BIODIVERSITY ASSESSMENT

Scobies Lane Realignment (Stage 1)

Prepared by EDM Ecological

On behalf of Maitland City Council

December 2023

Document Details

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2				

Glossary

B&C SEPP	*State Environmental Planning Policy (Biodiversity and Conservation) 2021*
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	NSW *Biosecurity Act 2015*
BOM	Bureau of Meteorology
CBD	Central Business District
CEMP	Construction Environmental Management Plan
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
EIS	Environmental Impact Statement
EP&A Act	NSW *Environmental Planning & Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GDE	Groundwater Dependent Ecosystem
ha	hectare
km	kilometre
LGA	Local Government Area
m	metre
m^3	cubic metre
MCC	Maitland City Council
mm	millimetre
MNES	Matters of National Environmental Significance
NSW	New South Wales
PCT	Plant Community Type
REF	Review of Environmental Factors
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
SRP	Spill Response Plan
Study area	The area assessed by this REF, which is likely to be affected by the proposal.

Contents

FIGURES

PLATES

TABLES

APPENDICES

1 Introduction

1.1 Background

EDM Ecological was engaged by Maitland City Council (MCC) to prepare a Biodiversity Assessment as part of a Review of Environmental Factors (REF) for the proposed realignment of Scobies Lane, Oakhampton. The proposed project site is located approximately 2 km north of Maitland central business district (CBD). The site is located to the west of the Hunter River, and directly east of Walka Water Works reserve.

The existing Scobies Lane is a narrow, low-lying public road that adjoins Oakhampton Heights with the neighbouring suburbs of Oakhampton, Maitland and Aberglasslyn. Scobies Lane is currently the only access road for residents of Oakhampton Heights and is regularly subject to closure during flood events due to inundation.

The new road would be situated on Council-owned property (Lot 171//DP1148522, Lot3//DP37838 Lot 2//DP1049034) and would link with the junction of South Willards Lane and current Scobies Lane (near the Walka Water Works reserve entrance). The new road would run south, parallel with the Walka Water Works boundary (**Plate 1-1**) and then bear to the east, parallel with the flood mitigation levee (**Plate 1-2**) and finally connecting with Oakhampton Road.

The proposed project will be undertaken in stages. This biodiversity assessment relates to the proposed works in Stage 1 only.

Plate 1-1. Approximate north-south alignment of the proposed road. View from the south at the flood mitigation wall where the road would bear east.

Plate 1-2. Approximate east-west alignment of the proposed road View from the east where the road would meet Oakhampton Road.

1.2 Purpose

This biodiversity assessment will inform the REF on potential impacts to biodiversity. The objectives of this biodiversity assessment are to:

- Record flora and fauna species and describe plant community types and terrestrial habitats within the study area.
- Provide a qualitative description of aquatic habitats within the study area.
- Identify any threatened species, populations, ecological communities, or their habitats within the study area, listed under the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and/or the Environment Protection and *Biodiversity Conservation Act 1999* (EPBC Act).
- Assess the significance of potential impacts of the proposal on terrestrial threatened species, threatened ecological communities or their habitats through consideration of the test of significance in Section 7.3 of the BC Act, where required.
- Assess the significance of potential impacts of the proposal on aquatic threatened species, populations, ecological communities or their habitats according to the test of significance in Section 220ZZ of the FM Act, where required.
- Determine if a species impact statement (SIS) or biodiversity development assessment report (BDAR) is required for the proposal.
- Assess the potential for the proposal to significantly impact a matter of national environmental significance or Commonwealth land and the need to make a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a decision by the Minister for the Environment and Water on whether assessment and approval is required under the EPBC Act.
- Assess whether the proposed project is likely to have a significant impact on the environment and therefore the necessity or an Environmental Impact Statement (EIS) to be prepared and approval to be sought from the Minister for Planning and Environment under Part 5, Subdivision 3 of the EP&A Act.
- Identify any permits and/or notifications required for the proposed project.
- Provide measures to avoid, minimise and mitigate ecological impacts associated with the proposed project.

2 Legislative context

Table 2.1 outlines the legislative context for the project.

Table 2.1. Legislative context.

Legislation	Significance to the proposed project
Commonwealth Legislation	
Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act protects matters of national environmental significance (MNES) including nationally threatened species and ecological communities, migratory species, wetlands of international importance, Commonwealth marine areas, world heritage properties and national heritage places. Other matters include actions proposed on or that will affect the environment of Commonwealth land. The EPBC Act regulates the assessment and approval of activities that have or are likely to significantly impact MNES or the environment of Commonwealth land. A referral to the Department of Climate Change, Energy the Environment and Water (DCCEEW) is required for proposals that may have a significant impact on these matters. Consideration of the impact of the proposal on MNES has been provided in **Table 6.2**.
State Legislation	
Environmental Planning and Assessment Act 1979 (EP&A Act)	The Environmental Planning and Assessment Act 1979 (EP&A Act) provides the framework for assessing the potential environmental impacts associated with proposed developments in NSW. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities which do not require development consent under the EP&A Act. This proposal is being assessed under Part 5 via a Review of Environmental Factors (REF).
Biodiversity Conservation Act 2016 (BC Act)	The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. It provides for listing and protection of threatened species and threatened ecological communities, biodiversity conservation, identifying area of outstanding biodiversity value and for biodiversity offset schemes and biodiversity certification of land.
Fisheries Management Act 1994 (FM Act)	The FM Act aims to conserve, develop, and share the fishery resources of the State for the benefit of present and future generations. The FM Act establishes mechanisms for: • the listing of threatened species, populations and ecological communities or key threatening processes • the declaration of critical habitat • consideration and assessment of threatened species impacts in the development assessment process.
Biosecurity Act 2015 (Biosecurity Act)	The primary object of the Biosecurity Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers

	and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers. The act aims to promote biosecurity as a shared responsibility between government, industry and communities. It also provides a framework for the timely and effective management of pests, weeds, diseases and other biosecurity matter that may impact the environment, the community and/or the economy.
Planning Instruments	
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (B&C SEPP)	Chapter 4 of the B&C SEPP aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline by: • Identifying land to which an approved Koala plan of management applies. • Encouraging the identification of areas of core Koala habitat.

2.1 Local plans and strategies

Maitland City Council has adopted the following environmental plans and strategies that relate to the proposed project:

Maitland Greening Plan

Maitland +10 Community Strategic Plan

The Environmental Sustainability Strategy 2030

The *Maitland Greening Plan* (Maitland City Council, 2002) was developed to provide a strategic framework for future vegetation management in Maitland. The aim of the strategy is to address widespread land degradation, loss of biodiversity and habitat through the protection of remnant vegetation, habitat enhancement and community-based revegetation programs.

The *Maitland +10 Community Strategic Plan* (Maitland City Council, 2022) aligns with current community goals and includes the theme – 'Let's live sustainably'. The Plan identifies what the community would like for the city over the next ten years, which in terms of environmental sustainability includes to:

- Love and look after the great outdoors
- Protect our native plants and animals
- Improve the quality of our waterways and wetlands

The *Environmental Sustainability Strategy 2030* (Maitland City Council, 2023a) responds to community feedback on environmental priorities received over recent years. It aligns with the *Maitland Local Strategic Planning Statement 2040+* and *Maitland +10 Community Strategic Plan* and builds upon the '*Let's live sustainably'* theme. Key targets of one of the Strategy's theme areas '*Green and Blue Maitland*' are:

- Deliver functional biodiversity corridors
- Protect important natural spaces

- Improve waterway health
- Increase community participation in environmental events and volunteering

Implementing the environmental safeguards and mitigation measures in **Section 7** will ensure that the proposed project remains consistent with the aims, goals and targets of the local plans and strategies listed above.

3 Project

3.1 Location

The proposed project site is in the Maitland LGA approximately 2 km north of Maitland CBD. It is situated approximately 60 m west of the Hunter River and is directly east of Walka Water Works, a well-used public recreation reserve. Refer **Figure 3.1** for locality.

3.2 Project area

The project area consists of mostly pasture which has been under an agistment agreement between MCC and a local resident for horse grazing for many years. The project area also includes an old livestock yard consisting of a rural shed, small storage shed, water tank, and livestock fencing which would all need to be demolished and removed as part of the proposal.

Almost the entirety of the study area is zoned as RU1 – Primary Production land. The land directly to the east is Walka Water Works reserve, which is zoned as RE1 – Public Recreation. Directly to the north-west is R5 – Large Lot Residential Land. Land use in the vicinity consists of mostly horse and cattle grazing and general rural residential activities.

The extent of Stage 1 of the project footprint is approximately 1.8 ha and the study area for this report is approximately 7.8 ha, refer **Figure 3.2.**

3.3 Project works

The proposed project works (Stage 1) would involve activities including the removal of vegetation, the demolishing of rural sheds, construction of a temporary access road (Haul Road), earthworks and bulk filling, installation of stormwater drainage, pavement construction, road surfacing, and revegetation works. See **Figure 3.3** for key features of the project.

The scope of works for this project are:

Pre-construction

- Service location
- Site establishment including traffic control and signage
- Installation of erosion and sediment controls
- Demolition and removal of sheds, water tank, and livestock fencing
- Treatment and removal of introduced weeds
- Removal of one Silky Oak tree and trimming of one Silky Oak tree
- Establishment of temporary compound (including erosion and sediment controls)
- Installation of fencing
- Relocation of powerlines

Construction

- Stripping of topsoil
- Installation of 6 m wide temporary millings ‘Haul Road’
- Excavation works
- Bulk fill works
- Installation of 4 x stormwater pipe crossings and flood flaps
- Grading and topsoiling of batters
- AC millings wearing course
- Relocation of watermain
- Backfilling works
- Revegetation works

Demobilisation

- Final revegetation works
- Removal of all plant and materials
- Removal of temporary site compound
- Planting of offset trees

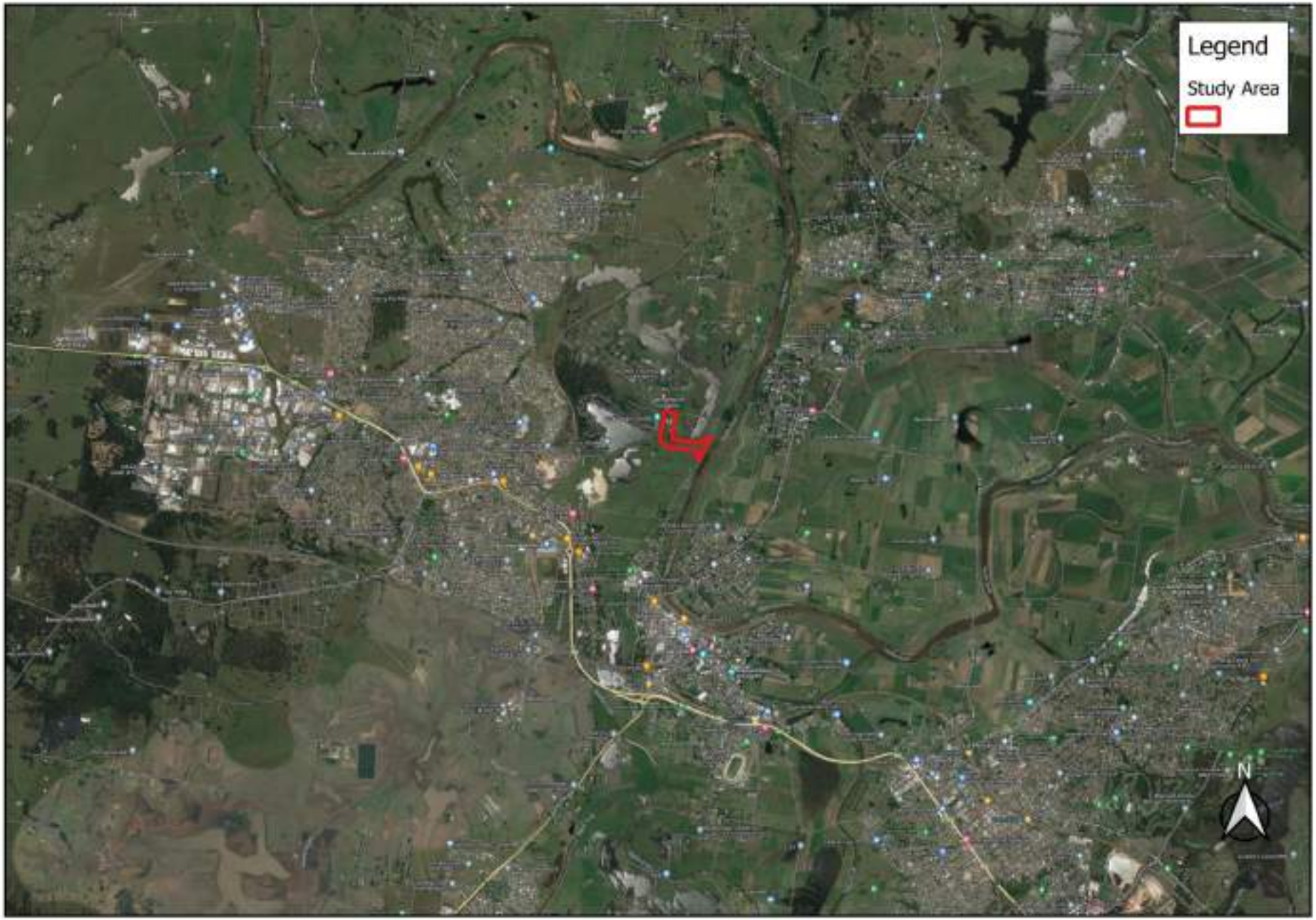

Figure 3.1. Locality of the proposed project.

Figure 3.2. Location of the study area and extent of the proposed project.

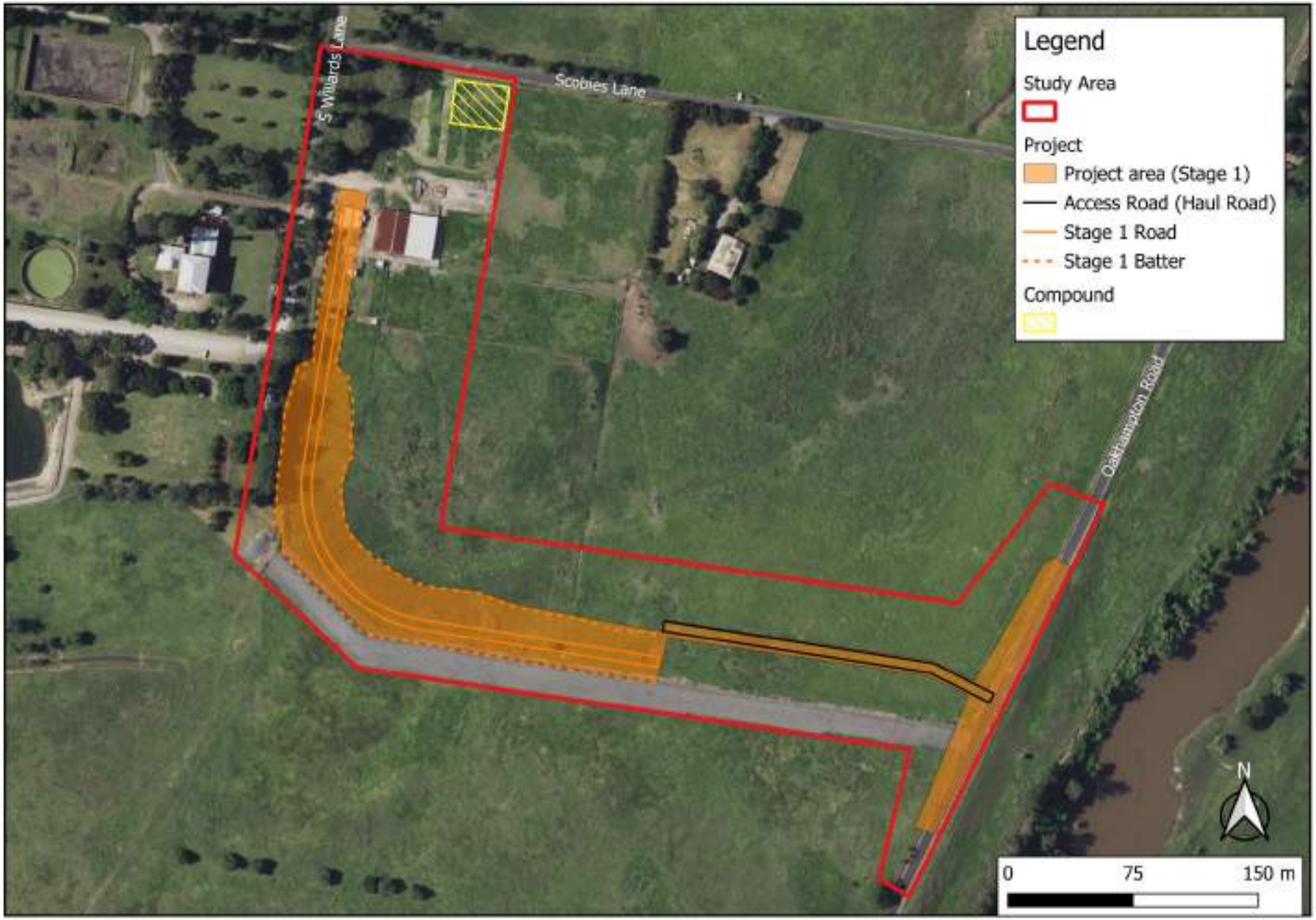

Figure 3.3. Key features of the project.

4 Methodology

4.1 Desktop assessment

To identify threatened and migratory species, endangered populations, and threatened ecological communities, or their habitats with the potential to occur in the study area, a detailed assessment of relevant databases was completed. These database searches included:

- EPBC Act Protected Matters Search Tool (DCCEEW, 2023) on 4 October 2023.
- NSW BioNet Atlas Search (DPE, 2023) on 4 October 2023.
- NSW State Vegetation Type Map (DPE, 2022) on 4 October 2023.
- Fisheries NSW Spatial Data Portal (DPI, 2023a) on 4 October 2023.
- Atlas of Groundwater Dependent Ecosystems (GDE) (BOM, 2023) on 4 October 2023.

A search of NSW WeedWise (DPI, 2023) identified all priority weeds listed for the Hunter region and associated measures needed to fulfil the requirements of the Biosecurity Act (**Appendix A**).

4.2 Field survey

Inspections of the study area were undertaken on 19 October 2023 and 1 December by EDM Ecological to:

- Assess and describe the existing environment in relation to terrestrial and aquatic flora and fauna species and communities.
- Identify threatened species or key ecological features (such as hollow-bearing trees and fallen timber) with the potential to provide habitat for threatened species.
- Identify if the study area supports or has potential habitat for threatened and migratory species, endangered populations or ecological communities listed under the BC Act and/or the EPBC Act.

Survey of the study area involved foot traverses of the areas with potential to be disturbed by the proposed works. Vegetation survey, terrestrial fauna survey and habitat assessment were all conducted on 19 October and 1 December.

4.2.1 Vegetation survey

Vegetation assessment was undertaken to record dominant plant species in the canopy, mid-storey and groundcover. Native vegetation was classified according to Plant Community Types (PCTs) using the BioNet Vegetation Classification (DPE, 2022). Areas of non-native vegetation were also identified and mapped.

4.2.2 Terrestrial fauna survey

Fauna surveys undertaken on site included:

- Fauna habitat assessment targeting key ecological features (such as hollow-bearing trees and fallen timber) with the potential to provide habitat for threatened species.
- Opportunistic observations of fauna.

- Scats, tracks, pellets, and other traces of fauna observed.

4.2.3 Aquatic habitat assessment

An aquatic habitat assessment was conducted on site to assess aquatic habitat and condition.

The objectives of the aquatic assessment were to:

- Identify any threatened and migratory species, endangered populations, communities, or their habitats within the study area. This includes matters listed under the EPBC Act, BC Act and FM Act.

- Assess the potential impact of the proposal on aquatic flora and fauna species, threatened and migratory species, populations, communities, or their habitats in the study area.

4.2.4 Wildlife corridors

An assessment of potential wildlife corridors that may provide linkages to other local and regional habitat was undertaken on site. A desktop review of Council's mapped biodiversity corridors and Green Blue Grid (Maitland City Council, 2023) was also undertaken to determine the significance of the study area according to the Environmental Sustainability Strategy (ESS).

4.3 Weather conditions

The closest operational weather station to the study area is Maitland Airport AWS (station 061428) located approximately 6.3 km to the west of the study area. Weather conditions for the 19 October and 1 December 2023 are provided in **Table 4.1**.

Table 4.1. Weather conditions during site surveys.

Date	Temperature Range (°C)	Rainfall (mm)	Wind direction	Maximum Wind gusts (km/hr)
19 October 2023	10.8 to 24.9	0.2	ESE	39
1 December 2023	18.5 to 26.9	0.2	WNW	17

4.4 Limitations

The survey was influenced by limitations in time, access, by seasonal factors and by water regime. Limitations included:

- Surveys were conducted during spring and on the first day of summer only, thereby reducing the likelihood of identifying a range of potentially occurring threatened species which may only utilise the habitats of the study area periodically or seasonally.

- Parts of the study area are intermittently inundated, depending on rainfall, groundwater flows, and local catchment runoff. At the time of inspections, the study area was relatively dry. It should be noted that the structure and composition of wetland communities can vary both spatially and temporally depending on the water regime.

- The wetland area was not accessible during the first site inspection in October due to live electric fencing and horses being present.

- The wetland area and surrounding pasture had been slashed prior to the second site inspection in December, potentially making flora species difficult to identify.

- Desktop assessments were also used to inform assessments of the likelihood of occurrence of threatened species.

- Time constraints were provided by the client, Maitland City Council.

5 Existing environment

5.1 Study area

The study area is in the Maitland local government area approximately 2 km north of Maitland CBD. It is situated approximately 60 m west of the Hunter River and directly east of Walka Water Works reserve. Depending on water regime, parts of the study area are intermittently inundated. A second order stream (drainage gully) intersects the study area (flowing north) however this was dry at the time of inspections. A flood mitigation levee runs east-west across the southern limit of the study area.

5.2 Plant community types

A search of the NSW State Vegetation Type Map identified one plant community type (PCT) as occurring in the study area. The PCT is:

PCT 3975 – Southern Lower Floodplain Freshwater Wetland

- Listed as endangered in NSW under the BC Act.

PCT 3975 was identified in the lower-lying portion of the study area. The majority of vegetation in the study area is pasture. A small stand of isolated trees is located in the north-eastern corner. A heavily weed infested embankment on the western boundary, is proposed for clearing (shrub and ground layer only). A map showing the spatial distribution of the plant community types (PCTs) and other vegetation identified in the study area is provided in **Figure 5.1**. A description of each PCT is provided below.

Figure 5.1. Spatial distribution of PCTs and other vegetation of the study area.

5.2.1 PCT 3975 – Southern Lower Floodplain Freshwater Wetland

PCT: 3975 – Southern Lower Floodplain Freshwater Wetland

Conservation status: Endangered Ecological Community in NSW

Condition: Poor

Extent in the study area: 0.26 ha

Description: A tall to very tall freshwater sedgeland or forbland occurring in depressions on Quaternary alluvial deposits (primarily backswamps with organic-rich mud, silt or clay soils) on coastal floodplains of the Central Coast and South Coast botanical divisions. Almost all known locations occur at elevations of below 10 metres asl, however this PCT can occur at higher elevations in lagoons that have prolonged inundation, such as Ellalong Lagoon south-west of Cessnock which is just over 100 metres asl. This PCT describes non-woody freshwater wetlands on Quaternary alluvium south from the Hunter Valley that are not dominated by *Phragmites australis* or *Eleocharis equisetina* and are either on low coastal floodplains or at the edges of more elevated lagoons that have prolonged inundation. Within these environmental and floristic parameters this PCT can encompass a range of sedgeland and aquatic forb assemblages. On presently available information the aquatic forb *Persicaria decipiens* is very frequently present with very sparse cover. The grasses *Cynodon dactylon* and *Paspalum distichum* and the reed *Typha orientalis* commonly occur with sparse cover, while the sedge *Eleocharis sphacelata* is occasionally present however where it does occur tends to have mid-dense cover. A diversity of other sedges, rushes and aquatic forbs are occasionally or rarely recorded, such as *Persicaria hydropiper*, *Triglochin microtuberosa*, *Ludwigia peploides subsp. montevidensis*, *Alternanthera denticulata* and species of *Juncus*. Rarely, a very sparse emergent tree layer is present, which may include *Casuarina glauca*, *melaleucas* or, very rarely, overhanging Eucalypts. Some sedges such as *Baumea articulata*, *Fimbristylis velata*, *Eleocharis acuta* and *Bolboschoenus* species dominate individual sites, reflecting the floristic diversity of this PCT. This community often occurs in disturbed environments and may potentially include derived states.

In the study area, PCT 3975 is limited to the lower-lying areas outside of the project footprint. No trees or shrubs were recorded. The grasses *Paspalum distichum* and *Cynodon dactylon* are the dominant native species, with *Persicaria hydropiper* also frequently present. All other herbs and groundcovers are introduced species. The PCT is highly disturbed and is in poor condition due to ongoing slashing and grazing by horses occurring in this wetland area for many years (see **Plate 5-1**). It is likely that some native species regularly present on site were not identified due to recent slashing (**Plate 5-2**).

Species identified in this PCT within study area include:

- *Brassica rapa* (Field Mustard)*
- *Cirsium vulgare* (Spear Thistle)*
- *Cynodon dactylon*
- *Paspalum distichum*
- *Persicaria hydropiper*
- *Rumex crispus* (Curled Dock)*
- *Senecio madagascariensis* (Fireweed)*
- *Trifolium repens* (White Clover)*

Note: * denotes an introduced species

Plate 5-1. PCT 3975 - Southern Lower Floodplain Freshwater Wetland (highly disturbed). View from the east.

Plate 5-2. PCT 3975 - Southern Lower Floodplain Freshwater Wetland (highly disturbed). Close-up view.

5.2.2 Non-native vegetation

Condition: Poor

Extent in the study area: 0.06 ha

Description: The non-native vegetation area is located on an embankment at the western boundary of the study area and Walka Water Works reserve. The dominant trees in this area are Silky Oak and Tree of Heaven. Green Cestrum and Tree of Heaven saplings/suckers dominate the shrub layer. The climber, Morning Glory is found sprawling over much of the vegetation. There are no native species present (see **Plate 5-3**).

The shrub and ground layer of the embankment is proposed for clearing as part of the proposal. During the second site inspection on 1 December 2023 the non-native vegetation on the embankment had already been cleared (**Plate 5-4**). Following discussions with MCC it appears that Ausgrid had recently undertaken this clearing as part of their regular powerline maintenance. It was noted that further pruning of the heavily pruned Silky Oak tree had also occurred.

Trees

- *Grevillea robusta* (Silky Oak)^
- *Ailanthus altissima* (Tree of Heaven)*

Shrubs

- *Cestrum parqui* (Green Cestrum)*
- *Ricinus communis* (Castor Oil Plant)*
- *Solanum mauritianum* (Wild Tobacco Bush)*

Climbers

- *Ipomoea purpurea* (Common Morning Glory)*

Note: * denotes an introduced species; ^ denotes an Australian native species that has been introduced

Plate 5-3. Non-native vegetation on western embankment. View from the north-east.

Plate 5-4. Western bank on 1 December. Presumed to have been cleared by Ausgrid.

5.2.3 Pasture

Condition: Poor

Extent in the study area: 4.78 ha

Description: The pasture areas are dominated by Kikuyu grass with various introduced shrubs, herbs and groundcovers also present throughout (see **Plate 5-5** and **Plate 5-6**). Isolated mature African Olive and Large-leaved Privet are located on the southern boundary. Chinese Tallow Tree saplings are also found along the fence lines. Small patches of the native sedge *Juncus usitatus* can be found in the drainage areas near the levee.

Species include:

Trees

- *Ligustrum lucidum* (Large-leaved Privet)*
- *Olea europaea* subsp. *cuspidate* (African Olive)*
- *Triadica sebifera* (Chinese Tallow Tree)*

Shrubs

- *Cestrum parqui* (Green Cestrum)*
- *Gomphocarpus fruticosus* (Narrow-leaved Cotton Bush)*
- *Ricinus communis (Castor Oil Plant)**

Groundcovers, herbs, grasses

- *Bidens pilosa* (Cobblers Pegs)*
- *Brassica rapa* (Field Mustard)*
- *Cenchrus clandestinus* (Kikuyu)*
- *Cirsium vulgare* (Spear Thistle)*
- *Foeniculum vulgare* (Wild Fennel)*
- *Juncus usitatus*
- *Nothoscordum gracile* (Onion Weed)*
- *Plantago lanceolata* (Lamb's Tongues)*
- *Rumex hypogaeus* (Spiny Emex)*
- *Senecio madagascariensis* (Fireweed)*
- *Sida rhombifolia* (Paddy's Lucerne)*
- *Verbena bonariensis* (Purpletop)*

Note: * denotes an introduced species

Plate 5-5. Pasture in the study area. View from the south-eastern corner of the site.

Plate 5-6. Pasture in the study area. View from the south.

5.2.4 Isolated trees

Condition: Good

Extent in the study area: 0.25 ha

Description: A small stand of isolated trees is located in the north-western corner of the study area (**Plate 5-7**). These trees include one large and one medium-sized *Corymbia citriodora* (Lemon-scented Gum). This species is native to temperate and tropical eastern Australia, distributed from the Cooktown area to south of Gladstone in Queensland but is sparingly naturalised in NSW. It is highly likely that these trees were planted. Other trees include one medium-sized *Grevillea robusta* and two African Olive trees. The understory is mostly introduced grasses and herbs.

Species include:

- *Corymbia citriodora* (Lemon-scented Gum)^
- *Grevillea robusta* (Silky Oak)^
- *Olea europaea* subsp. *cuspidate* (African Olive)*

Note: * denotes an introduced species; ^ denotes an Australian native species that has been introduced to the region.

Plate 5-7. Isolated trees in north-western corner of the study area. View from the south.

5.2.5 Disturbed land

The remaining land within the study area is considered disturbed land. This includes the roads, roadsides, levee, stock yard, buildings and driveways (**Plate 5-8**). The extent of disturbed land within the study area is 2.42 ha.

Plate 5-8. Disturbed land in the northern portion of the study area. View from the south-west.

5.3 Fauna habitats

5.3.1 Terrestrial habitat

There are several hollow bearing trees located at the western boundary of the study area and Walka Water Works reserve. These trees are predominantly *Grevillea robusta* (Silky Oak). One isolated Silky Oak tree would require removal (**Plate 5-9**). This tree has been heavily pruned on one side due to its proximity to powerlines. Consequently, there are several scars in the tree, however, these appear to be shallow and it is not likely that these have formed into hollows that would be suitable as habitat (**Plate 5-10**). This tree is also infested with Longicorn beetle (*Phoracantha solida*). A flock of the introduced Common Myna *Acridotheres tristis* was observed feeding on the larvae.

The rural shed and storage shed were identified as potential roosting habitat for microbat species. A thorough inspection of all areas found no evidence of microbats roosting including no audible squeaking, no distinctive smell of ammonia, no visible guano, and no staining from urine (**Plate 5-11**). Piles of timber and other rubbish in the old stock yard may be providing habitat for reptiles, amphibians and/or rodents (**Plate 5-12**).

Plate 5-9. Silky Oak tree proposed for removal.

Plate 5-10. Shallow scar in Silky Oak tree.

Plate 5-11. One of the sheds inspected for signs of microbats.

Plate 5-12. Timber and other rubbish potentially providing habitat for reptiles, amphibians and/or rodents.

5.3.2 Aquatic habitat

The second order stream that intersects the study area is mapped as Key Fish Habitat (**Figure 5.2**) according to Fisheries NSW Spatial Data Portal (DPI, 2023a). This was dry at the time of inspections. The study area is not mapped as habitat for any threatened aquatic species.

No other significant aquatic habitat was identified on site during inspections. At the time of inspections, the study area was relatively dry and no surface water was evident. The wetland and surrounding pasture had also been slashed prior to inspection and is grazed by horses, therefore highly disturbed. Despite this, the currently dry wetland area does have potential to provide aquatic habitat for native frogs, fish, birds and other fauna when the natural water regime inundates the area. It is also likely that if the disturbances of slashing and grazing are removed that wetland species would recover.

5.3.3 Koala habitat

The study area contains one koala use tree species – *Corymbia maculata* (Spotted Gum), listed under the Central Coast Koala Management Area in Schedule 3 of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (B&C SEPP). One isolated tree is located within the Walka Water Works reserve on the western boundary of the study area.

The NSW BioNet Atlas identified six historic records of koalas within 10 km of the study area. Many of these records are historic (up to 19 years old) and have poor locational accuracy (10,000 m). One recorded location is approximately 1 km east of the study area. This sighting was recorded in 2018 (5 years ago). The koala favours habitat consisting of eucalypt woodlands and forests. To the north and west of the reservoir in the Walka Water Works reserve is vegetation mapped as PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest. This ecological community could provide habitat for the koala. However, this habitat is not found in the study area which is heavily cleared and disturbed. It is considered unlikely that the study area provides habitat for koalas.

5.3.4 Wildlife corridors

Considerable clearing in the immediate vicinity of the study area for rural land use and urbanisation has resulted in disturbed and fragmented vegetation with reduced habitat connectivity. However, the avenue of trees on the boundary of Walka Water Works and the study area does provide a narrow wildlife corridor. This links the mature, dense vegetation in the upper slopes of the reserve and surrounds of the reservoir with other wildlife corridors, pockets of vegetation, floodplains and wetlands in the vicinity of the site.

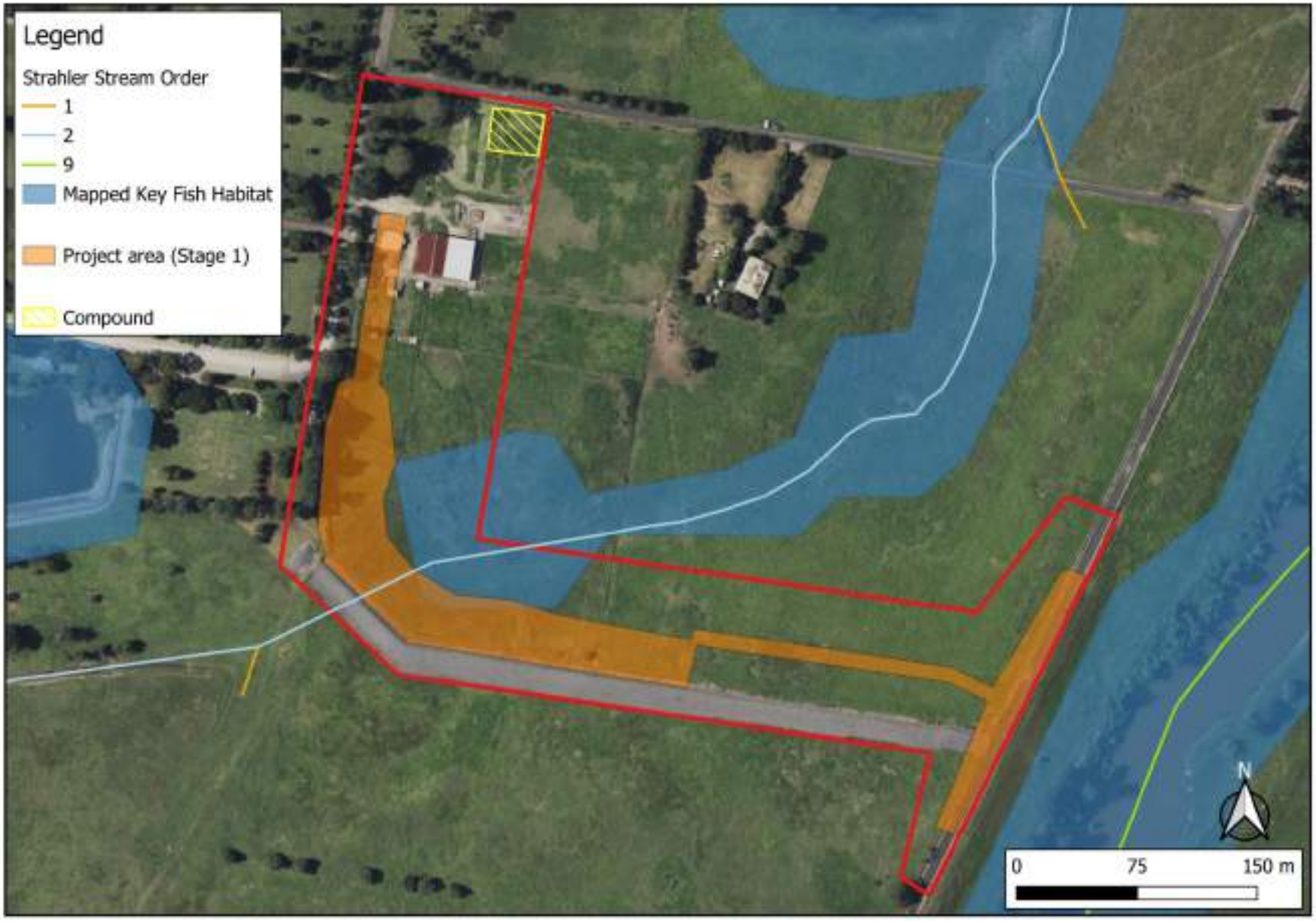

Figure 5.2. Key Fish Habitat and Strahler Stream Order mapped in the study area.

5.4 Fauna

Fauna recorded in the study area during inspections of the site in October and December 2023 are listed in **Table 5.1**.

Table 5.1. Fauna recorded in the study area.

Scientific name	Common name	Status	
		BC Act	EPBC Act
Birds			
*Acridotheres tristis**	Common Myna	-	-
Cacatua galerita	Sulphur-crested Cockatoo	-	-
Cacatua tenuirostris	Long-billed Corella	-	-
Corvus coronoides	Australian Raven	-	-
Cracticus nigrogularis	Pied Butcherbird	-	-
Dacelo novaeguineae	Laughing Kookaburra	-	-
Egretta garzetta	Little Egret	-	-
Egretta novaehollandiae	White-faced Heron	-	-
Eudynamys orientalis	Eastern Koel	-	-
Gymnorhina tibicen	Australian Magpie	-	-
Ocyphaps lophotes	Crested Pieon	-	-
Rhipidura leucophrys	Willie Wagtail	-	-
Threskiornis moluccus	Australian White Ibis	-	-
Trichoglossus haematodus	Rainbow Lorikeet	-	-
Zanda funereus	Yellow-tailed Black-Cockatoo	-	-
Reptiles			
Pseudonaja textilis	Eastern Brown Snake	-	-
Amphibians			
Crinia signifera	Common Eastern Froglet	-	-

*** introduced species.**

5.5 Priority weeds

The *Biosecurity Act 2015* is the key legislation regulating weed management in New South Wales. The act provides for the prevention, elimination, minimisation and management of biosecurity risks posed by particular weed species known as 'priority weeds'. To assist land managers across NSW, these priority weeds are listed in a Regional Strategic Weed Management Plan for each of the 11 regions in the state. Priority weeds can be listed as a State priority and/or a regional priority and can have mandatory or recommended measures associated with their management. See **Appendix A** (DPI, 2023b) for further information.

Table 5.2 lists the introduced flora observed in the study area which are listed as priority weeds in the Hunter Regional Strategic Weed Management Plan 2023 – 2027 (HLLS, 2022).

Table 5.2. Priority weeds observed in the study area.

Common name	Scientific name
State Priority Weeds	
^Fireweed	*Senecio madagascariensis*
Regional Priority Weeds (Hunter)	
African olive	*Olea europaea* subsp. *cuspidata*
Chinese Tallow Tree	*Triadica sebifera*
Green cestrum	*Cestrum parqui*
Tree of Heaven	*Ailanthus altissima*

^ Mandatory Measure - prohibited from sale or import into NSW.

All other introduced plants found on site are managed according to a *General Biosecurity Duty* under Section 22 of the Biosecurity Act.

Priority weeds on site (particularly Green Cestrum and Tree of Heaven) are mostly found on the western embankment and surrounding area. One isolated African Olive tree is located on the southern boundary along with a Large-leaved Privet and Chinese Tallow Tree saplings along the fence line. Two African Olive trees are located in the isolated tree area at the north-western corner of the study area along with some Green Cestrum seedlings.

5.6 Groundwater dependent ecosystems

A search of the Atlas of Groundwater Dependent Ecosystems (GDE) (BOM, 2023) identified the Hunter River to the east as a high potential GDE. Vegetation along the banks of the river is also mapped as a high potential terrestrial GDE. Areas within Walka Water Works reserve (to the west) are mapped as both high and low potential terrestrial GDE.

5.7 Threatened species, populations, and ecological communities

Table 5.3 lists threatened species, populations and ecological communities that were recorded within the study area during surveys and those threatened species, populations and ecological communities identified in the BioNet Atlas of NSW (DPE, 2023) (**Appendix B**) and the Protected Matters Search Tool (DCCEEW, 2023) (**Appendix C**) as being known to or likely to occur or its habitat known to or likely to occur in the area.

An assessment of the likelihood of occurrence in the study area was made for each species, population or community based on known and predicted range, whether suitable habitat is available in the study area, and previous records in the locality. Each species, population or community was allocated one of the following terms for likelihood of occurring in the study area:

Recorded: has been observed in the study area

Likely: medium to high likelihood that it occurs in the study area

Potential: suitable habitat occurs in the study area, but it is not likely to occur

Unlikely: very low to low likelihood that it occurs in the study area

Not expected: habitat in the study area and in the vicinity is unsuitable

The potential (**Yes** or **No**) for each to be significantly impacted by the proposal was also determined.

Table 5.3. Threatened species, populations and communities recorded within or with potential to occur in the study area.

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
Ecological Communities					
Central Hunter Valley eucalypt forest and woodland		-	CE	Not expected	No. Not recorded on site.
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community		-	E	Not expected	No. Not recorded on site.
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland		-	E	Not expected	No. Not recorded on site.
Lowland Rainforest of Subtropical Australia		-	CE	Not expected	No. Not recorded on site.
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria		-	CE	Not expected	No. Not recorded on site.
Southern Lower Floodplain Freshwater Wetland		**V**	-	**Recorded**	**Yes. Recorded in the study area. The proposal does not include the removal of vegetation associated with this community. However, this community could be impacted by construction activities. A Test of Significance was conducted for this species in Appendix D.**
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		-	CE	Not expected	No. Not recorded on site.

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
Flora					
A leek-orchid	*Prasophyllum sp. Wybong (C.Phelps ORG 5269)*	-	CE	Not expected	No. This species is known to occur in open eucalypt woodland and grassland.
Austral Toadflax	*Thesium australe*	V	V	Not expected	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass
Cymbidium canaliculatum population in the Hunter Catchment	*Cymbidium canaliculatum*	E	-	Unlikely	No. Study area is within the known range for this species, however none of the common host trees it is associated with occur in the study area. No stag trees or native vegetation will be removed.
Eucalyptus camaldulensis population in the Hunter catchment	*Eucalyptus camaldulensis*	E	-	Not expected	No. This species has not been identified in the study area. occur with Eucalyptus tereticornis, Eucalyptus melliodora, Casuarina cunninghamiana subsp. cunninghamiana and Angophora floribunda.
Euphrasia arguta	*Euphrasia arguta*	CE	CE	Not expected	No. Outside of known and predicted range. Historically has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. Has been reported in eucalypt forest with a mixed grass and shrub understorey.
Heath Wrinklewort	*Rutidosis heterogama*	V	V	Not expected	No. Not suitable habitat. Grows in heath on sandy soils and moist areas in open forest and has been recorded along disturbed roadsides.
Illawarra Greenhood	*Pterostylis gibbosa*	E	E	Not expected	No. Associated with dry sclerophyll forests or grassy woodlands. Not suitable habitat.
Knotweed	*Persicaria elatior*	V	V	Unlikely	No. Usually found on the margin of standing water. This species has not been identified in the study area.

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
Leafless Tongue-orchid	*Cryptostylis hunteriana*	V	V	Not expected	No. Typically occurs in swamp-heath and woodland dominated by Scribbly Gum, Silvertop Ash, Red Bloodwood and Black Sheoak.
Magenta Lilly Pilly	*Syzygium paniculatum*	E	V	Not expected	No. No rainforest habitat present in study area.
Magenta Lilly Pilly	*Syzygium paniculatum*	E	V	Not expected	No. Not suitable habitat. Restricted to riverside gallery rainforests and remnant littoral rainforest.
Native Guava	*Rhodomyrtus psidioides*	CE	CE	Not expected	No. Suitable rainforest and wet forest habitat not present in study area.
Scrub Turpentine	*Rhodamnia rubescens*	CE	CE	Not expected	No. Occurs in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest. Not suitable habitat.
Slaty Red Gum	*Eucalyptus glaucina*	V	V	Not expected	No. Grows in grassy woodland and dry eucalypt forest on deep, moderately fertile and well-watered soils.
Thick-lipped Spider-orchid	*Caladenia tessellata*	E	V	Not expected	No. Not suitable habitat. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, and known to occur in low woodland with stony soil.
Mammals					
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	-	Not expected	No. Prefers dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest.
Brush-tailed Rock-wallaby	*Petrogale penicillata*	E	V	Not expected	No. Not suitable habitat. Occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.
Eastern Cave Bat	*Vespadelus troughtoni*	V	-	Not expected	No. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
					overhangs; has been recorded roosting in disused mine workings.
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	Not expected	No. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	Unlikely	No. Prefers moist habitats, with trees taller than 20 m.
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	Unlikely	No. Uses a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. No removal of hollow-bearing trees. No evidence of microbats roosting in sheds to be removed.
Greater Glider	*Petauroides volans*	E	E	Not expected	No. Not suitable habitat. Found in eucalypt forests and woodlands. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows.
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Unlikely	No. Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Commonly recorded in surrounding areas. No roosting camps identified within the study area or surrounding area. No removal of potential feed trees proposed.
Koala	*Phascolarctos cinereus*	E	E	Not expected	No. Not suitable habitat. Inhabits eucalypt woodlands and forests. See **Section 5.3.3** for more details.
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	Unlikely	No. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
					other man-made structures. No evidence of microbats roosting in sheds to be removed.
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	V	Unlikely	No Not suitable habitat. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these features.
Little Bent-winged Bat	*Miniopterus australis*	V	-	Not expected	No. Prefers moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas.
Long-nosed Potoroo (northern)	*Potorous tridactylus tridactylus*	V	V	Not expected	No. Not suitable habitat. Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.
New Holland Mouse	*Pseudomys novaehollandiae*	-	V	Not expected	No. No suitable habitat. Inhabits open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.
Southern Myotis	*Myotis macropus*	V	-	Unlikely	No. Roosts close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forages over streams and pools. No removal of hollow-bearing trees. No evidence of microbats roosting in sheds to be removed.
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	Not expected	No. Not suitable habitat. Habitat includes rainforest, open forest, woodland, coastal heath and inland

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
					riparian forest, from the sub-alpine zone to the coastline.
Squirrel Glider	*Petaurus norfolcensis*	V	-	Not expected	No. Not suitable habitat. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.
Yellow-bellied Glider (south-eastern)	*Petaurus australis australis*	V	V	Not expected	No. Not suitable habitat in the study area. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	Unlikely	No. Roosts in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. No removal of hollow-bearing trees. No evidence of microbats roosting in sheds to be removed.
Birds					
Australasian Bittern	*Botaurus poiciloptilus*	E	E	Unlikely	No. Not suitable habitat. Favours permanent freshwater wetlands with tall, dense vegetation, particularly *Typha* spp. and *Eleocharis* spp..
Australian Painted Snipe	*Rostratula australis*	E	E	Unlikely	No. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Forages nocturnally on mud-flats and in shallow water. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.
Black-faced Monarch	*Monarcha melanopsis*	-	M	Not expected	No. Not suitable habitat. Occurs in rainforests, open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands.

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
Black-necked Stork	*Ephippiorhynchus asiaticus*	E	-	Unlikely	No. Not suitable habitat. Wetland is too disturbed and degraded.
Blue-billed Duck	*Oxyura australis*	V	-	Not expected	No. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation.
Blue-winged Parrot	*Neophema chrysostoma*	V	V	Not expected	No. Range includes coastal, sub-coastal and inland areas, through to semi-arid zones. Favours grasslands and grassy woodlands.
Brown Treecreeper (south-eastern)	*Climacteris picumnus victoriae*	V	V	Not expected	No. Not suitable habitat. Found in eucalypt woodlands and dry open forest; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts; also found in mallee and River Red Gum Forest bordering wetlands with an open understorey.
Common Greenshank	*Tringia nebularia*	-	M	Not expected	No. Not suitable habitat. Occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms.
Common Sandpiper	*Actitis hypoleucos*	-	M	Unlikely	No. Not Utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats.
Curlew Sandpiper	*Calidris ferruginea*	E	CE, M	Not expected	No. Not suitable habitat. Occupies littoral and estuarine habitats, and is mainly found in intertidal mudflats of sheltered coasts. Also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland.
Diamond Firetail	*Stagonopleura guttata*	V	V	Unlikely	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
					Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.
Eastern Curlew	*Numenius madagascariensis*	-	CE	Not expected	No. Not suitable habitat. Found on intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours and lagoons.
Eastern Osprey	*Pandion cristatus*	V	-	Unlikely	No. Favours coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. No stag trees will be removed.
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	Not expected	No. Favours tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests or open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas. Often found in urban areas as well.
Greater Sand Plover	*Charadrius leschenaultii*	V	V	Not expected	No. Not suitable habitat. Almost entirely restricted to coastal areas, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.
Grey Falcon	*Falco hypoleucos*	V	V	Unlikely	No. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.
Grey Plover	*Pluvialis squatarola*	-	M	Unlikely	No. Prefers coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats.

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	-	Not expected	No. Not suitable habitat. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.
Latham's Snipe	*Gallinago hardwickii*	-	M	Unlikely	No. Prefers freshwater wetlands with low, dense vegetation.
Little Lorikeet	*Glossopsitta pusilla*	V	-	Unlikely	No. Forages primarily in the canopy of open *Eucalyptus* forest and woodland.
Magpie Goose	*Anseranas semipalmata*	V	-	Unlikely	No. Prefers shallow wetlands with dense growth of rushes or sedges.
Oriental Cuckoo	*Cuculus optatus*	-	M	Not expected	No. Not suitable habitat. Mostly inhabits forest. Forages in trees and bushes as well as on the ground.
Painted Honeyeater	*Grantiella picta*	V	V	Not expected	No. Not suitable habitat. Inhabits Boree/ Weeping Myall, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. Feeds on the fruits of mistletoes growing on woodland eucalypts and acacias.
Pectoral Sandpiper	*Calidris melanotos*	-	M	Unlikely	No. Favours shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, floodplains and artificial wetlands.
Red Goshawk	*Erythrotriorchis radiatus*	E	E	Unlikely	No. Inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers.
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	Not expected	No. Not likely to breed or forage in the study area due to lack of preferred habitat with significantly large

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
					numbers of mature trees, high canopy cover and abundance of mistletoes.
Rufous Fantail	*Rhipidura rufifrons*	-	M	Not expected	No. Not suitable habitat. Mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood Mountain Grey Gum, Narrow-leaved Peppermint, Mountain Ash,Alpine Ash, Blackbutt or Red Mahogany; usually with a dense shrubby understorey often including ferns.
Satin Flycatcher	*Myiagra cyanoleuca*	-	M	Not expected	No. Not suitable habitat. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.
Sharp-tailed Sandpiper	*Calidris acuminata*	-	M	Not expected	No. Not suitable habitat. Likes shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.
Sharp-tailed Sandpiper	*Calidris acuminata*	-	M	Not expected	No. Not suitable habitat. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.
Short-tailed Shearwater	*Ardenna tenuirostris*	-	M	Not expected	No. Not suitable habitat for this species.
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami lathami*	V	V	Not expected	No. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E	E	Not expected	No. Not suitable habitat. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
					eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.
Speckled Warbler	*Chthonicola sagittata*	V	-	Not expected	No. Not suitable habitat. Prefers grassy woodland - *Eucalyptus* dominated communities that have a grassy understorey.
Spectacled Monarch	*Symposiachrus trivirgatus*	-	M	Not expected	No Not suitable habitat. Found in understorey of mountain/lowland forests, thickly wooded gullies, waterside vegetation; mostly well below the canopy.
Swift Parrot	*Lathamus discolor*	E	CE	Unlikely	No. No suitable habitat or favoured feed trees present. Occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*.
Wedge-tailed Shearwater	*Wedge-tailed Shearwater*		M	Not expected	No. Not suitable habitat for this species.
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	Potential	No. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. No clearing of native vegetation or stag trees will occur.
White-fronted Chat	*Epthianura albifrons*	V	-	Potential	No. Found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.
White-throated Needletail	*Hirundapus caudacutus*	-	M	Not expected	No. Recorded most often above wooded areas, including open forest and rainforest, and may also fly

Species, Population or Community		Status		Likelihood of occurring	Potential to be significantly impacted
Common Name	Scientific Name	BC Act	EPBC Act		
					between trees or in clearings, below the canopy, and are less commonly recorded flying above woodland.
Amphibians					
Green and Golden Bell Frog	*Litoria aurea*	E	V	Not expected	No. Preferred habitat was not identified in the study area. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (Typha spp.) or spikerushes (Eleocharis spp.). Not recorded on site. Most recent record within 10 km in 2008.
Littlejohn's Tree Frog	*Litoria littlejohni*	E	E	Not expected	No. Outside of known and predicted range. Not suitable habitat.

CE=critically endangered, E=endangered, V=vulnerable, M=migratory.

6 Impact assessment

Threatened species, populations and communities listed under the BC Act and EPBC Act that have the potential to occur within the study area have been identified in **Table 5.3**. The impact assessment has been informed by the following analysis of impacts.

6.1 Vegetation

No vegetation associated with **PCT 3975 – Southern Lower Floodplain Freshwater Wetland** would be removed or disturbed during the project. However, the proposed construction activities do have the potential to impact on the endangered ecological community. A Test of Significance was conducted for this community in **Appendix D** which determined that the proposal would not have a significant impact on the Southern Lower Floodplain Freshwater Wetland.

The proposed works would involve the removal of the shrub and ground layer in the non-native vegetation area along the embankment at the western boundary of the study area. One isolated individual Silky Oak tree would need to be removed. This tree is regularly heavily pruned on one side, is infested with Longicorn beetles, and is not considered in good health. One African Olive and one Large-leaved Privet would also be removed. These are located along the southern boundary of the site. One Silky Oak will need minor pruning at the northern limit of the western embankment. See **Figure 6.1** for locations.

No other trees will be removed as part of the stage 1 works. However, it is noted that one large mature tree, *Corymbia citriodora* (Lemon-scented Gum) is proposed for removal during stage 2. This tree is located within the isolated trees in the north-western corner of the study area.

A summary of the vegetation to be impacted by the proposal is provided in **Table 6.1**.

Table 6.1. Vegetation impacted by stage 1 of the proposal.

Plant community type (PCT)	Extent in the study area (ha)	Area to be removed (ha)
Southern Lower Floodplain Freshwater Wetland	0.26	-
Isolated trees	0.25	-
Non-native vegetation	0.06	0.06
Pasture	4.78	1.32
Total	**5.38***	**1.38**

*** Remainder of study area is disturbed land.**

The western embankment is heavily infested with weeds which have the potential to spread further during construction works and following the disturbance of soils.

6.2 Terrestrial habitat

The isolated Silky Oak tree proposed for removal may provide habitat for fauna, however this is considered unlikely. No signs of fauna were identified during inspections, and the scars in the tree from pruning appeared too shallow for habitat hollows. There are many larger Silky Oak trees and local native trees in the vicinity of the study area that provide hollows for fauna. No hollow-bearing trees or stag trees will be removed.

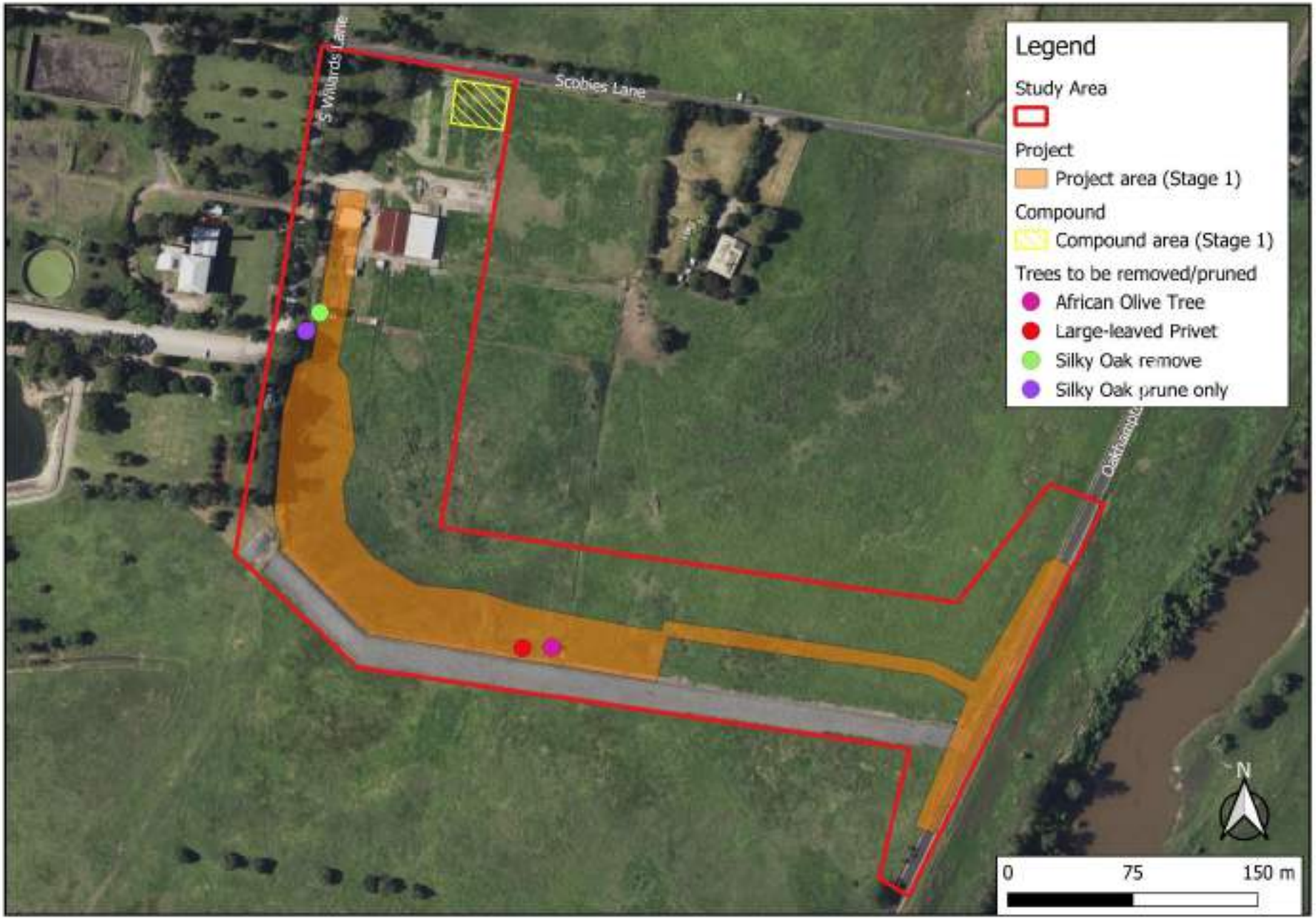

Figure 6.1. Trees and weeds proposed for removal/pruning.

6.3 Aquatic habitat

The second order stream that intersects the study area is mapped as Key Fish Habitat. Consultation with DPI will be required to determine if any permits would be required for the proposed project.

The earthworks and stockpiling associated with construction of the project have the potential to temporarily expose soils increasing the risk of erosion. This may lead to increased sedimentation of the floodplain and downstream environments, either directly via stormwater run-off or deposition of soils. Run-off containing sediment from stockpiles may result in increased turbidity and enhanced sedimentation in wetlands and waterways. If heavy rain or flooding occurs during construction works, there is potential for the severity of this impact to be compounded.

During construction, the potential exists for spills of fuels and oils from machinery or vehicles, which may pollute wetlands and waterways.

6.4 Groundwater dependent ecosystems

The prosed project is not considered likely to impact on groundwater dependent ecosystems in the vicinity of the study area. The excavations are unlikely to intercept groundwater during construction activities considering groundwater depths observed during geotechnical investigations and limited depth of excavations expected as part of the project. Despite this, local, seasonal and climatic changes that may occur that result in changes to groundwater levels and excavation works should be undertaken with caution, monitoring for the presence of groundwater at all stages.

During construction, the potential exists for spills of fuels and oils from machinery or vehicles, which may pollute groundwater.

6.5 Wildlife corridors

The vegetation that will need to be cleared for this proposal is not part of Council's mapped local, regional, or sub-regional biodiversity corridors. However, parts of the study area are mapped within Council's Green Blue Grid under its Environmental Sustainability Strategy 2030 (Maitland City Council, 2023). These areas would potentially provide terrestrial and aquatic linkages between Walka Water Works reserve to other areas of habitat in the vicinity of the site.

The proposal would not break continuous habitats (aquatic or terrestrial) into separate smaller fragments. The Silky Oak tree and other non-native vegetation proposed for removal are regularly pruned and cleared by Ausgrid during powerline maintenance works. It is considered that given the already disturbed location, and very minimal habitat that would be impacted the proposal, it is unlikely to have significant impact on local wildlife corridors or any species that utilise them.

6.6 Noise, vibration and light impacts

Noise and vibration from the construction activities have the potential to disturb native fauna in the vicinity of the site, however this impact is considered minimal considering the distances that vibratory machinery will be used from habitat trees and dense vegetation located in the Walka Water Works reserve and along the western boundary of the study area. No night work lighting would be required during the construction works as it will be carried out in standard work hours.

6.7 Operational impacts

The operation of the proposed new road may have minimal impacts on biodiversity in the area including a minor increase in unvegetated, hard surfaces to navigate. The road would increase the amount of impermeable surface in the area which could cause an increase in localised erosion due to runoff. The location of the road is in an already disturbed area, directly adjacent to the existing flood mitigation levee.

Rehabilitation of the disturbed areas with local provenance native trees, shrubs and grasses would likely improve the quality of the habitat once established.

6.8 Cumulative impacts

The Maitland LGA has historically been negatively impacted by land clearing, agriculture, and urbanisation in the region. This has resulted in poor habitat connectivity, increased erosion, sedimentation, reduction in water quality, reduced canopy cover and increased urban heat.

Cumulative impacts from the proposed project could include increased erosion and sedimentation, increased turbidity, and a reduction in water quality in the wetlands and waterways in the area.

One large tree, *Corymbia citriodora* (Lemon-scented Gum) is proposed for removal during stage 2 of the project. This tree is within the isolated tree area in the north-western corner of the study area. The removal of this tree would cause a minor reduction in canopy cover in the vicinity of the study area. No hollows in the tree were observed (this species does not readily lose limbs) however its age and size suggest it would likely be providing foraging habitat and the species is a known feed tree for native fauna.

6.9 Matters of National Environmental Significance

A search of the EPBC Protected Matters Search Tool (DCCEEW, 2023) was completed on 4 October 2023 and a report has been included as **Appendix C**. **Table 6.3** contains a summary of an assessment of potential impacts to Matters of National Environmental Significance (MNES).

Table 6.2. Assessment of impacts to Matters of National Environmental Significance.

MNES	Applicability to the proposal
World Heritage Properties	Not applicable
National Heritage Places	Not applicable
Wetlands of International Importance (Ramsar Wetlands)	The Hunter Estuary Wetlands Ramsar listed site is located approximately 21 km south-east (straight line distance) from the study area. The distance to the wetland via the Hunter River is approximately 41 km downstream. The proposal would not result in any impact on this Ramsar site.
Threatened species and ecological communities	The Protected Matters Report identified 6 threatened ecological communities, 27 threatened fauna species and 11 threatened flora species that could potentially occur within a 10 km radius of the proposed project. Likelihood of these occurring in the study area (via examining records held by DPE (2023) and availability of habitat) is provided in **Table 4.3**. No threatened species or communities were recorded or determined as likely to occur in the study area. No threatened species or communities were determined as likely to be impacted by the proposal.
Migratory species	The Protected Matters Report identified 17 listed migratory species that could potentially occur within a 10 km radius of the study area. Likelihood of these occurring in the study area (via examining records held by DPE (2023) and availability of habitat) is provided in **Table 4.3**. No listed migratory species were recorded or determined as likely to occur in the study area. No migratory species were determined as likely to be impacted by the proposal.
Commonwealth marine areas	Not applicable
Great Barrier Reef Marine Park	Not applicable
Nuclear actions (including uranium mines)	Not applicable
Water resources (concerning coal seam gas and large coal mining development).	Not applicable
Commonwealth land	Not applicable

6.10 Tests of significance

The following tests of significance were undertaken for threatened species and ecological communities that were identified in **Table 5.3** as having potential to be significantly impacted by the proposal.

6.10.1 Biodiversity Conservation Act 2016 (BC Act)

The objective of Section 7.3 of the BC Act (the test of significance) is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process.

Impacts to threatened species and ecological communities listed under the BC Act have been assessed via a test of significance according to the *Threatened Species Test of Significance Guidelines* (OEH, 2018) which is presented in **Appendix D.**

6.11 Permits

The proposed project may require the following permits under the FM Act for:

- Dredging and reclamation work permit under Section 200.
- Blockage of passage of fish under Section 219.

Consultation with NSW Department of Primary Industries (DPI) will be required to determine what permit/s are required.

7 Mitigation measures

The following mitigation measures will be implemented to avoid or minimise potential impacts on biodiversity as a result of the proposed project.

7.1 Vegetation

- Disturbance of vegetation (including pasture) will be limited to the minimum areas required for the project to be completed.
- The one isolated tree proposed for removal (Silky Oak) will be clearly marked prior to removal.
- Silky Oak tree would be offset according to Maitland City Council's tree replacement requirement of a 3:1 ratio. Three *Grevillea robusta* trees (or more suitable local species, such as *Corymbia maculata*) would be planted in a suitable location determined by MCC.
- The area mapped as **Southern Lower Floodplain Freshwater Wetland** must not be disturbed.
- Wetland area will be marked as 'No Access' zone using para-webbing or similar - no access allowed for vehicles, machinery, or workers. No materials to be stored in or within 40 m of these areas.
- Spoil from clearing works is to be stockpiled outside of any vegetated areas and outside of the dripline (usually 5 metres) of any trees.
- Disturbed areas will be revegetated with suitable local provenance native trees, shrubs and grasses.
- Targeted priority weed management will be undertaken prior to, during and post construction where required.
- Non-native vegetation (western embankment) will be removed and kept separate to other vegetation, waste or stockpiles. This material must not be moved to any other locations on or off-site. This material will be removed from the site and disposed of at a licenced waste facility.
- A hygiene protocol to be included as part of the CEMP for construction vehicles and equipment to prevent the spread or introduction of weeds, pest and pathogens.
- Parking vehicles, storing materials or placing stockpiles within the dripline of trees (usually 5 metres) will be avoided.

7.2 Terrestrial fauna

- A qualified ecologist must be present onsite during the clearing of the Silky Oak tree. The ecologist should provide a description on a suitable way to remove this tree and collect any sheltering fauna. Any fauna present should be collected and relocated locally. If microbats, or any other nocturnal fauna, are present, these should be released at dusk.
- Do not remove or disturb any fallen trees on site. If fallen trees are required to be moved, then they will be placed back in a location as close to the original position as possible.
- Do not remove any dead standing trees.
- Do not disturb or harm any fauna found on site.
- If native fauna is injured or trapped on site, contact the local National Parks & Wildlife office or a licensed wildlife rescue and rehabilitation group in the local area to arrange for collection/removal from site.

7.3 Aquatic habitat

- A site-specific Soil and Water Management Plan (SWMP) incorporating an Erosion and Sediment Control Plan (ESCP) will be developed in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom, 2004). This will form part of the Construction Environmental Management Plan (CEMP) and will be implemented throughout the construction period. The ESCP:
    - Must include specific erosion and sediment control measures that will be implemented on site.
    - Must be flexible to allow adjustments to changing conditions on site.
- A demobilisation strategy from the construction site will be developed in the event of heavy rain or flooding and will be included in the SWMP. This will include how water, bare or disturbed soils, and stockpiles will be managed to avoid excessive erosion and sedimentation, in a significant weather event.
- Disturbed areas will be stabilised and revegetated in stages during construction to minimise the risk of erosion and sedimentation occurring.
- Groundwater will be monitored for at all stages during excavation works and a Groundwater Management Plan implemented in the event that groundwater is intercepted during works.
- A spill response plan (SRP) will be developed for the project. This plan will detail measures including spill prevention, containment, and clean-up of accidental spills of oils, fuels and chemicals.
- Any accidentally contaminated soil will be immediately excavated, stockpiled, classified for disposal and transported to a licenced waste facility for disposal.

- An emergency spill kit will be kept on site at all times. All persons on site are to be made aware of the location of the spill kit and trained in its use.

- Refuelling or maintenance of plant and equipment will only occur in bunded areas located a minimum of 40 metres from the wetland, floodplain, waterways or drainage lines.

- Only vehicles and machinery essential for the project works will be permitted into the project area.

- Plant and equipment will be well maintained and checked daily before commencing work on site.

- Weather and water levels will be monitored prior to and during construction. Works will be reassessed where there may impact nearby wetlands and waterways.

- Vehicles and machinery essential for works will be confined to the Haul Road designated roadways and access points only and will not be permitted elsewhere on site.

- Equipment and materials will not be stored within 40 m of wetland, floodplain or watercourses.

7.4 Cumulative impacts

- Stabilisation of disturbed areas is to be staged progressively during the construction works.

- All disturbed areas will be revegetated with suitable local provenance native trees, shrubs and grasses.

- All road alignment options that would avoid removing mature tree (*Corymbia citriodora*) during Stage 2 will be considered and implemented wherever possible.

- If the removal of mature tree (*Corymbia citriodora*) is essential (during Stage 2) this will be offset according to Maitland City Council's tree replacement requirement of a 3:1 ratio. Three *Corymbia citriodora* trees (or similar local species, such as *Corymbia maculata*) would be planted in a suitable location determined by MCC.

8 Conclusion

The proposed realignment of Scobies Lane will result in the removal of approximately 0.06 ha of non-native vegetation and 1.32 ha of pasture. One threatened ecological community PCT 3975 – Southern Lower Floodplain Freshwater Wetland listed as endangered under the BC Act was identified in the study area. A Test of Significance according to Section 7.3 of the BC Act (**Appendix D**) was conducted for PCT 3975, which determined that the proposal would not have a significant impact on the endangered community.

No other threatened flora and fauna species, populations, or ecological communities, listed under the BC Act, FM Act, and/or the EPBC Act were identified within or determined likely to occur in the study area. No species impact statement (SIS) or biodiversity development assessment report (BDAR) is required for the proposal.

The proposal is not likely to significantly impact a matter of national environmental significance or Commonwealth land. Therefore, there is no need to make a referral to DCCEEW under the EPBC Act.

The proposal is not likely to have a significant impact on the environment and therefore there is no need for an Environmental Impact Statement (EIS) to be prepared under the EP&A Act.

Consultation with NSW Department of Primary Industries (DPI) will be required as the proposed project may require a permit under the FM Act for:

- Dredging and reclamation work permit under Section 200.
- Blockage of passage of fish under Section 219.

The proposed works would have some minor biodiversity impacts which can be ameliorated satisfactorily through the implementation of the specific mitigation measures listed in this report.

Note: For the long-term management of wetlands in the study area and surrounds, it is recommended that the current slashing and horse grazing practices cease in these areas. This will allow for wetland species to recover and the wetlands to re-establish in a more natural state. This would assist with reducing cumulative issues in the area associated with erosion, sedimentation, and water quality, and would provide more suitable habitat for native fauna in the locality.

9 References

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