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**Additional Crossing of the Clarence River at Grafton SSI-6103  
MCoA D1 – Biodiversity Offset Statement.**

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Dear Michael

I refer to the Planning Approval SSI-6103 dated 19 December 2014 for the Additional Crossing of the Clarence River at Grafton.

In accordance with MCoA D1, Transport for New South Wales is submitting the Biodiversity Offset Statement.

The Biodiversity Offset Statement has been developed in consultation with the EPA and Clarence Valley Council throughout the project and discussed on a regular basis during the monthly ERG's.

A copy of the Biodiversity Offset Statement was provided to the EPA in September 2019 for review, the EPA raised no major issues with the Biodiversity Offset Statement. Refer to Appendix 4 of the Biodiversity Offset Statement for details. A final copy will be provided to the EPA as part of this submission.

Clarence Valley Council were also consulted as part of the detailed design for the project, in particular the Landscape Design which included components for revegetation that has been captured in the Biodiversity Offset Statement to offset any impacts.

If you have any further questions, Mr Brett Tribe, Resident Engineer, Grafton Bridge, would be pleased to take your call on 0429 447 179. I hope this has been of assistance.

Yours sincerely



**Greg Nash**  
A/Project Director W2B, Northern Project Office

**Attachment**

- Additional Crossing of the Clarence River at Grafton Biodiversity Offset Statement July 2020.

# Additional Clarence River Crossing Grafton Bridge Biodiversity Offset Statement

July 2020



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## GLOSSARY

BOS	Biodiversity Offset Statement
CVC	Clarence Valley Council
DPI&E	Department of Planning Industry and Environment
EEC	Endangered Ecological Community
EIS	Additional Crossing of the Clarence River at Grafton Environment Impact Statement August 2014
EPA	Environment Protection Authority
MCoA	Ministers Condition of Approval
TTSTS	Three-toed snake-tooth skink
TEC	Threatened Ecological Community
TfNSW	Transport for New South Wales
UDLMP	Urban Design and Landscape Management Plan

## 1. Background

The Additional Crossing of the Clarence River at Grafton (the Project) is delivering a key piece of infrastructure as part of New South Wales regional road network improvements. This State and Federally funded Project improves the linkage between the township of Grafton and the Pacific Highway and Gwydir Highway to the East.

The main components of the Project identified in the Project's Environmental Impact Statement are:

- Construction of a new bridge over the Clarence River about 70 metres downstream (east) of the existing road and rail bridge (which is to be retained), comprising two traffic lanes.
- Construction of new roads and upgrades to existing roads to connect to the new bridge.
- An approach viaduct, about 64 metres long, on the South Grafton side of the Clarence River and 29 metres long on the Grafton side.
- Flood mitigation works, which include raising the height of sections of the existing levee upstream from the new bridge in Grafton and South Grafton.
- Construction of a stormwater detention basin and pump station in Grafton to manage local flooding.
- Public utilities adjustment.
- Ancillary facilities required for the construction of the Project, including some or all of the following: site compounds, concrete batching plant, pre-cast facilities, and stockpile areas for materials and temporary storage of spoil and mulch.
- Covers an area of approximately 50 hectares of which 0.4 ha is native vegetation with the remainder a mixture of planted vegetation, grazing lands and hard surfaces relating to infrastructure.
- Native vegetation with potential to be impacted consists of:
  - Freshwater Wetlands on Coastal Floodplains TEC (0.10 ha).
  - Subtropical Coastal Floodplain Forest TEC (0.31 ha).
- Works within areas showing a high level of previous soil disturbance related to infrastructure development and flood protection works.

### 1.1 Purpose of this Offset Statement

The Project is subject to State Minister's Conditions of Approval (MCoA). This Biodiversity Offset Statement specifically addresses Transport for New South Wales approach to meeting MCoA D1 which requires that:

*Prior to the commencement of operation of the SSI, the Proponent shall prepare a Biodiversity Offset Statement in consultation with the EPA. The Statement shall:*

- confirm the threatened species, communities and their habitat (in hectares) cleared and their condition; and*
- provide details of measures to offset impacts of the SSI on native vegetation, including threatened species, communities and their habitats, including the timing, responsibility, management and monitoring, and implementation of the offset measures.*

*Biodiversity impacts shall be offset in accordance with the document Principles for the Use of Biodiversity Offsets in NSW (DECCW, 2008). A copy of the statement shall be submitted to the Secretary and EPA".*

Table 1 outlines where MCoA D1 and other relevant MCoA and Project commitments are addressed within this Statement.

Table 1. Minister's Conditions of Approval and other Environmental Management Measures (EMM's) addressed in this Statement.

MCoA or EMM	Requirement / commitment	Sections of this Statement
MCoA B1	<i>The clearing of native vegetation shall be generally in accordance with the areas specified in the documents listed in condition A2, and with the objective of reducing impacts to any endangered ecological communities (EECs), threatened species and their habitat to the greatest extent practicable.</i>	Section 2.1 & 2.2
MCoA B3	<i>The Proponent shall undertake flora and fauna surveys of those parts of the Project area previously not surveyed, due to accessibility issues, prior to the commencement of construction that affects those areas. Should threatened species, communities or habitats be identified, these shall be offset and addressed in the Biodiversity Offset Statement required under condition D1.</i>	Sections 2 & 3
MCoA B4	<i>The Proponent shall undertake a targeted rehabilitation program post construction to restore riparian habitat to at least the pre-construction condition or better, unless otherwise agreed by DPI (Fisheries) and NOW.</i>	Sections 3 & 4
MCoA B5	<i>Vegetation shall be established in or adjacent to disturbed areas and include species which may provide habitat for wildlife following the completion of construction in the vicinity of the disturbed area Revegetation is to be consistent with the Urban Design and Landscape Plan required under condition D42</i>	Section 3 & 4
MCoA D1	<i>Prior to the commencement of operation of the SSI, the Proponent shall prepare a Biodiversity Offset Statement in consultation with the EPA. The Statement shall: (a) confirm the threatened species, communities and their habitat (in hectares) cleared and their condition; and (b) provide details of measures to offset impacts of the SSI on native vegetation, including threatened species, communities and their habitats, including the timing, responsibility, management and monitoring, and implementation of the offset measures. Biodiversity impacts shall be offset in accordance with the document Principles for the Use of Biodiversity Offsets in NSW (DECCW, 2008). A copy of the statement shall be submitted to the Secretary and EPA”.</i>	This document
EMM B1	<i>Disturbance and clearing of native vegetation will be minimised, particularly avoiding and minimising vegetation removal wherever possible through the detailed design process. Detailed design will investigate opportunities to retain the two hollow bearing and five habitat trees identified within the Project area. A revegetation management sub-plan will be developed as part of the flora and fauna management plan to revegetate with species suitable for the creation of hollows and foraging resources. Strategies to compensate for the loss of hollow bearing/habitat trees will focus on revegetation and rehabilitation activities along riparian and adjoining areas.</i>	This document and the Project’s Urban Design Landscape Management Plan (UDLMP)
EMM B2	<i>As part of the flora and fauna management plan, a revegetation management sub-plan will be developed to provide specific details for the re-establishment of native vegetation on areas disturbed by the Project construction. This plan will be developed in accordance with Transport for New South Wales Biodiversity Guidelines (RTA, 2011) and the design principles identified in Appendix L, Technical Paper: Flora and Fauna Assessment of the EIS. It will also include details for the regeneration and rehabilitation of areas with a focus on riparian areas within the Project area with reference to Guide 3, Guide 6 and Guide 10 of the Transport for New South Wales Biodiversity Guidelines. The plan will include objectives to incorporate local native species across all revegetation and landscaping efforts along the Clarence River and in the adjoining Project area. This will include species consistent with freshwater wetlands on coastal floodplain and sub-tropical coastal floodplain forest threatened ecological communities species composition, which could potentially provide foraging resources and roosting to threatened fauna species, and increase corridors and connectivity throughout the landscape. This plan will be developed in consultation with OEH.</i>	Construction Flora and Fauna Management Plan and the Revegetation Strategy included in the UDLMP. This Offset Statement addresses riparian revegetation and threatened species habitat restoration and augmentation.



EMM B12	<i>Direct disturbance of aquatic fauna and riparian zones will be minimised in accordance with Transport for New South Wales Biodiversity Guidelines – Guide 10 Aquatic habitat and riparian zones (2011).</i>	This document
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## 1.2 Objectives and desired biodiversity outcomes of this Biodiversity Offset Statement

The objective of the Biodiversity Offset Statement has been prepared to identify mitigation and offset measures that aim to achieve a neutral or net beneficial biodiversity outcome for any threatened species and endangered ecological communities likely to be impacted directly or indirectly during construction and operation of the Project. In order to achieve this objective this Biodiversity Offset Statement details how Transport for New South Wales aims to:

- Maintain or improve biodiversity values;
- Meet the requirements for offsets as specified in the MCoA;
- Implement a process for setting a scope and quantum for offsetting Project biodiversity impacts that is transparent and justifiable on environmental, social and economic grounds i.e. value for money.

## 1.3 Consultation

The formulation of the measures included in this Statement have been undertaken through ongoing consultation with the Environment Protection Authority (EPA), Department of Primary Industries (Fisheries) and Clarence Valley Council. Details of consultation undertaken are included at Section 5.

## 2. Project impacts

The following section provides information on:

- the predicted level of impact on biodiversity as detailed in the Project’s EIS working paper (*Additional Crossing of the Clarence River at Grafton Appendix L – Technical Paper: Flora and fauna assessment*, August 2014) (refer Section 2.1); and
- the actual area of native vegetation and threatened species habitat cleared as part of the Project following design refinement (refer Section 2.2).

### 2.1 EIS estimated Project clearing impacts

The Project traverses a highly modified landscape comprising a mixture of urban, agricultural, industrial and infrastructure lands. As such, the EIS identified that there was very limited native vegetation within the Project and any native vegetation present was considered to be in poor condition due to past disturbances, levels of fragmentation and weed infestation.

The EIS details both areas of native vegetation and areas of exotic and native plantings potentially impacted across an area of 36 ha either side of the Clarence River at Grafton. The EIS considered that impacts that may result from the removal of exotic and native plantings were mainly visual impacts and minor loss of potential habitat for some threatened species. The loss of native and exotic plantings and any associated potential impact has been addressed through the Urban Design and Landscape Plan (UDLP). The UDLP includes a Revegetation Strategy that incorporates measures to rehabilitate and augment native vegetation within the Project. The outline of the UDLP is discussed in Sections 3 and 4. The remainder of this Offset Statement focuses on the Project’s impact on native vegetation and threatened species habitat and measures being employed to mitigate these impacts.

To accommodate the footprint of the Project and to allow for its construction, the EIS identified a total area of 0.41 ha of remnant native vegetation that was considered likely to be impacted. This consisted of small disjointed areas of riparian vegetation along the edge of the Clarence River and small fragmented areas of vegetation on the adjoining floodplain (refer Table 2). Both vegetation communities identified are consistent

with State listed Threatened Ecological Communities on floodplains of NSW north coast - based on their floristic components and landscape position. Both communities within the Project and surrounding floodplains have been subjected to extensive previous disturbances.

Table 2. Areas of native vegetation predicted to be impacted at the EIS stage, including the mainline work zones, ancillary sites and levee work zones.

Ecological community	Total Clearing (ha)
Freshwater Wetlands on Coastal Floodplain TEC	0.10
Sub-tropical Coastal Floodplain Forest TEC	0.31
<b>Total</b>	<b>0.41 ha</b>

## 2.2 Actual clearing areas

Through design refinement, including bridge pier skirt design and setbacks, levee bank refinements and through applying construction methods consistent with the *Biodiversity Guidelines: Protecting and managing biodiversity on RTA Projects* (RTA, 2011), the area of native vegetation required to be cleared by the Project was reduced by around 87% from about 0.4 ha to about 0.05 ha.

Impacts to the Freshwater Wetlands on Coastal Floodplain community were reduced by 44% or 0.044ha while direct impacts on Sub-tropical Coastal Floodplain Forest community were eliminated altogether (refer Table 3).

Table 3. Areas of native vegetation cleared by the Project including the mainline work zones, ancillary sites and levee work zones (April 2018).

Ecological community	Total EIS predicted clearing (ha)	Total actual clearing (ha)	Saving (ha)
Freshwater Wetlands on Coastal Floodplain TEC	0.10	0.056	0.044
Sub-tropical Coastal Floodplain Forest TEC	0.31	0	0.31
<b>Total</b>	<b>0.41</b>	<b>0.056</b>	<b>0.354</b>

The impacted native vegetation was part of an area of 0.17 ha of riparian vegetation removed by the Project. Of this 0.17ha, about 0.12ha consisted of exotic weeds, plantings and mown areas.

The majority of clearing works required for construction were completed between November 2017 and May 2018 with some minor incidental clearing being undertaken after this period.

A total of 8 hollowing bearing trees and 32 hollows were assessed as likely to be impacted by the construction of the Project. The majority of these hollows were considered likely to be suitable for microbat species. During the clearing process however it was identified that no hollows would be cleared that were suitable fauna habitat.

Also refer to the attached Project levee clearing maps in Appendix 2

## 2.3 Threatened Species impacts

The Project EIS investigated potential impacts on a range of threatened species known or predicted to occur within the Project's impact area. Given that the Project occurs within a predominantly industrial and residential urban landscape, the range of threatened species potentially present was significantly reduced due to the highly disturbed environment and lack of suitable habitat. Despite this, 7 micro-bat species, and the Three-toed Snake-tooth Skink (*Saiphos reticulatus*) (TTSTS) were recorded within the Project area during biodiversity assessments.

Eleven EP&A Act Assessments of Significance and 5 EPBC Act Significant Impact Criteria Assessments were undertaken as part of the EIS for individual species or groups of species with similar habitat requirements. These assessments determined that the Project would be unlikely to have a significant impact on any threatened species. It was however noted that there was some potential for a significant impact on the TTSTS which is listed as Vulnerable under both the Biodiversity Conservation Act (BC Act) and EPBC Act and that further investigation of the occurrence of this species was warranted before making a final determination.

### 2.3.1 Three-toed Snake-tooth Skink (*Saiphos reticulatus*)

Following survey work undertaken during the EIS and as a result of recommendations that were incorporated into the MCoA, Transport for New South Wales commissioned Lewis Ecological to undertake extensive surveys of the potential population area of the TTSTS in 2016.

These investigations confirmed the presence of the species throughout the township of Grafton on the northern bank of the Clarence River. Despite some potential marginal habitat, the species has not been recorded on the southern bank of the Clarence.

A total of 3.22 ha of at least moderately suitable TTSTS habitat was identified within the Project work areas. Of this area, 2.41 ha were impacted by temporary works for a short duration (2 weeks) during levee improvement works. These impacts were minor in nature with no individuals impacted during the construction period.

The remaining 0.81 ha of suitable TSSTS habitat was impacted to accommodate the bridge and associated road connections. These impacts were considered to be more permanent and therefore required further consideration of measures that could be employed to minimise and mitigate impacts. Suitable skink habitat areas identified encompassed both remnant native vegetation and highly modified habitats, with the majority of habitat occurring in the later.

Lewis (2016) determined, following these investigations, that the Project would be unlikely to have a significant impact on the population of TTSTS that occurs in Grafton. It was noted that as the species persists in highly modified habitats where ongoing disturbance occurs, it would be likely to be tolerant to the range of disturbances resulting from the Project's construction. Based upon this, the range of mitigation measures proposed to be implemented during construction and operation and as incorporated into the Project's Urban and Landscape Design Plan were considered more than adequate to compensate for the loss of a small area of suitable habitat. Refer to Section 3 for the mitigation measures that are being implemented.

As a precautionary measure Transport for New South Wales referred the Project to the Department of Environment (DoE). After considering the findings of the TTSTS survey work undertaken by Lewis (2016), DoE were satisfied that the Project was not a Controlled Action.

### 3. Management of Biodiversity Impacts

The following sections detail measures to offset impacts of the SSI on native vegetation, threatened species, communities and their habitats, including the timing, responsibility, management and implementation of the offset measures

#### 3.1 Biodiversity Mitigation Measures

The Project was approved as State Significant Infrastructure under Part 5.1 of the NSW Environmental Planning and Assessment Act 1979 (SSI-6103) on 19 December 2014. The Project approval conditions included the requirement to develop a range of management plans that would be implemented during construction and operation of the Project for the management of impacts on native vegetation and threatened fauna or flora that may be identified. These plans included:

- Biodiversity Monitoring Program
- Bat Management Plan
- Construction Flora and Fauna Management Plan
- Construction Soil and Water Quality Management Plan
- Nest Box Management Plan
- Three-Toed Snake Tooth Skink (*Saiphos reticulatus*) Construction Management Plan
- Urban Design and Landscape Plan
- Weed Management Plan

To provide relevant information for these plans and to meet plan requirements, ecological assessment and monitoring has been carried out throughout the development and construction phases of the Project. Where necessary, monitoring will continue until landscaped and rehabilitated areas have suitably established.

In addition to EIS/SPIR ecological assessments, further surveys were completed between 2014 and 2016 prior to commencement of the Project's construction. These assessments refined and expanded upon previous studies and guided the development of plans to manage the one threatened species known to inhabit the construction footprint - Three-Toed Snake Tooth Skink.

The EIS considered the need for offsets to impacts on native vegetation and threatened species habitat in accordance with Offset Guidelines and MCoA. Assessments of Significance undertaken as part of the EIS for a range of species and the two threatened ecological communities predicted or recorded on the Project, and later studies by Lewis Ecological for the TTSTS, determined that the Project would not have a significant impact on any State or Federally listed species, population or ecological community.

In accordance with Transport for New South Wales Guideline for Biodiversity Offsets (2016), where an impact on a Threatened Ecological Community does not meet threshold levels on a number of attributes and where the action has been determined to not have a significant impact on a threatened matter by DP&E or DoE&H, then formal offsets will not be required. The EIS considered that as the two State listed threatened communities were less than 1 ha in each case and that both communities were in poor condition and in an isolated location, there would be no additional offset required beyond the range of mitigation measures that would be incorporated into the Project.

Transport for New South Wales proposed to adopt a range of mitigation measures to offset Project impacts and address the removal of poor condition native vegetation. These included:

- A comprehensive and sensitive Urban Design and Landscape Management Plan (refer section 3.1.2)

- Implementation of a Three-toed Snake-toothed Skink habitat augmentation program within the modified landscapes surrounding and within the Project.
- Restoration or re-establishment of the degraded Freshwater Wetland TEC within the disturbed footprint of the project, focusing on the northern and southern river banks as part of the UDLP.
- Installation of nest boxes to replace tree hollows lost through tree removal
- Restoration works along the southern bank of the Clarence River and Alipou Creek in areas beyond and adjoining the Project.

### 3.1.1 Reduced clearing footprint limits

Through a combination of detailed design refinements and strict clearing limits established during construction, the overall native vegetation clearing required for the Project has been reduced by around 90%. Under the current configuration, the overall clearing of native vegetation has reduced to around 0.049 ha (490 m<sup>2</sup>) from the original predicted impact of around 0.41 ha (4100 m<sup>2</sup>) as approved in the MCoA. As the Project is still under construction this figure is likely to be further revised and may result in an increase or decrease in the final clearing which will be accounted for in any future updates to this Offset Statement. Despite this, the Project is unlikely to require further clearing of native vegetation.

### 3.1.2 Urban Design and Landscape Plan

The UDLP incorporates a range of plantings to replace both native vegetation communities and exotic and native plantings removed during the Project's construction, refer to Figures 1 (a-e) for excerpts from the UDLP. The plan will result in an increase in the overall revegetated/ landscaped areas in both Grafton and South Grafton including:

- 0.44 ha riparian zone vegetation plantings and dryland grasses comprising representative species from pre-existing vegetation communities, including the TEC Freshwater Wetland. The list of species to be installed expands upon the limited range of species that were present in the low quality and exotic dominated vegetation that was present on the site.
- 2.34 ha of garden bed plantings of predominantly native and trees and shrubs;
- Establishing 0.2 ha of TTSTS suitable habitat that will be vested to Council;
- A further 4.44 ha of grassland plantings; and
- Use of native species including a selection of those removed and those that form part of relevant vegetation communities being impacted. These include plantings of:
  - Around 9,000 trees and shrubs, most of which are native species.
  - Around 45,000 grasses and groundcovers.

All planting areas would provide, to a greater or lesser extent, suitable habitat for TTSTS. The use of thick mulch layers and plant species that would provide either a dense canopy or ground layer are measures that have been introduced to provide the specific microhabitat needs of this species. This species has been demonstrated to successfully colonise the range of modified habitats present throughout Grafton and with the measures in the proposed UDLP the skink is considered highly likely to recolonise the site. This includes at least 1.9 ha of vegetation on the Grafton side of the Clarence.

The UDLP specifically includes a range of plant species that will provide habitat for other fauna groups and threatened species. Overtime the development of a mixed tree canopy will re-establish and expand feeding and roosting opportunities within the Project footprint. This is being complemented by shrub and groundcover plantings and riparian plantings that will provide habitat for a range of ground dwelling species. Revegetated areas aim to provide linkage to other areas of suitable vegetation beyond the Project Boundary that would allow for fauna movement pathways.

Table 4. Quantity of tree, shrub, grass and groundcovers in landscaped and riparian revegetation areas (UDLP April 2018, plus amendments to riparian plantings).

	Tree and shrubs (number)	Groundcovers and grasses (number)	Area revegetated (ha)
Grafton	4,359	15,740	1.63
South Grafton	4,608	29,110	5.16
Riparian area revegetation	861	3,230m <sup>2</sup>	0.445

The overall area proposed to be revegetated will cover around 7.2 ha and includes vegetation that will provide a range of feeding and roosting opportunities for a wide range of species.

The bridge abutments have been set back from the low flow shoreline of the Clarence River and through a combination of planting and natural recruitment it is expected that species characteristic of Freshwater Wetland on Coastal Floodplain TEC will re-establish within the river's riparian zone. This setback also provides opportunities for terrestrial fauna movements along the Clarence River corridor with vegetation plantings providing refuge in an otherwise predominantly cleared landscape, refer below to Figures 1 (a-e).

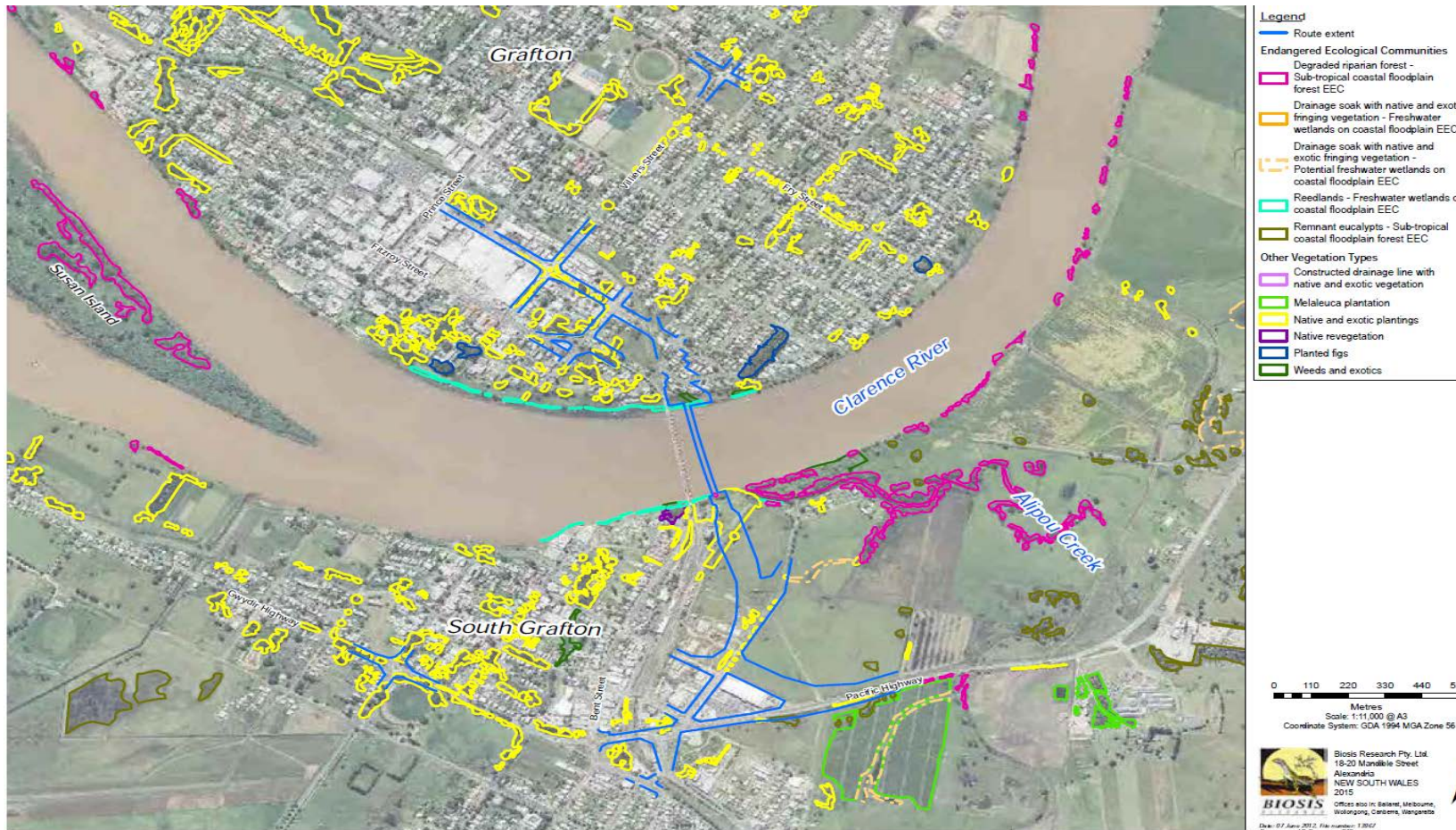


Figure 1 a). Existing native vegetation and native and exotic plantings surrounding the Project (Biosis, 2015).j







Fig. 5-37: Revised Greaves Street Precinct plan showing additional housing blocks, infiltration area under bridge and relocation of pump station and generator to improve overall outcome.



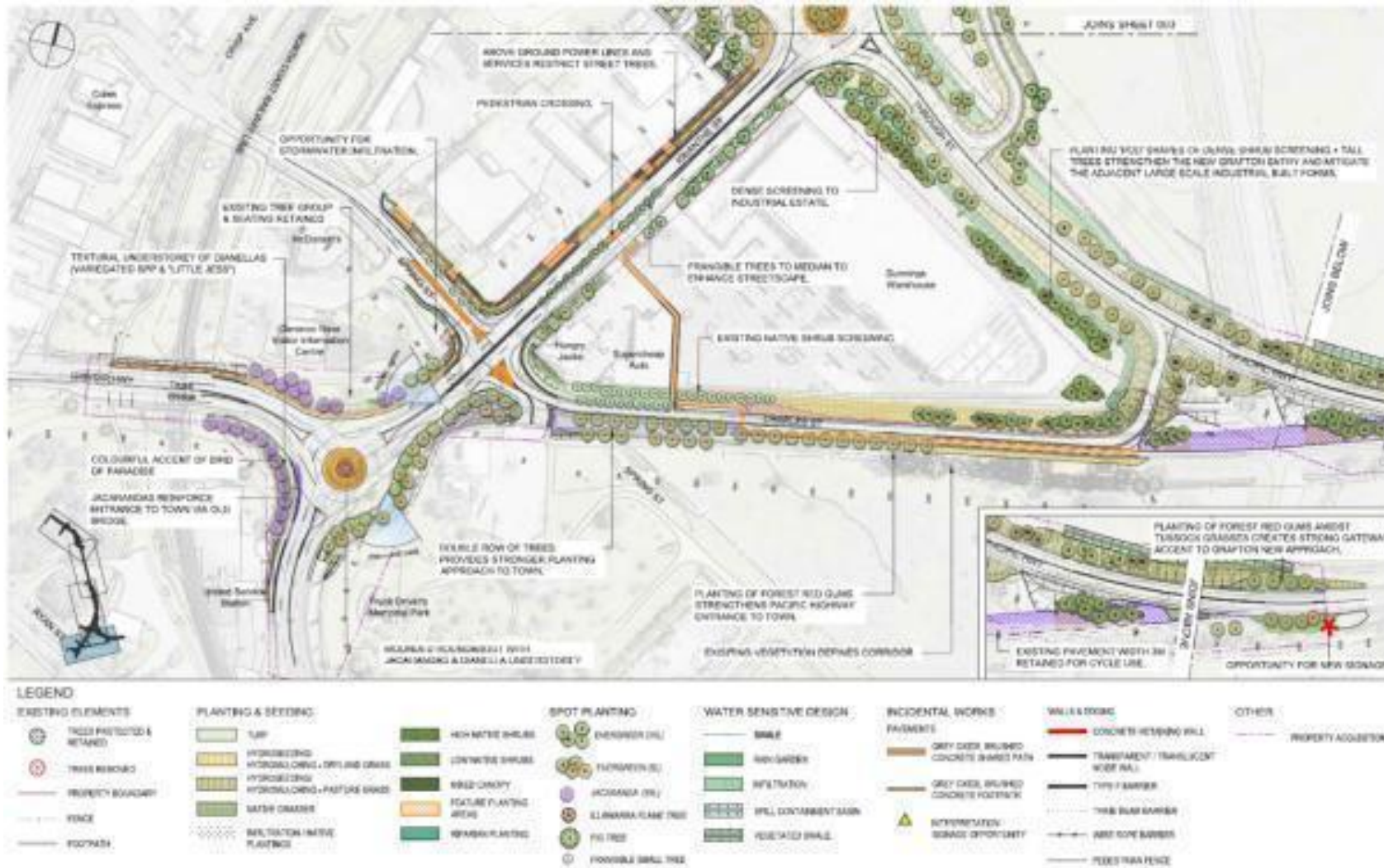


Fig. 5.71 - Urban and Landscape Design Plan (Street 5) - Asenby Street Parallel Highway Design Project (Scale: 1:2000)

Figures 1 c) - e) from the UDLMP indicating the extent of landscaping within the Project corridor.

### 3.2 Measures to manage and reduce impacts on Three-toed Snake-tooth Skinks

The Project has implemented an extensive ecological survey program to ensure that impacts on the Three-toed Snake-tooth Skink (TTSTS) are minimised. The mitigation measures, as described in the approved Three-toed Snake-tooth Skink Construction Management Plan, included:

- Pre-construction and construction surveys by an appropriately qualified and experienced ecologist to minimise the impact on individuals that may occur within the construction footprint and associated access points;
- Installation of temporary exclusion fencing during construction;
- Identification of suitable relocation sites or, where there would only be short duration impacts, holding facilities until TTSTS could be re-released into the disturbed trap sites; and
- Establishing and documenting guidelines for the augmentation of suitable TTSTS habitat within the Project and its urban surrounds.
- Monitoring of retained skink habitat to maintain suitable habitat and where possible release of skinks within the enclosures.

To date during construction, the Project has successfully implemented the above proposed mitigation measures. Lewis (2016) also included the provision to update mitigation measures as and where needed if additional information becomes available. Through this process the Project has implemented additional measures including:

- Additional on ground surveys well ahead of the construction program, this included extensive two person pre-clearing surveys throughout the work area;
- Evening and night surveys to locate skinks ahead of construction;
- The use of standard and innovative trapping techniques – pitfall traps, funnel traps, and traps with run diversions;
- Extensive site personnel training resulting in an additional individual skink being identified by site crews during works; and
- Extending the requirement for relocating skinks to alternative suitable habitat due to the required carrying capacity of the enclosures not being exceeded. Further suitable habitat areas were established under the guidance and recommendations of the Project Ecologist and EPA Biodiversity Unit.

As a result of the above measures a total of 50 TTSTS were identified during survey work within the Project and surrounding urban areas of Grafton. This extensive survey effort has substantially increased the knowledge of the requirements of this species which will allow Council and other governing authorities and residents the ability to factor in its habitat requirements when planning future developments.

### 3.3 Retained areas for Three-toed Snake-tooth Skinks and improved habitat

All captured skinks were released into relocation areas identified by the Project ecologist. In order to maximise the suitability of the sites, the Ecologist's recommendations were adopted to augment existing conditions through the addition of cane mulch, coir fibre, site mulch/ leaves and additional planting of suitable native species. Where necessary, to limit the potential for predation or road kill within the urban surrounds, skink exclusion fencing was installed to limit both above and below ground travel away from relocation sites. Refer details in Figures 2 (a to d) and 3 below.

Further monitoring of the retained TTSTS habitat enclosures established as part of the project have discovered a TTSTS hatchling in one of the enclosures located in close proximity to a high activity construction site. This has shown that a self-sustaining population may exist during an intense construction period with good management practices.

Refer details in Figures 2 (a to d) and 3 below.



Figure 2 (a – d) Restoration and rehabilitation of Three-toed Snake Tooth Skink relocation areas adjoining the Project. Temporary fencing has been installed to limit potential movement onto adjoining roads.



Figure 3. Three-toed Snake-tooth Skink being successfully released into mulched garden beds adjoining the Project.



Figure 4. Landscaped areas where the microhabitat requirements of the Snake-toothed Three-toed Skink have been incorporated into the design. An additional 0.21 ha riparian vegetation will be planted within the existing skink habitat area shown here as a dashed line.



Figure 5 Improved garden beds in Fitzroy Street, Grafton with mulching and expansion of the area suitable for Three-toed Snake-tooth Skink guided by the Project ecologist.

TTSTS have been successfully relocated to a number of areas adjacent to the Project. Relocation areas were identified by the Project ecologist and agreed with adjoining residents. The relocation areas are outlined in Figure 7



TTSTS relocation areas were set up at 8 sites adjoining the Project in Grafton. Sites were selected based on identified suitable habitat or areas that could be rehabilitated to be suitable habitat and sites that were acceptable to adjoining residents.

Given the close proximity of the sites to the Project, it is expected that through the Project's landscaping and revegetation program, TTSTS from the release sites will be able to recolonise the Project area.

Upon completion of bridge and connecting road linkages, areas of the Project that are not dedicated hard surfaces will be progressively landscaped and revegetated. After consultation with EPA and consultant ecologists, the Urban Design and Landscape Management Plan was refined to ensure that areas on the Grafton side of the Clarence River that could provide more suitable TTSTS habitat will be maximised. This included revisions to ensure the interlinking of mulched garden beds across the flatter parts of the areas surrounding the bridge and intersecting roads - where a more moist friable soil profile was considered likely to develop. Mulched garden beds will be installed that link from the northern extent of the road connections through to the foreshore areas of the Clarence River. Plantings proposed include both canopy species - that will overtime develop to provide shade and leaf litter - and shrubs and grass that will provide refugia to accommodate skink movement pathways, refer to Figure 7.

Given the skink's habitat preference for sites with higher levels of moisture (Lewis, 2016), the Project's water sensitive landscape design elements such as vegetated swales, infiltration areas and low native grasses that border infiltration areas are other prime sites that have been specifically configured to maximise potential for skink re-colonisation.

Despite no TTSTS recorded on the south Grafton side of the Clarence River, either within or adjoining the Project, riparian area plantings are planned that may in the future provide suitable habitat. These planting areas will offer similar habitat attributes to those on the northern side of the Clarence River. It was considered that the existing habitat present prior to the Project's construction was likely to be unsuitable for skink colonisation and that the proposed plantings may present opportunities for future establishment of a population on the southern side of the river.

### 3.4 Other Project fauna and flora measures

To compensate for the removal of 32 identified habitat hollows, 32 nest boxes were installed in agreed locations close to the Project. The ratio of 1:1 installations compared to hollows removed is consistent with the approved Nest Box Management Plan (2016). Nest boxes were progressively installed prior to construction commencing or any associated impact upon existing hollows. Results of hollow checks undertaken during the project's clearing works, as reported in Compliance Report number 2, concluded that there were no significant hollows suitable for larger fauna and where minor hollows occurred they were occupied by exotic species such as Asian house geckos. In effect then, this has resulted in an additional 32 potential hollows being provided for a range of fauna species that were not present prior to commencement of the project.

Weed management has been undertaken during the Project to manage both existing weed loads in areas that have not been cleared within the Project Boundary and in stockpiled soils that will be used as part of the landscape and rehabilitation of the site. Weed management will continue throughout the Project both within the Project's footprint and adjoining rehabilitation sites along the edge of the Clarence River.



Figure 6. Nest box installation on the Project

### 3.5 Riparian revegetation

To replace and offset the degraded remnant riparian revegetation removed by the Project, the UDLMP (2018) incorporates planting of a greater area and greater number of representative species from the relevant vegetation communities than impacted. In addition, as the removed habitat was in a similar condition to adjoining areas along the edge of the Clarence River, it is expected that over time, through seed dispersal, other species will re-establish.

## 4. Additional offset requirements for the Project

### 4.1 Offsetting options considered

A range of approaches to offsetting the Project's impacts on native vegetation and threatened species habitat were considered as part of the design process. Given the limited nature of impacts and no Significant impact considered likely on any threatened listed vegetation or species, the scope of potential options for offsets was narrowed.

The following sections discuss the proposed options to offset three key Project impacts:

- Loss of native vegetation
- Loss of potential Three-toed Snake-toothed Skink habitat
- Loss of hollow bearing trees

Options considered firstly focused on whether or not the impacts were of a scale that warranted off-site land-based offsets. Applying the Principles for the Use of Biodiversity Offsets in NSW (DECCW, 2008), given the minor nature of the impacts and EP&A Act Assessments of Significance indicating no significant impact, offsite land-based offsets were not considered appropriate. The reasoning behind this decision included:

- Areas of native vegetation impacted were less than 1 ha in size, were impacts on low quality examples of these vegetation types that showed high levels of disturbance, limited species composition, a high level of isolation and fragmentation and a high level of weed invasion. It needs to be noted that the overall area of native vegetation impacted was reduced further than the area predicted to be impacted in the EIS and upon which the initial Assessments of Significance had been based.
- Impacts to TTSTS habitat were primarily through the loss of non-native vegetation and other residential garden areas, dwellings and associated miscellaneous refuse.
- The loss of habitat hollows through unavoidable tree removal would be able to be successfully addressed through the installation of nesting boxes within and surrounding the Project. Investigating of the removed trees indicated the trees did not contain the range of fauna suitable hollows that were predicted as part of the EIS.
- Areas that would be rehabilitated as part of the landscape and revegetation component of the Project would largely replace and expand upon the area of impacted native vegetation and would incorporate native species representative of the relevant vegetation community impacted and these areas would provide suitable TTSTS and other fauna habitats.

Potential alternative options to addressing offsetting in relation to Three-toed Snake-tooth Skink include:

- Cooperative approach with Clarence Valley Council on Parks and Gardens.
- Installation of additional planting areas, likely to be located on the edge/ outside of town or elsewhere.
- Encouragement of Three-toed Snake-tooth Skink friendly gardens by Transport for New South Wales with Three-toed Snake-tooth Skink garden incentives.
- Engagement with the Gummaney Aboriginal Preschool for the establishment of skink friendly gardens on their premises as a means of habitat establishment and educational learning for the species.
- Establishment of a Three-toed Snake-Tooth Skink friendly garden on a parcel of land within the project boundary that is under the ongoing management of Clarence Valley Council.

The advantages/ disadvantages of these potential alternative options are outlined below in Table 5.

Table 5. Advantages/ disadvantages of potential alternative offset options in relation to Three-toed snake-tooth skink.

Potential alternative offset option	Advantages of these potential alternative offset option	Disadvantages of these potential alternative offset option
Cooperative approach with Council on Parks and Gardens.	<ul style="list-style-type: none"> <li>• Habitat in park areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Council not supportive</li> <li>• Cost of ongoing maintenance</li> </ul>

Potential alternative offset option	Advantages of these potential alternative offset option	Disadvantages of these potential alternative offset option
		<ul style="list-style-type: none"> <li>Not possible in many areas (below levees, safety issues)</li> </ul>
Planting area, likely on the edge outside of town.	<ul style="list-style-type: none"> <li>Habitat provision</li> </ul>	<ul style="list-style-type: none"> <li>Habitat provision away from Project, possibly skinks.</li> <li>High Cost</li> </ul>
Encouragement of TTSTS friendly gardens by Transport for New South Wales TTSTS garden incentives.	<ul style="list-style-type: none"> <li>Habitat provision.</li> <li>Ongoing maintenance of gardens allowed for.</li> <li>Greater ownership and awareness of skinks throughout Grafton.</li> <li>Targeted closer/ adjacent to the Project in good areas.</li> <li>Hopefully will assist skink corridors.</li> </ul>	<ul style="list-style-type: none"> <li>Inability for RMS to provide verification and validation of the establishment and maintenance of the gardens.</li> <li>Inability to provide any long term benefits and ensure gardens remain in place on private properties.</li> </ul>
Establishment of skink friendly gardens on the Gummaney Aboriginal Preschool premises.	<ul style="list-style-type: none"> <li>Provides additional skink habitat in an area that is located in close proximity to existing known or high potential habitat. In particular where a drainage feature flows next to the school which will provide more desirable friable soils.</li> <li>Allows provisions for ongoing maintenance of the gardens to provide functional habitat in an urban environment.</li> <li>Provides a means for education and awareness within the local community.</li> </ul>	<ul style="list-style-type: none"> <li>Long lead time to reach agreement and installation of the skink garden which is not in line with the project timeframes.</li> <li>Does not provide a means to guarantee the long term viability of the garden given it is on a private parcel of land.</li> </ul>
Establishment of a skink friendly garden on a parcel of land within the project boundary that will be under the ongoing management of Clarence Valley Council.	<ul style="list-style-type: none"> <li>Provides a long term establishment of a skink friendly garden in an area that is located in close proximity to existing known or high potential habitat.</li> <li>Provides additional skink habitat in an area that is located in close proximity to existing known or high potential habitat.</li> <li>Allows provisions for ongoing maintenance of the gardens to provide functional habitat in an urban environment.</li> </ul>	

Potential alternative offset option	Advantages of these potential alternative offset option	Disadvantages of these potential alternative offset option
	<ul style="list-style-type: none"> <li>Provides a means for education and awareness within the local community.</li> </ul>	

Transport for New South Wales considers the implementation of the skink friendly gardens on a parcel of land within the project boundary that will be under the ongoing management of Clarence Valley Council to be a suitable approach to meet the offset requirements for the Three-toed Snaked Toothed Skink and providing suitable friendly habitat. This is the fifth listed alternate option in Table 5.

Transport for New South Wales consider the best approach for addressing offsetting in relation to riparian/ EEC habitat is reinstating and/or improving the riparian/ EEC revegetation around the bridges in Grafton and South Grafton. In the case of South Grafton Transport for New South Wales propose to restore the disturbed areas of the Clarence River bank riparian habitat.

#### 4.2 Native vegetation offsets

The Project has resulted in the removal of a total of around 0.056 ha of native vegetation. This is a substantial reduction in the overall area predicted to be impacted, with a reduction from 0.41 ha to 0.056 ha. Impacted vegetation was identified to include species representative of the Freshwater Wetland on Coastal Floodplain Endangered Ecological Community. The areas impacted were considered to be in a degraded state, with low species diversity and high levels of weed invasion. Ongoing, public access and a high degree of fragmentation were considered to be added pressures to the vegetation community's long-term viability.

Given the small size of the impact and the condition of the vegetation present, no additional offset areas are proposed beyond the Project Boundary. This approach is considered to be consistent with Principles for the Use of Biodiversity Offsets in NSW (DECCW, 2008). To compensate for the impact however, Transport for New South Wales have committed to incorporate a range of mitigation measures within the Project Boundary with a focus on:

- re-establishing native vegetation incorporating a range of representative species through direct plantings in close proximity to areas removed; and
- Provision of similar environmental conditions to allow for natural recruitment from surrounding areas.

The majority of impacts to native vegetation occurred in riparian vegetation adjoining the Clarence River, noting that there was still a reduction in the amount of clearing undertaken. In total the area of riparian vegetation, including both native vegetation and non-native vegetation and mown grassland, impacted by the Project was around 0.17 hectares. To address the loss of this vegetation, the Project's UDLP incorporates extensive areas of riparian plantings that will increase the overall vegetated areas compared to those removed. In addition, the plantings will re-establish and introduce native species representative of the native vegetation communities removed by the Project. Refer to Appendix 1 for figures relating to areas impacted by the projected and the proposed rehabilitation.

These measures will provide an additional 1.09 hectares of revegetated riparian habitat including elements that would be consistent with Freshwater Wetlands on Coastal Floodplain EEC. When combined with the other revegetation initiatives being undertaken by the Project, an area of 7.2ha of vegetation will be either retained or revegetated. This will result in an offset to impact ratio of 129:1.

The proposed riparian revegetation along the banks of the Clarence River would primarily be through suppression of established weeds, additional plantings and assisted regeneration techniques to reduce the weed component of retained areas of EEC vegetation. The existing native vegetation at these locations are isolated and in small patch sizes. They are dominated by weeds and subject to ongoing disturbance. Transport for New South Wales approach would see the reduction in weed cover to maximise the recovery of native vegetation across the sites. The additional planted areas of riparian vegetation will increase the overall patch sizes and allow for natural recruitment of native species overtime through seed dispersal.

MCoA D 20 requires “Works in riparian areas and on riverfront land shall be undertaken in accordance with NOW guidelines for controlled activities on waterfront land, as applicable.”

As noted in the DPI July 2012 *Controlled Activities on Waterfront Land Guidelines* for riparian corridors on waterfront land, the objective of the provisions are to establish and preserve the integrity of riparian corridors and ideally maintain and restore the environmental functions of riparian corridors by applying the principles outlined in Table 6.

Table 6. Principles from DPI July 2012 Controlled Activities on Waterfront Land Guidelines for riparian corridors on waterfront land.

Principles from DPI July 2012 Controlled Activities on Waterfront Land Guidelines for riparian corridors on waterfront land	How Project addresses principles
Where a watercourse is present, define the Riparian Corridor on a map in accordance with Table 1.	The guidelines recommend a vegetated riparian corridor width of 40 metres. Within and surrounding the Project, the vegetated riparian corridor is up to about 20 metres width. This predominantly occurs as either clumps of retained vegetation or unmanaged weed infested areas along steeper banks. A substantial area of potential riparian vegetation is currently regularly mown to maintain open grassland. The proposed area of revegetation and assisted regeneration would expand and improve the area of native riparian vegetation and contribute to interlinking isolated patches.
Seek to maintain or rehabilitate a Riparian Corridor with fully structured native vegetation in accordance with Table 1.	Through a combination of planting of local native species and the control of weeds, it is expected that the Project will provide an overall benefit to a longer term stable riparian corridor within and surrounding the Project. Formalising of planting areas will limit the ongoing disturbance that is currently occurring through slashing and mowing. Species selected will reintroduce a multi layered vegetation community with ground covers, shrub and canopy layers.
Seek to minimise disturbance and harm to the recommended Riparian Corridor.	Formalising of planting areas and extension of the rehabilitation works into areas adjoining the Project will improve the current management of the riparian vegetation along the foreshores of the Clarence River both in Grafton and South Grafton.

Minimise the number of creek crossings and provide perimeter road separating development from the RC/VRZ.	No creek crossings are proposed as part of the regeneration works and the elevated bridge and placement of bridge abutments away from the River edge will allow for the establishment of vegetation along much of the Clarence River foreshore.
Locate services and infrastructure outside of the RC/VRZ. Within the RC/VRZ provide multiple service easements and/or utilise road crossings where possible.	The Project has been designed to limit the disturbance of Riparian habitat and allow for the reestablishment of vegetation in areas that currently have none. The infrastructure being constructed will mainly be undertaken in areas away from or above the riparian corridor.
Treat stormwater run-off before discharging into the RC/VRZ.	The Project incorporates storm water absorption and water sensitive planting areas to assist the treatment of stormwater runoff prior to entering adjoining watercourses.

#### 4.3 Loss of hollow bearing trees

A total of 32 suitable fauna hollows were predicted to be removed for the construction of the Project. During the clearing works it was determined that hollows observed from ground level during the assessment phase were limited to small fissure with no well-formed hollows present. Despite this, 32 nest boxes that would meet the requirements of the range of fauna known to occur within the area have been strategically placed in areas in close proximity to Project. Nest boxes will be monitored in accordance with the Nest Box Management Plan's monitoring requirements in order to identify and rectify any observed deficiencies. To date, monitoring undertaken in 2017-2018 has not recorded occupation of any of the installed nest boxes.

#### 4.4 Three-toed snake-tooth skink

The area of Three-toed Snake-tooth Skink habitat impacted by the Project is around 0.36 hectares. The impact area was reduced from the EIS predicted impact through design refinement that allowed for the retention of suitable habitat at two residences on Pound St, Grafton.

In addition to retention of suitable habitat originally predicted to be impacted, areas of potentially suitable habitat surrounding the Project were augmented to allow for the relocation of animals that were captured within the impact area during the early stages of construction. A combined area of 0.2 ha of suitable skink habitat has been retained within the Project or augmented through this process. Refer to Figure 7.

The UDLP includes measures to increase the area of suitable skink habitat through plantings and garden bed preparation within the Project boundary. These areas have been designed with attributes to encourage skinks to re-colonise the Project area at the completion of construction. Table 7 provides the final areas of proposed garden bed and grassland plantings within the Project. In total an additional area of about 1.86 ha of revegetation and landscaping will be installed that is likely to provide skink habitat. This figure includes about 1.04 ha that would not be expected to provide all micro habitat needs of the skink, that is, areas that will be seeded with a mulch matrix included, however over time the build-up of grass thatch, grass clumps and leaf litter will provide at least seasonal habitat for skinks and / or cover for movement pathways between better patches of habitat.

Table 7. Areas of landscape plantings that will occur as part of the Project

	Mulched planting beds	Seeded grassland	Water sensitive design areas	Total
Grafton	0.72 ha	1.04 ha	0.1 ha	1.86 ha
South Grafton	0.87 ha	3.72 ha	0.54 ha	5.13 ha

Transport for New South Wales propose to rehabilitate an additional 0.03 hectares of garden beds within the project boundary on a parcel of land that will be under the ongoing maintenance of the Clarence Valley Council. Given the urban surrounds, this approach will provide benefits both in terms of actual physical skink habitat expansion and by providing awareness within the local community of the role that individuals can play in the long-term persistence of this species within the area.

In consultation with the Project ecologist and environment team, a range of suggested tree and shrub species that would be suitable to include in habitat augmentation efforts has been compiled, refer Table 8. Species selection criteria that were used to select trees and shrubs included:

- Known to grow well in the Grafton climate
- Able to grow in a range of situations including close to dwellings and other infrastructure and those that may be suited to sites further from areas that may be damaged by tree roots or falling branches
- That would provide suitable cover for skinks including through dense ground layer vegetation cover and leaf litter as well as canopies that would be likely to allow for higher soil moisture levels to be retained.
- Species that were commonly available from nursery suppliers
- That were unlikely to become weedy and that were ideally native to the local area

Table 8. Suggested plant species for the establishment and improvement of TTSTS habitat

Recommended plant species	Common name	Native or Exotic	Height (metres)	Comment
<b>Ground cover</b>				
<i>Lomandra spp</i>	Mat rush	N	1	Dense, long lived clumping growth suitable for refuge sites
<i>Dianella spp</i>	Flax lillies	N	1	Dense clumping growth suitable for refuge sites
<i>Scaevola aemula</i>	Fan flower	N	0.3	Dense groundcover with higher moisture retention
<b>Shrub species</b>				
<i>Melaleuca thymifolia</i>	Thyme honey myrtle	N	2	Avian predator exclusion
<i>Dodonaea triquetra</i>	Hop bush	N		Rapid growth for predator exclusion and leaf litter accumulation
<i>Eremophila spp</i>	Emu bush	Aust N Suitable		Cover and predator deterrence



Recommended plant species	Common name	Native or Exotic	Height (metres)	Comment
<b>Ground cover</b>				
		cultivars available for the region		
<i>Hovea acutifolia</i>	Hovea	N	2	Cover and predator deterrence
<i>Austromyrtus dulcis</i>	Midgen berry	N	2	OK
<i>Ozothamnus diosmifolius</i>	Sago flower	N	2	Cover and predator deterrence
<i>Zieria smithii</i>	Sandfly zieria	N	2	Cover and predator deterrence
<i>Breynia oblongifolia</i>	Coffee bush	N	2	Cover and predator deterrence
<i>Melastoma affine</i>	Blue Tongue	N	2	Cover and predator deterrence
<i>Callistemon species</i>	Bottle brush	N cultivars available	2 - 4	Long lived, cover and predator deterrence
<i>Pittosporum revolutum</i>	Rough-fruited pittosporum	N	3	Cover and predator deterrence
<i>Syzygium select australe</i>	Improved form bush cherry	N - cultivar	3-4	Dense growth, predator deterrent, dense leaf litter development
<i>Syzygium oleosum</i>	Blue lilly pilly	N	4-15	Leaf litter and canopy shading
<i>Persea americana</i>	Avocado	E	5-6	Leaf litter and canopy shading. Dual purpose – edible fruit.
<i>Cupaniopsis anacardioides</i>	Tuckeroo	N	10	Leaf litter and canopy shading.
<i>Ficus rubiginosa</i>	Rusty Fig	N	10 - 30	Leaf litter and canopy shading. Note only recommended for areas away from dwellings or other infrastructure
<i>Harpullia hillii</i>	Blunt leaved tulip	N	10-20	Leaf litter and canopy shading. Note only recommended for areas away from dwellings or other infrastructure
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	N	15	Leaf litter and canopy shading
<i>Pittosporum undulatum</i>	Australia Cheesewood	N	15	Leaf litter and canopy shading
<i>Macadamia tetraphylla</i>	Bauple nut	N	18	Leaf litter and canopy shading
<i>Syzygium smithii</i> (formerly <i>Acmena</i> )	Creek lilly pily	N	20	Leaf litter and canopy shading. Note only recommended for

Recommended plant species	Common name	Native or Exotic	Height (metres)	Comment
<b>Ground cover</b>				
				areas away from dwellings or other infrastructure
<i>Syzygium luehmanni</i>	Small Leaved lilly pily	N	20-30	Leaf litter and canopy shading
<i>Elaeocarpus grandis</i>	Blue Marble tree/ Blue Quandong	N	35	Leaf litter and canopy shading. Note only recommended for areas away from dwellings or other infrastructure

*Canopy species selected include those that would provide shade, particularly during the warmer months and that are prone to drop leaves to provide cover, while those that provide dense groundcover or shrub layers are expected to reduce potential for skink predation.*

The establishment of a skink friendly garden within the project boundary on a parcel of land that will be under the ongoing management of Clarence Valley Council has been designed to utilise some of the species included in Table 8. The establishment of this garden is in an area that is in close proximity to known existing and high potential habitat and will improve areas for skink habitat in the adjoining areas of the project. The garden is located next to the pedestrian pathway on the eastern side of Pound Street near the rail viaduct. The longer-term benefits of the skink friendly gardens will be the increased awareness of the role that individuals and organisations can play in maintaining conditions for the skinks persistence within the urban surrounds and provide some further assurance around long term viability for the establishment of skink friendly gardens in an urban environment.

The maturing of landscapes within the Project boundary will establish permanent habitat areas that will be managed by Transport for New South Wales and Clarence Valley Council. It is expected that these areas would provide a source for ongoing re-establishment in areas surrounding the Project, in particular for the skink friendly gardens located in proximity to the project.

In total, the combined area of suitable habitat for TTSTS that will be installed as part of the Project, within the Project Boundary, will be around 1.9 ha. This equates to a 5:1 offset to impact ratio.

**ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON**  
Three Toed Snake Toothed Skink (TTSTS) Landscape/Revegetation Areas,  
Including In Project Revegetation Areas and Current Relocation Areas



Figure 7. Areas within the Project where revegetation is proposed and relocation sites where skink habitat has been protected and augmented during construction.

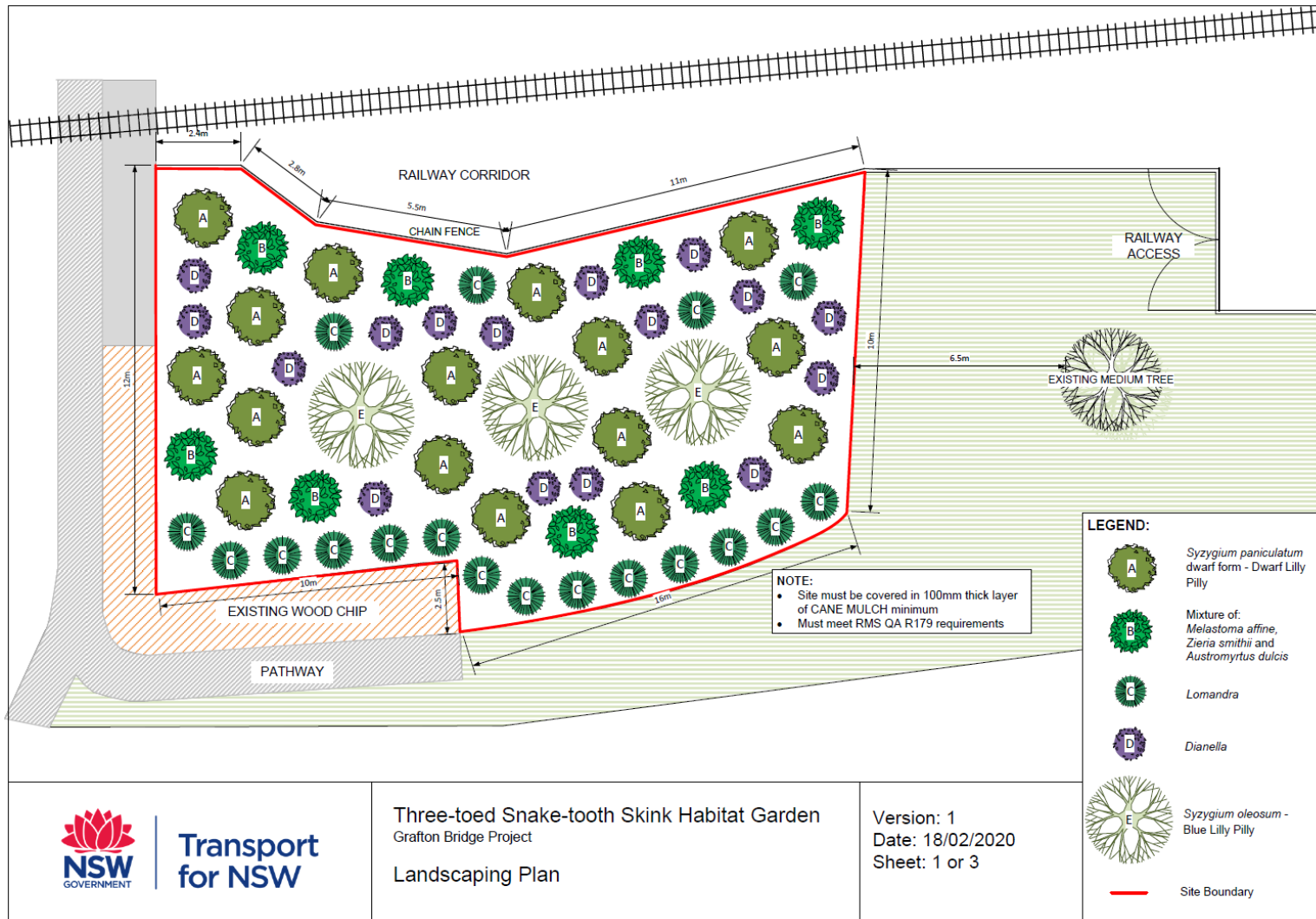


Figure 8. Proposed extent of Transport for New South Wales TTSTS friendly garden within the Project Boundary.

As part of promoting the awareness of the species within an urban environment, Transport for New South Wales has prepared information sheets detailing the biology and habitat needs of TTSTS and how the species can be encouraged through sensitive garden design, refer Appendix 5. The information sheets detail indicative locations where skinks have been found, examples of skink friendly gardens that have been established and details of the preferred garden establishment techniques and revegetation species. Transport for New South Wales will provide these details to the Clarence Valley Council and other local community organisations which may provide an avenue for increasing awareness for the species.



Figure 9. Riparian area between the old and new bridges on the southern bank of the Clarence River that will be rehabilitated as part of the Project (2020).



Figure 10 a) and b). Revegetation areas of Grafton along the northern bank of the Clarence River include areas between the old and new bridge structures. Garden bed and riparian plantings will replace periodically mown grassland and unmanaged areas dominated by weeds (2018).

## 5. Consultation in regards to offsets

Transport for New South Wales met with Clarence Valley Council to discuss options and opportunities to provide offsets for biodiversity impacts associated with the Grafton Bridge Project. In particular discussions included:

- Relaying to council that the Project has reduced clearing impacts from that predicted in the EIS;
- Identifying offsetting opportunities and potential for Council's involvement;
- Areas within the project boundary that were proposed to be rehabilitated as part of the Landscape Design and include the establishment of habitat area's for the Three-toed Snake Tooth Skink;
- Details of strategies that are being proposed by the Project to offset impacts to Three-toed Snake Tooth Skink habitat in close proximity to the Project.

As part of the development of the Landscape Design and UDLMP, Transport for New South Wales met with CVC on multiple occasions and undertook site inspections of the proposed areas to be rehabilitated and provide suitable habitat and ongoing management for the Three-toed Snake Tooth Skink. CVC provided endorsement of the Landscape Design and UDLMP which included the skink habitat areas, refer to Appendix 4 for CVC consultation.

During August 2017, there was further discussions with CVC in regards to proposed planting species for both the Three-toed Snake Tooth Skink habitat and riparian/ EEC habitat. These discussions included CVC's suggested minor additions to the proposed plantings. Transport for New South Wales were guided by the Project ecologists suggested range of plant species that would maximise skink habitat suitability.

The offset requirements were discussed with ERG members in June 2017 and July 2017.

As outlined in the June 2017 ERG minutes:

- Transport for New South Wales proposal to provide funding to adjacent landholders to install skink friendly gardens was discussed although CVC highlighted that using private land for offsetting raised issues with the long term security of the sites.
- Discussion during and after presentations included: EPA – suggested signage with Three-toed Snake-tooth Skink information. It was suggested that this should occur while there is increased public interest during the Project's construction.
- Transport for New South Wales to explore opportunity to support the creation of refuge areas that would be available for skinks during periods of flooding. The adjoining railway corridor could be a potential for skink refuge/ movement corridor that could be further explored.
- CVC highlighted that using private sites as offsetting raises issues with security of the sites. Transport for New South Wales had raised this option in the presentation to increase areas of skink friendly habitat (with some additional areas to be added to address the security issue), further discussions will occur with EPA and DPE.

Transport for New South Wales provided an update to project impacts and likely offset requirements in the July 2017 ERG, including:

- actual clearing areas are in the process of being determined
- actual clearing has been substantially less than EIS predicted clearing in regards to levees, somewhat less for the main corridor

- Alipou Creek as a potential planting site adjacent to Transport for New South Wales lands. As these works also occur on Crown Lands a Short Term Licence under the *Crown Land Management Act 2016* was obtained to undertake the works. This option was not pursued due to works being in a culturally sensitive site and the project being unable to gain access.
- Offset report is being prepared and will be distributed prior to operation of the Project in accordance with MCoA.

The EPA supported the proposed offset measures during the ERG meetings and during further discussions following refinement of the Project's impact areas.

Transport for New South Wales provided a further update to the ERG on the 16<sup>th</sup> August 2018 and presented a draft copy of the Biodiversity Offset Statement which included the proposed mitigation and management measures for offsetting the impacts of the project. The ERG did not raise any concerns or objections to the draft BOS and supported the proposal.

A draft BOS was provided to the EPA Biodiversity Team in September 2019 with the EPA providing in principle endorsement of the BOS. This formed the basis for finalising the BOS and submission to DPI&E in accordance with Condition of Approval D1.

Transport for New South Wales discussed potential Three-toed Snake-tooth Skink offset options with ARTC, looking at habitat planting along selected parts of the rail embankment in the vicinity of the Project to improve connectivity. ARTC advised on 17 August 2017 that there would not be an opportunity to provide additional skink habitat at this stage due to concerns about restrictions this habitat might have on future works.

Transport for New South Wales met with the Gummyaney Aboriginal Preschool to investigate the feasibility of establishing skink friendly gardens on their premises. It was determined that it was not a suitable option and would not be pursued, refer to table 5.

Transport for New South Wales has subsequently developed a plan to establish a skink friendly garden within the project boundary on land that is managed by CVC. The works will be established at the completion of the project and will be handed over to CVC for ongoing maintenance. CVC has been consulted as part of the establishment of the skink friendly garden and are agreeable to maintaining the area, refer to Appendix 4 for consultation details with CVC.

## 6. Monitoring

Monitoring of biodiversity impacts resulting from the Project has occurred throughout construction in accordance with the Annexure A of the Construction Flora and Fauna Management Plan. This has included regular monitoring and reporting on impacts to vegetation and threatened fauna habitat within the construction footprint.

### 6.1 Nest Box Monitoring

Monitoring of nest boxes that have been installed has been undertaken as per the requirements of the Nest Box Monitoring Plan and Construction Flora and Fauna Management Plan for the construction period. There are no requirements for monitoring of nest boxes during the operational phase.

The Bat Management Plan monitoring requirements are captured as part of the Nest Box Management Plan monitoring program.



## 6.2 Three-toed Snake-tooth Skink monitoring

Monitoring for the Three-toed Snake-tooth Skink has been undertaken as per the management plan and the Construction Flora and Fauna Management Plan. There are no requirements for further ongoing monitoring during the operational phase.

Areas that have been revegetated or established for Skink habitat as part of the Landscape Design/Plan and Offsets (within the final road corridor) will be monitored in accordance with the maintenance requirements of R178, R179, UDLP and the Contract Deed.

## 6.3 Riparian impact and offset site monitoring

Areas revegetated or established as part of the Landscape Design/Plan to meet the requirements for riparian/ EEC offset would be monitored in accordance with the maintenance requirements of R178, R179, UDLP and the Contract Deed.

# 7. Conclusion

The Grafton Bridge Project has been refined to reduce impacts to native vegetation and threatened species. The Project has incorporated a range of mitigation measures that will result in an overall increase of native vegetation within and surrounding the Project. Through a combination of vegetation retention and rehabilitation within and surrounding the Project and through the planting of additional areas of vegetation, the Project will provide an overall increased area of habitat for fauna.

The Project's revegetation and restoration program has specifically targeted the habitat requirements of the one threatened species known to occupy the Project area - Three-toed Snake-tooth Skink. In recognition of this species ability to occupy disturbed habitats and that its occurrence intersects with the urban environments in Grafton, the Project has commenced initiatives to assist the persistence of the skink both within and around the Project. The provision for establishing Skink friendly gardens within the project boundary and the creation of suitable micro habitats that will be protected within the Project have been designed to allow skinks the opportunity to persist and to re-establish across the revegetation and augmented habitat areas.

To compensate for the impact on small areas of degraded Freshwater Wetland on Coastal Floodplain Endangered Ecological Community, Transport for New South Wales have incorporated areas of riparian revegetation into the Urban Design and Landscape Plan both within the Project boundary and lands controlled by Transport for New South Wales.

To maximise the success of the proposed mitigation and offsetting measures, Transport for New South Wales will continue to monitor the development of plantings within the revegetation areas and assisted regeneration sites and where necessary additional ameliorative actions will be undertaken if deficiencies are identified through this process.



## 8. Appendices.

Appendix 1. Package of key Figures from the Biodiversity Offset Statement report.



**ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON**  
Three Toed Snake Toothed Skink (TTSTS) Relocation Areas



Three-toed snake-tooth skinks relocation areas adjacent to the Project. Skink relocation areas include: 31-33 Pound St, 17 Pound St, 15 Pound St, 13 Pound St, land behind 15 Pound St, lane ways between 13 and 15 Pound St, 7 Greaves St and 4 McClymont Place.

**ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON**  
Three Toed Snake Toothed Skink (TTSTS) Landscape/Revegetation Areas,  
Including In Project Revegetation Areas and Current Relocation Areas



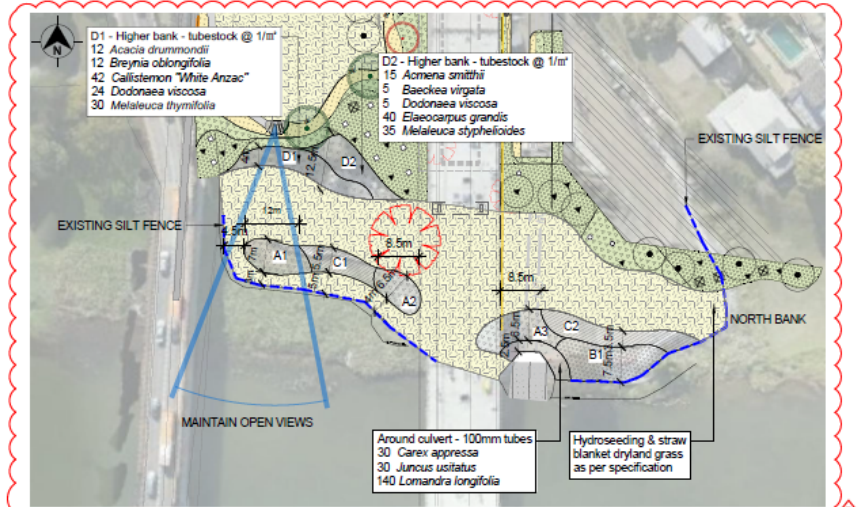
Figure A. UDLMP Three-toed Snake-tooth Skink areas (Fig. 5-38 of the UDLMP, Skink Habitat Plan) along with the retained Three-toed Snake-tooth Skink relocation areas (in green) as outlined in Figure 5 above. The relocation areas were selected to maximise the potential for Three-toed snake-tooth skinks recolonising of Project areas.



ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON  
Riparian Clearing Impact



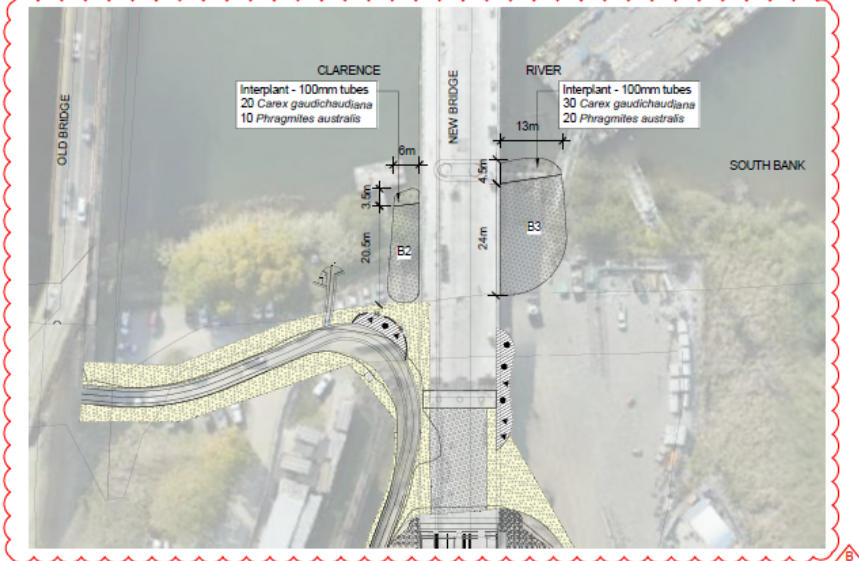
Figure C. Areas of riparian and EEC habitat impacts.



RIPARIAN PLANTING SCHEDULE

Riparian Planting Mix A - Lower Planting					Areas of Mix A			
Species	Common Name	Size	Plant%	Density	Areas of Mix A			Total
					B2m <sup>2</sup>	B4m <sup>2</sup>	100m <sup>2</sup>	
<i>Acmena smithii</i>	Creek Lilly Pilly	Tubestock	20%	0.5/m <sup>2</sup>	8	6	10	24
<i>Carex gaudichaudiana</i>	Carex	Tubestock	5%	4/m <sup>2</sup>	16	13	20	49
<i>Callistemon viminalis</i>	Weeping Red Bottlebrush	Tubestock	45%	0.5/m <sup>2</sup>	18	14	23	55
<i>Breynia oblongifolia</i>	Breynia	Tubestock	20%	0.5/m <sup>2</sup>	8	6	10	24

Riparian Planting Mix B - Middle Bank					Areas of Mix B			
Species	Common Name	Size	Plant%	Density	Areas of Mix B			Total
					B1	B2	B3	
<i>Callistemon viminalis</i>	Weeping Red Bottlebrush	Tubestock	25%	0.5/m <sup>2</sup>	19	15	36	72
<i>Dianella caerulea</i>	Blue Flax Lily	Tubestock	10%	4/m <sup>2</sup>	60	49	122	231
<i>Eleocharis obovatus</i>	Hard Quandong	Tubestock	5%	0.5/m <sup>2</sup>	4	3	8	15
<i>Ficus coronata</i>	Sandpaper Fig	Tubestock	5%	0.5/m <sup>2</sup>	4	3	8	15
<i>Glochidion ferdinandi</i>	Cheese Tree	Tubestock	5%	0.5/m <sup>2</sup>	4	3	8	15
<i>Leptospermum brachyandrum</i>	Thin-fruited Tea Tree	Tubestock	5%	0.5/m <sup>2</sup>	4	3	8	15
<i>Leptospermum polygalifolium subsp. cismontanum</i>	Creek Tea Tree	Tubestock	10%	0.5/m <sup>2</sup>	7	6	15	28
<i>Lomandra longifolia</i>	Spiny Mat Rush	Tubestock	5%	4/m <sup>2</sup>	30	25	61	116
<i>Melaleuca linearifolia</i>	Snow in Summer	Tubestock	5%	0.5/m <sup>2</sup>	4	3	8	15
<i>Melaleuca stypheloides</i>	Prickly Paperbark	Tubestock	15%	0.5/m <sup>2</sup>	11	9	23	43
<i>Pitiosporum undulatum</i>	Sweet Pittosporum	Tubestock	10%	0.5/m <sup>2</sup>	7	6	15	28



Riparian Planting Mix C - Upper Bank					Areas of Mix C		
Species	Common Name	Size	Plant%	Density	Areas of Mix C		Total
					73m <sup>2</sup>	124m <sup>2</sup>	
<i>Acacia floribunda</i>	White Sallow Wattle	Tubestock	10%	0.5/m <sup>2</sup>	4	6	10
<i>Acmena smithii</i>	Creek Lilly Pilly	Tubestock	10%	0.5/m <sup>2</sup>	4	6	10
<i>Allocasuarina littoralis</i>	Black She-Oak	Tubestock	15%	0.5/m <sup>2</sup>	5	9	14
<i>Callistemon salignus</i>	White Bottlebrush	Tubestock	25%	0.5/m <sup>2</sup>	9	15	24
<i>Eucalyptus tereticomis</i>	Forest Red Gum	Tubestock	10%	0.5/m <sup>2</sup>	4	6	10
<i>Eucalyptus camaldulensis</i>	River Red Gum	Tubestock	15%	0.5/m <sup>2</sup>	5	9	14
<i>Eleocharis grandis</i>	Blue Quandong	Tubestock	15%	0.5/m <sup>2</sup>	5	9	14

**LEGEND**

- DRYLAND GRASSING & STRAW MULCHING AS PER RMG178 SPECIFICATION - NO TOPSOIL REQUIRED
- RIPARIAN REVEGETATION
  - TUBESTOCK @ 1/M<sup>2</sup>
  - TOPSOIL TO PLANTING HOLES ONLY (0.08M<sup>3</sup>/PLANT)
  - WEEDMAT (IN LIEU OF MULCH) AS PER SPECIFICATION & PINNED TO GROUND AS PER MANUFACTURER'S INSTRUCTIONS

Figure D. Areas of riparian and EEC habitat that will be landscaped and rehabilitated as part of the Project.



Appendix 2. Actual construction clearing of the main line Project.





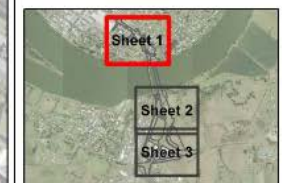
**ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON**  
Construction Clearing



G:\Grafton GIS\Spec05 GIS\03\_Map\01\_MXD\000306\_2017057\_WorkzoneClearingAreas\_A3L\_MapBook\_v03.mxd

**Legend**

- TEC Identified in EIS
  - Cadastral Boundary
  - Project Boundary (12/2/2019)
- Riparian Vegetation Clearing - Construction**
- Freshwater wetlands on coastal floodplain TEC
  - Native and exotic plantings



Map Created:	5/10/2017
Author:	WILSOTH

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Coordinate System: GDA 1984 MGA Zone 56  
Projection: Transverse Mercator  
Horizontal Datum: GDA 1984





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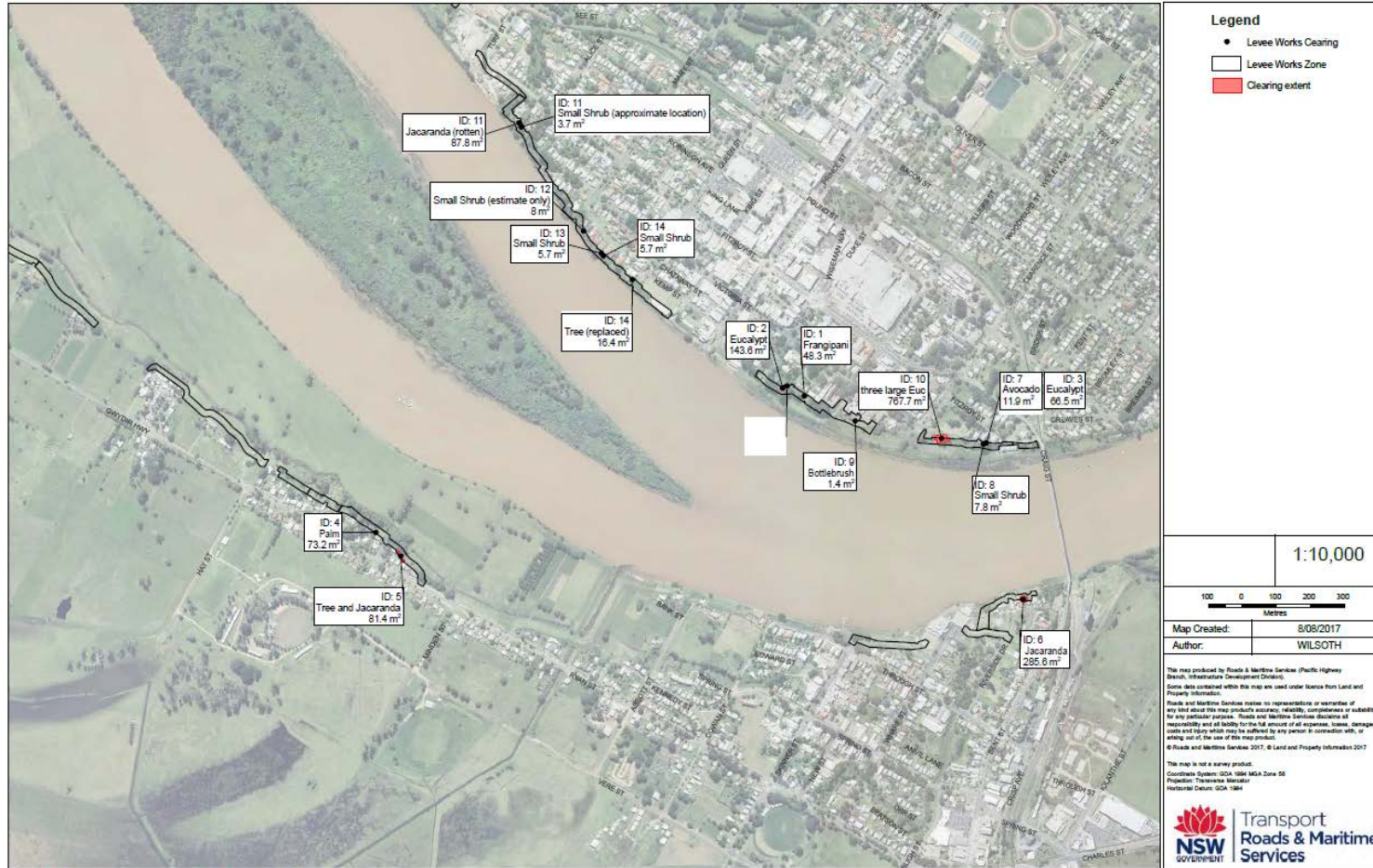


G:\Grafton Bridge\GIS\GIS\_Maps\01\_X\DCI00308\_2517657\_WorkzoneClearingAreas\_A3L\_MapBook\_V03.mxd

# Appendix 3. Actual construction levee clearing.



## ADDITIONAL CROSSING OF THE CLARENCE RIVER AT GRAFTON Levee Works Clearing



## Appendix 4. Consultation with EPA and Clarence Valley Council.

**From:** Peter Higgs  
**To:** [Jason Sheehan](#)  
**Cc:** [Gregory Nash](#); [Scott Lawrence](#); [Kylie Wells](#)  
**Subject:** RE: HPE CM: Grafton Bridge Biodiversity Offset Statement - Draft for EPA Review  
**Date:** Friday, 11 October 2019 12:02:11 PM

---

Hi Jason,

As discussed recently, and in fact throughout the Grafton bridge ERG process, the EPA have generally been satisfied with the ecological mitigations employed throughout construction and with the development of the Biodiversity Offset arrangements to date.

The Three toed snake tooth skink has been well catered for during construction and the EPA is satisfied that the considerations for this species in the BOS are adequate and in parallel with the intent of the approval conditions and offset framework.

Regarding the vegetation and EEC components of the statement the EPA is supportive of the principles and actions espoused and encourages robust oversight in delivering the on-ground revegetation and rehabilitation requirements (which is relevant to the skink as well of course).

I agree that the outstanding components of the biodiversity offset statement, as you describe in your email below, should not alter the nature of the BOS and our comfort with it, however the EPA would like to receive these additions as they are finalised and reserve the right to offer comment on these if they are perceived to alter the outcome of our review.

In summary the EPA raises no major issues regarding the Additional Clarence River Crossing Grafton Bridge Offset Statement as it has been delivered with your email below.

Note that this review was largely finalised when I sat in the role of senior threatened species officer on the Pacific Highway Upgrade Team in the EPA.

Regards

Peter

**Peter Higgs**

Senior Ecologist

Forestry Branch, NSW Environment Protection Authority

[Peter.Higgs@epa.nsw.gov.au](mailto:Peter.Higgs@epa.nsw.gov.au) [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au) ☐@EPA NSW +61 2 6659 8223

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**From:** Jason Sheehan <[Jason.L.SHEEHAN@rms.nsw.gov.au](mailto:Jason.L.SHEEHAN@rms.nsw.gov.au)>

**Sent:** Monday, 30 September 2019 2:51 PM

**To:** Peter Higgs <[Peter.Higgs@epa.nsw.gov.au](mailto:Peter.Higgs@epa.nsw.gov.au)>

**Cc:** Gregory Nash <[Gregory.NASH@rms.nsw.gov.au](mailto:Gregory.NASH@rms.nsw.gov.au)>; Scott Lawrence

<Scott.LAWRENCE@rms.nsw.gov.au>; Kylie Wells <Kylie.WELLS@rms.nsw.gov.au>  
**Subject:** HPE CM: Grafton Bridge Biodiversity Offset Statement - Draft for EPA Review

Hi Peter,

As discussed and in accordance with MCoA D1 for the Grafton Bridge project, RMS would like to submit to EPA for their review the Draft Grafton Bridge Biodiversity Offset Statement.

We are currently still working through a few items that have been included in the document such as the final Landscape Design as there have been some minor changes along with the riparian revegetation works and the proposed skink friendly gardens to be undertaken in conjunction with Gummyaney Aboriginal Preschool. The outcome of these proposal may slightly alter some of the detail in the Offset Statement, although it is not expected that this will change the intent, outcome or conclusion of the Offset Statement.

Would you be able to review the attached document and provide any comments or feedback so RMS can finalise and submit to DPI&E.

Let me know if you have any questions or require clarification of anything in the document.

Thanks

Jason

**Jason Sheehan**  
Environment Officer  
Northern Project Office  
Safety, Environment and Regulation

T 02 6604 9331 | M 0422 003 460 | F 02 6640 1001  
[www.rms.nsw.gov.au](http://www.rms.nsw.gov.au)

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## LEE, Andrew

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**From:** David Sutton <David.Sutton@clarencensw.gov.au>  
**Sent:** Tuesday, 18 July 2017 7:58 PM  
**To:** LEE, Andrew  
**Cc:** Peter Ashenden; SANTOS, Roger; Tim Jenkins; Peter Birch  
**Subject:** Re: Council Concurrence on Landscape Design

Hi Andrew,

Sorry for delayed reply, please accept this mail as confirmation that I have reviewed the detailed design and have no objection to the proposed works.

Regards

David

Sent from my iPhone

On 18 Jul 2017, at 9:20 am, LEE, Andrew <[Andrew.Lee@fultonhogan.com.au](mailto:Andrew.Lee@fultonhogan.com.au)> wrote:

Peter / David,

Can we please get a response from council confirming concurrence of the Landscape Design today. In conversation with David, CVC concur with the design, however we need this in writing by response to this email to enable this package to progress to IFC.

Thanks,

**Andrew Lee** | Design Manager | **Fulton Hogan** | Level 3, 90 Bourke Road Alexandria NSW 2015 | PO Box 6099 Alexandria NSW 2015 | Phone +61 449 922 762 | Web [www.fultonhogan.com](http://www.fultonhogan.com)

David Sutton  
Open Spaces Coordinator  
**Clarence Valley Council**  
Locked Bag 23, GRAFTON NSW 2460  
P: (02) 6643 0225  
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[www.clarencensw.gov.au](http://www.clarencensw.gov.au)



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**From:** LEE, Andrew  
**Sent:** Wednesday, 5 July 2017 8:52 AM  
**To:** [Peter.Ashenden@clarencensw.gov.au](mailto:Peter.Ashenden@clarencensw.gov.au); [Tim.Jenkins@clarencensw.gov.au](mailto:Tim.Jenkins@clarencensw.gov.au)

**Cc:** 'David Sutton'; SANTOS, Roger ([Roger.Santos@fultonhogan.com.au](mailto:Roger.Santos@fultonhogan.com.au))  
**Subject:** Council Concurrence on Landscape Design

Tim / Peter,

This email is to confirm that Clarence Valley Council (CVC) have reviewed the design package **GB-LD-01 Landscape Design** throughout the detailed design and all comments have been incorporated as described below:

**Detailed Design Phase:**

- Draft set submitted to CVC 25/10/2016;
- Meeting in Grafton with KI Studio, CVC, Grafton Ngerrie LALC and RMS 17/11/16 (outcomes incorporated in 85% SDD);

**85% Substantial Detailed Design:**

- Submitted to CVC 02/12/16;
- Reviewed by CVC 02/12/16 – 16/12/16;
- Received CVC comment and provided responses 11/01/17;
- Phone conversation KI Studio & David Sutton regarding Angophora substitution and skink habitat 20/01/17;

**100% Final Detailed Design:**

- Issued to CVC 25/01/17;
- Reviewed by CVC 25/01/17 – 08/02/17;
- On-going correspondence and collaboration FH, KI Studio & CVC 30/01/17 – 07/03/17;
- CVC concurrence on adoption of plant species to accommodate skink habitats 15/03/17;
- CVC confirmation of minutes of close-out phone consultation KI Studio & CVC 15/03/17;

Could CVC please respond to this email acknowledging the above as confirmation of concurrence with the design.

David,

As discussed, could you please assist with confirmation of the above.

Thanks,

**Andrew Lee** | Design Manager | **Fulton Hogan** | Level 3, 90 Bourke Road Alexandria NSW 2015 | PO Box 6099 Alexandria NSW 2015 | Phone +61 449 922 762 | Web [www.fultonhogan.com](http://www.fultonhogan.com)

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**From:** Tim Jenkins  
**To:** [Andrew Hart](#)  
**Subject:** RE: Grafton Bridge: Additional Skink Garden  
**Date:** Tuesday, 28 July 2020 1:40:40 PM

---

Hi Andrew,

As per our discussion Council does not object to the additional skink garden in principle but would like to discuss some operational issues that may occur as a result and possible minor amendments to the plan as proposed.

Regards,  
Tim

Tim Jenkins  
Asset Systems Project Coordinator  
**Clarence Valley Council**  
Locked Bag 23 GRAFTON NSW 2460  
P: (02) 6640 3560  
M: 0407 299 594  
[https://clicktime.symantec.com/3CM5D2SJLaazEJD24EZD7Dr7Vc?  
u=www.clarence.nsw.gov.au](https://clicktime.symantec.com/3CM5D2SJLaazEJD24EZD7Dr7Vc?u=www.clarence.nsw.gov.au)



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**From:** Andrew Hart [mailto:[Andrew.HART@transport.nsw.gov.au](mailto:Andrew.HART@transport.nsw.gov.au)]  
**Sent:** Monday, 27 July 2020 12:02 PM  
**To:** Tim Jenkins  
**Cc:** Jason Sheehan; Kylie Wicken; Brett Tribe  
**Subject:** Grafton Bridge: Additional Skink Garden  
**Importance:** High

Hi Tim

The project is proposing to build an additional skink habitat area in the triangle of land between Bridge Street and the new road. A plan of the proposal is attached.

As you are aware, management of the Three Toes Tooth Skink was an important aspect the project and we are trying to maximise the suitable habitat for this species moving forward. This is in addition to the areas provided under the approved landscape design and will also supplement

the areas I will need to disturb to remove the trees from the levee as requested by CVC.

Could you please review the plan and advise if CVC concur with the proposal?

Kind regards

Andrew

Andrew Hart  
Resident Engineer  
Infrastructure and Place  
**Transport for NSW**

M 0488 191 090  
Level 1 76 Victoria Street Grafton NSW 2460



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## Appendix 5. Information sheet to assist in creating Three-toed Snake-tooth Skink friendly gardens.

**This document includes the Three-toed Snake-tooth Skink Information Sheet provided to CVC and the general public to assist in Three-toed Snake-tooth Skink awareness.**

INFORMATION DOCUMENT. ESTABLISHING THREE-TOED SNAKE-TOOTH SKINK FRIENDLY GARDENS IN GRAFTON.

### **1. Introduction.**

Three-toed Snake-tooth Skinks appear well adapted to the gardens in Grafton. To date, no skinks have been recorded in South Grafton. Additional Three-toed Snake-tooth Skinks were identified during surveys for the Grafton Bridge Project and many have been rescued in ecological surveys before clearing and works activities.

Transport for New South Wales with the generous assistance of local community members have been able to establish a number of skink friendly garden areas adjacent to the Grafton Bridge Project. These areas will be important sites to allow skinks to recolonise the extensive areas of garden beds that will be installed within the Project upon completion of construction. The key garden improvements have included use of cane mulch, coir fibre, site mulch/ leaves, additional plantings of suitable native species and protective fencing.

Transport for New South Wales ecologist have been busy collecting data on the population of Three-toed Snake-tooth Skinks as part of the Project. Key findings have been included in this information sheet to help the community and Council understand how they can help maintain suitable environments for this threatened species.

### **2. Three-toed Snake-tooth Skink gardens established in Grafton**

It was reported in Barung Landcare News Three-toed Snake-tooth Skink Wildlife Wanderings Susie Duncan in August September 2009 that a skink was found under a rotting cane mulch bale. The same approach was used in improving gardens in Grafton, using cane mulch for habitat improvement along with available leaf litter. The promotion of deep layers of leaf litter and areas of cool friable soil beneath are the main benefits of mulching.

Transport for New South Wales have established a number of Three-toed Snake-tooth Skink friendly gardens in Grafton or improved current gardens for skinks. Examples of completed Three-toed Snake-tooth Skink friendly garden works are highlighted below in Figures 1 (a-c), 2, 3 and 4.



Figure 1 a-c. Restoration and revegetation to optimise establishment of Three-toed Snake-tooth Skink habitat. This has been achieved using sugarcane mulch and leaf litter (from existing and outside garden areas), combined with suitable tree and shrub planting (such as lilly pillies) and periodic weed suppression. Planted *Syzygium select* form *australe* (Lilly Pilly) in Figure 1c will over time increase shade and provide the soil and leaf litter conditions thought to be favoured by skinks.



Figure 2. Placing leaf litter mulch to increase the area of a skink friendly garden in Grafton.



Figure 3. Improved garden for skinks associated with the levee works.



Figure 4. A Three-toed Snake-tooth Skink being successfully released into newly mulched garden. for the combination of Sugarcane with leaf litter mixed through is thought to provide the most appropriate habitat for skinks.

### **3. Information to assist in establishing Three-toed Snake-tooth Skink friendly gardens in Grafton**

Sugarcane mulch can be easily sourced from local produce and garden stores. Both Sugarcane and leaf litter from existing gardens have been identified as the best way to improve Three-toed Snake-tooth Skink habitat within gardens. Where possible, mulch should be added to a depth of at least 100mm and can include both cane mulch and any available leaf litter.

It is important for the skinks to have plant species that provide shade (at least 70-80% canopy cover is ideal) and species that drop a heavy leaf litter are ideal. Tube stock can be purchased from local nurseries. It is important to select the appropriate plant species for the site. Things to consider include: the eventual size of plant and any impact it may have on structures and any above and below ground services, watering requirements and whether the local climate is suitable for the species. A list of potential species that could be used after considering the above factors are outlined below in Table 1.

Table 1. Potential suitable plant species for Three-toed Snake-tooth Skink habitat.



	Suitable plant species for Three-toed Snake-tooth Skink	Common name	Native or Exotic	height (metres)	Considerations
Groundcover	Groundcover species could include <i>Lomandra</i> spp.; <i>Dianella</i> spp. and <i>Scaevola aemula</i>	NA	Native	Up to 1	Mostly long-lived species that will provide useful groundcover to allow for movement and predator protection.
Small Shrubs	<i>Melaleuca thymifolia</i> , <i>Dodonaea triquetra</i> and various <i>Eremophila</i> spp.	NA	Native	2	Shrub species can provide the benefit of limiting the potential for predation of skinks and providing a source of leaf litter
	<i>Hovea acutifolia</i>	Hovea	Native	2	
	<i>Austromyrtus dulcis</i>	Midyim	Native	2	
	<i>Ozothamnus diosmifolius</i>	Sago flower	Native	2	
	<i>Zieria smithii</i>	Sandfly zieria	Native	2	
	<i>Breynia oblongifolia</i>	Coffee bush	Native	2	
	<i>Melastoma affine</i>	Blue Tongue	Native in parts of Australia	2	
Medium shrubs	<i>Callistemon species</i>	Dwarf varieties	Native	2 - 4	
	<i>Pittosporum revolutum</i>	Hairy pittosporum	Native	3	
	<i>Dodonaea triquetra</i>	Forest hop bush	Native	3	
Large shrubs and trees	<i>Syzygium select australe</i>	Improved form brush cherry	Native	3-4	Before planting any tree species, consider structures and services that may be impacted nearby. Consult your local horticulturist for appropriate
	<i>Syzygium oleosum</i>	Blue lilly pillly	Native	4-15	
	<i>Persea americana</i>	Avocado	Exotic	5-6 m	
	<i>Cupaniopsis anacardioides</i>	Tuckeroo	Native	10	
	<i>Ficus rubiginosa</i>	Rusty Fig	Native	10 m up to 30 m rarely	
	<i>Harpullia hillii</i>	Blunt leaved tulip	Native	10-20	
	<i>Elaeocarpus reticulatus</i>	Blueberry Ash	Native	15	

	Suitable plant species for Three-toed Snake-tooth Skink	Common name	Native or Exotic	height (metres)	Considerations
	<i>Pittosporum undulatum</i>	Australia Cheesewood	Native	15	species that would suit your garden.
	<i>Macadamia tetraphylla</i>	Bauple nut	Native	18	
	<i>Syzygium smithii</i> (formerly <i>Acmena</i> )	Creek lilly pily	Native	20 m	
	<i>Syzygium luehmanni</i>	Small Leaved lilly pily	Native	20-30	
	<i>Elaeocarpus grandis</i>	Blue Marble tree/ Blue Quandong	Native	35	

Note. Three-toed Snake-tooth Skink in Grafton have not been recorded under or in close proximity to Allocasuarina/Casuarinas species and therefore this species is not thought to be useful for revegetating for TTSTS. These species needle-like foliage are not thought to provide suitable skink habitat due to the hydrophobic and phytotoxic conditions they create. They often suppress the growth of other vegetation nearby that would otherwise provide more suitable habitat.

Watering gardens can assist in optimising skink presence in gardens and when combined with the right depth of mulch and favourable plantings can increase the habitat's suitability.

#### 4. Three-toed Snake-tooth Skinks

**Common name:** Three-toed Snake-tooth Skink

Scientific name: *Saiphos reticulatus* (formerly *Coeranoscincus reticulatus*)

The Three-toed Snake-tooth Skink has reduced limbs, each with three digits. The species is listed as Vulnerable under the NSW Threatened Species Conservation Act (1995) and the Environmental Protection and Biodiversity Conservation Act (1999).

Adults usually have a dark eye-patch, dark ear markings and a distinct wedge-shaped, pointed pale snout. Dorsal colour in adults is generally brown to yellowish brown or grey, sometimes with a vague indication of the dark juvenile bands, and side and belly scales paler brown. Individual flecked scales are streaked with dark brown, a black collar and often small, scattered dark brown spots on the back, with dark brown streaks on the throat.



Plate 1. Adult Three-toed Snake-tooth Skinks recorded in leaf litter beneath a mature Avocado Tree in Grafton. Micro habitat at the capture site included a leaf litter layer up to 300 mm in depth and loose friable soil adjacent to some mown lawns. Numerous earth worms were also observed at this location.

Juveniles have dark patches centered on the eye and ear depression, the snout is cream, and the scales on the sides of the body are dark-edged, forming irregular longitudinal streaks.



Plate 2. Juvenile or sub adult Three-toed Snake-Tooth Skink in from the Project study area (Grafton) recorded beneath a house brick on the eastern side of a dwelling. This property has regularly maintained gardens with deep mulch beds to reduce moisture loss for ornamental plantings.

The Three-toed Snake-tooth Skink occurs from Crescent Head on the mid north coast NSW to Fraser Island in south-east Queensland. Most records are from the Border Ranges in the vicinity of the NSW/Queensland border. Records in fragmented habitat and restored riparian vegetation (Barung Landcare 2008) indicates that the skink has some adaptability to modified environments as a result of clearing.

In NSW, the Three-toed Snake-tooth Skink is known as far south as the Macleay Valley where it is known from a single record at Crescent Head, although it is considered very rare south of Grafton. Collections have been made from the Clarence River valley, Tweed River valley, Richmond Range, Beaurie State Forest (SF), Koreelah SF, Whian SF, Grafton, Grady's Creek Flora Reserve, Wiangaree SF, Yabbara SF and Mt Lion Road near the Queensland border.

The Three-toed Snake-tooth Skink has been found in loose, well mulched friable soil, in and under rotting logs, in forest litter, under fallen hoop pine bark and under decomposing cane mulch.

In NSW, the Three-toed Snake-tooth Skink has been recorded in dry rainforest, northern warm temperate rainforest, subtropical rainforest, grassy wet sclerophyll forest and shrubby sclerophyll forest. Records have been made in logged and unlogged forest. Locally, in Grafton the species appears confined to the residential areas of Grafton, particularly where extensive gardens or large street trees with high foliage Projective cover grow on alluvial soils. This has included rose garden beds, a fruit tree (i.e. Avocado) and ornamental street tree and park plantings (i.e. Small-leaved Fig).

Examination of the Three-toed Snake-tooth Skink's stomach contents has found earthworms, beetle larva, insect remains and mud. It is believed the Three-toed Snake-tooth Skink would encounter earthworms on the forest floor at night and in the loose soil that the skink burrows. In captivity, the skink feeds on worms while beneath the soil surface. It has been suggested the pointed and recurved teeth of the skink are an adaptation for preying on worms.

Appendix 6. Assessment of offset principles against proposed Three-toed Snake-tooth Skink offsets and riparian/ EEC impacts

<b>OEH principles for the use of biodiversity offsets in NSW</b>	<b>Assessment against proposed Three-toed Snake-tooth Skink offsets</b>	<b>Assessment against proposed riparian/ EEC offsets</b>
1. Impacts must be avoided first by using prevention and mitigation measures.	<b>Project refinement resulted in a reduced TTSTS habitat clearing footprint.</b>	<b>Project refinement resulted in a reduced riparian / EEC vegetation clearing footprint.</b>
Offsets are then used to address the remaining impacts. This may include modifying the proposal to avoid an area of biodiversity value or putting in place measures to prevent offsite impacts.	A range of measures used to reduce impacts. Offset proposal addressed in this report.	A range of measures used to reduce impacts. Proposal involves revegetation within the Project footprint. Offset proposal addressed in this report.
2. All regulatory requirements must be met.	<b>Addressed in Project EIS</b>	<b>Addressed in Project EIS</b>
Offsets cannot be used to satisfy approvals or assessments under other legislation, such as assessment requirements for Aboriginal heritage sites and for pollution or other environmental impacts (unless specifically provided for by legislation or additional approvals).	Not proposed.	Not proposed.
3. Offsets must never reward ongoing poor performance.	-	-
Offset schemes should not encourage landholders to deliberately degrade or mismanage offset areas in order to increase the value from the offset.	The proposed offset scheme would not result in deliberate degradation or mismanagement of offset areas.	The proposed offset scheme would not result in deliberate degradation or mismanagement of offset areas. Currently heavily degraded areas will be rehabilitated as part of the proposal.

4. Offsets will complement other government programs.	-	-
A range of tools is required to achieve the NSW Government's conservation objectives, including the establishment and management of new national parks, nature reserves, state conservation areas and regional parks, and incentives for private landholders.	Proposed TTSTS offsets are innovative and will result in improved habitat for skinks in the urban landscape where this population occurs. Particular effort will be placed on augmenting existing habitat in areas surrounding the Project and providing additional habitat as part of the Projects landscape and revegetation areas.	Proposed riparian/ EEC offsets are innovative and will result in improved habitat along the Clarence River which retain areas of highly degraded EEC.
5. Offsets must be underpinned by sound ecological principles.	-	-
They must:	-	-
<ul style="list-style-type: none"> <li>include the conservation of structure, function and compositional elements of biodiversity, including threatened species</li> </ul>	<ul style="list-style-type: none"> <li>Proposed offsets have been designed to increase the suitability of habitats for TTSTS within the urban surrounds where the Grafton population has been recorded.</li> </ul>	<ul style="list-style-type: none"> <li>The Project's Urban Design and Landscape Plan incorporates restoration of riparian areas/ EEC vegetation within and surrounding the Project.</li> </ul>
<ul style="list-style-type: none"> <li>enhance biodiversity at a range of scales</li> </ul>	<ul style="list-style-type: none"> <li>The offsets proposed have considered the localised nature of the population of TTSTS in Grafton's Urban environment. The offsets have considered the overall increase in available habitat and elements that are required for this to occur both within and adjacent to the Project.</li> </ul>	<ul style="list-style-type: none"> <li>riparian areas/ EEC vegetation within the Project are in a degraded state due to ongoing land management practices within the urban surrounds The Project offset seeks to Improve habitat within the Project corridor.</li> </ul>
<ul style="list-style-type: none"> <li>consider the conservation status of ecological communities</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable.</li> </ul>	<ul style="list-style-type: none"> <li>Due to the small area of highly degraded Freshwater Wetlands TEC proposed to be removed, the offsets are considered to be appropriate and will provide wider benefits to this community in close proximity to the Project through restoration efforts that will be applied.</li> </ul>
<ul style="list-style-type: none"> <li>ensure the long-term viability and functionality of biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>The TTSTS population in Grafton persists in a highly disturbed and largely unnatural environment. The proposed measures would create additional skink habitat within the project and its surrounds and increase public awareness on measures that can be employed to ensure the long term persistence of the species within the locality.</li> </ul>	<ul style="list-style-type: none"> <li>The area of degraded Riparian habitat and EEC along the thin strip of land between urban gardens and industrial, transport and grazing lands will be restored through the proposed planting and management scheme with future maintenance likely to be required by land managers.</li> </ul>

Biodiversity management actions, such as enhancement of existing habitat and securing and managing land of conservation value for biodiversity, can be suitable offsets. Reconstruction of ecological communities involves high risks and uncertainties for biodiversity outcomes and is generally less preferable than other management strategies, such as enhancing existing habitat.	Offset proposal enhances additional habitat for skinks. The proposed offsetting approach will increase community knowledge of TTSTSs.	Proposed offsetting greatly enhances existing habitat.
6. Offsets should aim to result in a net improvement in biodiversity over time.		
Enhancement of biodiversity in offset areas should be equal to or greater than the loss in biodiversity from the impact site.	The Project will result in an increased area of habitat suitable for the TTSTS within the Grafton population	The area of degraded Riparian habitat and EEC along the thin strip of land between urban gardens and industrial, transport and grazing lands will be restored through the proposed planting and management scheme with future maintenance likely to be required by land managers.
Setting aside areas for biodiversity conservation without additional management or increased security is generally not sufficient to offset the loss of biodiversity. Factors to consider include protection of existing biodiversity (removal of threats), time-lag effects, and the uncertainties and risks associated with actions such as revegetation.	Offset proposal enhances additional habitat for skinks. The proposed offsetting approach will increase community knowledge of TTSTSs.	The area of degraded Riparian habitat and EEC along the thin strip of land between urban gardens and industrial, transport and grazing lands will be restored through the proposed planting and management scheme with future maintenance likely to be required by land managers.
Offsets may include:		
<ul style="list-style-type: none"> <li>enhancing habitat</li> </ul>	<ul style="list-style-type: none"> <li>Proposal enhances habitat for TTSTS.</li> </ul>	<ul style="list-style-type: none"> <li>Proposal enhances riparian habitat. Within the Project boundary along the Clarence River.</li> </ul>
<ul style="list-style-type: none"> <li>reconstructing habitat in strategic areas to link areas of conservation value</li> </ul>	<ul style="list-style-type: none"> <li>Offset proposal enhances additional habitat for TTSTS's adjacent to and outside the Project.</li> </ul>	<ul style="list-style-type: none"> <li>Areas within the Project will be rehabilitated as part of the Project. These areas will reinstate and improve areas of native vegetation within the local environment.</li> </ul>

<ul style="list-style-type: none"> <li>increasing buffer zones around areas of conservation value</li> </ul>	<ul style="list-style-type: none"> <li>Offset proposal enhances additional habitat for TTSTS's adjacent to and outside the Project, effectively establishing additional protection for the TTSTS.</li> </ul>	<ul style="list-style-type: none"> <li>Offset proposal enhances additional riparian/ EEC habitat within the Project, The proposed works would protect and create buffers around riparian and EEC vegetation.</li> </ul>
<ul style="list-style-type: none"> <li>removing threats by conservation agreements or reservation.</li> </ul>	<ul style="list-style-type: none"> <li>Not planned in this case, planned extra areas to address this.</li> </ul>	<ul style="list-style-type: none"> <li>Not planned. Creek protection zones would be unlikely interfered with, much of the land is either Transport for New South Wales or CVC owned/ managed lands.</li> </ul>
<p>7. Offsets must be enduring – they must offset the impact of the development for the period that the impact occurs.</p>	<p><b>Proposed offsets for TTSTS will result in an increase in available habitat within the Project which would be retained during the Projects operational phase. Any future development of the site would consider the skinks as part of project approval. The increased knowledge of the skink within the local community and Council is considered likely to result in further habitat retention and consideration of skinks as part of planning for the Townships management.</b></p>	<p>Riparian areas and EEC vegetation will be reinstated throughout the project footprint along the banks of the Clarence River and on adjoining areas managed by Transport for New South Wales and Clarence Valley Council.</p>
<p>As impacts on biodiversity are likely to be permanent, the offset should also be permanent and secured by a conservation agreement or reservation and management for biodiversity. Where land is donated to a public authority or private conservation organisation and managed as a biodiversity offset, it should be accompanied by resources for its management. Offsetting should only proceed if an appropriate legal mechanism or instrument is used to secure the required actions.</p>	<p>As the Grafton TTSTS population has only been recorded within the urban environment and its highly altered surrounds, it is considered that the proposed revegetation and habitat augmentation measures will adequately offset short term impacts of the project. The increased area of habitat for this species that will be permanently managed as part of the Project is considered to address this requirement.</p>	<p>Not planned. Creek protection zones would be unlikely interfered with, much of the land is either Transport for New South Wales or CVC Riparian areas and EEC vegetation will be reinstated and rehabilitated within the Project. These areas will remain under the management of the local Government authority and Transport for New South Wales and therefore will be afforded the protections accompanying this.</p>
<p>8. Offsets should be agreed prior to the impact occurring.</p>	<p>MCoA requires biodiversity offset statement prior to Project operation.</p>	<p>MCoA requires biodiversity offset statement prior to Project operation.</p>
<p>Offsets should minimise ecological risks from time-lags. The feasibility and in-principle agreements to the necessary</p>	<p>Addressed on approval of the Biodiversity Offset Statement.</p>	<p>Addressed on approval of the Biodiversity Offset Statement.</p>

offset actions should be demonstrated prior to the approval of the impact. Legal commitments to the offset actions should be entered into prior to the commencement of works under approval.		
9. Offsets must be quantifiable – the impacts and benefits must be reliably estimated.	Addressed through this Biodiversity Offset Statement.	Addressed through this Biodiversity Offset Statement.
Offsets should be based on quantitative assessment of the loss in biodiversity from the clearing or other development and the gain in biodiversity from the offset. The methodology must be based on the best available science, be reliable and used for calculating both the loss from the development and the gain from the offset. The methodology should include:	Addressed through this Biodiversity Offset Statement.	Addressed through this Biodiversity Offset Statement.
<ul style="list-style-type: none"> <li>the area of impact</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement
<ul style="list-style-type: none"> <li>the types of ecological communities and habitat or species affected</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement
<ul style="list-style-type: none"> <li>connectivity with other areas of habitat or corridors</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement
<ul style="list-style-type: none"> <li>the condition of habitat</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement
<ul style="list-style-type: none"> <li>the conservation status and/or scarcity or rarity of ecological communities</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement
<ul style="list-style-type: none"> <li>management actions</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement
<ul style="list-style-type: none"> <li>level of security afforded to the offset site.</li> </ul>	As the Grafton TTSTS population has only been recorded within the urban environment and its highly altered surrounds, it is considered that the proposed revegetation and habitat augmentation measures will adequately offset impacts of the project. The increased area of habitat for this species that will be permanently managed as part of the Project is considered to address this requirement.	Biodiversity Offset Statement report. Riparian areas and EEC vegetation will be reinstated and rehabilitated within the Project. These areas will remain under the management of the local Government authority and Transport for New South Wales and therefore will be afforded the protections accompanying this.
The best available information or data should be used when assessing impacts of	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement



biodiversity loss and gains from offsets. Offsets will be of greater value where:		
<ul style="list-style-type: none"> <li>they protect land with high conservation significance</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement
<ul style="list-style-type: none"> <li>management actions have greater benefits for biodiversity</li> </ul>	Addressed through this Biodiversity Offset Statement	Addressed through this Biodiversity Offset Statement.
<ul style="list-style-type: none"> <li>the offset areas are not isolated or fragmented</li> </ul>	<ul style="list-style-type: none"> <li>Biodiversity Offset Statement report. Proposed to establish corridors where possible through the revegetation works proposed within the Project and linkages with habitat augmentation sites in the adjoining urban areas where the skink is known to occur</li> </ul>	Biodiversity Offset Statement report. <b>Riparian and EEC vegetation will be re-established within the Project and link to the surrounding areas.</b>
<ul style="list-style-type: none"> <li>the management for biodiversity is in perpetuity, such as secured through a conservation agreement.</li> </ul>	<ul style="list-style-type: none"> <li>Biodiversity Offset Statement report. As the Grafton TTSTS population has only been recorded within the urban environment and its highly altered surrounds, it is considered that the proposed revegetation and habitat augmentation measures will adequately offset impacts of the project. The increased area of habitat for this species that will be permanently managed as part of the Project is considered to address this requirement.</li> </ul>	Biodiversity Offset Statement report. Riparian areas and EEC vegetation will be reinstated and rehabilitated within the Project. These areas will remain under the management of the local Government authority and Transport for New South Wales and therefore will be afforded the protections accompanying this.
Management actions must be deliverable and enforceable.	Biodiversity Offset Statement report. The management actions would be agreed with regulatory agencies and applied as part of the construction and operation of the Project	The management actions would be agreed with regulatory agencies and applied as part of the construction and operation of the Project
10. Offsets must be targeted.	-	-
They must offset impacts on the basis of like-for-like or better conservation outcomes. Offsets should be targeted according to biodiversity priorities in the area, based on the conservation status of the ecological community, the presence of threatened species or their habitat, connectivity and the potential to enhance	As the Grafton TTSTS population has only been recorded within the urban environment and its highly altered surrounds, it is considered that the proposed revegetation and habitat augmentation measures will adequately offset short impacts of the project. The increased area of habitat for this species that will be permanently managed as part of the Project is considered to address this requirement.	Riparian areas and EEC vegetation will be reinstated within the Project and this combined with additional areas adjoining the Project will result in an overall increase in this vegetation community within the locality.

condition by management actions and the removal of threats.		
Only ecological communities that are equal or greater in conservation status to the type of ecological community lost can be used for offsets. One type of environmental benefit cannot be traded for another: for example, biodiversity offsets may also result in improvements in water quality or salinity but these benefits do not reduce the biodiversity offset requirements.	As the Grafton TTSTS population has only been recorded within the urban environment and its highly altered surrounds, it is considered that the proposed revegetation and habitat augmentation measures will adequately offset short impacts of the project. The increased area of habitat for this species that will be permanently managed as part of the Project is considered to address this requirement	Riparian areas and EEC vegetation will be reinstated within the Project will result in an overall increase in this vegetation community within the locality.
11. Offsets must be located appropriately.	-	-
Wherever possible, offsets should be located in areas that have the same or similar ecological characteristics as the area affected by the development.	Revegetation and augmented habitat sites will occur across the same area as the impact site and adjoining lands. The offsets have been designed to maximise suitability of the habitats created for TTSTS	Riparian areas and EEC vegetation will be reinstated within the Project and this combined with additional areas adjoining the Project will result in an overall increase in this vegetation community within the locality. Degraded EEC vegetation will be rehabilitated as part of the Project.
12. Offsets must be supplementary.	-	-
They must be beyond existing requirements and not already funded under another scheme. Areas that have received incentive funds cannot be used for offsets. Existing protected areas on private land cannot be used for offsets unless additional security or management actions are implemented. Areas already managed by the government, such as national parks, flora reserves and public open space, cannot be used as offsets.	Proposed offsets are supplementary measures that will occur as a direct result of the Project and are supplementary to other projects that may occur from time to time in the locality.	Proposed offsets are supplementary measures that will occur as a direct result of the Project and are supplementary to other projects that may occur from time to time in the locality.

<p>13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or contracts.</p>	<p>As the Grafton TTSTS population has only been recorded within the urban environment and its highly altered surrounds, it is considered that the proposed revegetation and habitat augmentation measures will adequately offset impacts of the project. The increased area of habitat for this species that will be permanently managed as part of the Project is considered to address this requirement</p>	<p>Riparian areas and EEC vegetation will be reinstated and rehabilitated within the Project. These areas will remain under the management of the local Government authority and Transport for New South Wales and therefore will be afforded the protections accompanying this.</p>
<p>Offsets must be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes.</p>	<p>Addressed, refer Section 6.1.</p>	<p>Addressed, refer Section 6.2.</p>