteridium esculentum* and *Xanthosia pilosa*
1141	Scrub She-oak – Swamp Banksia coastal lowland heath	*Allocasuarina littoralis* and *Banksia serrata.*	*Acacia suaveolens, Allocasuarina paludosa, Banksia paludosa, Correa reflexa, Dillwynia glaberrima, Epacris impressa, Gompholobium huegelii, Hibbertia empetrifolia subsp. Empetrifolia and Leptospermum continentale and Pimelea linifolia subsp. Linifolia*.	*Anisopogon avenaceus, Bossiaea ensata, Burchardia umbellata, Dampiera stricta, Entolasia stricta, Gonocarpus teucrioides, Hypolaena fastigiata, Lepidosperma neesii, Lindsaea linearis, Lomandra glauca, Mitrasacme polymorpha, Patersonia glabrata, Phyllanthus hirtellus, Scaevola ramosissima, Schoenus brevifolius and Selaginella uliginosa.*

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