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Construction Flora and Fauna Management Plan

Eurobodalla Southern Water Supply Storage: Tuross River Intake Pump Station (TRIPS)

Reference No. SSD-7089
Prepared for Quay Civil Pty Ltd
17 November 2020

SMEC INTERNAL REF. 30012985

Document Control

Document:	Construction Flora and Fauna Management Plan
File Location:	\\AUSYFSV003\Group\projects\30012985 - TRIPS - D&C Environmental Compliance\140 Deliverables\CFFMP
Project Name:	Eurobodalla Southern Water Supply Storage: Tuross River Intake Pump Station (TRIPS)
Project Number:	30012985
Revision Number:	5

Revision History

Revision No.	Date	Prepared by	Reviewed by	Approved for Issue by
1	2 October 2020	Gregg Goldin	Jessica Miller	M Sejournee
2	8 October 2020	Gregg Goldin	Jessica Miller	M Sejournee
3	22 October 2020	M Davey	M Sejournee	M Sejournee
4	2 November 2020	Jessica Miller	M Davey	M Sejournee
5	17 November 2020	Jessica Miller	Jessica Miller	M Davey

Issue Register

Distribution List	Date Issued	Number of Copies
Quay Civil Pty Ltd	17 November 2020	1

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1 Introduction

1.1 Context

This Construction Flora and Fauna Management Sub Plan (CFFMP) forms part of the Construction Environmental Management Plan (CEMP) and has been prepared to outline and describe how the contractor responsible for the construction of Stage 2 – Tuross River Intake Pump Station (TRIPS) as part of the Eurobodalla Southern Water Supply Storage Project (the Project) will comply with State Significant Development (SSD) 7089 Development Consent, the Environmental Impact Statement (EIS), Addendum Submissions Report and all associated licences, permits and approvals required for the Project. Figure 1 of the CEMP outlines the TRIPS location.

A separate FFMP was produced specifically to address vegetation clearing to facilitate the TRIPS (SMEC 2019), while this document is to cover the construction and rehabilitation phase of the Stage 2 – TRIPS construction.

1.2 Background and Project description

The Eurobodalla Southern Storage (ESS) EIS, submitted for determination in September 2018, assessed the impacts of the Project's construction and operation on flora, fauna and ecological communities. As part of the EIS, a detailed flora and fauna assessment was prepared in the form of a *Biodiversity Assessment Report* (BAR) (SMEC 2018) to assess the impact of the Project and provide measures to minimise and manage impacts to flora and fauna. The BAR was included in the EIS as Appendix E.

The EIS proposed the implementation of the mitigation and management measures, including further survey, monitoring and the development of a CFFMP. As this CFFMP only relates to the Stage 2 – TRIPS construction, not all of the matters identified within the EIS and BAR are relevant to this CFFMP.

1.2.1 Project description

The Project location is approximately 30 kilometres south of Moruya within the Eurobodalla Local Government Area. The TRIPS site is located along the eastern bank of the Tuross River, just south of the existing water treatment facility on Eurobodalla Road within Lot 1 DP 1168581. The TRIPS site will be located on a section of the Tuross River that runs in a north-easterly direction through the valley on the western side of Bodalla State Forest.

The TRIPS will abstract river flow and direct flow to the Eurobodalla Southern Storage facility. It will consist of a 4.5 m diameter, 18 m deep concrete wet well with 3 submersible flight pumps receiving water from an inlet screen installed in the flowing river. This screen will be protected by marine piles. Associated ancillary infrastructure will include concrete structures used in the operation and maintenance of the pump station, flow control and sampling instrumentation and all associated electrical works. Power will be fed by a new transformer, and power and water flow will be provided by new in ground services. Control of the new infrastructure will take place remotely, with a Supervisory Control and Data Acquisition (SCADA) system being developed to monitor, control and report fault status of the new infrastructure.

The TRIPS component of the overall EES Project is divided into two stages, specifically:

- Stage 1 – Clearing of the Tuross River Intake Pump Station (TRIPS) site. This stage of the Project has since been completed
- Stage 2 – Construction of the river intake pump station component of the works (covered by this CEMP and Sub-plans)
- Stage 3 - Clearing and construction of the remaining components of the Eurobodalla Southern Water Supply Storage (which will be covered by a separate CEMP and Sub-plans).

This CFFMP relates to Stage 2 only.

1.2.2 Construction activities

The Stage 2 - TRIPS construction works would include:

- Site mobilisation and preparation of work area including:
  - Traffic control and erection of site fencing
  - Installation of erosion and sediment control as outlined in this CSWMP
  - Floating of plant and equipment

- In-river works, likely involving:
  (a) Crane and barge mobilisation/demobilisation
  (b) Drilling of intake pile and fender piles
  (c) Bulk excavation to platform level, likely involving:
  (d) Excavation of access track cut into river bank face
  (e) Batter stabilisation and anchoring
  (f) Intake Pipe Installation, likely involving:
  (g) Staged excavation of intake trench
  (h) Assembly, installation of intake pipe
  (i) Concrete encasement and backfill of intake pipe
  (j) Wet well construction and commissioning, likely involving:
  (k) Completion of wet well excavation
  (l) Construction of wet well
  (m) Backfilling and installation of retaining wall
  (n) Installation of in-ground services such as wet well valve chamber pipework, drainage, electrical
  (o) Roadworks and finishing.

2 Purpose

The purpose of this CFFMP is to describe how impacts on flora and fauna will be minimised and managed during the Stage 2 – TRIPS construction.

The Development Consent SSD-7089, provided by the Minister for Planning, states that the Conditions are required to:

- Prevent, minimise, or offset adverse environmental impacts
- Set standards and performance measures for acceptable environmental performance
- Require regular monitoring and reporting
- Provide for the ongoing environmental management of the development.

Condition B2 states The CFFMP must form part of the CEMP required by Condition C2 and, in addition to the general management plan requirements listed in Condition C1, the CFFMP must include the conditions that are described in Table 2-1 below. Additional conditions are given in Condition of Consents Appendix Section 3.1.

Table 2-1 Construction Flora and Fauna Management Conditions of Development Consent SSD-7089

Condition	Section where condition addressed in CFFMP
a. measures to ensure biodiversity values not intended to be impacted are delineated by mapping of 'no-go areas' and the installation of on-site measures such as temporary exclusion fencing prior to clearing,	Refer to Section 6.1.3.
b. measures to minimise the risk of introducing weed species via construction vehicles, plant and equipment and control of pest and weed species existing at the site,	Refer to Section 6.1.2 and Appendix A.
c. method of vegetation removal and measures to minimise impacts outside the water storage facility construction boundary and within the perimeter road construction boundary as a result of the equipment used for clearing and general access for heavy vehicles and construction plant and equipment,	Clearing is not applicable to the Stage 2 – TRIPS construction.
d. options to reuse cleared vegetation, in preference to burning, such as relocation of hollow logs for habitat and mulch for use in areas to be revegetated within the site and use elsewhere within the local area	Clearing is generally not applicable to the Stage 2 – TRIPS construction. However, requirements relating to habitat retention are reiterated in Section 6.1.6 for reference.
e. measures to minimise the impacts on fauna within the site including the installation of nest boxes prior to clearing, relocation of fauna to adjacent habitat (including any fish during dewatering of the cofferdam), staged clearing and timing of clearing outside breeding seasons, and	The TRIPS site has already been cleared of vegetation (refer to Section 1.2.1 above). However, fauna handling protocols are provided in Section **Error! Reference source not found.** in case of unanticipated finds, or if additional vegetation clearing is required, or where injured wildlife are otherwise encountered at the site. Coffer dam and nest box conditions are not relevant to this Stage 2 – TRIPS construction.
f. details on rehabilitation and revegetation including:	Section 6.4 sets out revegetation requirements relevant to the Stage 2 -TRIPS construction site. Conditions (i) and

Condition	Section where condition addressed in CFFMP
(i) use of locally indigenous plant species including collection of seed prior to clearing for this purpose, (ii) for construction areas outside the full supply level including the construction compounds, on-site quarry areas and the new storage access road batters, (iii) for the construction area at the existing water treatment plant (WTP) including for the bed and banks of the Tuross River affected by the temporary cofferdam.	(ii) are relevant to the larger storage site, and so are not managed under this CFFMP.
Appendix 3.1 • plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas.	Refer to Section 4. Revegetation area details pending finalisation within the landscaping plan, and guidance is also provided in Section 6.4.
Appendix 3.1 • pre-clearing survey requirements	Clearing is not applicable to the Stage 2 – TRIPS construction.
Appendix 3.1 • procedures for unexpected threatened species finds and fauna handling.	The TRIPS site has already been cleared of vegetation (refer to Section 1.2.1 above). However, fauna handling protocols are provided in Section **Error! Reference source not found.** in case of unanticipated finds, or if additional vegetation clearing is required, or where injured wildlife are otherwise encountered at the site.
Appendix 3.1 • procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries,	There are no direct impacts to fish habitat in this stage. The CSWMP covers other potential impacts.

2.1 Objectives

The CFFMP must outline the implementation of all avoidance, mitigation and management measures relevant to the protection of native flora and fauna, including threatened species and endangered ecological communities referred to in the EIS and Development Consent SSD-7089. By outlining these avoidance, mitigation and management measures the CFFMP will provide technical input to assist in the execution of the TRIPS construction contract.

2.2 Targets

The following targets have been established for the management of flora and fauna impacts during the Stage 2 – TRIPS construction:

- Ensure full compliance with the relevant legislative requirements, EIS, and Development Consent SSD-7089
- No disturbance to flora and fauna outside the proposed construction footprint and associated access tracks and site compounds
- No increase in distribution of weeds currently existing within the Project Areas
- No new weeds introduced to the Project Areas
- No transfer of plant diseases or pathogens to or from work areas

- All fauna species encountered during construction are handled humanely in accordance with industry standards
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat
- Minimise barriers to fauna movement.

3 Environmental requirements

3.1 Legislation

All legislation relevant to this CFFMP is included in Section 2 of the CEMP, including the following:

- EP&A Act
- *Biodiversity Conservation Act 2016* (BC Act)
- *Fisheries Management Act 1994*
- *Biosecurity Act 2015.*

3.2 Additional approvals, licences, permits and requirements

As part of the EP&A Act, there are Conditions of Development Consent SSD-7089 that have been specified by the Minister for Planning that the Project must comply with. These Conditions are stated in Section 2.

The Project was determined as an SSD, and as such, it must comply with the relevant guidelines for SSD under the EP&A Act.

3.3 Guidelines

The main guidelines, specifications and policy documents relevant to this CFFMP include:

- *Best Practice Management Guidelines for Phytophthora cinnamomi within the Sydney Metropolitan Catchment Management Authority Area* (Botanic Gardens Trust 2008)
- *New South Wales Weed Control Handbook* (DPI 2018)
- *Hygiene protocol for the control of disease in frogs* (DECCW 2008)
- *Australian Standard AS4373 Pruning of Amenity Trees* (Standards Australia 2007)
- *Australian Standard AS4970 Protection of Trees* (Standards Australia 2009)
- *NSW Biodiversity Offsets Policy for Major Projects* (OEH 2014).

4 Existing environment

4.1 Location and surrounding terrain

The Project's location is approximately 30 kilometres south of Moruya within the Eurobodalla Local Government Area. The TRIPS site is located along the eastern bank of the Tuross River, just south of the existing water treatment facility on Eurobodalla Road – Lot 1 DP 1168581. The TRIPS facility will occur on a section of the Tuross River that runs in a north-easterly direction through the valley on the western side of Bodalla State Forest. The extent of the Tuross River occurring within the TRIPS site has created a steep bank (refer to Photograph 4-1 and Photograph 4-2 below).

Photograph 4-1. The steep bank of the Tuross River within the TRIPS site supports extents of both vegetated and rocky terrain

Photograph 4-2. Vegetated and rocky terrain on the banks of the Tuross River

The site was cleared early in 2020, under a separate, approved CEMP and CFFMP. Three mature trees remain on the TRIPS site, including a habitat tree.

4.2 Threatened Ecological Communities

As previously mentioned, the Plant Community Type (PCT) (1108/SR608) identified within the TRIPS site prior to the site being cleared, was a component of a TEC. Specifically, PCT1108/SR608 is a component of *River Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions*. This community is listed as an Endangered Ecological Community under Schedule 2 of the BC Act. No EPBC listed TECs were found to occur within the development site.

The TRIPS site has been cleared according to the approved clearing boundary (Figure 4-1) under separate approvals, therefore will not be discussed further.

DATE 25/11/2019

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COORDINATE SYSTEM GDA 1994 MGA Zone 56

FIG NO. 4-1

FIGURE TITLE Existing Environment

PROJECT NO. 30012466

PROJECT TITLE Eurobodalla Southern Storage TRIPS CFFMP

CREATED BY FA13847

SOURCES Roadnet MDS 2017
public_NSW_Imagery: © Department of Finance, Services and Innovation 201

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4.3 Fauna habitat

Fauna habitat types that remain at the TRIPS site following the approved clearing are listed in Table 4-1 below.

Table 4-1 Fauna habitat types in the TRIPS site

Name	Habitat features
Hollow bearing trees	Nesting, roosting and sheltering habitat for numerous threatened and non-threatened birds, arboreal mammals and microbats. Species predicted to occur that may utilise this resource on site include *Callocephalon fimbriatum* (Gang Gang Cockatoo), *Tyto novaehollandiae* (Masked Owl) and various microbat species.
Fallen tree trunks, woody debris and deep leaf litter	Sheltering habitat for small terrestrial mammals, amphibians, and reptiles.
Access roads and pathways	Foraging habitat and flyways for microbats.
Tuross River	Riparian vegetation contains foraging, nesting, roosting and sheltering habitat for small, medium and large birds, arboreal mammals, as well as providing connectivity through cleared agricultural land. River provides foraging habitat for threatened and non-threatened microbat species. The river also provides foraging habitat for water birds, namely birds in the groups Anseriformes, Ciconiiformes and Coraciiformes.

4.4 Threatened fauna

Threatened fauna species identified during the ESS EIS surveys and those which were predicted to occur using the Biobanking Calculator are listed in Table 4-2. These include species known to be associated with the site's vegetation type in this Bioregion. Potential impacts to habitat of these species has already been considered under offset calculations for the BAR and clearing of potential habitat has been completed (refer to Section 1.2.1 above). There is a small potential for there to be incidental finds of these species in the construction area. None of these species has been identified as a requiring specific attention on site. All native fauna must be unharmed even if there are doubts to its identity.

Table 4-2 Threatened fauna recorded/predicted to occur in the TRIPS site

Common name	Scientific name	BC Act	EPBC Act	Recorded
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	-
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	-	✓
Varied Sitella	*Daphoenositta chrysoptera*	V	-	✓
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	-
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	-
Little Lorikeet	*Glossopsitta pusilla*	V	-	-
Little Eagle	*Hieraaetus morphnoides*	V	-	-
Square-tailed Kite	*Lophoictinia isura*	V	-	-
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	✓
Southern Myotis	*Myotis macropus*	V	-	-

Common name	Scientific name	BC Act	EPBC Act	Recorded
Turquoise Parrot	*Neophema pulchella*	V	-	-
Barking Owl	*Ninox connivens*	V	-	-
Powerful Owl	*Ninox strenua*	V	-	-
Scarlet Robin	*Petroica boodang*	V	-	-
Koala	*Phascolarctos cinereus*	V	V	-
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	✓
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	✓
Diamond Firetail	*Stagonopleura guttata*	V	-	-
Masked Owl	*Tyto novaehollandiae*	V	-	✓

4.5 Aquatic fauna

Species recorded in freshwater and estuarine habitats during investigations for the EIS, as well as those predicted to occur, are shown in Table 4-3 below.

One threatened aquatic fauna species, *Prototroctes maraena* (Australian Grayling), had previously been recorded in the Tuross River by NSW Fisheries in 2003/04. *Prototroctes maraena* was not detected in subsequent sampling or surveys for the EIS. The Aquatic Ecological Assessment (écologique 2017) prepared for the EIS determined that it was unlikely both that the Australian Grayling was present in the development site and that the development site was an important habitat for the species.

Table 4-3 Aquatic fauna recorded in the Tuross River

Common name	Scientific name	BC Act	EPBC Act
Short-finned Eel	*Anguilla australis*	-	-
Long-finned Eel	*Anguilla reinhardtii*	-	-
Plague Minnow	*Gambusia holbrookii**	-	-
Striped Gudgeon	*Gobiomorphus australis*	-	-
Firetail Gudgeon	*Hypseleotris galii*	-	-
Australian Smelt	*Retropinna semoni*	-	-
Mullet (juvenile)	*Mugil cephalus*	-	-
Freshwater Shrimp	*Paratya australiensis*	-	-

** denotes an introduced species*

The fisheries habitat classification for each of the waterways referred to above is provided in Table 4-4. TRIPS construction does not affect important fish habitats.

Table 4-4 Aquatic habitat in the TRIPS site

Waterway	Classification	Description
Tuross River	Class 1 Waterway, major key fish habitat (reference AE report)	Sand-bedded meandering river with an intermittent/ephemeral discharge regime. Limited cobbles and gravels. Adjacent vegetation = PCT SR608

4.6 Aquatic flora

Species recorded in freshwater and estuarine habitats during investigations for the EIS are shown in Table 4-5.

Table 4-5 Aquatic flora recorded in the Tuross River

Common name	Scientific name	BC Act	EPBC Act
Dense water weed*	*Egeria densa*	-	-
Spotted Knotweed	*Persicaria praetermissa*	-	-
Water Pepper	*Persicaria lapathifolia*	-	-

5 Environmental impacts

5.1 Bushfire

Fires affected the site of the storage area during the Summer 2019-2020 fires. The TRIPS site was unaffected and previous fire history is unknown. Construction activity constituting hot works will not occur in outside environments during times of total fire bans.

5.2 Ecological impacts

The biodiversity impacts associated with the Stage 2 – TRIPS construction is discussed in the EIS, BAR and Aquatic Ecology Report. Those relevant to the TRIPS construction are summarised in Table 5-1 below. As this area has already been cleared, this CFFMP only details management measures relevant to construction activities.

Table 5-1 Summary of potential impacts of the Stage 1 TRIPS site clearing to terrestrial ecology

Potential Impact	Details	Extent/Scale	Relevant mitigation measure
Fauna mortality.	May result from earthworks or collisions with vehicles or machinery.	Most likely during clearance activities.	Delineation of no-go zones. Fauna management protocols
Degradation of aquatic habitats.	Caused by changes in run-off, infiltration, pollution and erosion. May influence downstream habitats.	Short term changes in water quality which could impact aquatic ecology.	Erosion and sediment control. See CSWMP document.
Edge effects and weed invasion.	Vehicles and plant may transport weed propagules into the development site. Disturbed edges area vulnerable to weed establishment	Cleared edges adjacent to retained native vegetation.	Implementation of hygiene control points during site set up. Weed control and management.
Pests and pathogens.	Vehicles and plant may transport pathogens into the development site. Clearing of native vegetation and increased human activity increase the risk of pest animal species increasing.	May occur during construction and operational phases.	Implementation of hygiene control points during site set up.
Risks of the introduction and spread of water weeds.	Egeria densa (Leafy Elodea, Dense Waterweed, Egeria), a water weed is reasonably widespread in the TRIPS site.	Already present in the Tuross River. Risk is only to spreading to other water bodies	Hygiene control points to remove vegetation debris from any in-river equipment before leaving site.

5.3 Tree Hollow Loss

The remaining hollow bearing trees on the TRIPS site would not be cleared during the Stage 2 construction. A hollow-bearing tree and one large fallen log remain within the TRIPS post-clearing. The largest tree was retained specifically to save its high habitat value. Three hollow-bearing trees occur just outside the TRIPS clearing boundary. These have been identified and marked. The hollow-bearing tree that remains on site is to be managed so that direct impacts are avoided (Table 5-2).

Table 5-2 Tree hollow remaining in the TRIPS clearing boundary

	Hollow 1 size (centimetres)	Hollow 2 size (centimetres)	Hollow 3 size (centimetres)
Tree 1 (Retained)	20+	11-15	6-10

6 Mitigation and management measures

6.1 Vegetation management during construction

6.1.1 Environmental inductions

An environmental induction must be carried out by all contractors and subcontractors working on the site prior to works commencing.

Minimum points to include

- Importance and location of hygiene control points.
- Location of no-go zones and avoiding disturbing vegetation and fallen logs or rocks in these areas.
- Instructions to stop work and reporting unexpected fauna finds in the construction areas to the Site Engineer.

6.1.2 Hygiene control points.

Site set up includes establishing site access points located off Eurobodalla Road. Hygiene control points will be maintained at all site access points for tracked vehicles and machinery. A mixture of bleach to water with a ratio of 1:1 should be used for all wash down procedures in in line with best practice methods of managing the spread of Phytophthora cinnamomic and Chytrid fungus. Hygiene management protocols are detailed in Appendix A.

6.1.3 Delineation of No-go zones

'No-go zones' are any areas outside the designated boundary indicated in Figure 4-1 in Section 4.2 above. A clearing boundary was identified prior to clearance and 'No-go zones' marked with high visibility bunting. The Project Manager/Project Engineer/Site Supervisor must ensure this boundary marking remains in place throughout the construction.

The retained habitat trees on the site, (Tree 1), which can clearly be identified as being the largest tree on site has specifically been retained because of its high habitat value. The tree was flagged with high visibility bunting and identified for avoiding any damage. Excessive ground disturbance should also be avoided within its Tree Protection Zone (TPZ – which equates to 12 time the trunk diameter measured at a height of 1.4 metres above ground, as per *AS 4970-2009 Protection of trees on development sites*). Where possible, these protection measures must remain in position and intact throughout construction so that the TPZ for this tree is marked as a no-go zone.

Moreover, where weed control measures are to be used within the TPZ of this tree, it is recommended that a suitable herbicide chemical formula be used in consultation with an arborist and/or hand removal of weed species be used as preferred weed control measures.

6.1.4 Weed control and management

Weed control has been carried out prior to vegetation clearing for construction works. Ongoing weed control is required to prevent the seeding cycles of any weeds on disturbed areas prior to landscaping and revegetation. This is particularly given the case as the Stage 1 – Clearing of the Tuross River Intake Pump Station (TRIPS) site works commenced in first quarter 2020, whereas the Stage 2 - TRIPS construction is not scheduled to commence until fourth quarter 2020 at the earliest. This means that various weed species will have had sufficient time to re-establish themselves at the site in the interim. Moreover, earthworks activities during the Stage 2 - TRIPS construction works would lead to the disturbance and relocation of various weed species propagules throughout the site. Weed control measures would therefore be required to be employed at the site so that post-construction vegetation rehabilitation measures have a better chance of success.

Specific weed control measures are contained within Appendix A.

6.1.5 Erosion and Sediment Control

Erosion and sediment control measures will be implemented to minimise impacts to retained vegetation and waterbodies as a result of erosion and water runoff. The specific erosion and sediment control measures as detailed within the Construction Soil and Water Management Plan (CSWMP).

6.1.6 Retention of fallen logs and bushrock.

Fallen logs greater than 10 centimetres in diameter and bushrock greater than approximately 20 centimetres by 20 centimetres in size have been retained within, or adjacent to the clearing boundary. Where possible, these should not be removed during the construction phase. If construction activities require these to be moved, they should be moved

to retained vegetation while causing minimal disturbance of the no go zone with machinery. Should any fauna be found during the relocation process, it should be relocated in accordance with the protocols detailed in Section 6.2.

6.1.7 Preclearing surveys

This measure is included in the unlikely event that additional trees or vegetation require clearing during the construction phase. Immediately prior to clearance of any vegetation, pre-clearing surveys and inspections for threatened and non-threatened fauna must be conducted. The surveys and inspections, and any subsequent relocation of species and associated management measures, must be undertaken under the guidance of a suitably qualified and experienced ecologist. Mowing or slashing of regrowth in the areas already cleared during the initial clearing phase will not require preclearing survey or the involvement of an ecologist.

6.1.8 Additional vegetation clearing

This measure is included in the unlikely event that additional trees or intact native vegetation require clearing during the construction phase. It is not relevant to mowing or slashing of regrowth in the areas already cleared during the initial clearing phase of the TRIPS site. Vegetation clearing if required would take place as a two-stage process, with understorey and non-hollow bearing trees removed prior to habitat trees. This Section 6.1.8 pertains to the first stage of vegetation clearance. Vegetation clearance must be overseen by a suitably qualified ecologist. The following best-practice vegetation clearing methodology will be applied to the TRIPS site:

- Light vegetation (shrubs, herb, forbs and grasses) should be cut down to ground level. This could be achieved with either a slasher of flail mower
- Grubbing and soil disturbance should be avoided. Retained roots can assist in soil stabilisation and some regrowth and coppicing can assist in the rehabilitation stage post construction
- Slashed native vegetation, unless there is a specific need to remove, should be left in place
- Weed and exotic vegetation in seed should be removed and disposed of appropriately in order to prevent spread as required under the *Biosecurity Act 2015*. This would namely include the Honeysuckle and Blackberry vines
- Larger trees within 10 metres of the clearing boundary are to be cut down with a chainsaw, not pushed over. Trees are to be felled into the clearing boundary to minimise damage to retained vegetation. Trunks and roots are to be left in situ to minimise soil erosion
- Trees could be chipped, and the mulch used in windrows to control potential run off if appropriate and/or spread over disturbed earth to avoid soil erosion
- Larger timber can be removed from site. However, where practicable, some should be retained as fauna habitat. The ecologist present for habitat tree removal should be consulted during this process.

6.1.9 Habitat tree clearing

Again, this measure is only included in the unlikely event that additional habitat trees require clearing during the construction phase. These trees have been marked with an 'H' and/or flagged with flagging tape. Habitat tree clearance must be overseen by a suitably qualified ecologist. The following best-practice vegetation clearing methodology will be applied to the identified fauna habitat trees within the TRIPS site:

- Removal of understorey vegetation and non-hollow bearing trees will occur at least 48 hours before habitat trees are removed
- HBTs are felled in the following method:
  - HBT to be knocked or shaken with an excavator bucket or other machinery to encourage fauna to evacuate the tree immediately prior to felling
  - Pause and wait five minutes to give fauna the opportunity to escape
  - Repeat knocking or shaking HBT with excavator bucket
  - Pause and wait five minutes to give fauna the opportunity to escape
  - Using the excavator bucket, slowly lower the tree to the ground. Where feasible, HBT should be lowered in a direction or position such that damage to hollows are minimised
- Felled trees must be left for a short period of time on the ground to give any fauna trapped in the trees an opportunity to escape before further processing of the trees
- Felled hollow bearing trees must be inspected by an ecologist as soon as possible (not any longer than 2 hours after felling)

- Should fauna be observed either during the felling process or during the inspection by an ecologist, the tree should be retained in place for 24 hours to allow fauna the opportunity to move on during the night.

6.2 Fauna management protocols

6.2.1 General protocols

Stock piles or materials can be used as temporary shelter sites for some animals. Should fauna be observed by workers on the Project Area prior to or during the movement of materials, and there is a risk these activities may harm the animal or pose risk to site personnel, the following steps will be taken:

- Stop all work in the vicinity of the fauna and immediately notify the Project Manager/Project Engineer/Site Supervisor
- Preferably allow fauna to leave the area without intervention
- If the fauna cannot or will not leave the area without intervention, the fauna will be removed by contacting a licensed fauna ecologist or wildlife carer with specific animal handling experience as follows:
  - Cover larger animals with a towel or blanket and place in a cardboard box and/or canvas bag
  - Place smaller animals in a cotton bag, tied at the top
  - Keep the animal in a quiet, cool, ventilated and dark located away from noisy construction activities until it can be relocated
  - Aquatic fauna are to be placed in plastic aquaria or a plastic bag with sufficient amount of water. Frogs will be transported in moistened plastic bags (1 frog/bag) with a small amount of leaf litter. The translocation of frogs shall be in accordance with the Hygiene Protocol for the Control of Disease in Frogs (refer to Section 6.2.4 below for more details)
  - If the animal cannot be handled (i.e. venomous reptiles):
    - Exclude all personnel from the vicinity with fencing and/or signage
    - Record the exact location of the animal/s and provide to the Project Manager/Project Engineer/Site Supervisor or appropriate rescue agency (i.e., WIRES).

6.2.2 Injured fauna

Should fauna be injured during construction, the following steps will be taken:

- Call the appropriate rescue agency immediately and follow any advice provided by the agency
- Once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency
- In the event the rescue service and/or local veterinary service cannot be contacted, the injured animal will be delivered to the relevant agency as soon as practicably possible.

The relevant fauna rescue services and local veterinary surgeries contact details are listed in Table 6-1.

Table 6-1 Fauna rescue services' contact details

Agency/Business	Contact Number
WIRES	1300 094 737
Vet 1 – Narooma Veterinary Hospital	(02) 4476 1125
Vet 2 – Moruya Veterinary Hospital	(02) 4474 2532

6.2.3 Relocation of fauna

Relocation of fauna adjacent to the footprint will be carried out by a wildlife rescuer if self-relocation is not a suitable option. If the animal is not injured or stressed, it may be released nearby in an area that is not to be disturbed by the Stage 2 – TRIPS construction works, in accordance with the following procedures:

- Site identified as suitable release points by the a wildlife rescuer

- Release site will contain similar habitat and occur as close to the original capture location as possible
- If the species is nocturnal, release will be carried out at dusk
- Release would generally not be carried out during periods of heavy rainfall
- Hollow-dependent species, particularly those with dependent young, shall be released into a temporary nest box.

Adjacent riparian vegetation directly south of clearing site offers the best relocation site for most species. The area of riparian vegetation maintains some connection with native vegetation and is in closest proximity to Bodalla State Forest.

6.2.4 Important fauna handling information

It is important to consider the following information when handling fauna:

- Some animals require particular handling (e.g. venomous reptiles, raptors) and should only be handled by appropriately qualified personnel i.e., WIRES representative(s)
- If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus (ABL – a form of rabies)
- Any frog handling will be carried out in accordance with the Hygiene Protocol for the Control of Disease in Frogs (DECC 2008). This protocol recommends onsite hygiene precautions be carried out to minimise the transfer of disease between and within wild frog populations. Measures recommended include:
  - Thoroughly cleaning/disinfecting footwear and equipment when moving from one site to another
  - Where necessary in high risk areas, spraying/flushing vehicle tyres with a disinfecting solution
  - Cleaning/disinfecting hands between collecting samples/frogs (preference would be given to using bags, rather than bare hands to handle frogs). Limiting one frog or tadpole to a bag. Bags should not be reused.

6.3 Unexpected finds

If any threatened species are observed within the Project Area during the Stage 2 – TRIPS construction activities that were not identified within this plan, the following procedure will be followed:

- Immediately cease all work likely to affect the threatened species
- The Project Manager/Project Engineer/Site Supervisor shall contact the relevant representatives from Eurobodalla Shire Council to inform them of the situation
- The Project Manager/Project Engineer/Site Supervisor shall then contact the following stakeholders to determine the appropriate corrective actions and additional safeguards to be carried out:
  - DPIE ESS (131 555)
  - Others as instructed DPIE ESS
- The adequacy of existing safeguards will be reviewed in consultation with the above stakeholders
- Project Manager/Project Engineer/Site Supervisor to record find using the Environmental Incident Reporting process where required following consultation with Council representatives. All relevant characteristics of the find should be recorded to the extent practicable
- Following consultation with all relevant stakeholders, the Environmental Representative shall implement any corrective actions and additional safeguards
- Following confirmation by the Environmental Representative that all appropriate safeguards have been implemented, construction works shall recommence
- All relevant Project documentation would be updated to display the new findings and subsequent management measures required. This would include such documents as the CFFMP (and associated documents) and the CEMP.

6.4 Rehabilitation and re-vegetation

The very steep riverbank section of the Project Area provides some challenges for revegetation on account of accessibility. Retained rootstock of trees and shrubs and the existing surface soil profile are to be preserved as much as possible surrounding the excavation of the intake trench and access track and this is expected to contribute to some natural revegetation post construction. Additional direct seeding with local native grasses in conjunction with hydromulching could be considered if feasible on this embankment and in other disturbance areas.

A hydromulching seed mix containing the following species is proposed:

- *Bothriochloa macra*
- *Microlaena stipoides*
- *Poa labillardieri*
- *Lomandra longifolia*
- and companion grasses- Sterile Rye corn or Millet (depending on season), Perennial rye grass.

Direct planting of native grasses and sedges may be used in areas where hydromulching or direct seeding is not feasible. This could include planting appropriate grasses and sedges among the rocky rip-rap along drainage lines and around the drainage sump.

Revegetation surrounding the operational infrastructure will require alignment with the landscape subplan to be produced in latter stages of the Project to incorporate features such as asset protection zones and accessibility. Revegetation should incorporate the following requirements to be implemented by a qualified bush regeneration contractor.

2. It is noted that approximately 0.26 ha of vegetation was cleared during Stage 1 of the TRIPS (refer to Section 1.2.1 above). It is therefore recommended that revegetation at the TRIPS site be undertaken to achieve this quantum of native vegetation where it is reasonable and feasible to do so (noting the landform challenges presented by the finished TRIPS site may not allow this to be achieved). Use should be made of native trees, shrubs and ground covers adjacent to retained vegetation where reasonable and feasible to do so.
3. Re-vegetation should include local provenance species and include at least three tree species aligned to PCT 1108 and other plants from the TRIPS site identified in the BAR (EIS Appendix E). A list of suggested species meeting these criteria are provided in Table 6-2 below, although this should not be seen as prescriptive given potential limitation on locally available stock.
4. Areas within the clearing area required to be kept open for APZ or operational purposes, or impractical to plant with trees and shrubs will be seeded or planted with local native grasses and groundcoves.
5. Retained exotic lawn adjacent to Eurobodalla Rd can be maintained as is by mowing and managed toprevent weed spread.

Table 6-2 Potential revegetation species found on the site or suitable for the vegetation community.

Revegetation species
Trees
Angophora floribunda
Eucalyptus elata
Eucalyptus botriyodes
Eucalyptus muelleriana
Casuarina cunninghamiana
Shrubs and small trees
Melicytus dentatus
Breynia oblongifolia
Acacia mernsii
Trema tomentosa
Leptospermum trinervium
Ground covers
Lomandra longifolia
Microlaena stipodes
Carex longebrachiata
Echinopogon ovatus
Dianella caeurlea

6.4.1 Weed management

On-going maintenance weeding is required for the successful establishment of revegetation. A weeds and pathogens management sub plan are included in Appendix A.

7 Monitoring

7.1 Monitoring schedule

Monitoring activities for key mitigation and management issues during construction is outlined in Table 7-1. Monitoring obligations are expected to be extended beyond the timeframes below when incorporated into the Stage 2 CEMP.

Table 7-1 Monitoring schedule for Mitigation and Management Measures

Measures	Monitoring	Timing	Performance Measures	Who	Reporting
Avoid and minimise clearing impacts to native PCTs where possible.	Visual inspection of clearance activity	Regularly – at least weekly during construction	No clearing in no go zone.	Site Engineer	On site reporting
Clearing limits will be clearly marked to prevent unnecessary clearing or damage.	Inspection of protected vegetation demarcation.	All times	All no-go zones clearly demarked with bunting or similar zone.	Site Engineer	On site reporting
Identify the location of any 'No Go Zones' in site inductions.	Induction signature	At time of induction	Induction material contains this information.	Site Engineer	Induction records.
Rehabilitating and revegetating areas with species that are endemic to the area.	Ecological inspection assessing dominant species and mapping of revegetated areas.	Progressively during TRIPS construction and post construction prior to Quay Civil demobilising from site.	70% Native cover by 1-year post construction or suitable mulch or rock coverage if season unfavourable for seed growth which will assist the Applicant (Eurobodalla Shire Council) to meet the 70% native cover by 1-year post construction target, noting that Quay Civil is contracted to hand control of the site including revegetation activities back to the Applicant before the 1-year post construction point	Bush regeneration contractor	Regeneration progress reporting.
Control weeds and feral pests.	Inspection during construction by Site manager for outbreaks.	Seasonal checks for high threat weeds outbreaks	New weed outbreaks contained before spreading.	Bush regeneration contractor.	Regeneration progress reporting

Measures	Monitoring	Timing	Performance Measures	Who	Reporting
			Weed density below 10% cover over revegetation areas.		
Control feral pest	Feral sightings recorded – e.g. rabbits.	Incidental sighting during construction.	Feral species are identified, and management activated in consultation with Eurobodalla Shire Council.	Site Engineer or regenerating contractors.	On site reporting Project Ecologist annual reports
Appropriate vehicle wash-down and hygiene facilities to clean vehicles maintained.	Inspection of availability and functionality of the facilities	Daily during construction	All tracked vehicles and heavy machinery cleaned prior to arrival and when leaving site.	Site Engineer	On site reporting

Appendix A Weeds and pathogens management sub-plan

Hygiene measures and protocols

The following general weed management measures are to be adopted for the clearing works in the TRIPS site:

- Light vehicles and mobile plant should be brought to site in clean condition to prevent the introduction of new weeds or pathogens. Likewise, soil and plant material should be cleaned from vehicles before leaving the site in order to prevent the transport of weeds into areas outside the development site
- Vehicle wash bays equipped with a high-pressure water cleaner and backpack or handheld sprayer containing disinfectant solution will be established at vehicle access points. Prior to entering site, the vehicle or plant (namely wheels, chassis, undercarriage) must be cleaned with the high-pressure water cleaner or hard bristled brush to remove loose soil and weed propagules. The vehicle must then be disinfected for pathogens using the disinfectant solution
- Boot washdowns will be located adjacent to site offices and ancillaries and equipped with a tub filled with disinfectant solution and scrubbing brush. Prior to accessing the site, boots must be washed in the disinfectant solution with the scrubbing brush used to remove dirt and mud

Most measures to prevent the colonisation of weeds in disturbed areas are to be addressed in the construction and rehabilitation stages, including follow up weed treatment and monitoring. No pre-clearance management of weeds is seen as necessary other than the appropriate disposal of any material removed.

Priority weed control

Weeds that are listed as 'priority weeds' for the Eurobodalla Shire Local Government Area must be removed from the site or controlled depending on the category of weed and according to the provisions of the *Biosecurity Act 2015*. Priority weed control is to be carried out across the entire site for the duration of the management works recommended in the CFFMP. Works will be undertaken according to industry best practices.

Primary Weeding

Primary weeding is the first round of weeding activity and involves the removal of most of the weed biomass present (shown in Figure A-1 below). Primary weeding methods include:

- 'Cut-and-paint', 'frill and fill', long stem scrape or target spraying of woody weeds (e.g., *Grevillea robusta*)
- Hand-removal and spot spraying of smaller woody, vine and herbaceous weeds
- Spot-spraying and hand-weeding of annuals (e.g. Blackberry, Fireweed and *Bidens pilosa*).

Primary weeding was to occur prior to construction commencing, however the status of weed management is not presently known.

Secondary weeds

Secondary weeding will occur approximately one to three months after the completion of primary weeding, depending on the amount of regrowth of herbaceous annuals (and other weeds that have an abundant seed source present in the soil). This will vary according to the timing of the primary weeding, insofar as regrowth will be stronger if primary weeding occurs during spring and summer, and slower during autumn and winter. The need for secondary weeding will also depend on climatic conditions in the intervening period (eg periods of sustained rainfall will promote germination of weed seeds and require secondary weeding to occur sooner than it would under dry conditions).

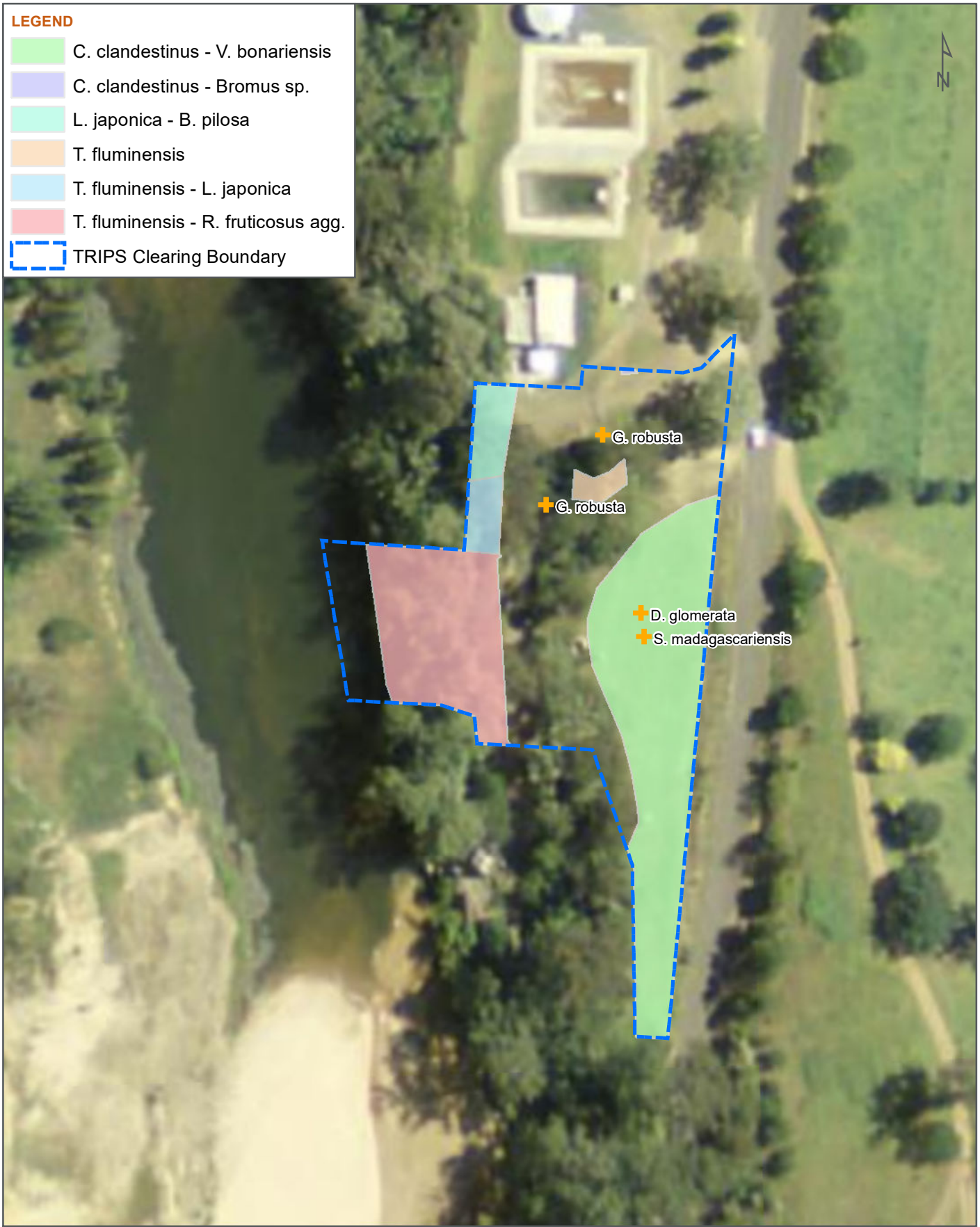
Secondary weeding will involve the targeted removal of priority weed regrowth and hand removal and spot spraying of exotic grasses, herbaceous weeds and seedlings of woody weeds.

Maintenance weeding

Maintenance weeding will occur after construction works and should target all exotic species in revegetation areas to reach a target cover of 10% exotic or less, with less than 2% priority weeds. Figure A-1 indicates the locations of weed infestations found prior to clearing. Propagules of some of these species are likely to result in regrowth during or following construction.

Herbicide Application

Herbicide applications by cut and paint, frill and fill, long stem scrape or spray will mainly use Glyphosate (or equivalent). Treatment of some noxious weeds species or grass weeds may require selective or residual herbicides. The use of herbicides on the site must be in accordance with labelling instructions and MSDS's and comply with the NSW Pesticides Act 1999. Herbicides should generally be applied when wind speeds are generally low. Where possible herbicide application should take place after two consecutive days with no rain; application should be delayed if rain is forecasted. Appropriate PPE should be worn during herbicide application.



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COORDINATE SYSTEM GDA 1994 MGA Zone 56

FIG NO. 4

FIGURE TITLE Weeds and Exotic Flora

PROJECT NO. 30012466

PROJECT TITLE Eurobodalla Southern Storage TRIPS CFFMP

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