



Construction Flora and Fauna Management Plan

**Shared Path Bridge over Newcastle
Road, Jesmond**

1630

INTEGRATED MANAGEMENT SYSTEM

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1 INTRODUCTION

This Construction Flora and Fauna Management Plan (CFFMP) forms part of the Construction Environmental Management Process Plan (CEMPP) for the Shared Path Bridge (SPB) over Newcastle Road, Jesmond which is being delivered as early works for the Newcastle Inner City Bypass (NICB) between Rankin Park and Jesmond (RP2J).

1.1 PURPOSE

This CFFMP has been developed with specific information to allow for effective management and control of the flora and fauna. This CFFMP has been developed taking into consideration the Integrated Project Management Plan, Daracons Legal and Other Requirements including but not limited to relevant Acts, Regulations, Codes of Practice and Industry Standards / Guidelines.

In addition, the framework for this plan has been prepared to align with the Daracon Management System (DMS), AS/NZS & ISO Standards and Client requirements where applicable.

The purpose of the flora and fauna management plan is to:

- Ensure impacts to flora, fauna and habitat features only occur within the approved areas of clearing;
- Minimise removal of vegetation within the approved areas of clearing;
- Consider the welfare of fauna potentially affected during clearing;
- Rehabilitate cleared areas in order to reinstate habitat areas and promote connectivity where possible;
- Determine the nature and extent of replanting required to maintain habitat;
- Provide a clear description of pre-clearing methods;
- Minimise and mitigate potential impacts on riparian zones during the construction phase;
- Avoid impacts on threatened species, populations and ecological communities; and
- Describe monitoring and reporting strategies to monitor impacts on flora and fauna and assess effectiveness of any mitigation measures during construction.

1.2 SCOPE

The project involves the construction of a new shared path bridge over Newcastle Road and associated works at Jesmond, within the Newcastle City Council Local Government Area (LGA).

The scope of work required for the project involves the following specific activities:

- Site Establishment;
- Vegetation clearing, including riparian vegetation, and topsoil stripping;
- Earthworks, including excavation or filling;
- Transportation of cut or fill materials;
- Site access;

- Drainage works;
- Stockpiling of topsoil, vegetation and other construction materials;
- Movement of heavy vehicles across exposed ground;
- Demolition works to remove a redundant retaining wall and ramps structures;
- Piling works to facilitate the construction of the SPB;
- Construction of a new shared path bridge over Newcastle Road west of Steel Street;
- Concrete Ramps, stairs and retaining structures providing access to the new shared path bridge;
- Relocation of existing utilities including overhead electricity and underground water mains;
- Roadworks in Coles Street and Jesmond park to connect the new bridge to existing facilities;
- Roadworks for minor widening on the northern side of Newcastle road west of Steel Street;
- Removal of the existing mid-block pedestrian crossing and removal of the existing bus shelter and
- Miscellaneous works including erosion and sedimentation control, utility adjustments, the construction of earthworks, drainage, kerbs and/or gutters, pavement, safety barriers, concrete paving for the shared path, footpaths and driveways, pavement markings and vegetation works.

Other operations will be undertaken by Daracon that are considered normal in delivery of the above activities. Additional activities may also be realised at the request of the Client throughout the duration of the project.

See [Figure 1](#) outlining the Shared Path Bridge (SPB) Project Location on the following page.

FIGURE 1 –SHARED PATH BRIDGE PROJECT LOCATION



1.3 CONSULTATION

1.3.1 CONSULTATION FOR PREPARATION OF THE SWMP

This CFFMP has been developed in consultation with Newcastle City Council (NCC) as required by CoA A9(a). In accordance with CoA A5, the evidence of the consultation undertaken for the preparation of this CFFMP, this documented in the following table.

1.3.2 CONSULTATION LOG

TABLE 1 – CONSULTATION LOG

Department	Contact	Date	Correspondence Type	Description
CoN	[REDACTED]	13 June 2019	Email	Nil comments
Environmental Representative	[REDACTED]	16 August 2019	Email	Draft plan submitted 13/8/19 and found to satisfy requirements. Updated by Daracon and resubmitted 8/11/19.

1.3.3 ONGOING CONSULTATION DURING CONSTRUCTION

Ongoing consultation between Roads and Maritime, Daracon, stakeholders, the community and NCC regarding the management of flora and fauna impacts will be undertaken during the construction of the SPB as required. The process for consultation is documented in the Construction Community Liaison Management Plan (CCLMP), which includes the key principals contained within the RP2J Community Communication Strategy (CCS) developed by Roads and Maritime.

2 OBJECTIVES AND TARGETS

2.1 OBJECTIVES

The key objective of the CFFMP is to ensure that flora and fauna impacts are managed appropriately throughout the construction of the SPB. To achieve this objective, the Contractor will minimise the removal of vegetation and will re-establish native vegetation.

2.2 TARGETS

The targets for the management of flora and fauna impacts during the construction of the SPB are:

- No unapproved disturbance to flora and fauna outside the proposed construction footprint and associated access roads and ancillary facilities.
- To implement effective rehabilitation / revegetation in accordance with ecological and landscaping objectives and design.

3 SUB-PLAN REFERENCE DOCUMENTS

Daracon will comply with all legislation, standards and guidelines, client documents and project approvals, as nominated within the [Section 3](#) of this CFFMP.

3.1 LEGISLATION

- Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act)
- Environmental Planning and Assessment Act 1979 (EP&A Act)
- National Parks and Wildlife Act 1974
- Biodiversity Conservation Act 2016
- Fisheries Management Act 1994
- Biosecurity Act 2015
- Pesticides Act 1999

3.2 STANDARDS, CODES OR GUIDELINES

- Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Biodiversity Guidelines) (NSW Roads and Traffic Authority (RTA), 2011)

3.3 CLIENT DOCUMENTS

The following Client documents have been identified as being important to ensure Daracon deliver the project safely, with minimal environmental impact and to specification.

TABLE 2 – CLIENT DOCUMENTS

Client Document Number and Name	
Document Number	Document Name
	Newcastle Inner City Bypass – Rankin Park to Jesmond Environmental Impact Statement (GHD, November 2016)
	Submissions and Preferred Infrastructure Report – Newcastle Inner City Bypass, Rankin Park to Jesmond (GHD, March 2018)
	NSW Department of Planning & Environment Minister’s Conditions of Approval (Feb 2019)
	Department of the Environment and Energy (DoEE) - Commonwealth Controlled Action Approval (April 2019)
QA Specification G1	Job Specific Requirements
QA Specification G36	Environmental Protection
QA Specification G38	Soil and Water Management
QA Specification G40	Clearing and Grubbing
QA Specification G10	Traffic Management
QA Specification G22	Work Health and Safety (Construction and Maintenance Works)

Where there are changes to the above document references, communication of changes that are applicable to this project will be communicated to all workers using a suitable means of communication as prescribed within this Sub-Plan.

3.4 PROJECT APPROVALS AND/OR LICENSING

The following approvals have been obtained by Roads and Maritime:

- EPBC Decision Notice dated October 2015 (confirming the RP2J project is a controlled action).
- Project Approval under Part 5.2 of the EP&A Act – SSI 6888 granted by the minister for planning on 15 February 2019.

All necessary licences, permits and approvals required for Daracon's contracted works will be obtained and maintained as required throughout the life of the Project. Inspection and monitoring programs completed as part of this plan will ensure the control measures outlined in any of the above approvals, licenses or permits are complied with at all times.

3.5 HOLD POINTS

Roads and Maritime specifications are a key source of environmental protection management processes relevant to this CFFMP. The specifications set out environmental protection requirements, including Hold Points that will be complied with during construction of the SPB. A Hold Point is a point beyond which a work process must not proceed without express written authorisation from Roads and Maritime. Hold points applicable to soil and water management are provided in Table 3.

TABLE 3 – HOLD POINTS APPLICABLE TO FLORA AND FAUNA

Clause no.	Description
Specification G36 – Environmental Protection	
5.2	Establishment of site facilities
14.1	Establishment of site facilities
Specification G36 – Environmental Protection	
4.13	Working in or near environmentally sensitive areas
4.15.2	Submission of pre-construction land condition assessment report for each area to be occupied for site facilities
Specification G40 – Clearing and Grubbing	
2.4	Written intention to clear any area
Specification R178 – Vegetation	
2.1.3	Delivery of imported topsoil
2.4	Application of fertiliser
3.3	Use of off-site pre-treated seed
3.4.1	Sowing
Specification R179 – Landscape Planting	
1.4.1	Inviting tenders for landscape planting and maintenance until Completion subcontract
1.4.2	Accepting tenders for landscape planting and maintenance until Completion subcontract
3.4	Advice that the setting out of all planting positions is complete
3.6.2	Advice that planting holes are ready for inspection

4 CONDITIONS OF APPROVAL

The Rankin Park to Jesmond Project proposal was subject to assessment and approval under the EP&A Act. The EPBC Act conditions directly reflect the EP&A Act conditions of approval. Subsequently, the NSW infrastructure Conditions of Approval (CoA) listed below in Table 4, detail the Commonwealth and State CoA's relevant to the CFFMP;

TABLE 4 – COA RELEVANT TO THE CFFMP

CoA	Requirement	Reference
E2	Any work associated with the SSI must limit the clearing of native vegetation to the greatest extent practicable.	Clause 6.2.1 Clause 7.1
E3	Impacts to plant community types must not exceed those identified in the SPIR.	Clause 6
E8	Prior to works that impact native vegetation the Proponent must consult with local community, Landcare groups and relevant public authorities to determine if there is an interest for the reuse of suitable timber and root balls in habitat enhancement and rehabilitation work. Timber and root balls must be retained from the project where there is a demonstrated demand for their reuse.	Clause 1.3 Clause 7.1
E9	The construction of the SSI must demonstrate how: (a) EPBC Act listed threatened species and ecological communities are protected; (b) noxious weeds are managed; and (c) contamination by pathogens, non-indigenous regenerative plant material and seeds can be prevented by the movement of all tools, vehicles, machinery and personnel. <i>Note: These additional requirements must be addressed in the Flora and Fauna Management Sub-plan required under Table 3(c).</i>	N/A – no threatened species or ecological communities Clause 5.1.2 Clause 5.1.3
E10	Before removing/clearing any vegetation, or demolition of structure identified as potential roosting sites for microbats, pre-clearing/demolition inspections for threatened species must be undertaken. The inspections, and any subsequent relocation of species and associated management/offset measures, must be undertaken under the guidance of a suitably qualified and experienced ecologist. Survey methodologies must be incorporated into the Construction Flora and Fauna Management Sub-plan required under Condition C4 and Ancillary Facilities Establishment Management Plan required under Condition A15, as relevant.	Clause 7.1 Appendix 3 - Guide1 AFEMP

E11	The SSI must be designed to retain as many trees as possible in Jesmond Park. Where trees are to be removed and those trees are not required to be offset under Condition E4, tree replacement must result in a net increase in trees. Replacement trees must be planted on public land within 500 metres of the SSI boundary. Replacement trees may be planted beyond 500 metres of the SSI boundary on public land within Newcastle City Council area if planting within 500 metres of the SSI boundary is not practicable. The location of the replacement tree plantings must be determined in consultation with Newcastle City Council.	Clause 7.7 Clause 1.3
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5 EXISTING ENVIRONMENT

The following sections describe the existing flora and fauna within and adjacent to the SPB construction footprint (including ancillary facilities locations) including species, communities and habitats based on information provided in Section 7 and Appendix E of the EIS and Section 6.2 and Appendix B of the SPIR.

The SPB project boundary and relevant ecological data are shown on the sensitive area maps in [Appendix 1](#) and [Appendix 2](#).

5.1 FLORA

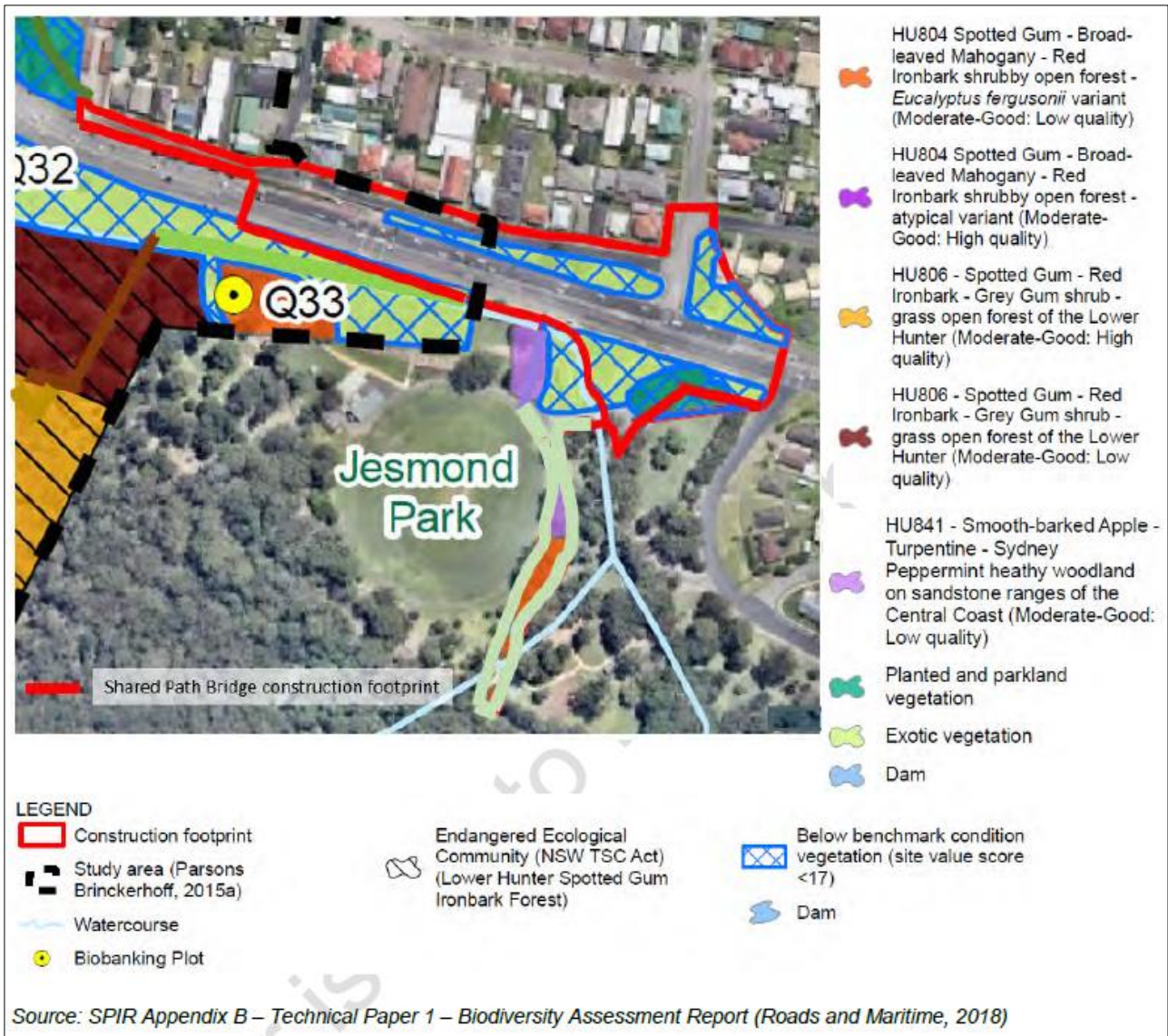
5.1.1 VEGETATION COMMUNITIES

The locations of the plant community types (PCTs) within the SPB footprint and in the immediate vicinity of the SPB are shown on Figure and the Sensitive Area Maps included at [Appendix 1](#) and [Appendix 2](#).

Vegetation mapping and detailed floristic assessment prepared for the EIS identified two PCTs in the SPB construction footprint:

- exotic vegetation (including occasional isolated planted *Eucalyptus sp.*).
- planted and parkland vegetation.

FIGURE 2 – PLANT COMMUNITY TYPES WITHIN THE VICINITY SPB PROJECT



5.1.2 THREATENED FLORA SPECIES

There are no threatened species were recorded in the vicinity of the SPB project location.

5.1.3 ENDANGERED ECOLOGICAL COMMUNITIES

No Threatened Ecological Communities (TEC) occur within the area of the SPB.

One Endangered Ecological Community (EEC) listed under the BC Act (Lower Hunter Spotted Gum – Ironbark Forest in the Sydney Basin Bioregion) is located to the west of the SPB footprint as shown on [Figure 2](#). This area is located well outside of the SPB construction footprint and will not be impacted by the SPB works. This area will be nominated as a no-go zone.

5.1.4 GROUNDWATER DEPENDENT ECOSYSTEMS

No listed high priority groundwater dependent ecosystems are located in the vicinity of the SPB.

5.1.5 NOXIOUS WEEDS

No weeds of national significance under the *Biosecurity Act* were identified in the vicinity of the SPB.

5.2 FAUNA

5.2.1 THREATENED FAUNA SPECIES

No threatened fauna species were recorded in the vicinity of the SPB.

5.2.2 FAUNA HABITAT

There are no hollow bearing trees, NCC habitat trees or nest boxes located within the SPB footprint.

Fauna habitats in the vicinity of the SPB are located mainly within Jesmond Park outside of the SPB footprint and are described below. The locations of hollow bearing trees and Newcastle City Council habitat trees are shown on [Figure 3](#) and also on the Sensitive Area Maps (Appendix 1 and Appendix 2). These areas will be nominated as no go zones.

Dry Open Forest

No dry open forest habitat occurs within the SPB footprint or would be impacted by the construction of the SPB. Patches of dry open forest occur within Jesmond Park adjacent to the proposed new shared path, as shown on [Figure 3](#). Canopy species in dry open forest contain a range of hollow sizes. Large hollows provide breeding habitat for birds and arboreal mammals, including forest owls. Spotted Gum (*Corymbia maculata*) and Fergusons Ironbark (*Eucalyptus fergusonii*) are both winter flowering species which provide foraging resources for the Swift Parrot (*Lathamus discolor*), Regent Honeyeater (*Anthochaera phrygia*), Grey-headed Flying-fox (*Pteropus poliocephalus*) and Squirrel Glider (*Petaurus norfolcensis*). Red Bloodwood (*Corymbia gummifera*) is an important feed tree for nectarivorous fauna during the autumn period. A variety of canopy species in the Myrtaceae family and understorey plants including a high abundance of proteaceous shrubs that produce nectar and pollen for gliders are present within dry open forest habitat.

A range of other fauna microhabitats are present within dry open forests including fallen timber, leaf litter, loose rocks, and shrubby ground cover. These habitat attributes have the potential to support a diverse range of ground dwelling fauna, including reptiles and small mammals. Arboreal mammals utilising these areas of habitat may provide a source of prey for the Powerful Owl (*Ninox strenua*).

Planted and parkland vegetation

Some planted and parkland vegetation occurs within the SPB footprint as shown in [Figure 3](#). This habitat consists of patches of vegetation occurring as cleared open areas with scattered trees (inclusive of native specimens), as well as maintained lawns, garden beds, retained trees and

planted trees. The ground cover is often dominated by exotic grasses and herbaceous weeds. This area is likely to provide foraging habitat for common species typical of urban parklands and gardens (e.g. birds, skinks, possums etc).

NCC Habitat Trees

No NCC habitat trees are located within the SPB footprint or would be impacted by the SPB works. A number of NCC habitat trees are located within Jesmond Park in the vicinity of the SPB, as shown on [Figure 3](#).

FIGURE 3 – FAUNA HABITAT



5.2.3 AQUATIC HABITAT AND THREATENED SPECIES

Dark Creek, where it runs through Jesmond Park in the vicinity of the SPB, is a third order stream system as shown on [Figure 4](#). Dark Creek is a concrete stormwater channel in the vicinity of the SPB and therefore it is not anticipated to be capable of supporting aquatic habitat.

The assessment of aquatic habitat and threatened species undertaken for the EIS found that no endangered aquatic communities, aquatic fauna or marine vegetation listed under the FM Act or EPBC Act occur in the vicinity of the SPB and no significant impacts on riparian vegetation or habitats

downstream of the SPB site are anticipated as a result of the SPB works. There would be no impact on key fish habitat as a result of the construction of the SPB.

FIGURE 4 – WATERCOURSES IN THE VICINITY OF THE SPB



5.3 MATTER OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

5.3.1 THREATENED SPECIES AND ECOLOGICAL COMMUNITIES

There are no EPBC Act listed threatened ecological communities recorded or predicted as likely to occur within the SPB area or likely to be affected by the SPB.

No threatened flora or fauna species were recorded in the vicinity of the SPB (refer Sections 5.1.2 and Section 5.2.1).

5.3.2 MIGRATORY SPECIES

As described in Section 5.1.1, the PCTs within the SPB footprint consist of exotic vegetation and planted and parkland vegetation. These PCTs provide limited foraging opportunities and do not include feed trees. Clearing of vegetation within the SPB footprint is not anticipated to impact on migratory species.

5.3.3 WETLANDS OF INTERNATIONAL IMPORTANCE

There are no wetlands of international importance listed under the Ramsar Convention in the vicinity of the SPB construction footprint.

The Hunter Estuary Wetlands (Australian Ramsar site number 24) are located approximately 6 km to the north of the SPB. The Hunter Estuary Wetlands provide an extremely important feeding and roosting site for a large seasonal population of shorebirds and a waylay site for transient migrants.

5.3.4 WORLD HERITAGE PROPERTIES

There are no World Heritage Properties located within 10 km of the SPB.

5.3.5 NATIONAL HERITAGE

There are no national heritage sites within or in the vicinity of the SPB.

6 ENVIRONMENTAL ASPECTS AND IMPACTS

6.1 CONSTRUCTION ACTIVITIES

Key aspects of the SPB that could result in impacts to flora and fauna include:

- clearing of exotic planted and parkland vegetation
- works around watercourses
- noise, vibration and light impacts
- general earthworks near vegetation, resulting in disturbance of soils, consequential erosion and the mobilisation of sediment
- establishment of ancillary facilities
- use of chemicals / fuels (potential for spills)

6.2 ECOLOGICAL IMPACTS

Construction of the SPB may result in direct and indirect impacts to biodiversity, including:

- loss of native vegetation
- clearing of exotic planted and parkland vegetation
- impact on water quality of creeks and streams
- indirect impacts to biodiversity due to:
 - pollution of watercourses, groundwater and/or surrounding sensitive habitat from accidental spills and contamination
 - changes to fauna activities and movements from light spill during construction and night work
 - encroachment and/or introduction of weeds and/or pathogens from general construction activities.

Further detail of these impacts is provided in the following sections.

6.2.1 VEGETATION CLEARING

Only exotic, planted and parkland vegetation communities will be cleared for the construction of the SPB. [Figure 5](#) and [Figure 6](#) shows the trees approved to be removed for the construction of the SPB. The location of the trees to be protected and retained is also shown on Figure 5 and 6. The locations of these trees are also shown on the SAMs ([Appendix 1](#) and [Appendix 2](#)). An exclusion zone will be marked around the trees to be protected and retained, as detailed in Section 7.2

FIGURE 5 - SPB TREE RETENTION AND CLEARING PLAN (1)

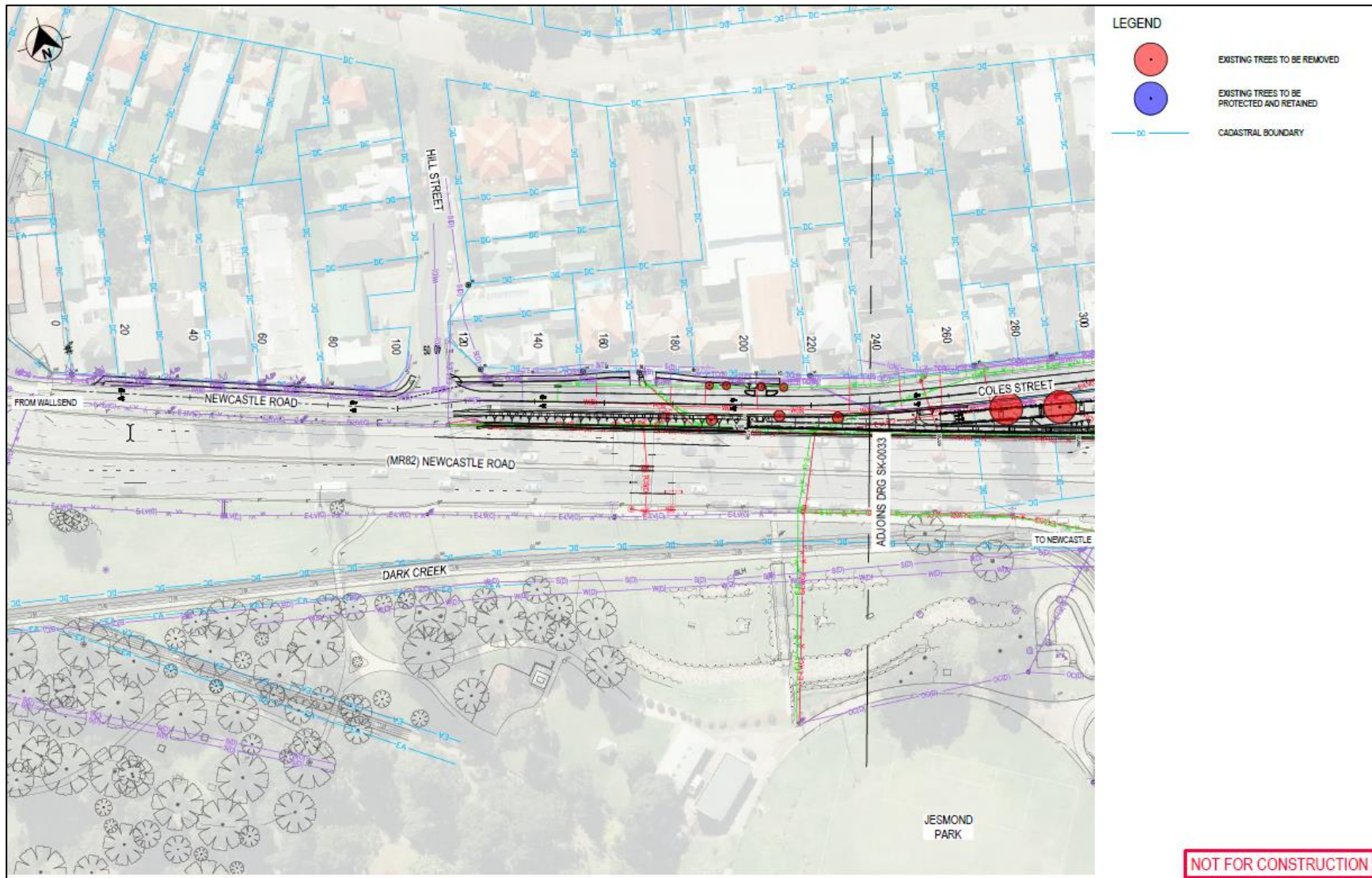
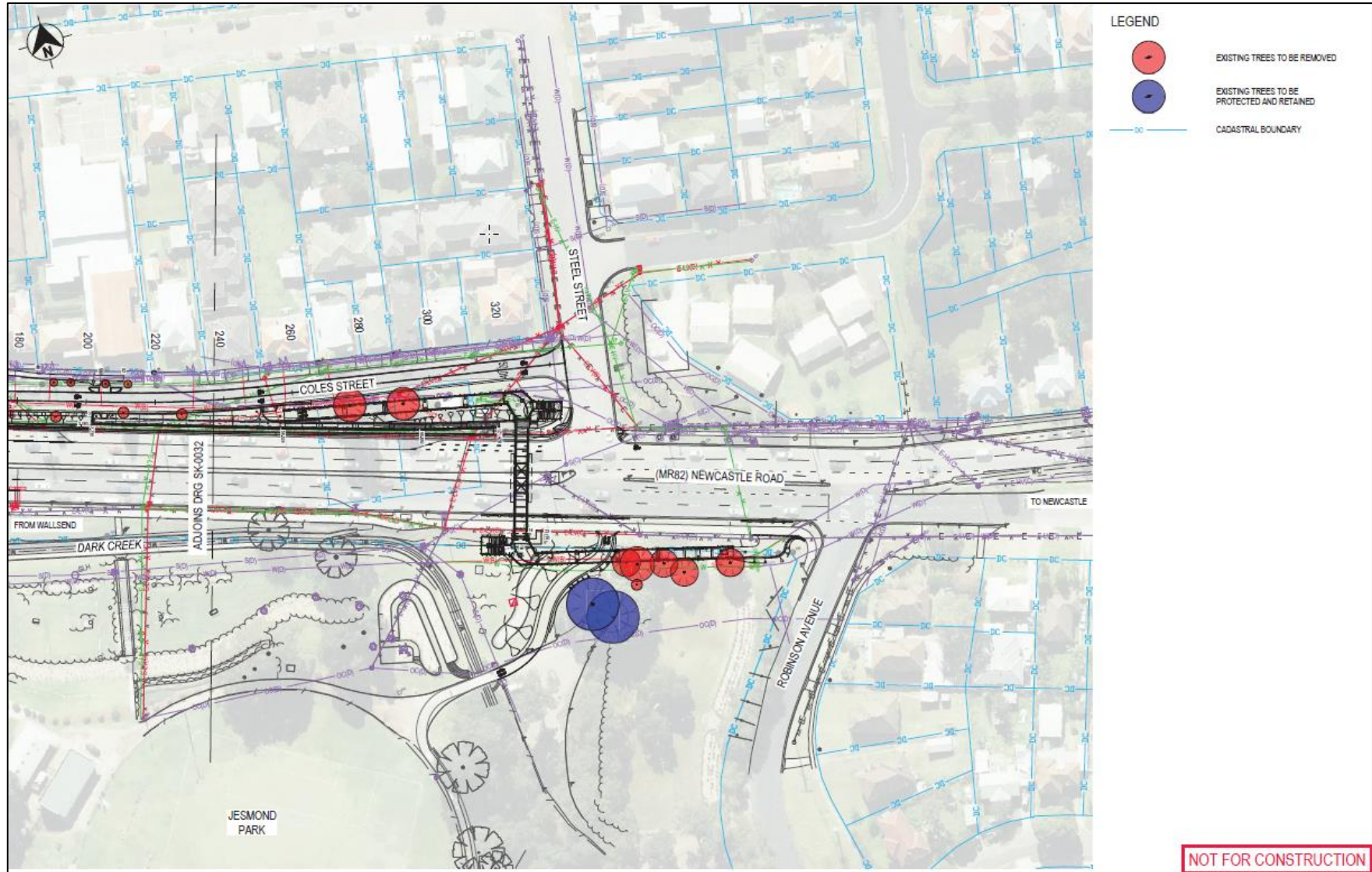


FIGURE 6 - SPB TREE RETENTION AND CLEARING PLAN (2)



6.2.2 IMPACTS TO AQUATIC BIODIVERSITY

No impacts are anticipated on endangered aquatic communities, aquatic fauna or marine vegetation listed under the *Fisheries Management Act 1994*. No significant impacts on riparian vegetation or habitats downstream of the SPB construction footprint are anticipated due to the construction of the SPB. There would be no impact on key fish habitat as defined by NSW DPI Fisheries *Policy and guidelines for fish habitat conservation and management - Update 2013* (Department of Primary Industries 2013).

Construction activities such as vegetation clearing, excavation, cut and fill and other earthworks adjacent to waterways have the potential to impact aquatic ecosystems due to changes in water quality, habitat loss and instream barriers. Increased scour potential in drainage lines may deepen waterways and cause bank erosion.

Stockpiling of earthworks could reduce downstream water quality during wet weather if not managed appropriately.

6.2.3 INJURY AND MORTALITY OF FAUNA

Clearing for the construction of the SPB has minimal potential to impact on local fauna populations due to the limited fauna habitat within the SPB footprint to be cleared.

Mobile species can evade injury and/or seek alternative habitat in nearby parkland. Small fauna such as reptiles or frogs which may be sheltering in dense vegetation or beneath woody debris may be more vulnerable to impact due to their decreased mobility.

6.2.4 INVASION AND SPREAD OF WEEDS

Construction activities such as earthworks, movement of soil and attachment of seed (and other propagules) to vehicles and machinery have the potential to disperse or import weed species into the SPB construction area.

6.2.5 INVASION AND SPREAD OF PATHOGENS AND DISEASE

Construction activities have the potential to introduce pathogens such as *Phytophthora* (*Phytophthora cinnamomic*) and Myrtle Rust (*Uredo rangelii*), both of which can lead to dieback of native vegetation, with associated loss of habitat for fauna species. Infection of native plants by *P. cinnamomi* and *U. rangelii* is listed as a key threatening process in NSW. In addition, there is potential for infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis, which is a key threatening process under both the EPBC Act and BC Act (formerly TSC Act).

Construction activities associated with the SPB project that have the potential to introduce or spread disease include earthworks, movement of soil and movement of vehicles and machinery. As the construction footprint mainly comprises mowed parkland and road reserve, the potential for invasion and spread of pathogens and disease will be very limited. Spread of Chytrid fungus is unlikely as the Dark Creek drainage line in the vicinity of the SPB is concrete lined.

6.2.6 WATER POLLUTION

Construction of the SPB has the potential to impact on the water quality of Dark Creek through:

- increased sedimentation affecting the ecosystems of downstream waterways
- increased levels of nutrients, metals and other pollutants, transported via sediment to downstream waterways
- fuel, chemicals, oils, grease or hydrocarbon spills from construction machinery directly polluting the downstream waterways and soils
- spills of concrete during concrete pours directly polluting downstream waterways and soils
- contamination from construction compounds, chemical storage areas and wash-down locations
- increased levels of litter from construction activities polluting waterways
- contamination of waterways as a result of disturbance of contaminated land
- tannin leachate from clearing and mulching of vegetation.

The *Water Quality and Watercourse Impact Assessment* (SPIR Appendix G) concluded that construction of the RP2J project, including the SPB, would be unlikely to have a substantial or significant impact the water quality of receiving watercourses when appropriate controls are planned and implemented.

Dark Creek is a heavily modified environment consisting of a concrete lined and artificial channel to mitigate local flooding impacts. Following the reduction of contaminants by the construction and operational mitigation measures proposed as part of the overall RP2J project and the mixing with other surface runoff water sources in the surrounding residential/commercial catchment, it is considered that the impact to Dark Creek water quality is unlikely to be substantial or significant. Water quality treatment by the RP2J project is modelled to reduce average pollutant concentrations by up to 92%, annual pollutant loads by up to 89% and substantially reduce gross pollutants compared to a no treatment scenario. As Dark Creek presents limited habitat for aquatic flora or fauna due to its heavily modified condition, it is considered that the changes to water quality would not result in a significant impact to the local environment or any potentially occurring aquatic flora or fauna in this watercourse.

6.2.7 NOISE, VIBRATION, DUST, LIGHT AND CONTAMINANTS

Construction of the SPB may result in indirect impacts such as noise, lighting and vibration to habitats in the vicinity of the construction footprint. These impacts may occur as a result of vegetation clearing, vehicle movement, operation of plant and addition of traffic into the locality. These impacts may disturb fauna and disrupt foraging, reproductive, or movement behaviours, particularly for nocturnal fauna and sensitive species. However, as there is limited habitat in the vicinity of the SPB works these potential impacts are anticipated to be minimal.

7 ENVIRONMENTAL MITIGATION AND MANAGEMENT MEASURES

In accordance with the SPIR / EIS, the following environmental management measures have been developed to minimise potential impacts on Flora and Fauna Management. Relative management measures applicable to the CFFMP during construction are identified below;

TABLE 5 – ENVIRONMENTAL MANAGEMENT MEASURES

No.	Environmental Safeguards	Daracon Reference	Responsibility	Timing
General				
B001	A flora and fauna management plan will be prepared as part of the Construction Environmental Management Plan (CEMP) for the project. The flora and fauna management plan will be prepared and implemented in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011)	This CFFMP (as required by CoA A9)	Daracon	Pre-Construction
B002	All workers will be provided with an environmental induction before starting work on-site. This would include information on the ecological values of the site and study area and measures to be implemented to protect biodiversity	Clause 8.4	Daracon	Construction
Impacts to threatened flora and fauna species				
B004	Vegetation clearing will be carried out in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Guide 4: Clearing of vegetation and removal of bush rock) (RTA, 2011)	Clause 7.1 Appendix 3	Daracon	Construction
B005	Pre-clearance surveys will be carried out in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Guide 1: Pre-clearing process) (RTA, 2011).	Clause 7.1 Appendix 3	Daracon	Construction
B006	Any unexpected threatened species finds will be dealt with in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA, 2011)	Clause 7.5 Appendix 3	Daracon	Construction
B007	Exclusion zones will be identified and demarcated in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Guide 2: Exclusion zones) (RTA 2011).	Clause 7.2 Appendix 3	Daracon ESR	Construction
Impacts to native vegetation				

B010	The location of trees to be retained in the construction footprint would be incorporated in the flora and fauna management plan, landscape plan and re-vegetation management plan.	Clause 6.2.1 Appendix 3 Landscape Plans (certified construction drawings)	Roads and Maritime	Pre-Construction
Potential for spread of exotic species, or spread of pathogens				
B012	Protocols for preventing or minimising the spread of noxious and environmental weeds will be developed and implemented in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Guide 6: Weed Management) (RTA, 2011).	Clause 7.4 Appendix 3	Daracon ESR	Construction
B013	Protocols for preventing the introduction and/or spread of disease-causing agents such as bacteria and fungi will be developed and implemented in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Guide 7: Pathogen Management) (RTA, 2011).	Clause 7.4 Appendix 3	Daracon ESR	Construction
Impacts of fauna and fauna habitat				
B014	Fauna handling will be conducted in accordance with the Roads and Maritime Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (Guide 9: Fauna handling) (RTA, 2011).	Clause 7.6 Appendix 3	Daracon ESR	Construction
B018	Down-lights and motion sensor lighting will be used where possible during construction in order to reduce light spill to surrounding habitat.	Utilised where possible	Daracon ESR	Construction

7.1 CLEARING

Daracon will prepare an EWMS for clearing and grubbing that meets the requirements of Specification RMS G40 and “RMS Biodiversity Guidelines: Protecting and Managing Biodiversity on RMS Projects (Guide 4: Clearing of vegetation and removal of bush rock)” to support this CFFMP – refer [Appendix 3](#).

The tree clearing and retention plan for the SPB construction is provided in and [Figure 5](#) and [Figure 6](#). Vegetation clearing will be carried out in a manner that prevents the mixing of topsoil with woody vegetation debris. Non-woody vegetation (groundcovers) will be incorporated into topsoils as organic nutrients for use in rehabilitation.

Daracon will consult with community groups, the local Landcare Group and relevant government agencies to determine if retained timber and root balls can be used for environmental rehabilitation projects before pursuing other disposal options. Where root balls are located close to utilities / services, stumps may need to be ground down and would not be suitable for reuse.

7.1.1 PRE-CLEARING SURVEY AND ASSESSMENT

Prior to commencement of the clearing activities, the Project Ecologist will undertake pre-clearance survey to verify the construction boundaries / footprint of the SPB and to confirm the vegetation to be cleared. The pre-clearance survey will be conducted by the Project Ecologist in accordance with the “RMS Biodiversity Guidelines: Protecting and Managing Biodiversity on RMS Projects (Guide 1: Pre-clearing process)” – refer [Appendix 3](#).

The pre-clearance survey will confirm the establishment of approved limits of clearing and exclusion zones.

Daracon will summarise the outcomes of the pre-clearance survey report which:

- Includes a statement from the Project Ecologist that identifies the species and location of any weeds within the SPB footprint to be cleared and grubbed and how the weed material will be isolated from mulch.
- Identifies any trees outside the limits of clearing which are unsound and likely to fall upon the roadway or onto private property, and a recommendation provided as to whether they should be pruned or removed.

Any additional mitigation or management measures resulting from the surveys will be incorporated into the clearing and grubbing EWMS as required. Daracon will update the Sensitive Area Maps with the information from these surveys including any areas of weed infestation.

7.1.2 POST-CLEARING REPORT

At the completion of clearing the Project Ecologist will complete post-clearing surveys and prepare a Post-Clearing Report. The report will confirm the final area cleared (square metres or similar detail for total area and each vegetation community), the number and identity of all vegetation removed and the post-clearance abundance and density count of hollow-bearing trees. The Post-Clearing Report will also identify if any fauna, nests or other fauna habitats were impacted by clearing works and provide fauna capture and relocation data.

7.2 EXCLUSION ZONES

Prior to clearing and grubbing, Daracon will install exclusion zones and fencing (or similar delineation) or other means to demarcate the exclusion zones identified in the pre-clearance surveys. Where possible, areas that do not need to be cleared for construction activities will be included in the exclusion zones and fenced (or delineated) accordingly. The approved limits of clearing and exclusion zones will be planned and established in accordance with “*RMS Biodiversity Guidelines: Protecting and Managing Biodiversity on RMS Projects (Guide 2: Exclusion zones)*” (refer [Appendix 3](#)). The fencing (or similar) will only be removed following agreement by the Roads and Maritime Environmental Manager (or delegate).

7.3 AQUATIC HABITAT

The Contractor will manage works near Dark Creek in accordance with Guide 10 of the *Biodiversity Guidelines* (RTA, 2011) – refer [Appendix 3](#), and Section 3.3.2 of the *Policy and Guidelines for Fish Habitat Conservation and Management Update* (DPI, 2013) including:

- Establishment of exclusion zones for vehicles, plant and equipment, and provision of exclusion fencing around sensitive areas.
- Keeping vehicles and machinery away from the banks of Dark Creek where possible.

7.4 WEED AND PATHOGEN CONTROL

Weed and pathogen management and control practices will be implemented during construction of the SPB to minimise the risk of spread into and out of the construction site in accordance with Guides 6 and 7 of the *Biodiversity Guidelines* (RTA, 2011) (refer [Appendix 3](#)).

7.5 UNEXPECTED THREATENED SPECIES

An Unexpected Threatened Species or EEC Finds procedure consistent with Guide 1 of the *Biodiversity Guidelines* (RTA, 2011) and Roads and Maritime specifications is provided in [Appendix 3](#). The procedure outlines the process to follow in the event of an unexpected species find during construction of the SPB.

7.6 FAUNA RESCUE AND RELEASE

Handling of fauna during the SPB may be required if fauna is encountered during construction and is required to be relocated or transported to a vet or wildlife carer in the case of injury. Fauna handling and rescue will be carried out in accordance with the requirements of Guide 9 the *Biodiversity Guidelines* (RTA, 2011) (refer [Appendix 3](#)) and Roads and Maritime specifications.

Handling of injured fauna will be carried out by licensed fauna handler such as fauna ecologist or wildlife carer. If native fauna is captured during vegetation clearing, it will be released into a suitable nearby location that has been identified as such by the Project Ecologist. Records of fauna captured and relocated will be kept. Any injury or death of threatened species will be reported to the Roads and Maritime Environmental Manager (or delegate).

7.7 VEGETATION REHABILITATION

Rehabilitation of the disturbed areas of the site will be undertaken in accordance with Roads and Maritime Contractor specifications.

Daracon will engage a landscape subcontractor to carry out all landscape planting and maintenance work until completion. Landscaping work will be carried out by qualified personnel in accordance Roads and Maritime Specification R179 (Landscape Planting). Daracon's landscape subcontractor will undertake the revegetation and landscaping for the SPB in accordance with the Landscape Drawings, which identify the locations of areas to be revegetated.

CoA E11 requires retention of as many trees as possible in Jesmond Park. The tree clearing and retention plan for the SPB construction is provided in [Figure 5](#) and [Figure 6](#), which shows that only exotic, planted and parkland vegetation communities will be cleared for the construction of the SPB. The location of the trees to be protected and retained in Jesmond Park is also shown on [Figure 5](#) and [Figure 6](#). The locations of these trees are also shown on the SAMs. An exclusion zone, will be marked around the trees to be protected and retained in Jesmond Park.

The SPB Landscape Drawings identify the planting locations, species, planting mixes, plant sizes, quantities and densities to be adopted for the SPB vegetation rehabilitation. Where trees are to be removed, Roads and Maritime will ensure that there will be a net increase in the number of replacement trees as part of the overall RP2J project. Replacement trees will also be planted on public land within the NCC LGA as part of Stage 4 of the RP2J project to ensure compliance with CoA E11. These plantings will be detailed in the Stage 4 detailed design and landscape drawings.

During revegetation, Daracon will comply with the requirements of Roads and Maritime Specifications R178 (Vegetation) and R179, including implementation of measures to avoid compaction of soils in revegetation areas and ensuring suitable moisture requirements are maintained. Daracon will regularly inspect, monitor and maintain revegetated areas in accordance with the requirements of R179 and R179.

8 COMPLIANCE MANAGEMENT

8.1 ROLES AND RESPONSIBILITIES

The organisational structure and roles and responsibilities for Daracon personnel are provided within IPMP (refer IPMP – Appendix 2). The roles and responsibilities specific to the construction of the SPB are provided within IPMP, which displays the organisational chart for the project (refer IPMP – Appendix 1).

8.1.1 ECOLOGIST

Daracon will engage an Ecologist to provide advice during construction and to supervise and lead the implementation of processes and management measures for ecologically sensitive activities. These activities will include, but not be limited to, pre-clearing processes, weed and pathogen management, and fauna relocation. The Project Ecologist will hold appropriate qualifications and all licenses relevant to the work being undertaken, in addition to specific experience in working in areas of a similar nature to the SPB.

8.2 COMMUNICATION

Communication with stakeholders and the community is detailed within the Construction Community Liaison Management Plan (CCLMP), which includes the key aspects identified within the Community Communication Strategy (CCS) developed by RMS.

Flora and Fauna management information will be communicated to the community and stakeholders in accordance with the principles and procedures outlined CCLMP.

8.3 COMPLAINTS MANAGEMENT

The management of complaints for the SPB will be in accordance with the Construction Community Liaison Management Plan (CCLMP), which includes the key aspects identified within the Complaints Management System (CMS) developed by RMS.

8.4 TRAINING

To ensure that this CFFMP is effectively implemented, all site personnel (including sub-contractors) will undergo site induction training relating to flora and fauna management issues prior to construction commencing. The induction training will address elements related to flora and fauna management, including:

- Existence and requirements of this CFFMP and all plans and procedures prepared under the CFFMP.
- Relevant legislation and regulations.
- Incident response, management and reporting.

- Environmentally sensitive locations and exclusion zones.
- Specific species likely to be affected by the Construction works and how these species can be recognised.
- Project boundary and exclusion zone flagging protocol.
- Fauna rescue requirements.
- Boundaries for vegetation clearing.
- Fauna and fauna habitat management measures.
- Weed control measures.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in flora and fauna management or those undertaking an activity with a high risk of environmental impact.

Daily pre-start meetings conducted by Daracon's Supervisor will inform the site workforce of any environmental issues relevant to flora and fauna that could potentially be impacted by, or impact on, the day's activities.

For further details on training refer to Section 8 of the IPMP, and section 5.5 of the CEMPP.

8.5 MONITORING AND INSPECTIONS

Daracon will carry out regular inspections of sensitive areas and activities with the potential to impact flora and fauna for the duration of construction of the SPB. A schedule of monitoring and inspections is contained in [Table 6](#).

TABLE 6 – MONITORING AND INSPECTIONS RELEVANT TO FLORA AND FAUNA MANAGEMENT.

Monitor / inspection	Frequency / Timeframe	Responsibility
Pre-clearance inspection	Prior to vegetation clearance	Ecologist / ESR
Post-clearance inspection	After vegetation clearance	Ecologist / ESR)
Working in environmentally sensitive areas	EWMS to be provided to RMS and ER at least 21 working days prior	ESR
Site inspections	Weekly	ESR
Visual surveillance (including exclusion zone fencing, erosion and sedimentation controls, stockpiles, threats to fauna or unexpected finds of flora and fauna)	Daily	Site Supervisor / ESR
Commencement of planting operations (R179 3.4)	At least 2 working days prior that the setting out of all trees, shrubs and ground cover positions is complete and ready for inspection	ESR
Planting and backfilling of planting holes (R179 3.6.2)	Give 2 days' notice of date and time at which planting holes will be ready for inspection	ESR

8.6 INCIDENTS

Incidents will be managed in accordance with Section 9 of the IPMP and Section 6.11 of the CEMPP.

8.7 AUDITING

Audits (both internal and external) will be undertaken to assess the effectiveness of flora and fauna management measures, compliance with this CFFMP, conditions of approval and other relevant approvals, licenses and guidelines. Audit requirements are detailed in Section 11.4 of the IPMP and Section 5.9 of the CEMPP.

8.8 NON-CONFORMANCES

A non-conformance is the failure or refusal to comply with the requirements of project system documentation, including this CFFMP. Non-conformances may be identified through auditing and review processes (Section 11.4 of the IPMP and section 5.9 of the CEMPP), monitoring and inspection processes (Section 11 of the IPMP) or incident management (Section 9 of the IPMP and Section 6.11 of the CEMPP).

8.9 REPORTING

Reporting requirements and responsibilities are documented in Section 5.11 of the IPMP and section 5.11 of the CEMPP.

Specific reporting requirements associated with additional survey work and control of clearing activities are outlined in [Table 7](#);

TABLE 7 – REPORTING REQUIREMENTS RELEVANT TO FLORA AND FAUNA MANAGEMENT.

Report	Frequency	Responsibility
Clearing and Grubbing EWMS and report on the presence of weeds and unsound trees together with written notice that limits of clearing and areas of weed infestation identified in the Ecologist report have been marked	At least 15 working days prior to commencement of clearing	Daracon
Pre-clearing Survey Report Confirm limits of clearing and total area for clearance, targeted species, habitat trees to be removed, fauna rescue events and relocations	Prior to undertaking clearing	Daracon
Post Clearing Report Summary of the results of surveys, type and area of vegetation cleared, fauna rescues, fauna injury and mortality during clearing activities Summary of areas of vegetation cleared and areas approved for clearing for the Project to be included in the Construction Compliance Reports	Weekly, and a final report within 21 days from the completion of substantial clearing six monthly	Daracon

Daracon will maintain accurate records substantiating all construction activities associated with the SPB or relevant to the conditions of approval, including measures taken to implement this CFFMP. Records will be made available to the RMS, ER and DPE upon request, within the timeframe nominated in the request.

9 REVIEW AND IMPROVEMENT

9.1 CONTINUAL IMPROVEMENT

Continuous improvement of this CFFMP will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance.
- Identify environmental risks not already included in the risk register.
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

Daracon will be responsible for ensuring SPB environmental risks are identified and included in the risk register and appropriate mitigation measures implemented throughout the construction of the SPB as part of the continuous improvement process.

9.2 CFFMP UPDATE AND AMENDMENTS

The processes described in Section 11 of the IPMP may result in the need to update or revise this CFFMP. This will occur as needed.

Any revisions and/or changes to the CFFMP will be distributed to all relevant stakeholders in accordance with the approved document control procedure detailed in Section 13 of the IPMP.

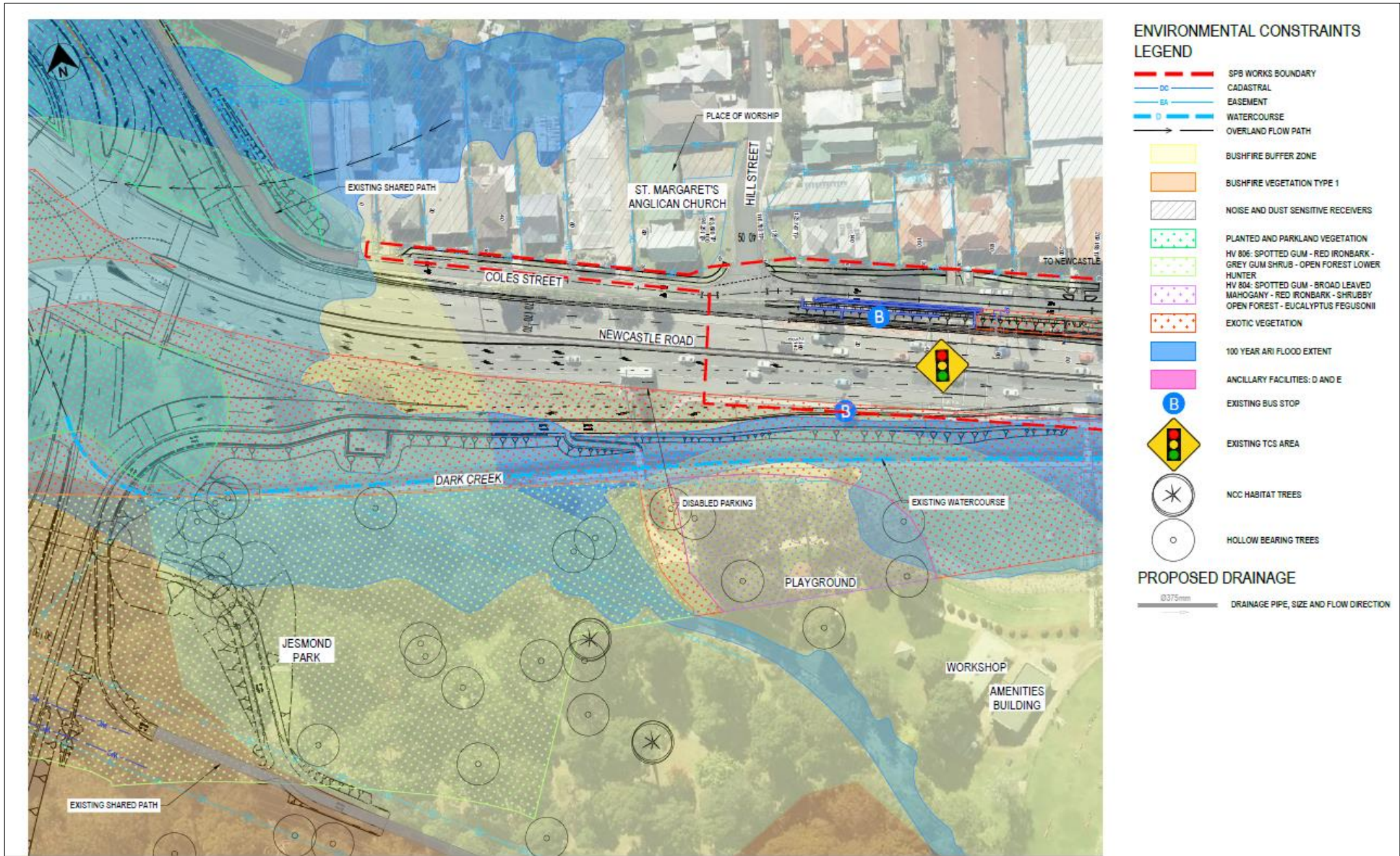
10 DEFINITIONS

All terms referenced within this plan are included within [REG.00001](#) *Definitions & Glossary of Terms Register*.

11 ASSOCIATED DOCUMENTS AND PROCEDURES

Approved Forms, Process Flowcharts, Registers and/or other documents referenced within the body of, or those that are associated with this plan, are accessible and made available for all Daracon personnel via the following link: <https://dms.daracon.com.au/documents>

APPENDIX 1 Sensitive Area: Map 1



APPENDIX 2 Sensitive Area: Map 2



APPENDIX 3 RMS Biodiversity Guideline Procedures



RMS - Biodiversity
Guideline Procedure