REVIEW OF ENVIRONMENTAL FACTORS

Richmond Street Wardell – Drain Maintenance

NOTE: This Review of Environmental Factors (REF) is for projects that have minor and predictable impacts and require a Division 5.1 assessment under the EPA Act 1979.

Council Document No:
Template Version #3 – [November 2022]

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INTRODUCTION

Project name:	Richmond Street Wardell – Drain Maintenance	**Project number:**	Click here to enter text.

Project budget: $150,000

Work order number: Click here to enter text.

Project manager: Paul Busmanis

CONSTRUCTION WORK MUST NOT COMMENCE UNLESS:

- The person completing this REF has signed the completed document, verifying that each of the steps has been satisfied and no further assessment or investigation is required; AND
- The Determining Officer has signed the completed document to verify that the assessment has been adequately completed, the conclusion as to the likely environmental impact of the project is reasonable, and the project can proceed subject to relevant control measures and conditions in any approval, licence or permit; AND
- Prior to the project commencing the required approvals, licences and permits have been obtained as outlined in Section 5; AND
- All relevant construction personnel are aware of:
  - The project details in Section 1
  - The project's environmental impacts in Section 6
  - The project's specific control measures in Section 6
  - The conditions in any approval, licence or permit in Section 5
  - Their responsibilities detailed in this REF.

NOTE: If any environmental issue is identified or if any environmental control measure is required, the following is to occur:

- Where a construction drawing is prepared as part of the construction work pack, the environmental control measures should be listed in the schedule on that drawing and/or the CEMP
- For more complicated projects the environmental control measures should be included in a project-specific construction and environmental management plan.

NOTE: If any approval, licence or permit is required then copies of these MUST be included in the construction work pack that is submitted to the Construction Manager for the project.

NOTE: Projects may require a more detailed assessment of particular issues (eg. a specialist ecology or heritage report). In these cases, this document should accompany this REF as an appendix, and the findings should be considered in the assessment and identification of control measures.

NOTE: Some minor projects are exempt development. There is a separate checklist to be completed if you think your project is exempt. Where the project meets the exempt criteria and the exempt criteria checklist has been completed, a REF is not required.

NOTE: Projects requiring a Part 4 planning approval require a Statement of Environmental Effects and approval from Council. DO NOT USE this REF template for these matters. For further details of assessing whether a project is exempt development or requires approval under Part 4, refer to relevant flow charts.

Section 1 PROJECT DETAILS

This Review of Environmental Factors (REF) has been prepared to consider potential environmental effects for the proposed routine drain maintenance to be undertaken by Ballina Shire Council (BSC), at an existing drain in Richmond Street, Wardell.

The REF has been prepared for Council by Rob van Iersel, Senior Town Planner of Planit Consulting.

The proposed works are located partly within a Council road reserve and partly within a Crown reserve at Wardell within the BSC Local Government Area.

The drain has become clogged with sediment and overgrown with vegetation, which is impacting on waterflow and impacting the functioning of the drain. The objective of the activity is to desilt the drain, which has not been maintained for some time, to reduce impacts on surrounding land. The intention is also to allow the ongoing routine maintenance to maintain the drainage function.

1.1 Site inspection

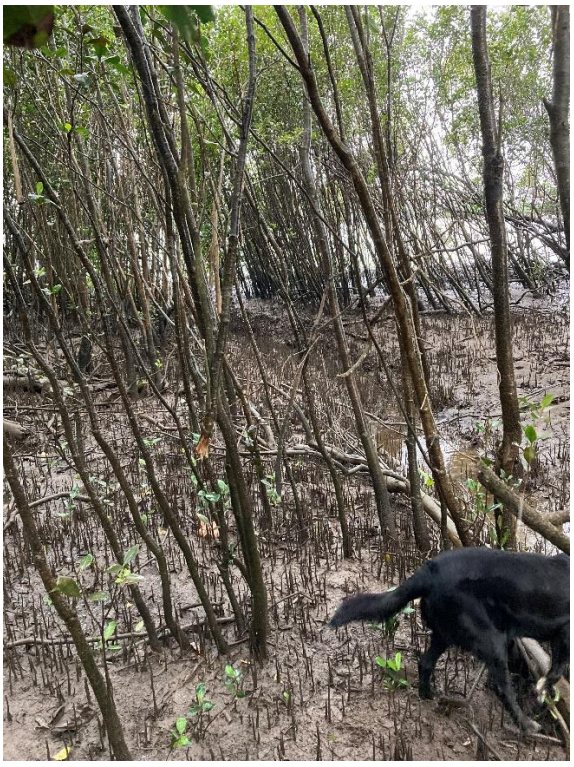
A site inspection was undertaken by the person completing this REF	☒ Yes	29/03/2023	9:00am

1.2 Location of activity

Site commonly known as *(if applicable)*	Richmond Street drain			
Street address *(if applicable)*	*No:* -	*Street name:*	Richmond Street	
	Town, village or locality:		Wardell	
Title reference	*Lot and deposited plan (or strata plan):*		Unformed Road Reserve	
Site reference	*Easting: (6 digits)*	Click here to enter digits.	*Northing: (7 digits)*	Click here to enter digits.
	Nearest cross street or streets:		Wilson Street	
	Site owner and tenure:		Part Council-owned road reserve & Part Crown Reserve	
	Land classification (Community or Operational, if applicable):		Road reserve – land not classified	

Aerial image showing footprint of works

Site Photos:

1.3 Description of the proposed activity

Description of the proposed activity – include pre-construction, construction, operation and remediation

The Proposal relates to the maintenance of an existing stormwater drain between the corner of Wilson Street/ Richmond Street and the Richmond River. It involves works that include construction of an access track and removal of sediment build-up and vegetation growth in the stormwater channel and provides for ongoing routine maintenance to preserve the drain's stormwater function.

A three metre wide access track will be established to enable access to the stormwater system to undertake the routine maintenance. The access track will be established 1.0m back from the top of bank on the eastern side of the drain, located within the unformed road reserve.

Accumulated silt will be mechanically removed from the bed of the drain to the historical invert of the drain, which is at -0.31m AHD, providing batters of 1m vertical to 2m horizontal.

Plans of the works are contained at **Appendix 1**.

The access track will be maintained for future ongoing routine maintenance of the stormwater system.

The initial works may require the removal of up to 14 native trees >3 m height for the access track, none of which are mature trees. Works within the drain and proximate to the Richmond River may require the removal of to 32 mature Grey Mangrove and up to 220 immature mangroves (both Grey and River Mangroves). Regular ongoing maintenance will not require any further vegetation removal.

Pre-construction:

- Completion of detailed construction plans.
- Preparation of Construction Environmental Management Plan (CEMP), incorporating recommendations from this REF.
- Survey works alignments and mark out construction area.
- Mark out vegetation clearing areas.
- Install new driveway access in accordance with the NRLG Standard Drawing, including new RCP under the driveway.
- Consultation with adjoining and affected landowners.
- Commence water quality monitoring in the drain with handheld meters.

Construction:

- Construction staff toolbox induction/ training regarding works scope and environmental constraints.
- Updating affected adjoining landholders on the status of the works and potential impacts.
- Engage vegetation contractor to clear and remove vegetation as part of access track construction.
- Set up and maintain appropriate erosion and sedimentation controls in accordance with Managing Urban Stormwater, Soils and Construction (the Blue Book) for each stage of works.
- Provide rock scour protection at upstream headwall
- Using an 8 or 14 tonne excavator and rigid body trucks, construct 3m wide maintenance access track 1m from the top of the drainage embankment using geotextile membrane covered with recovered aggregate, in accordance with the NSW EPA Resource Recovery requirements.

  The track will be narrowed at the Richmond River end to minimise disturbance.
- Once access track is established, using a suitably sized excavator fitted with a slotted bucket, clear the sediment and material from the drain. Material will be loaded into a lined truck for liming and management in accordance with the Acid Sulfate Soil Management Plan (**Appendix 2**).
- Works will commence at the furthest upstream point and work progressively downstream.
- Some minor bank stabilization works may be required as part of this work.
- Mature native vegetation within the drain will be retained wherever possible and works will dig around these trees.
- Works will continue until the drain is widened and cleared at the point of discharge into the Richmond River.
- The exposed bed and banks of the drain will be treated with lime in accordance with the Acid Sulfate Soil Management Plan.

Post-construction:

- Access track will remain in place for ongoing routine maintenance of the drain, which will involve using a suitably sized excavator fitted with a slotted bucket, clear the sediment and material from the drain.

- Water quality monitoring will continue for five days after completion of the works, in accordance with the Acid Sulfate Soil Management Plan.

Size of the proposed activity footprint

See aerial image above and Concept Design plans in **Appendix 1**. The works footprint covers approx. 800m^2. The existing drain is approx. 125m long and 3m wide.

Ancillary activities, such as advertising or other signage (including any temporary sign, banner or structure promoting an event or sponsorship arrangement), roads, infrastructure, bushfire hazard reduction

A temporary acid sulfate soil treatment area will be established at a nearby Council road reserve, in accordance with the Acid Sulfate Soil Management Plan (**Appendix 2**).

Proposed construction methods, materials and equipment

Construction activities would be guided by a CEMP to ensure work is carried out to specifications within the specified work area. Detailed work methodologies would be identified by the construction team and vegetation clearing contractor.

The broad sequence of construction will be:

- Site preparation
- Vegetation removal
- Access track construction
- Desilting works

For the ongoing routine maintenance, the first two phases will not be required, and machinery will access the drain on the constructed track.

The access track will be formed using aggregate, to create an all-weather track 200mm deep. Within the drain, silt will be dug out to a hard drainage bed, ensuring that batters of 1m vertical: 2m horizontal are not exceeded.

The drainage channel will be desilted to the historical invert of -0.31m from Richmond Street to the River.

Receivables, storage and on-site management of materials used in construction (e.g. stockpiles and lay-down areas)

The works program does not propose storing material outside of the Council Road Reserve.

Council will utilise other managed stockpile locations and licensed waste facilities for the management of waste.

Earthworks or site clearing, including extent of vegetation to be removed

General earthworks:

See Concept Plan in **Appendix 1**.

Vegetation assessment:

The works may require the removal of up to 14 native trees >3 m height for the access track, none of which are mature trees. Works within the drain and proximate to the Richmond River may require the removal of to 32 mature Grey Mangrove and up to 220 immature mangroves (both Grey and River Mangroves).

See detailed biodiversity assessment in **Appendix 3.**

Sustainability measures, including choice of materials (such as recycled content) and water and energy efficiency

Recovered aggregate will be used for the access track construction.

Environmental safeguards and mitigation measures

Potential area of impact	Safeguards or mitigation measures
Erosion and sediment control	Standard construction sedimentation and erosion controls will be used (in accordance with "the Blue Book". A silt curtain will be installed at the downstream end of the drain and will remain in place until the desilted drain has been stabilised. Works will be scheduled outside of known rainy periods and forecasts checked daily. Works will cease and controls secured in the event of a significant rain event.
Waterways	As above, a silt curtain is to be installed at the drain outlet
Noise and vibration	Immediate neighbours to be notified of intended work days and periods.
Air quality	Dust suppression to be used on access track, via watering, if required.
Non-Aboriginal heritage	None relevant
Aboriginal heritage	An AHIMS search of the work site was conducted on 28 March 2023. No Aboriginal sites were found (see **Appendix 4**).
Biodiversity	See attached Biodiversity Assessment (**Appendix 3**)
Trees and vegetation	See attached Biodiversity Assessment (**Appendix 3**)
Traffic, transport and parking	No issues likely. Parking available within adjacent road reserves. Workers should be required to park on the adjacent sealed verge to avoid tracking dirt and mud onto local road.
Socio-economic	No issues of relevance
Waste	All site waste to be collected and disposed of at an approved facility.

Potential area of impact	Safeguards or mitigation measures
Visual amenity	Clearing for the access track will alter the existing visual environment by the removal of vegetation through the area shown below:  Photo taken from close to Richmond River bank, looking north-west along access track alignment (i.e. edge of drain). Visual impacts minimized by retention of majority of existing vegetation and the compensatory plantings within the road reserve.
Land contamination	No history of potentially contaminating land uses.
Soils and geotech	Acid sulfate soil will be encountered. The provisions of the Acid Sulfate Soil Management Plan (**Appendix 2**) will be implemented at all stages of the project.

Construction timetable and staging hours of operation

Hours of work (including delivery of materials to and from the site) shall be restricted as follows:

1 Between 7:00am and 6:00pm – Monday to Friday, inclusive.

2 Between 8:00am and 1:00pm Saturdays

3 No work Sundays or public holidays

Estimated commencement date: **On receipt of Fisheries Permit**

Estimated completion date: **Four weeks from permit receipt**

1.4 Reasons/objectives for the activity and consideration of alternatives

Provide details of the reasons/objectives for the activity (need for the activity)

The drainage system's poor function has added negatively to the recent flood impacts on the local community by not letting flood waters effectively drain away from the town.

While the drain would have a minimum impact in terms of major flooding, it functions in smaller storm events to drain water from the immediate vicinity of the site and minimise impact of stormwater on the existing roads in the locality.

Alternatives

Option 1 Do nothing

The drain is not functioning, resulting in stormwater backup with potential to impact on local road network and private property in the locality. The do nothing option will continue and potentially exacerbate local drainage/ stormwater issues

Option 2 Clear the drain and set up for ongoing routine maintenance.

This option is recommended as it will provide for efficient local stormwater drainage.

Justification for preferred option

Cleaning the drain and regularly maintaining it will provide for efficient local stormwater drainage and lessen the risk to local properties.

1.5 Relationship with other projects, programs and plans

None relevant to the proposed activity.

Section 2 CONSULTATION

Preliminary consultation has occurred with NSW Fisheries and with Crown Lands. No significant issues have been raised.

Additional consultation with both agencies will be undertaken following completion of this REF and prior to construction.

Consultation will also be undertaken with adjoining residents and landowners, including the Jali Local Aboriginal Land Council, to inform them of the works schedule.

Section 3 STATUTORY FRAMEWORK

3.1 Description of relevant environmental planning instruments

3.1.1 State Environmental Planning Policies (SEPPs)

SEPP (Transport and Infrastructure) 2021

The drain functions as a *stormwater management system* as defined in Clause 2.136 of the SEPP.

stormwater management system means—

(a) works for the collection, detention, harvesting, distribution or discharge of stormwater (such as channels, aqueducts, pipes, drainage works, embankments, detention basins and pumping stations), and

(b) stormwater quality control systems (such as waste entrapment facilities, artificial wetlands, sediment ponds and riparian management), and

(c) stormwater reuse schemes

Pursuant to clause 2.137 of the SEPP, development for the purpose of stormwater management systems may be carried out by or on behalf of a public authority without consent on any on any land.

Clause 2.137 (2) (b) clarifies that this includes:

> *routine maintenance works, including maintenance dredging to remove sediment build-up in a stormwater canal or at exit points into natural waterways that affects the efficiency of the stormwater management system*

Note: The access track required for the routine maintenance works is not a separate form of development and is an essential component of the routine maintenance works.

SEPP (Resilience and Hazards) 2021

Works are required within a Coastal Wetland mapped under the *State Environmental Planning Policy (Resilience and Hazards) 2021* (refer to figure below). Normally, such development would constitute designated development pursuant to clause 2.7 (2) of the that SEPP (previously clause 10 of Coastal Management SEPP).

However, clause 2.7 (4) of the Transport and Infrastructure SEPP states:

A provision of this Chapter that permits development for the purpose of emergency works or routine maintenance works to be carried out without consent, or that provides that development for that purpose is exempt development, prevails over clauses 10 and 11 of State Environmental Planning Policy (Coastal Management) 2018 *to the extent of any inconsistency, but only if any adverse effect on the land concerned is restricted to the minimum possible to allow the works to be carried out.*

As such, consent in not required for the proposed routine maintenance works.

Coastal Wetland Mapping (Blue – Coastal Wetland; Hatched -

3.1.2 Ballina Local Environmental Plan 2012 (and/or Ballina LEP 1987)

Zoning

The land is zoned R2 Low Density Residential. The objectives of the R2 zone are:

- *To provide for the housing needs of the community within a low density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*
- *To provide for development that is compatible with the character and amenity of the surrounding neighbourhood.*
- *To provide for development that meets the social and cultural needs of the community.*
- *To encourage development that achieves the efficient use of resources such as energy and water.*

Local provisions

Clause 7.1 Acid Sulfate Soils

The site is mapped as containing Class 3 Acid Sulfate Soils. Works more than 1m below natural ground surface would ordinarily require development consent. The works proposed will not extend to that depth.

In any case, the provisions of clause 1.137 of the Transport & Infrastructure SEPP override the LEP provisions.

An Acid Sulfate Soil Management Plan has been prepared to guide all works and ensure that there are no impacts associated with exposure of acid soil (see **Appendix 2**).

Section 4 EXISTING ENVIRONMENT

4.1 Description of the existing environment

The drain is located between Richmond Street and the Richmond River. It is approx. 125m long and 3-5m wide. Drain vegetation includes a mix of intertidal vegetation, native coastal floodplain species and exotic weeds.

River mangrove and Grey mangrove are dominant along the banks of the river and extend up the drain channel as far as Richmond Street. Both species occur as seedlings in the drain channel and pneumatophores of the Grey mangrove dominate the channel bed.

Along the western bank of the drain, vegetation occurs as a narrow band of separated trees as a driveway extends along the bank to a battle-axe block with maintained yards. Native trees along the bank include Grey mangrove, Brown kurrajong and Tuckeroo with exotic palms and the invasive Cocos palm. South of the power pole mangroves are more common.

The eastern side of the drain is unmaintained land and includes a grassland of Setaria, Coastal morning glory and other weeds closer to the pump station, becoming overgrown closer to the drain.

Two dwellings are located immediately to the west of the drain, with associated sheds and outbuildings. Some unauthorised clearing of vegetation has occurred within the Crown reserve, which appears to be associated with one of the dwellings, as it is accessed by way of a makeshift bridge across the drain.

4.2 Topography

The construction area is generally flat, with the invert of the drain having a shallow grade to the River.

4.3 Surrounding land uses

Dwellings are located immediately to the west of the drain, with one fronting Richmond Street and the second located behind, with a driveway access-handle along the western edge of the drain.

A sewer pump station is located immediately to the north-east of the drain, with dwellings adjoining to the north of that pump station.

4.4 Geology/Geomorphology

Landscape: level to very gently inclined deltaic alluvial plain of the Richmond River. Relief 3–5 m, slopes 0–1%.

4.5 Soil types and properties

Soils: deep (>200 cm), moderately well-drained Prairie Soils, minimal Prairie Soils and Dense Clays overlying poorly drained mixed sediments.

Qualities and Limitations: reactive, highly plastic soils with permanently high watertable and localised low wet bearing strength and salinity.

The site is mapped as containing Class 3 Acid Sulfate Soils. Soil samples analysed for the Acid Sulfate Soil Management plan comprised fine grained, dark grey to brown clay with a field pH of 6 to 6.5.

4.6 Waterways

The site is adjacent to the Richmond River, with the drain opening to the river.

4.7 Flora (including flora of conservation significance)

Refer to **Appendix 3**. The activity will require tree removal including terrestrial species and mangroves. No threatened flora were recorded within the works area, nor are any considered likely to occur at the site.

In addition to weed removal, the works will require removal of up to 14 native trees that are greater than 3m in height, as well as 32 mature Grey Mangroves and up to 220 immature mangroves.

A permit under the *Fisheries Management Act 1994* will be obtained in relation to the mangroves, for which offset plantings will likely be required.

The Biodiversity Offsets Scheme (BOS) is not triggered as the proposed works would be unlikely to result in significant biodiversity impacts and therefore a Biodiversity Development Assessment Report (BDAR) is not required.

Ballina Shire Council's *Biodiversity – Compensatory Habitat and Offsets Policy* applies and offset plantings will be undertaken in accordance with that policy within the road reserve directly adjacent to the proposed works.

4.8 Fauna (including fauna of conservation significance)

Refer to **Appendix 3**. No threatened fauna species were recorded on the site, but it is noted that the site provided potential opportunistic foraging habitat for several threatened fauna species. The proposed works will result in very short-term impact on these foraging opportunities but will not have any significant long-term impacts.

4.9 Biodiversity values mapping

The Crown foreshore land is mapped on the Biodiversity Values Map

4.10 Test of significance – threatened species and endangered ecological communities

Refer to detailed assessment in **Appendix 2**. The results of the tests undertaken for the Reconeco assessment concluded that the proposal would not significantly affect threatened species or ecological communities, or their habitats.

4.11 Aboriginal cultural heritage

An AHIMS search was undertaken on 28 March 2023. No sites were found (see **Appendix 3**).

There are no Native Title claims shown on the NSW Native Title mapping.

Due diligence process step		Comment
1	Will the activity disturb the ground surface or any culturally modified trees?	Yes – very minor disturbance to ground surface within an area previously disturbed by construction of the drain.
2(a)	Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?	No records – see AHIMS search results **Appendix 4**
2(b)	Are there any other sources of information of which a person is already aware?	None known
2(c)	Are there any landscape features that are likely to indicate the presence of Aboriginal objects?	The drain is located along the river flats, which could have been used locally.
If after completing steps above and no information indicates site importance, it is reasonable to conclude that there are no known Aboriginal objects or a low probability of objects occurring in the area of the proposed activity, you can proceed with caution. If the answer to any of the above questions is yes then the following three questions must be answered.		
3	Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	No Aboriginal objects are known to be present in this area. The extent of ground disturbance for these maintenance works will be minor and limited to historically disturbed areas. These works are essential for the functioning of the drain.
4	Does a desktop assessment and visual inspection confirm that there are Aboriginal objects on the site or that they are likely to be there?	No objects are known to be at the site.
5	Is further investigation and impact assessment warranted?	No further assessment is required given that ground disturbance will be minor. In addition, site works will be carried out by staff who have undertaken Aboriginal Cultural Heritage training. If any Aboriginal objects are identified during works, Council's Unexpected Finds Protocol will be followed.

4.12 Native Title and Crown land management

Council is not the crown land manager for the waterway. However, as per a recent teleconference with Crown, Council will formally advise Crown of the statutory powers being relied upon to undertake the works (specifically Clause 191A of the Local Government Act *Powers of entry – construction and maintenance of water supply, sewerage and stormwater drainage works*).

It is assumed that Fisheries will have to do a future act validation under the Native Title Act 1993 (Cth) for the grant of the fisheries permit.

4.13 Non-Aboriginal heritage item or place or heritage conservation area

There are no known areas of non-aboriginal heritage.

4.14 Interests of external stakeholders (e.g. adjoining land owners, lease holders)

Adjoining landowners will be advised of the works before commencement and kept informed of progress throughout.

4.15 Hazards mapping

The land is not mapped as bushfire prone land. There are no known dip sites or other areas of contamination mapped in the locality.

The site is flood prone.

Section 5 APPROVALS, LICENCES and PERMITS

Item	Locations that may trigger an external approval, licence or permit	*Check one*	
5.1	Working in an area containing endangered, threatened, vulnerable or protected species, populations, ecological communities or critical habitat (flora and fauna) – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)* – *Department of Primary Industries—Fishing (DPI–Fishing)*	☐ Yes	☒ No
5.2	Working on land reserved under the National Parks and Wildlife Act (eg. National Park, Nature Reserve, Aboriginal area, wilderness area, conservation area or wild river) – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)*	☐ Yes	☒ No
5.3	Working in an area of national environmental significance (Ramsar wetlands, threatened species, migratory birds, World Heritage, National Heritage, nature reserve, etc) or on Commonwealth land or marine area – *Department of Agriculture, Water and the Environment (Commonwealth)*	☐ Yes	☒ No
5.4	Working within an area that is subject to any conservation agreement entered into under the *National Parks and Wildlife Act 1974* – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)*	☐ Yes	☒ No
5.5	Working within an area that is subject to any plan of management under the *National Parks and Wildlife Act 1974* – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)*	☐ Yes	☒ No
5.6	Working within an area that is subject to any joint management agreement under the *National Parks and Wildlife Act 1974* – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)*	☐ Yes	☒ No
5.7	Working in an area subject to a joint management agreement entered into under the *Threatened Species Conservation Act 1995* – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)*	☐ Yes	☒ No

Item	Locations that may trigger an external approval, licence or permit	*Check one*	
5.8	Working in an area subject to a biobanking agreement entered into under Part 7A of the *Threatened Species Conservation Act 1995* that applies to the whole or part of the land to which the activity relates – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)*	☐ Yes	☒ No
5.9	Working in an aquatic reserve or in marine vegetation such as seagrass, mangroves, saltmarsh, etc – *Department of Primary Industries—Fishing (DPI-Fishing)* – *Department of Primary Industries—Marine Parks (DPI–Marine Parks)* – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EES Group)*	☒ Yes	☐ No
5.10	Working in a Marine Park declared under the Marine Parks Act – *Department of Primary Industries—Marine Parks (DPI–Marine Parks)*	☐ Yes	☒ No
5.11	Dredging or reclamation of water. (Note that councils do not need approval for a controlled activity under the *Water Management Act 2000*) – *Department of Primary Industries—Fishing (DPI–Fishing); and/or* – *NSW Water* – *Transport for NSW*	☐ Yes	☒ No
5.12	Enlarge, deepen or sink a new water bore – *NSW Water*	☐ Yes	☒ No
5.13	An activity that will pollute water (eg dewatering) – *Department of Planning and Environment—Environment, Energy and Science Group (DPE–EPA Group)*	☐ Yes	☒ No
5.14	Working within the curtilage of a 'Heritage Place' or 'Heritage Item' identified on the Ballina LEP Heritage Schedule, the State Heritage Register or the National Heritage List – *Australian Heritage Council* – *Heritage NSW* – *Heritage Council of NSW* – *Ballina Shire Council*	☐ Yes	☒ No
5.15	Working within a 'heritage conservation area' identified in Ballina LEP Schedule 5 Environmental Heritage – Part 2 – *Ballina Shire Council*	☐ Yes	☒ No
5.16	Working where a 'Relic' is likely to be discovered (eg Archaeological Zoning Plans) – *Heritage Council of NSW; or* – *Heritage NSW*	☐ Yes	☒ No
5.17	Working near Aboriginal relics or places where an Aboriginal Heritage Impact Permit (AHIP) may be required; working on land or water successfully claimed by traditional owners – *Jali Local Aboriginal Land Council* – *Heritage NSW*	☐ Yes	☒ No
5.18	An activity comprising a fixed or floating structure in or over a navigable waterway – *Transport for NSW*	☐ Yes	☒ No

Item	Locations that may trigger an external approval, licence or permit	*Check one*	
5.19	An activity comprising work on Crown land not subject to a plan of management – *Department of Planning and Environment—Crown Lands (DPE–Crown Lands)*	☒ Yes	☐ No
5.20	Working at sites at which asbestos or asbestos-containing materials exist. (Determine if a licence or exemption will be required) – *SafeWork NSW*	☐ Yes	☒ No

Are any permit(s) required? ☒ Yes ☐ No

If **Yes**, please indicate what permit(s) are required:

		Check box if required
A	Fisheries Permit	☒
B	Marine Park Permit	☐
C	Other: Nil	☐

NOTE: If you have checked any ☒ **Yes** in the table above then you must do one of the following:

1 Attach a copy of the approval, licence or permit to the final REF, OR

2 Detail who is responsible for obtaining the approval, licence or permit, OR

3 Explain why the project is exempt.

NOTE: If you have checked ☒ **Yes** at any item in the table above, a referral to the relevant authority may still be required under the Transport and Infrastructure SEPP, even if a permit or approval is not required. A period of 21 days is allowed for response. All responses are to be considered and included in this assessment.

Section 6 ENVIRONMENTAL IMPACT ASSESSMENT

If an impact is predicted, place a **1**, **2** *or* **3** *in columns 7, 8 and 9. Multiply these three scores to obtain the environmental score in column 10.*

For each of columns 7, 8 and 9: 1 = *Minor* 2 = *Moderate* 3 = *Major*

Projects with any HIGH environmental score (greater than or equal to 10) will require specialist advice to assess environmental issues or re-evaluation of the project options or mitigation measures. It is recommended that there is consultation with your supervisor to determine the most appropriate course of action. Where the project is modified, a revised REF will be required.

In relation to impacts consider type, extent, size, duration, severity and geographic area, importance and level of community concern/interest.

Columns:	4	5	6	7	8	9	10
			Multiply the three scores:	*1–3*	*1–3*	*1–3*	=

Item	Issue	Examples of impacts	Description of impacts AND causes *NOTE: Either check 'No impact' OR provide details*		Project-specific control measures	Likelihood	Extent	Sensitivity	Environmental score
6.1	AIR	**Construction:** Dust generation (excavating, disturbing soil, stockpiling, clearing of vegetation, transporting soil, etc). Fumes, odours and other air pollution from vehicles, equipment, machinery or other activities.	☐ **No impact** *If checked, go to next issue*	Dust generation is possible during vegetation clearing and construction of the access track	Watering of exposed surfaces can manage dust generation. The extent of exposed area is relatively small and the short duration of the construction will assist.	1	1	2	2
6.2		**Operation:** Fumes, odours and other air pollution from vehicles, equipment, machinery or other activities.	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9

Columns:	4	5	6	7	8	9	10
			Multiply the three scores:	*1–3*	*1–3*	*1–3*	=

Item	Issue	Examples of impacts	Description of impacts AND causes *NOTE: Either check 'No impact' OR provide details*		Project-specific control measures	Likelihood	Extent	Sensitivity	Environmental score
6.3	WATER	**Construction:** Polluting waterways, wetlands, (eg storing, transporting, handling or disposing of oils, fuels, pit/trench water or other liquids). Machinery related spills (eg fuel, oil, hydraulic fluid). Sedimentation of waterways, wetlands, (eg excavating, disturbing soil, stockpiling, trenching, concrete cutting, access tracks, erosion-prone sites, etc).	☐ **No impact** *If checked, go to next issue*	Sedimentation impacts are likely if uncontrolled. Surface of the drain will be exposed following desilting. Surface of access track will also be exposed prior to placement of gravel.	Appropriate erosion and sedimentation controls, in accordance with "The Blue Book" will be established as appropriate for each stage of works, including a silt curtain at the downstream end of the drain. Any fuels kept onsite will be within bunded storage. Prior to use, hoses of all machinery will be checked for leaks.	2	2	2	8
6.4		**Operation:** Polluting waterways, wetlands, (eg storing, transporting, handling or disposing of oils, fuels, pesticides, chemicals, pit/trench water or other liquids).	☐ **No impact** *If checked, go to next issue*	Sedimentation impacts unlikely given stabilisation of the drain surface.	Appropriate erosion and sedimentation controls will be used for all future routine drain maintenance. Hoses of all machinery will be checked before use for future routine maintenance.	1	2	2	4
6.5	NOISE & VIBRATION	**Construction**: Noise/vibration (eg excavators, backhoes, trucks, vehicles, generators, etc).	☐ **No impact** *If checked, go to next issue*	Noise from excavators during works likely to impact on residents in adjoining dwellings.	Conventional construction hours and relatively short duration of works will mitigate impacts. Pre-construction consultation will ensure that residents are aware of upcoming works.	2	1	2	4

Columns:	4	5	6	7	8	9	10
			Multiply the three scores:	*1–3*	*1–3*	*1–3*	=

Item	Issue	Examples of impacts	Description of impacts AND causes *NOTE: Either check 'No impact' OR provide details*		Project-specific control measures	Likelihood	Extent	Sensitivity	Environmental score
6.6		**Operation:** Noise/vibration	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9
6.7	CONTAMINATION & WASTE	**Construction:** Disturbing contaminated soil (eg ASS,). Contaminating or polluting land (eg storing, handling or disposing of oils, fuels, pesticides, chemicals, pit/trench water or other liquids). Environmental problems caused by generating, storing, handling, transporting or disposing of waste (eg soils, oils, solvents, toilets, etc).	☐ **No impact** *If checked, go to next issue*	The site contains acid sulfate soil, which will be disturbed.	The provisions of the Acid Sulfate Soil Management Plan (**Appendix 2**) will be implemented throughout all stages of the work.	2	2	2	8
6.8		**Operation:** Contaminating or polluting land (eg storing, handling or disposing of oils, fuels, pesticides, chemicals, pit/trench water or other liquids). Environmental problems caused by generating, storing, handling, transporting or disposing of waste (eg soils, building materials, oils, solvents, etc). Restricting current and potential activities associated with the land (eg amenity, buildings, parking).	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9
6.9	TRANSPORT	**Construction:** Restricting or affecting transport (eg pedestrian, car, bus, train, airports, boats, river crossings, bus stops, public transport corridors and infrastructure, construction-related disturbances, property access, parking restrictions, etc).	☒ **No impact** *If checked, go to next issue*	All works are outside of the formed road network.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9

Columns:	4	5	6	7	8	9	10
			Multiply the three scores:	*1–3*	*1–3*	*1–3*	=

Item	Issue	Examples of impacts	Description of impacts AND causes *NOTE: Either check 'No impact' OR provide details*		Project-specific control measures	Likelihood	Extent	Sensitivity	Environmental score
6.10		**Operation:** Restricting or affecting transport	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9
6.11	FLORA & FAUNA	**Construction:** Clearing or modifying native vegetation (including trees, shrubs, grasses, roots, herbs or aquatic species). Clearing or modifying critical habitat. Clearing in a Biodiversity Value mapped area. In the case of threatened species, populations and ecological communities and their habitats, whether there is likely to be a significant effect on those species, populations or ecological communities, or those habitats. Introducing or spreading weeds (including noxious) or vermin. Introducing bushfire risk factors. Endangering any species of animal, plant or other form of life, whether living on land, in water or in the air (eg any danger to birds in the locality). Displacing, disturbing or damaging terrestrial or aquatic fauna (eg creating a barrier to fauna movement, clearing remnant vegetation or wildlife corridors, collisions, etc). Any other environmental impact on the ecosystems of the locality.	☐ **No impact** *If checked, go to next issue*	See assessment of impacts in attached Biodiversity Assessment. The works may require the removal of up to 14 native trees >3 m height for the access track, none of which are mature trees. Works within the drain and proximate to the Richmond River may require the removal of to 32 mature Grey Mangrove and up to 220 immature mangroves (both Grey and River Mangroves).	Compensation plantings to offset the loss of terrestrial and marine vegetation have been prescribed: Terrestrial tree planting of minimum 35 trees at a site to be confirmed by Council within the shire. Tree species should be consistent with and augment Swamp Oak Floodplain Forest (ie. 'like for like') and ideally be located as close to the site as possible. Any other relevant matters in Council's Offset policy will also be satisfied. Further liaison is required with DPI Fisheries (and a copy of the REF and all appendices provided) with regard to confirming the offsets required and identifying the receiving site for the works. Any requirements of DPI Fisheries will need to be accommodated	2	2	3	12

Columns:	4	5	6	7	8	9	10
			Multiply the three scores:	*1–3*	*1–3*	*1–3*	=

Item	Issue	Examples of impacts	Description of impacts AND causes *NOTE: Either check 'No impact' OR provide details*		Project-specific control measures	Likelihood	Extent	Sensitivity	Environmental score
6.12		**Operation:** Introducing or spreading weeds (including noxious) or vermin. Introducing bushfire risk factors. In the case of threatened species, populations and ecological communities and their habitats, whether there is likely to be a significant effect on those species, populations or ecological communities, or those habitats. Endangering any species of animal, plant or other form of life, whether living on land, in water or in the air (eg any danger to birds in the locality). Displacing, disturbing or damaging terrestrial or aquatic fauna (eg creating a barrier to fauna movement, clearing remnant vegetation or wildlife corridors, collisions, etc). Any other environmental impact on the ecosystems of the locality.	☐ **No impact** *If checked, go to next issue*	Following stabilisation of the drain and access track, there will be no further flora & fauna impacts associated with ongoing routine maintenance.	Click here to enter text.	1	1	3	3
6.13	SOCIAL	**Construction:** Creating a nuisance to the community (eg impact on amenity through noise, perceived risk of fires, explosions, property value devaluation, etc). Creating financial loss to members of the community (eg restricting access to commercial premises, changing land use, etc).	☐ **No impact** *If checked, go to next issue*	Minor nuisance associated with construction noise	Normal construction hours and short duration for the project.	2	1	2	4

Columns:	4	5	6	7	8	9	10
			Multiply the three scores:	*1–3*	*1–3*	*1–3*	=

Item	Issue	Examples of impacts	Description of impacts AND causes *NOTE: Either check 'No impact' OR provide details*		Project-specific control measures	Likelihood	Extent	Sensitivity	Environmental score
6.14		**Operation:** Creating a nuisance to the community (eg impact on amenity through noise, perceived risk of fires, explosions, property value devaluation, etc). Creating quantifiable financial loss to members of the community (eg restricting access to commercial premises, changing land use, etc).	☐ **No impact** *If checked, go to next issue*	Works will result in a social benefit, improving the functioning of the existing drain will alleviate local stormwater impacts.	Click here to enter text.	1	1	1	1
6.15	HERITAGE	**Construction:** Affecting a locality, item, place or building having aesthetic, anthropological, archaeological, architectural, historical, scientific, cultural or social significance or other special value (eg visual effect on adjoining heritage buildings or items; disturb, move, excavate Aboriginal object) or working where heritage items could be found. Affecting any Aboriginal heritage (eg engravings, middens, carved trees, grinding grooves, paintings, burial sites, etc).	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9
6.16		**Operation:** Affecting a locality, item, place or building having aesthetic, anthropological, archaeological, architectural, historical, scientific, cultural or social significance or other special value (eg visual effect on adjoining heritage buildings or items; disturb, move, excavate Aboriginal object) or working where heritage items could be found. Affecting any Aboriginal heritage (eg engravings, middens, carved trees, grinding grooves, paintings, burial sites, etc). Affecting land claimed by traditional owners.	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9

Columns:	4	5	6	7	8	9	10
			Multiply the three scores:	*1–3*	*1–3*	*1–3*	=

Item	Issue	Examples of impacts	Description of impacts AND causes *NOTE: Either check 'No impact' OR provide details*		Project-specific control measures	Likelihood	Extent	Sensitivity	Environmental score
6.17	VISUAL & OTHER ENVIRONMENTAL ISSUES	**Construction:** The effect of an activity on any wilderness area (within the meaning of the *Wilderness Act 1987*) in the locality in which the activity is intended to be carried on. Changing the visual or scenic landscape (eg impacting or restricting views). Transforming a locality (eg significant earthworks).	☐ **No impact** *If checked, go to next issue*	The works will alter the current visual environment, by replacing existing vegetation with the access track.	Revegetation of the site edges and compensatory planting within the road reserve will minimise visual impacts	2	2	2	8
6.18		**Operation:** Any other risk to the safety of the environment (eg long-term effects on the environment as a result of waste emissions). Increasing demands on resources (natural or otherwise) that are or are likely to become in short supply (eg demand on water use). Changing the visual or scenic landscape (eg impacting or restricting views). Transforming a locality (eg significant earthworks). Any cumulative environmental effect with other existing or likely future activities. Reducing the range of beneficial uses of the environment (eg effect on surrounding land uses and considering response of affected land owners).	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9
6.19	OTHER	Click here to enter text.	☒ **No impact** *If checked, go to next issue*	Click here to enter text.	Click here to enter text.	Enter score	Enter score	Enter score	Multiply scores in columns 7,8,9
					TOTAL ENVIRONMENTAL SCORE:				**54**

NOTE 1: For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.

NOTE 2: In assessing the impacts on flora and fauna, Council must show that it has taken into account:

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

  (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

  (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

(c) in relation to the habitat of a threatened species or ecological community:

  (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

  (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

  (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Section 7 ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 2021, SECTION 171(2) CHECKLIST

In addition to the requirements of the "Guidelines for Division 5.1 Assessments", the following factors listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021 *must be considered to assess the likely impacts of the proposal on the environment.*

Compliance with section 171(2) of the EPA Regulation 2021

Environmental factor	IMPACTS:		Minor	Medium	Major
(a) Any environmental impact on the community? Minor short-term impacts likely during construction works, associated with noise and disturbance. Short duration of the works will mitigate impacts.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(b) Any transformation of the locality? Minor transformation associated with vegetation removal and construction of the routine maintenance of the access track.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Environmental factor	IMPACTS:		Minor	Medium	Major
(c) Any environmental impact on the ecosystems of the locality? See Biodiversity Assessment attached. Assessment concludes that there will not be any significant impacts on threatened species of their habitat. Vegetation offsets, undertaken in accordance with Council's policy, will mitigate longer term impacts.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality? The works are relatively minor and will not significantly impact local environmental values.	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(e) The effect on any locality, place or building that has— (i) aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance, or (ii) other special value for present or future generations. The works will not impact such places.	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Environmental factor	IMPACTS:		Minor	Medium	Major
(f) Any impact on the habitat of protected animals, within the meaning of the *Biodiversity Conservation Act 2016*? See Biodiversity Assessment attached. Assessment concludes that there will not be any significant impacts on threatened species of their habitat. Vegetation offsets, undertaken in accordance with Council's policy, will mitigate longer term impacts.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(g) Any endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air? See Biodiversity Assessment attached. Assessment concludes that there will not be any significant impacts on threatened species of their habitat. Vegetation offsets, undertaken in accordance with Council's policy, will mitigate longer term impacts.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(h) Any long-term effects on the environment? The works are not likely to result in long-term impacts. Ongoing routine maintenance can be mitigated by way of conventional erosion and sedimentation controls.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Environmental factor	IMPACTS:		Minor	Medium	Major
(i) Any degradation of the quality of the environment? The works will not result in degradation of the quality of the environment.	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(j) Any risk to the safety of the environment? Minor short-term impacts are likely and can be managed through appropriate work practices.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(k) Any reduction in the range of beneficial uses of the environment? No reduction in the range of beneficial uses of the environment.	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Environmental factor	IMPACTS:		Minor	Medium	Major
(l) Any pollution of the environment? Suitable construction controls, designed and implemented in accordance with "The Blue Book", will mitigate potential impacts.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(m) Any environmental problems associated with the disposal of waste? Suitable treatment of excavated material will mitigate impacts.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(n) Any increased demand on natural or other resources that are, or are likely to become, in short supply? No increased demands likely.	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Environmental factor	IMPACTS:		Minor	Medium	Major
(o) Any cumulative environmental effect with other existing or likely future activities? No cumulative impacts have been identified.	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? Potential impacts on local coastal wetlands can be adequately managed though conventional construction techniques.	☐ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☒ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☒ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(q) Any applicable local strategic planning statements, regional strategic plans or district strategic plans? None relevant	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Environmental factor	IMPACTS:		Minor	Medium	Major
(r) Other relevant environmental factors. None relevant	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Section 8 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the environmental assessment provisions of the Environment Protection and Biodiversity Conservation Act 1999*, the following Matters of National Environmental Significance are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Agriculture, Water and the Environment.*

Factor	IMPACTS:		Minor	Medium	Major
(a) Any impact on a World Heritage property? No impacts	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Factor	IMPACTS:		Minor	Medium	Major
(b) Any impact on a National Heritage place? No impacts	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(c) Any impact on a wetland of international importance? No impacts	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(d) Any impact on a listed threatened species or community? See Biodiversity Assessment attached. Assessment concludes that there will not be any significant impacts on threatened species of their habitat. Vegetation offsets, undertaken in accordance with Council's policy, will mitigate longer term impacts.	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Factor	IMPACTS:		Minor	Medium	Major
(e) Any impact on listed migratory species? No impacts identified	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(f) Any impact on a Commonwealth marine area? No impacts	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
(g) Does the proposal involve a nuclear action (including uranium mining)? No	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Factor	IMPACTS:		Minor	Medium	Major
(h) Additionally, any impact (direct or indirect) on Commonwealth land? No impacts on Commonwealth land	☒ Nil *If checked, go to next factor*	☐ Positive	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term
		☐ Negative	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term	☐ Short-term ☐ Medium-term ☐ Long-term

Section 9 CONCLUSION

9.1 Publishing the REF

	Check one	
Does the activity have a capital investment value of more than $5 million?	☐ Yes	☒ No
Does the activity require an approval or permit in relation to:		
• Fisheries Management Act 1994 (sections 144, 201, 205, 219)?	☒ Yes	☐ No
• Heritage Act 1977 (section 57)?	☐ Yes	☒ No
• National Parks and Wildlife Act 1974 (section 90)?	☐ Yes	☒ No
• Protection of the Environment Operations Act 1997 (sections 47–49 or 122)?	☐ Yes	☒ No
Is it in the public interest to publish the REF?	☒ Yes	☐ No

If the answer to any of the above questions is **Yes** then the REF must be published on the Council website OR the NSW Planning Portal.

9.2 Person who prepares this REF

I certify to the best of my knowledge that:

- I have completed this REF, and
- The assessment meets the requirements of sections 1.7, 5.5 and 5.7 of the EPA Act, clause 171(2) of the EPA Regulation and other relevant legislation and guidelines, and
- The information contained in this REF is not materially misleading, and
- My assessment has been adequately completed, and
- My conclusion as to the likely environmental and community impact of the project is reasonable, and is likely to be ☒ **LOW** ☐ **MODERATE** ☐ **HIGH** *(check one)*, and
- I am satisfied that, subject to the inclusion of the mitigation measures included in this REF, the project will not have a significant impact on the environment or significantly affect threatened species, populations, ecological communities or their habitats during the construction or operation phases, and
- An Environmental Impact Statement is not required, and
- A Species Impact Statement is not required, and
- A Biodiversity Assessment Report is attached, and
- The REF is required to be published on the Council website.

Signature:		Date:	27/04/2023
Name *(print)*:	Rob van Iersel		
Position:	Senior Town Planner, Planit Consulting		

Section 10 QUALITY ASSURANCE

10.1 Person who reviews this REF

I have reviewed this REF and agree with the conclusion in section 9.			
Signature:		Date:	1/05/23
Name *(print)*:	Alistair Weallans		
Position:	Project Engineer - Roads		

Section 11 DETERMINATION AND DECISION STATEMENT

11.1 Determining officer – person who determines this REF

- I certify that on behalf of Ballina Shire Council I have reviewed the completed REF.
- I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Regulation and the Guidelines approved under clause 170 of EP&A Regulation, and the information it contains is neither false nor misleading.
- The proposed activity ~~is/~~is not likely to have a significant impact on the environment and therefore an EIS ~~is/~~is not required
- The proposed activity ~~will/~~will not be carried out in a declared area of outstanding biodiversity value and ~~is/~~is not likely to significantly affect threatened species, populations or ecological communities, or their habitats or impact biodiversity values, meaning a SIS and/or BDAR ~~is/~~is not required
- Mitigation measures are~~/are not~~ required to eliminate, minimise or manage environmental impacts
- The proposed activity ~~does/~~does not require referral to the Commonwealth Minister for the Environment to determine if the activity is a controlled action under the EPBC Act.
- I conclude that the assessment has been adequately completed and the conclusion as to the likely environmental impact of the project is reasonable
- The project may~~/may not~~ proceed subject to the mitigation measures in this REF, as well as any relevant referral approval, licence or permit.
- I determine the REF is~~/is not~~ required to be published on the Council website or NSW Planning Portal.

Signature:		Date:	1/05/2023
Name *(print)*:	John Truman		
Position:	Director Civil Services		
Site inspected:	N/A	Date:	1/05/2023

APPENDIX 1

Concept Plans

APPENDIX 2

Acid Sulfate Soil Management Plan

APPENDIX 3

Biodiversity Assessment

APPENDIX 4

Aboriginal Heritage Information Management System Search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : J7820
Client Service ID : 767973

Rob Van Iersel

Date: 28 March 2023

34 Burnet Street
Ballina New South Wales 2478
Attention: Rob Van Iersel

Email: robv@planitconsulting.com.au

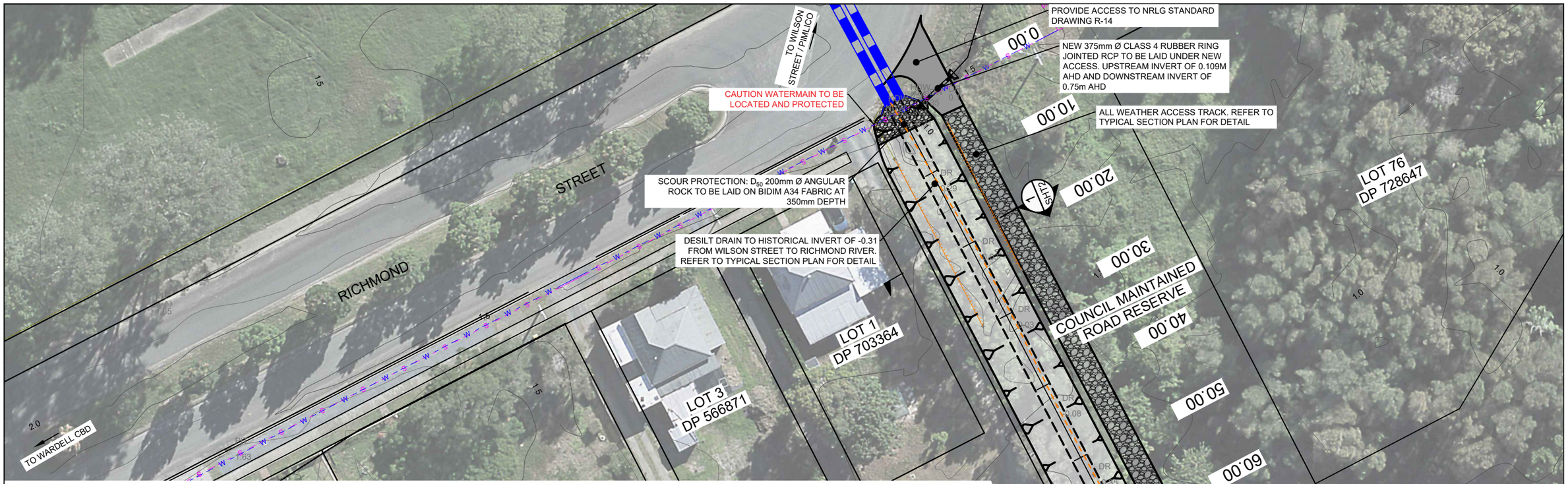
Dear Sir or Madam:

AHIMS Web Service search for the following area at Address : 3 RICHMOND STREET WARDELL 2477 with a Buffer of 50 meters, conducted by Rob Van Iersel on 28 March 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

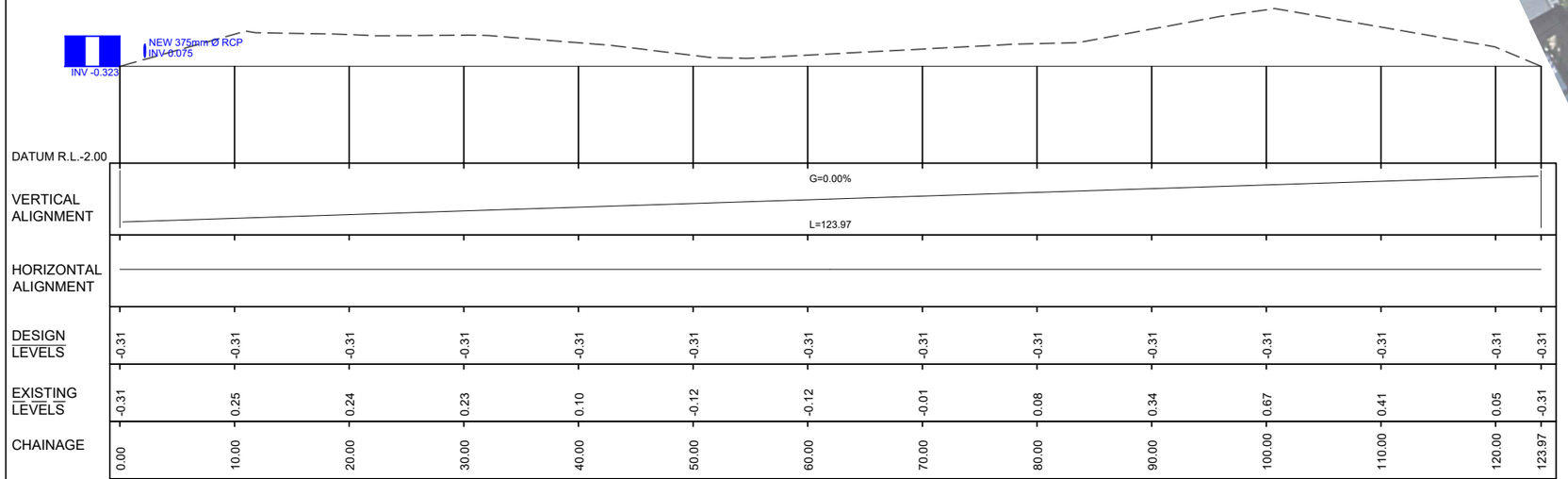


ALIGNMENT PLAN
SCALE: 1:500

WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATIONS OF UNDERGROUND SERVICES ARE BASED OFF SERVICE LOCATION FROM OCT 2021 POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.



DRAINAGE CHANNEL BED LONGITUDINAL SECTION SCALE: VERT 1:100
HOR 1:500

N

LEGEND

(EXISTING)	(PROPOSED)	(SERVICES)
EDGE OF BITUMEN	CHANNEL CTRL LINE	WATER EXISTING (LOCATED)
TOP OF BATTER	TOP OF BATTER	WATER EXISTING (DBYD)
BOTTOM OF BATTER	BOTTOM OF BATTER	NBN OPTIC FIBRE (LOCATED)
ROAD CENTERLINE	EXTENT OF DESILT	O/HEAD POWER (LOCATED)
PROPERTY BOUNDARY	SCOUR PROTECTION	U/GROUND POWER (LOC'D)
+ DR 0.03 SURVEY SPOT HEIGHT	MAINTENANCE TRACK	SEWER RISING MAIN (LOC'D)
0.5 LIDAR CONTOURS	NEW STORMWATER	UNKNOWN SERVICE
		STORMWATER EXISTING DPY/GIN & SSM/PM

NO.	DATE	BY	CHANGE	X'D
0	APR 23	SA	ISSUED FOR REVIEW	

AMENDMENTS

ballina shire council

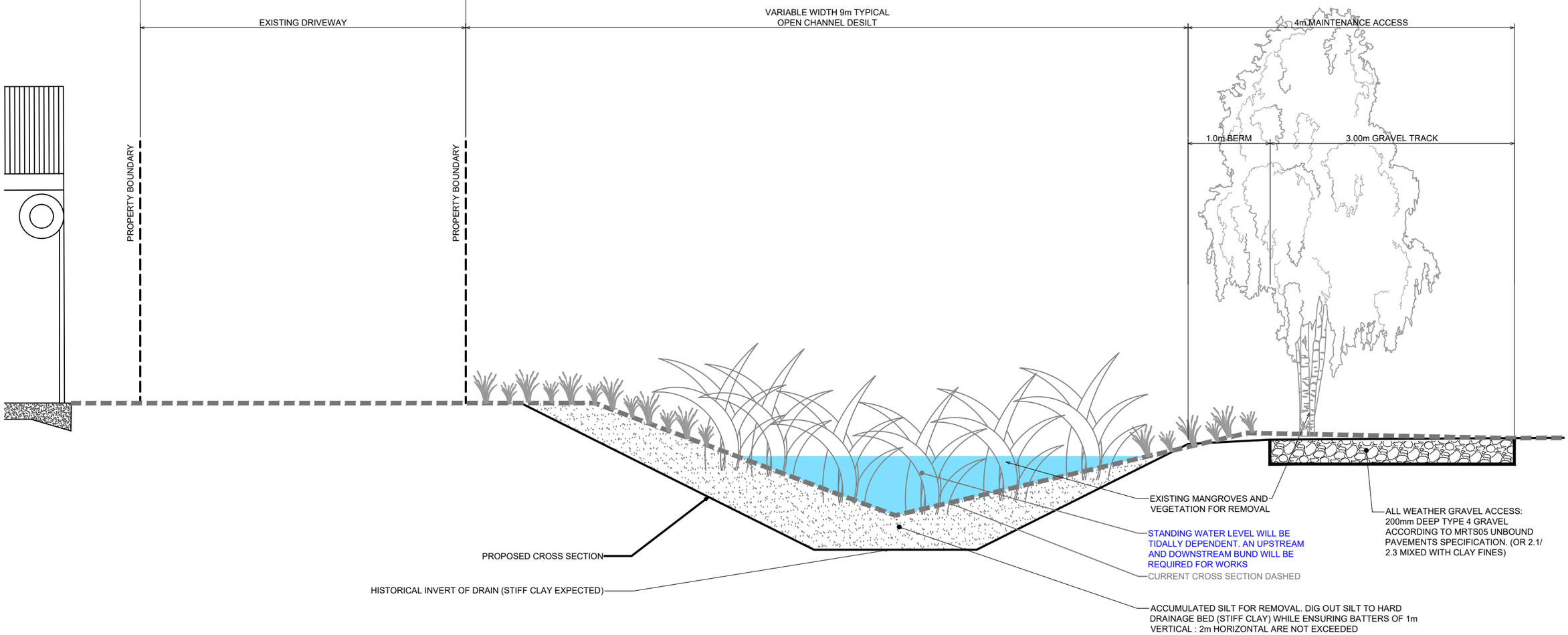
SURVEY	WARD 2-MGA SEG	DESIGNED	SJA
DATE	APR 23	DRAWN	SJA
F.B.	L.B.	CHECKED	PC
DATUM	AHD	APPROVED	PC
DRAWING	WILSON ST TO RICHMOND RIVER OPEN ..DWG		

SHEET 1 OF 2

BALLINA SHIRE COUNCIL

WILSON ST - DRAINAGE CHANNEL DESILT
ALIGNMENT PLAN AND LONGITUDINAL SECTION
CH0 TO CH123.97

Scale	Plan No.	
HOR; 1:250 VERT; 1:50	D50009	A1



1
SHT 1

TYPICAL CROSS SECTION OF DRAINAGE DESILT

SCALE: 1:25 @ A1, 1:50 @ A3

No.	Date	By	Change	X'd
0	APR 23	SA	ISSUED FOR REVIEW	

Amendments

ballina shire council

SURVEY	WARD 2-MGA SEG	DESIGNED	SJA
DATE	APR 23	DRAWN	SJA
F.B.	L.B.	CHECKED	PC
DATUM	AHD	APPROVED	PC
DRAWING	WILSON ST TO RICHMOND RIVER OPEN ..DWG		

SHEET 2 OF 2

BALLINA SHIRE COUNCIL

WILSON ST - DRAINAGE CHANNEL DESILT
TYPICAL SECTION

Scale HOR; 1:25

Plan No. D50009

A1

ballina shire council

Acid Sulfate Soil Management Plan Drain Maintenance

Richmond Street, Wardell

April 2023

Version	Date	Reason/Comments	Name/Position
1.1	12/4/2023	Prepare for works	Coordinator Environmental Management

ballina shire council

40 cherry street • po box 450 • ballina nsw 2478
t 1300 864 444 • **e** council@ballina.nsw.gov.au

ballina.nsw.gov.au

Contents

Introduction

This Acid Sulfate Soil Management Plan details acid sulfate soil management requirements for drain clearing works along the open drain within the council road reserve at the intersection of Wilson and Richmond Streets, Wardell.

The drain is overgrown with vegetation and has become clogged with silt and sediment. This is reducing flow and the function of the drain. The drain requires maintenance to reduce impacts on the surrounding land and neighbouring properties.

Purpose

This plan provides guidance for the management of acid sulfate soils where they are disturbed during works including the removal of accumulated silt, debris and vegetation from these stormwater drains.

A key objective of this plan is to outline appropriate environmental controls and procedures to be implemented during works to avoid or reduce potential adverse environmental impacts associated with actual acid sulfate soil (ASS) and potential acid sulfate soil (PASS) disturbance, handling, treatment or disposal.

Background information on acid sulfate soils and a map of their occurrence in the Shire is provided in Appendix A.

Site information

Site details

The open drain that requires maintenance is located within the Council road reserve at the end of Wilson Street, Wardell (refer Figure 1).

Land uses adjoining the drain are residential properties to the west, Wardell Public School across Richmond Street to the north, the Richmond River to the south and vacant Crown land to the east.

Vegetation at the site has been historically cleared but vegetation along the drain comprises mangrove and sheoak species.

All works will occur within the council road reserve and foreshore Crown land. There will be no negative impact to traffic and neighbours will be notified via letter drop of the proposed works.

Figure 1: Section of drain to be cleaned

The proposed works will mechanically remove the build-up of vegetation and sediment from a section of the drain that is approximately 125m in length and 3 m in width.

This drain flows south-east toward the Richmond River and the intertidal area has been identified as key fishery habitat, accordingly a permit under the Fisheries Management Act 1994 will be required.

Acid sulfate soil planning maps

The proposed works area is mapped as Class 3 Acid Sulfate Soils (ASS) under the Ballina LEP 2012 (Appendix A).

According to the ASS Manual (Ahern *et. al.,* 1998), within a Class 3 area, further investigations are required to determine if ASS are present for any works beyond 1 metre the natural ground surface or works by which the watertable is likely to be lowered by 1 metre below natural ground surface.

Given the extent of maintenance works required, an acid sulfate soil investigation was undertaken at the site.

Soil sampling investigation

Council's Coordinator Environmental Management undertook field sampling on 30 March 2023 to determine the presence of ASS within the project area.

The purpose of the investigation was to identify if potential or actual acid sulfate soil was present and if so, determine the liming rate necessary for the material removed from the drain.

Three sediment samples were collected from the section of the drain to be cleared. Sample locations are shown in Figure 2.

Figure 2: Soil sample locations along the proposed drain maintenance area

The three samples comprised fine grained, dark grey to brown clay with a field pH of 6 for S1 and 6.5 for S2 and S3.

Soil samples will be collected and analysed and the results will be compared against Action Criteria presented as Table 1.1 (*Sullivan et. al., 2018*). If the net acidity of any individual soil material tested is equal to or greater that the action criterion, a detailed ASS management plan will need to be prepared.

Table 1.1 Action criteria based on the texture and volume of material disturbed.

Type of material		Net Acidity#			
Texture range* (NCST 2009)	Approximate clay content (%)	1–1000 t materials disturbed		> 1000 t materials disturbed	
		% S-equiv. (oven-dried basis)	mol H^+/t (oven-dried basis)	% S-equiv. (oven-dried basis)	mol H^+/t (oven-dried basis)
Fine: light medium to heavy clays	> 40	≥ 0.10	≥ 62	≥ 0.03	≥ 18
Medium: clayey sand to light clays	5–40	≥ 0.06	≥ 36	≥ 0.03	≥ 18
Coarse and Peats: sands to loamy sands	< 5	≥ 0.03	≥ 18	≥ 0.03	≥ 18

* If bulk density values are not available for the conversion of cubic meters to tonnes of soil, then the default bulk densities, based on the soil texture in Table 5.1, may be used.
# Net Acidity can only include a soil material's measured Acid Neutralising Capacity where this measure has been corroborated by other data (for example slab incubation data) that demonstrates the soil material does not experience acidification during complete oxidation under field conditions (Equation 3.1). Where the Acid Neutralising Capacity has not been corroborated, the Net Acidity must be determined using Equation 3.2.
Source: Adapted from Dear et al. 2014.

Laboratory testing

The samples were sent to the NATA accredited, Environmental Analysis Laboratory (EAL) for analysis. Samples were tested for Chromium Reducible Sulfur (Scr %), Total Actual Acidity (TAA) and bulk density.

This analysis was to determine if sulfidic material is present in the soil and ascertain the oxidisable sulfur concentrations. Table 1 provides a summary of laboratory results, with full laboratory results presented in Appendix B.

Table 1: Summary of laboratory results of SCR testing of select soil samples

Sample ID	Texture	Bulk Density	Chromium reducible Sulfur (%Scr)	pH_{KCl}	Actual Acidity (TAA) (mol H^+/t)	Net Acidity (mol H^+/t)	Liming Rate (kg $CaCO_3$/t)*
S1	Fine	0.96	0.106	5.86	42	108	8
S2	Fine	0.43	1.332	4.70	111	941	71
S3	Fine	0.54	0.512	6.05	9	329	25

* the liming rate in Table 1 has not used the site specific bulk density calculations.

The laboratory results indicate that the risk of ASS at the site exceeds the Table 1.1 action criteria for fine texture clays (*Sullivan et. al., 2018*).

Liming Rates

Liming rates have been determined in accordance with the results and advice provided by EAL and a neutralising value of 95% has been applied for agricultural lime.

The following steps were followed to determine the volume of agricultural lime required to neutralise material at this site.

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Net Acidity (mol H^+/t)	Weight of pure CaCO3 to neutralise Net Acidity, divide NA by 19.98 (kg $CaCO_3$/tDW)	Apply lime neutralising value = 95	Apply factor of safety (1.5)	Lime application rate for the bulk density of the soil (0.4 g/cm^3)	Amount of lime required (kg Ag lime) for 120 m^3
941	47.1	49.6	74.4	32	**6,000**

On the basis of a volume of 187.5 m^3 of sludge to be cleared from the drain (125m x 3m x 0.5m) and a bulk density value of 0.43 g/cm^3, 6,000 kg Ag lime (6 tonnes) will be required.

A further 5 x 20kg bags of lime will be required for the rate of 1 bag/ 25 m of drain water for 125 m length of drain to be disturbed.

Management strategy

This Acid Sulfate Soil Management Plan has been developed in accordance with best practice techniques used by Rous County Council. Complying with the environmental controls outlined in this Plan will reduce the environmental risk of disturbing sediment of this nature.

Material that is removed from these drains must be managed and neutralised using agricultural lime at the appropriate rate, followed by either the re-use of this treated material onsite or offsite disposal.

Any treated material to be disposed offsite must be in accordance with the NSW EPA *Waste Classification Guidelines, Part 4: Acid Sulfate Soils*. Many licensed landfill facilities will require a copy of the ASSMP and documentation to confirm that the material being disposed has been managed in accordance with the ASSMP.

General principles

These works aim to remove accumulated silt and vegetation to clear the drain and reinstate the previous drainage profile. Any clearing works must not increase the depth or width of the drain.

Any impacts from drain cleaning must be contained within the drainage system. A silt curtain will be deployed downstream of the works area. Poor water quality cannot be released from

the system during this time. Council will monitor its strategies for neutralising the sediment removed and treating any decrease in drain water quality.

All effort must be made to undertake drain sediment extraction works during dry climatic conditions. In the event that rainfall is predicted or occurs during scheduled drain maintenance, works must not commence or continue.

The removal of riparian vegetation (vegetation growing along watercourses) will be limited to what is necessary to be removed to facilitate construction of a maintenance access track for the excavating machinery.

Responsibilities

The identification, assessment and management of potential impacts relating to acid sulfate soils is the responsibility of the Coordinator Environmental Management, Site Foreman, Team Leader and Works Engineer.

Induction / Training

Personnel involved in acid sulfate soil management will be trained in the requirements of this Management Plan. Training will include inductions, toolbox talks, pre-starts and targeted training as required. A copy of this Plan is kept on site with project management documentation at all times.

Type of Lime

Medium to fine grained agricultural (Ag) lime is to be used to treat ASS and PASS soils. Hydrated or slaked lime must not be used without specific approval from Council.

Ag lime is non-corrosive, and requires no special handling, however the lime will be stored under plastic to control dust generation, to keep dry (as wet lime is more difficult to spread) and to prevent the generation of alkaline runoff from the stockpile.

Lime is to be thoroughly mixed with the excavation material. Treatment is to occur on-site unless previous approval has been obtained from Council's Public and Environmental Health Section for alternative arrangements.

Work, Health and Safety

Lime can be absorbed into the body by inhalation of its aerosol and by ingestion.

Facemasks, gloves and protective overalls and eye protection must be worn at all times when mixing and applying lime.

Drain Clearing Process

Minimising disturbance

Material that is removed from the drain will be taken to a nearby temporary stockpile location for treatment prior to transport to a waste management facility. An excavator with a slotted, weed bucket will be used to minimise disturbance of acid sulfate soil material.

Survey levels will be used during excavation to ensure that the works do not result in the deepening and/or widening of drains.

Pre-drain cleaning activities

- Confirm that NSW DPI Fisheries Permit has been received.
- Notify neighbours when works will occur.
- Identify above and underground infrastructure and services (e.g. water, sewer and power).
- Pipe the small section of drain along Richmond Street to permit driveway access for plant to access the maintenance track.
- Engage a contractor to clear and remove vegetation within the designated access track. Once vegetation has been removed, construct the 3m wide access track beside the drain. Topsoil will be stripped and geotextile material will be placed prior to overlaying with suitable aggregate material.
- Set up appropriate erosion and sediment controls as appropriate for each stage of works.
- Install scour protection on the banks near the pipe outlet (Richmond Street section of drain).
- Acquire a slotted weed bucket for use.
- Schedule works to occur during dry weather.
- Commence water quality monitoring in the drain with handheld meters the day before works start.

During drain cleaning

- Pre-works briefing with contractors and project manager.
- An excavator fitted with a slotted, weed bucket will be used to scoop the vegetation and sediment out of the drain until the fall height is achieved. This material will be loaded into a lined truck and transported to the ASS treatment location.
- Mechanical cleaning of the drain will commence at the furthest upstream point. Cleaning will work progressively downstream, allowing the overgrown vegetation to act as a natural boom and filter.
- All care must be taken to ensure that the works do not result in the deepening and/or widening of drains.
- Mature trees along the drain should be left, any trees that have fallen across or into the drain can be removed. Young saplings (less than 5 metres tall) that are restricting access for maintenance i.e. growing along edge of drain bank, can be removed.

- To reduce the risk that drain water may become acidified during and after it is mechanically cleaned, a 20 kg bag of agricultural lime will be spread across each 25m section of drain over the drain banks and the drain water immediately after disturbance.
- Check and maintain erosion and sediment control measures.
- If there are any obvious visible decline in water quality during the works, work will stop while these are investigated. This could include (but is not limited to) increased turbidity and visible plumes of sediment or floccing of iron or aluminium from the disturbance of acid sulfate soils.

Post-works drain cleaning

- Erosion and sediment control measures will remain in place until the works are completed and water quality in the drain has stabilised.
- Ensure that the future and on-going maintenance program for this drain has been scheduled and programmed before completion of works.

Off-site acid sulfate soil treatment

Given the site constraints and amenity considerations, excavated material will be neutralised on a temporary treatment pad at a nearby Council road reserve stockpile location positioned on stable ground, away from overland flow paths.

The following process shall be followed for the offsite treatment of material:

1. A designated acid sulfate soil treatment area will be established prior to transport of material.
2. The stockpile will be constructed on an impervious pad with a collection drain and bund wall to collect any potential leachate or runoff.
3. A guard layer of lime will be applied prior to the treatment of drain material as an added precaution.
4. Acid sulfate soil material will be placed on the treatment pad in thin layers. Thinner layers of soil can be more easily and thoroughly dried and mixed; 300 mm is suggested as a maximum, for ease of mixing and to prevent equipment from bogging. Once the ASS is dry enough to work, agricultural lime will be applied at the rate of 32 kg $CaCO_3$/t and mixed in (total of 6,000 kg agricultural lime for the extent of the project).

Verification sampling

Final verification sampling of treated soils will meet the requirements of the licensed waste disposal facility for where the material will be taken.

Water quality monitoring

Water quality monitoring will be undertaken before, during and after works are completed and continue for five days afterwards. The pH, dissolved oxygen and electrical conductivity of water shall checked, prior, during and at the completion of the works at 100m intervals by hand held meters.

Monitoring

Regular visual monitoring of PASS/ASS areas and surrounds shall be undertaken to identify signs of ASS oxidation. This monitoring should include detecting:

- Unexplained scalding, degradation or death of surrounding vegetation.
- Unexplained death or disease in aquatic organisms.
- Formation of the mineral jarosite and other acidic salts in exposed or excavated soils.
- Areas of green-blue water or extremely clear water indicating high concentrations of aluminium.
- Rust coloured deposits on plants and on the banks of drains, water bodies and watercourses indicating iron precipitates.
- Black to very dark coloured waters indicating de-oxygenation.
- Area of black ooze (potentially indicating monosulfidic black oozes) typically in drains and low lying areas.

References

Sullivan, L, Ward, N, Toppler, N and Lancaster, G (2018), National Acid Sulfate Soils guidance: National acid sulfate soils sampling and identification methods manual, Department of Agriculture and Water Resources, Canberra ACT. CC BY 4.0

Sullivan, L, Ward, N, Toppler, N and Lancaster, G (2018), National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT.

Richmond River County Council (RRCC) (2015), *Floodgate and drain management guidelines*, Richmond River County Council, Lismore, New South Wales.

NSW Sugar Milling Co-operative LTD 2005, *The NSW Sugar Industry Best Practice Guidelines for Acid Sulfate Soils*, March 2005 ed.

QLD Government Department of Science, Information Technology, Innovation and the Arts 2014, *Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines V4.0*, 2014

Ahern, C.R, Stone, Y, and Blunden, B. (1998) Acid Sulfate Soil Manual 1998. Acid Sulfate Soil Management Advisory Committee, Wollongbar, NSW, Australia.

Department of Infrastructure, Planning and Natural Resources (1997) Acid Sulfate Soil Planning Map (Edition 1) –Map 1:25 000.

Appendix A- ASS Background and Risk Map

Background

Occurrence of Potential and Actual Acid Sulfate Soils (PASS and ASS)

Acid Sulfate Soils (ASS) occurs predominantly on coastal lowlands, with elevations generally below 5m Australian Height Datum (AHD). The NSW Acid Sulfate Soils Manual (ASSMAC, 1998) notes that ASS are generally associated with the Holocene age (last 10,000 years) sediments.

These sediments were deposited in specific conditions such as within mangrove areas, saltmarsh, floodplain backswamps, coastal flats, seasonal or permanent freshwater swamps that were once saline or brackish and open tidal waters such as the beds of coastal rivers or lakes existed.

The NSW department of Land and Water Conservation have produced maps which indicate the likely presence of acid sulfate soils and what depth below natural ground surface they may be expected to occur, see attached Figure.

Types of Acid Sulfate Soils (ASS)

There are two main types of acid sulfate soils:

Potential Acid Sulfate Soils (PASS)

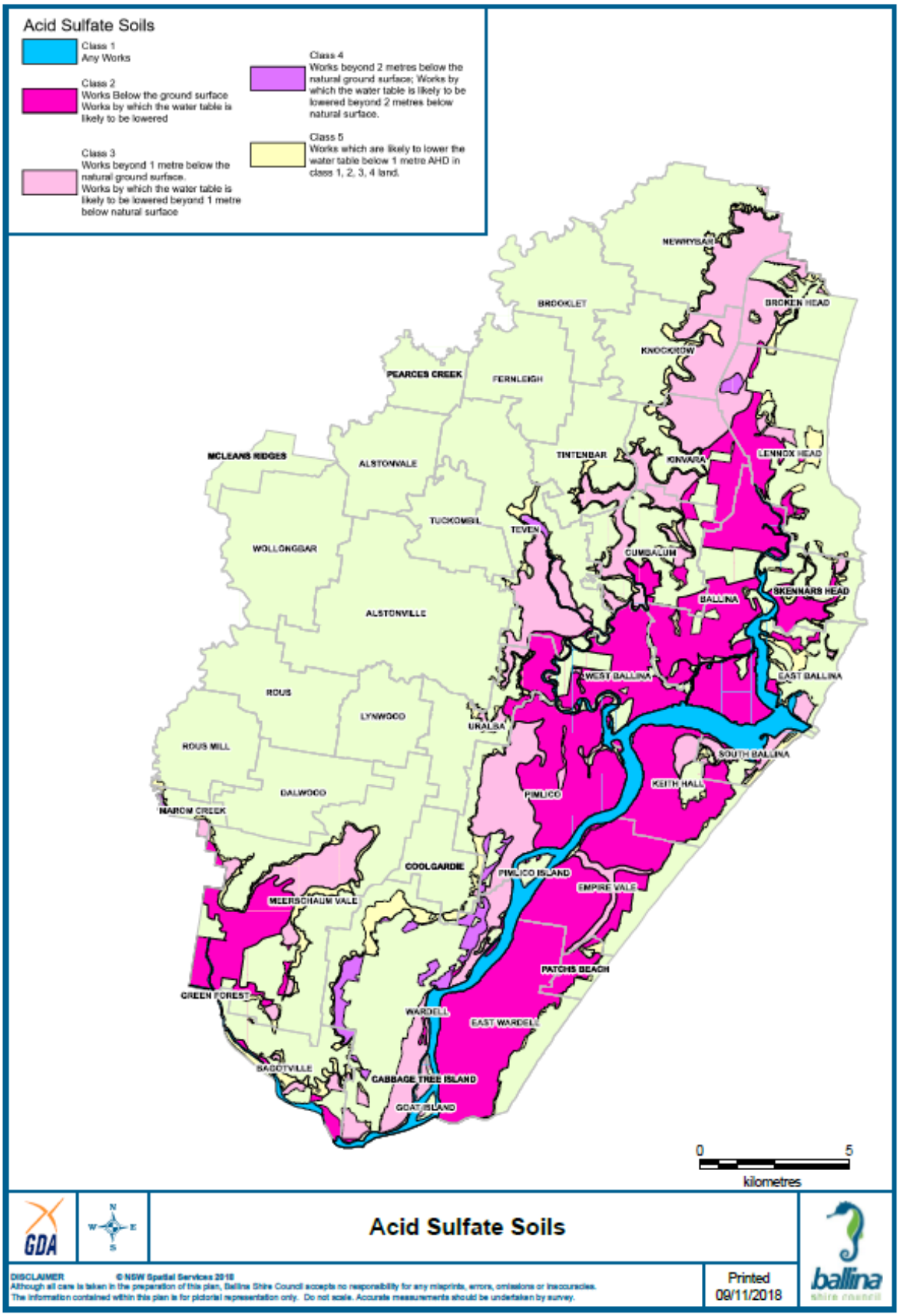
PASS contain iron sulfides or sulfidic material which has not been exposed to air and oxidised. These soils are located in an oxygen deficient environment, typically below the water table. The field pH of these soils is typically 4 or higher, sometimes ranging into the alkaline.

The sulfides/sufidic materials oxidise once exposed to air with the potential to generate sulfuric acid, and hence pose risks to the surrounding environment through acid run-off.

Actual Acid Sulfate Soils (ASS)

ASS are soils that contain highly acidic layers, this high acidity is a result of the oxidation of soil materials that are rich in iron sulfides. ASS soils can have field pH measurements of 4 or less in dry conditions and are typically characterised as possessing pale yellow mottling. This mottling is caused by the presence of the mineral Jarosite, a product of the oxidation of iron sulfides which generally requires a pH <3.7 to form.

ASS may also contain dissolved metals such as aluminium, which can be toxic to aquatic animals and plants.


Acid Sulfate Soils
Class 1
Any Works
Class 2
Works Below the ground surface
Works by which the water table is likely to be lowered
Class 3
Works beyond 1 metre below the natural ground surface.
Works by which the water table is likely to be lowered beyond 1 metre below natural surface
Class 4
Works beyond 2 metres below the natural ground surface; Works by which the water table is likely to be lowered beyond 2 metres below natural surface.
Class 5
Works which are likely to lower the water table below 1 metre AHD in class 1, 2, 3, 4 land.
NEWRYBAR
BROOKLET
BROKEN HEAD
KNOCKROW
PEARCES CREEK
FERNLEIGH
MCLEANS RIDGES
ALSTONVALE
TINTENBAR
KINVARA
LENNOX HEAD
TUCKOMBIL
TEVEN
WOLLONGBAR
CUMBALUM
SKENNARS HEAD
BALLINA
ALSTONVILLE
WEST BALLINA
EAST BALLINA
ROUS
LYNWOOD
UNALSA
ROUS MILL
SOUTH BALLINA
KEITH HALL
DALWOOD
PIMLICO
NARROM CREEK
COOLGARDIE
PIMLICO ISLAND
EMPIRE VALE
MEERSCHAUM VALE
PATCHS BEACH
GREEN FOREST
WARDELL
EAST WARDELL
SADDLEVILLE
CABBAGE TREE ISLAND
GOAT ISLAND
0
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kilometres
GDA
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Acid Sulfate Soils
DISCLAIMER
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The information contained within this plan is for pictorial representation only. Do not scale. Accurate measurements should be undertaken by survey.
Printed
09/11/2018
ballina
shire council

Monosulfidic Black Ooze

Monosulfides and Monosulfidic Black Ooze (MBO) are characterised by their black and often oily appearance, and when disturbed the release of hydrogen sulfide (rotten egg gas).

The formation and accumulation of MBOs are common in acid sulfate soil (ASS) affected drainage channels, in low flow conditions where vegetation collects including drains and waterways behind floodgates.

They generally accumulate in low energy ASS environments such as waterways and lagoons and form thick ‘blankets’ of organic rich, gel like materials.

When disturbed in significant quantities they can cause acidification of waterways and severe deoxygenation of waters. Where drains and wetlands are constructed, MBO can continue to accumulate where favourable conditions exist and present an ongoing management issue. Particular care needs to be taken within these environments.

Appendix B - Summary of Results provided by EAL Laboratory

RESULTS OF ACID SULFATE SOIL ANALYSIS

3 samples supplied by Ballina Shire Council on 30/03/2023. Lab Job No. N9232.
Analysis requested by Christine Pitman. Your Job: Sediment.

PO Box 450 BALLINA NSW 2478

Sample Identification	EAL Lab Code	Texture	Moisture Content (% moisture of total wet weight)	Moisture Content (g moisture / g of oven dry soil)	Bulk Density (g/cm^3)	Potential Sulfidic Acidity (Chromium Reducible Sulfur - CRS) ($\%S_{Cr}$)	Potential Sulfidic Acidity (Chromium Reducible Sulfur - CRS) (mol H^+/t)	pH_{KCl}	Actual Acidity (Titratable Actual Acidity - TAA) (mol H^+/t)	Retained Acidity ($\%S_{NAS}$)	Retained Acidity (mol H^+/t)	Non-treated soil: Acid Neutralising Capacity (ANC_{BT}) ($\%\ CaCO_3$)	Non-treated soil: Acid Neutralising Capacity (ANC_{BT}) (mol H^+/t)	Non-treated soil: Net Acidity (mol H^+/t)	Non-treated soil: Lime Calculation (kg $CaCO_3$/t DW)
Method Info.		**		**		(In-house method S20)		(In-house method 7b3)		**		(In-house method S14)		**	**
S1 0.2-0.3m	N9232/1	Fine	60.0	1.50	0.96	0.106	66	5.86	42	--	--	--	--	108	8
S2 0.2-0.3m	N9232/2	Fine	74.1	2.86	0.43	1.332	831	4.70	111	--	--	--	--	941	71
S3 0.2-0.3m	N9232/3	Fine	50.7	1.03	0.54	0.512	319	6.05	9	--	--	--	--	329	25

NOTES:

1. All analysis is reported on a dry weight (DW) basis, unless wet weight (WW) is specified.
2. Samples are dried and ground immediately upon arrival (unless supplied dried and ground).
3. Analytical procedures are sourced from Sullivan L, Ward N, Toppler N and Lancaster G. 2018. National acid sulfate soils guidance: national acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT. CC BY 4.0.
4. The Acid Base Accounting Equation, where Acid Neutralising Capacity has not been corroborated by other data, is Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity (Eq. 3.2; Sullivan et al. 2018 - full reference above).
5. The Acid Base Accounting Equation for post-limed soil materials is Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity - (post treatment Acid Neutralising Capacity - initial Acid Neutralising Capacity) (Eq. 3.3; Sullivan et al. 2018 - full reference above).
   While the Acid Neutralising Capacity of a soil material may not be included in the Net Acidity calculation (Note 4), it must be measured to give an Initial Acid Neutralising Capacity if verification testing is planned post-liming.
   The Inital Acid Neutralising Capacity must be provided by the client to enable EAL to produce Verification Net Acidity and Liming calculations for post-limed soil materials.
6. The Acid Base Accounting Equation, where Acid Neutralising Capacity has been corroborated by other data, is Net Acidity = Potential Acidity + Actual Acidity + Retained Acidity - Acid Neutralising Capacity (Eq. 3.1; Sullivan et al. 2018 - full reference above).
7. The lime calculation includes a Safety Factor of 1.5 as a safety margin for acid neutralisation (Sullivan et al. 2018). This is only applied to positive values. An increased Safety Factor may be required in some cases.
8. Retained Acidity is required when the pHKCl < 4.5 or where jarosite has been visually observed.
9. A negative Net Acidity result indicates an excess acid neutralising capacity.
10. If insufficient mixing occurs during intial sampling, or during post-liming, or both: the Potential Sulfidic Acidity may be greater in the post-limed sample than in the intial sample; the post-liming Acid Neutralising Capacity may be lower in the post-limed sample than in the intial sample.
11. **An acid sulfate soil management plan is triggered by Net Acidity results greater than the texture dependent criterion: coarse texture ≥ 0.03% S or 18 mol H+/t; medium texture ≥ 0.06% S or 36 mol H+/t; fine texture ≥ 0.1% S or 62 mol H+/t) (Table 1.1; Sullivan et al. 2018 - full reference above)**
12. For projects that disturb > 1000 t of soil material, the coarse trigger of ≥ 0.03% S or ≥ 18 mol H+/t must be applied in accordance with Sullivan et al. (2018) (full reference above).
13. Acid sulfate soil texture triggers can be related to NCST (2009) textures: coarse and peats = sands to loamy sands; medium = clayey sand to light clays; fine = light medium to heavy clays (Sullivan et al. 2018 - full reference above).
14. Bulk density is required to convert liming rates to soil volume based results. Field bulk density rings can be submitted to EAL for bulk density determination.
15. A negative Net Acidity result indicates an excess acid neutralising capacity.
16. '..' is reported where a test is either not requested or not required. Where pHKCl is < 4.5 or > 6.5, zero is reported for SNAS and ANC in Net Acidity calculations, respectively.
17. Results refer to samples as received at the laboratory. This report is not to be reproduced except in full.
18. ** NATA accreditation does not cover the performance of this service.
19. Analysis conducted between sample arrival date and reporting date.
20. All services undertaken by EAL are covered by the EAL Laboratory Services Terms and Conditions (refer SCU.edu.au/eal/t&cs or on request).
21. Results relate to the samples tested.
22. This report was issued on 04/04/2023.

NATA
Accreditation No. 14960
Accredited for compliance with ISO/IEC 17025 - Testing

Environmental Analysis Laboratory, Southern Cross University,
Tel. 02 6620 3678, website: scu.edu.au/eal

checked: .....
Graham Lancaster
Laboratory Manager

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Biodiversity Assessment

Wardell Drainage Works

Prepared for: Planit Consulting
Date: April 2023

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This report has been prepared for the use of the stated client and for the specific purpose described in the introduction and is not to be used for any other purpose or by any other person or business entity. ReconEco accepts no responsibility for any loss or damage suffered howsoever arising to any person or corporation who may use or rely on this report in contravention of the terms of this disclaimer.

Due consideration has been given to site conditions and to appropriate legislation and documentation available at the time of preparation of the report. As these elements are liable to change over time, the report is to be considered current at the time of preparation only.

The report relies on information supplied by the client and on findings obtained using accepted survey and assessment methodologies. The specific survey methodology utilised is described in the relevant section of the report.

While due care was taken during field survey and subsequent report preparation, ReconEco accepts no responsibility for any omissions that may have occurred due to the nature of the survey methodology.

Ian Colvin

Biodiversity Assessment Method (BAM) accredited assessor (BAAS18055)

Date	Document Version	Author	Client
04/04/2023	V1 (draft)	I. Colvin	Rob van Iersel (Planit Consulting)
13/04/2023	V2 (FINAL)	I. Colvin	Rob van Iersel (Planit Consulting)

Executive Summary

ReconEco Pty Ltd has been engaged by Planit Consulting to complete a biodiversity assessment to examine the potential impacts of drainage maintenance works within a constructed drain within the road reserve of Wilson Street, Wardell. The biodiversity assessment supports a Review of Environmental Factors (REF) prepared in accordance with requirements of part 5 of the *Environmental Planning and Assessment Act 1979*.

The site occurs within a portion of land designated as a Coastal Wetland as per State Environmental Planning Policy (SEPP) Resilience & Hazards 2021. The works are consistent with the definition of stormwater management systems (routine maintenance works) under SEPP (Transport and Infrastructure) 2021 ('T & I SEPP') and are assessed under part 5 of the *Environmental Planning and Assessment Act 1979*. On this basis the Biodiversity Offsets Scheme (BOS) trigger is limited to whether the proposal may significantly impact threatened species/communities or their habitats.

A test of significance completed under s7.3 of the *Biodiversity Conservation Act 2016* determined that the proposed works would be unlikely to result in significant biodiversity impacts and therefore a *Biodiversity Development Assessment Report (*BDAR) is not required.

A combination of field and desktop assessment indicate that:

- The site comprises highly disturbed vegetation alongside the drain dominated by weed species, within area which would have formerly comprised Swamp Oak forest (PCT 3993). Within the drain and flanking the Richmond River mangrove communities dominate (PCT 4090).
- PCT 3993 is characteristic of the threatened ecological community (TEC) 'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' as listed in the BC Act'; vegetation alongside the drain is a highly degraded form of this TEC.
- No threatened flora were recorded, nor likely to occur.
- Drainline vegetation comprises poor quality fauna habitat; no trees with discernible hollows occur. The drain provides poor quality fish habitat. Mangroves flanking the Richmond River provide riparian habitat for a range of birds which may utilise estuarine habitats.
- No threatened fauna species were recorded; the site provides potential opportunistic foraging habitat for several threatened fauna species.
- The works may require the removal of up to 14 native trees >3 m height for the access track, none of which are mature trees. Works within the drain and proximate to the Richmond River may require the removal of to 32 mature Grey Mangrove and up to 220 immature mangroves (both Grey and River Mangroves).
- Vegetation impacts are spatially quantified as:
  - ~ 220 m² of PCT 4090 (including regrowth removal at Richmond River at the drain mouth and within the drain.
  - ~ 400 m² of PCT 3993 (highly degraded Swamp Oak Floodplain Forest TEC), with all Swamp Oak along the drain bank retained.
- As mangroves will require removal for the works a permit from NSW Fisheries under Part 7 of the FM Act is required to 'harm marine vegetation'.
- Compensation plantings to offset the loss of terrestrial and marine vegetation have been prescribed:
    - Terrestrial tree planting of minimum 35 trees within the road reserve at the site. Tree species should be consistent with and augment Swamp Oak Floodplain Forest (ie. 'like for like'). Any other relevant matters in Council's Offset policy must also be satisfied.
    - Further liaison is required with DPI Fisheries (and a copy of the REF and all appendices provided) with regard to confirming the offsets required and identifying the receiving site for the works. Any requirements of DPI Fisheries will need to be accommodated.

1 Introduction & Background

1.1 Introduction

ReconEco Pty Ltd has been engaged by Planit Consulting to complete a biodiversity assessment to examine the potential impacts of drainage maintenance works within a constructed drain within the road reserve of Wilson Street, Wardell. The biodiversity assessment supports a Review of Environmental Factors (REF) prepared in accordance with requirements of part 5 of the *Environmental Planning and Assessment Act 1979*.

The site occurs within a portion of land designated as a Coastal Wetland as per State Environmental Planning Policy (SEPP) Resilience & Hazards 2021. The works are consistent with the definition of stormwater management systems (routine maintenance works) under SEPP (Transport and Infrastructure) 2021 ('T & I SEPP').

The aim of this assessment is to identify the biodiversity values of the site, including:

- vegetation communities and their condition
- threatened flora species* and their habitats
- threatened ecological communities (TECs)*
- habitat for threatened fauna*
- significant habitat features (eg. koala habitat trees, hollow bearing trees, microbat roosting habitat)
- significant aquatic habitat.

**Biodiversity Conservation Act 2016* (BC Act), *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

1.2 The site

The site comprises the road reserve which includes an existing stormwater channel between the corner of Wilson Street/ Richmond Street and the Richmond River (refer **Figure 1**). On the western side of the site lies several private residences; east of the site a small Crown Reserve occurs within Lot 76 DP728647, along with riparian vegetation Crown Land which flanks the Richmond River.

The site occurs on the Empire Vale soil landscape (eSPADE v2.2); attributes include:

- Landscape: level to very gently inclined deltaic alluvial plain of the Richmond River. Relief 3–5 m, slopes 0–1%. Extensively cleared closed and open forest, now almost entirely devoted to sugar cane.
- Soils: deep (>200 cm), moderately well-drained Prairie Soils, minimal Prairie Soils and Dense Clays overlying poorly drained mixed sediments.
- Qualities and Limitations: reactive, highly plastic soils with permanently high watertables and localised low wet bearing strength and salinity. Localised potential acid sulphate soils. Flood hazard.

The site occurs within a portion of land designated as a Coastal Wetland as per SEPP (Resilience & Hazards) 2021; refer **Plate 1**. Coastal Wetlands are also mapped as biodiversity value land in the Biodiversity Values Map and Threshold Tool.

The site lies within the Clarence Lowlands subregion of the South East Queensland IBRA region (Thackway & Cresswell, v7).

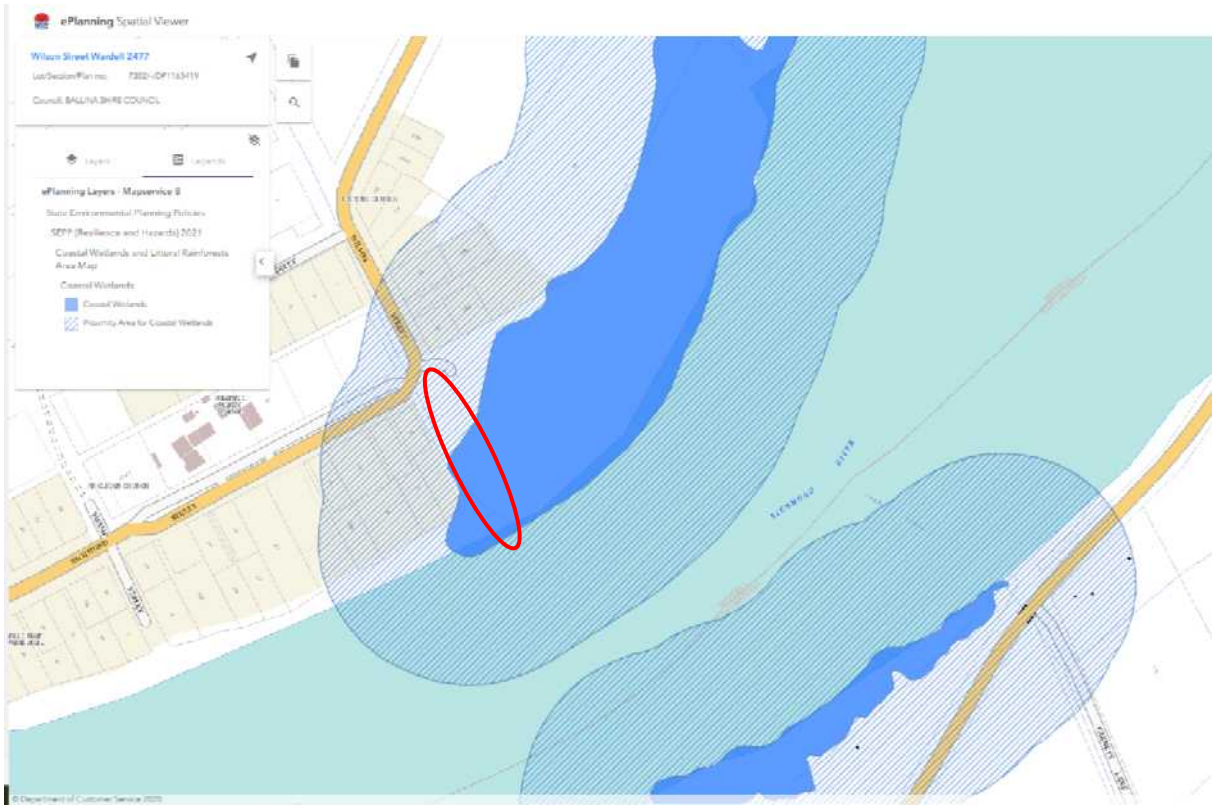

Plate 1 *Coastal wetlands mapping; site outlined in red*

1.3 Proposed works

The proposal ('the Activity') involves the routine maintenance of the existing stormwater channel including removal of sediment build- up and vegetation growth in the stormwater channel. A 3 metre wide access track will be established to enable access to the stormwater system to undertake the routine maintenance. The access track will be established on the eastern side of the drain to be located off private property (refer concept at **Appendix A**). The access track will be maintained for future ongoing routine maintenance of the stormwater system. Vegetation removal required for the works will be offset in accordance with the Ballina Shire Council *Biodiversity - Compensatory Habitat and Offsets Policy*.

The proposed sequence of works for the project is understood to include:

- Pipe the small drain at the entrance of the access track
- Engage vegetation contractor to clear and remove vegetation as part of access track construction
- Using an 8 or 14 tonne excavator and rigid body trucks, construct 3m wide maintenance access track 1m from the top of the drainage embankment using geotextile membrane covered with recovered aggregate in accordance with the NSW EPA Resource Recovery requirements
- Once access track is established, using a suitably sized excavator fitted with a slotted bucket, clear the sediment and material from the drain. Material will be loaded into a lined truck for offsite liming and management in accordance with the Acid Sulfate Soil Management Plan.
- Works will commence at the furthest upstream point and work progressively downstream
- Some minor bank stabilization works may be required as part of this work
- Mature native vegetation within the drain will be retained wherever possible and works will dig around these trees.
- Works will continue until the drain is widened and cleared at the point of discharge into the Richmond River.

- All works will be completed with appropriate erosion and sediment control measures in accordance with Managing Urban Stormwater, soils and construction (the Blue Book).

Notes:

1. Plant and a compound /ancillary facilities may be positioned in the adjacent road reserve (at the end of Richmond Street).
2. Council will utilise other managed stockpile locations and licensed waste facilities for the management of waste.

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Figure 1: Site location

Legend

- Subject Site
- Hydro Line
- Crown Land

Author: LD

Date: March, 2023

2 Methodology

The methodology for this assessment has included both a desktop review and field survey as follows.

2.1 Desktop Review

A range of online databases and information sources were searched to inform the assessment including:

- Atlas of NSW Wildlife (BioNet) database to identify NSW listed threatened species recorded within the locality (10km x 10km area centred on the site)
- Protected Matters Search Tool (PMST) to determine any Matters of National Environmental Significance (MNES) within a 5km radius of the site
- Fisheries NSW Spatial Data Portal.

An earlier assessment by Blackwood Ecology (November 2022) was also reviewed.

2.2 Field Survey

Field assessment of the subject site was carried out by a qualified ecologist on 27th March 2023 and included the following activities:

- Description and mapping of vegetation communities
- Recording typical flora species within each vegetation community, inclusive of weed species
- Targeted searches for threatened flora
- Identification of any habitat features (eg. tree hollows, termitaria)
- Opportunistic fauna survey (visual/aural records).

Photographs from the field survey are provided at **Appendix B**.

Survey limitations

- Vegetation survey was limited to the road reserve only and detailed assessment was not completed within adjacent vegetation within Crown land.
- Field assessment did not include targeted fauna surveys. Instead, a habitat assessment was undertaken to identify habitat features/values on the site and determine the suitability of the site for occupancy by any threatened species known or likely to occur on the site and in surrounding landscape.

3 Vegetation Assessment

3.1 Desktop assessment

3.1.1 BioNet

Threatened flora

BioNet searches returned confirmed records of 25 threatened flora species within 5km of the site (refer **Table 3.1; Appendix C**).

Table 3.1 *BioNet results - threatened flora*

Scientific Name	Common Name	BC Act	EPBC Act	Records
Acalypha eremorum	Acalypha	E		4
Acronychia littoralis	Scented Acronychia	E1	E	15
Archidendron hendersonii	White Lace Flower	V		41
Arthraxon hispidus	Hairy Jointgrass	V	V	677
Belvisia mucronata	Needle-leaf Fern	E1		4
Coatesia paniculata	Axe-Breaker	E1		12
Corynocarpus rupestris subsp. rupestris	Glenugie Karaka	V	V	3
Cryptocarya foetida	Stinking Cryptocarya	V	V	89
Davidsonia jerseyana	Davidson's Plum	E	E	1
Davidsonia johnsonii	Smooth Davidson's Plum	E	E	12
Endiandra hayesii	Rusty Rose Walnut	V	V	23
Endiandra muelleri subsp. bracteata	Green-leaved Rose Walnut	E		134
Floydia praealta	Ball Nut	V	V	1
Lindsaea brachypoda	Short-footed Screw Fern	E		1
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V	167
Marsdenia longiloba	Slender Marsdenia	E	V	3
Oberonia titania	Red-flowered King of the Fairies	V		38
Ochrosia moorei	Southern Ochrosia	E	E	5
Peristeranthus hillii	Brown Fairy-chain Orchid	V		3
Persicaria elatior	Tall Knotweed	V	V	1
Phaius australis	Southern Swamp Orchid	E	E	2
Rhodamnia rubescens	Scrub Turpentine	CE	CE	15
Rhodomyrtus psidioides	Native Guava	CE	CE	39
Syzygium hodgkinsoniae	Red Lilly Pilly	V	V	18
Tinospora tinosporoides	Arrow-head Vine	V		4

V = Vulnerable; E = Endangered; CE = Critically Endangered

Threatened communities

BioNet search results indicate habitat for numerous TECs may occur within the Ballina LGA (refer **Table 3.2**).

Table 3.2 *BioNet results - threatened communities*

Community	**BC Act**	**EPBC Act**
Coastal Cypress Pine Forest in the New South Wales North Coast Bioregion	E	
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland		E
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	
Grey Box—Grey Gum Wet Sclerophyll Forest in the NSW North Coast Bioregion	E	
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia		CE
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	E	
Lowland Rainforest of Subtropical Australia		CE
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	E	
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	E	
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E	
White Gum Moist Forest in the NSW North Coast Bioregion	E	

E = Endangered; CE = Critically Endangered

3.2 Results of field assessment

3.2.1 Vegetation

Vegetation at and adjacent to the site comprises a combination of swamp sclerophyll and estuarine communities with varying degrees of disturbance. Vegetation along the drain is almost entirely dominated by weed species with occasional canopy trees including Cockscomb Coral Tree (*Erythrina crista-galli*) and Hackberry (*Celtis sinensis*); Swamp Oak (*Casuarina glauca*) occurs very infrequently. To the east a larger patch of Swamp Oak estuarine forest occurs which is more intact. Mangrove communities flank the river and are dominated by Grey Mangrove (*Avicennia marina*); within the drain Grey Mangrove occurs with regrowth of River Mangrove (*Aegiceras corniculatum*) and infrequent Milky Mangrove (*Excoecaria agallocha*). Adjacent grassland is highly disturbed and dominated by exotic grasses (primarily Setaria *S. sphacelata*); Cumbungi (*Typha orientalis*) is present in the minor feeder drain in the road shoulder.

Vegetation communities and equivalent Plant Community Types (PCTs) at the site are described in **Table 3.3** and depicted at **Figure 2**.

Table 3.3 *Plant community types (PCTs)*

	Description	Equivalent PCT
1	Swamp sclerophyll forest dominated by Swamp Oak (*Casuarina glauca*) with infrequent Tuckeroo (*Cupaniopsis anacardioides*)	PCT 3993 Far North Swamp Oak-Paperbark Tidal Forest
1x	Highly degraded variant of Community 1 along the drainline. Canopy species include Cockscomb Coral Tree* (*Erythrina crista-galli*) and Hackberry* (*Celtis sinensis*), with several Brown Kurrajong (*Commersonia bartramia*). Weedy midstorey of Murraya* (*Murraya paniculata*), Lantana* (*L. camara*), Coffee* (*Coffea arabica*) and Climbing Asparagus (*A. africanus*). Infrequent native trees include Tuckeroo and Swamp Oak. Minor regeneration of Guioa (*G. semiglauca*) and Pepperberry (*Cryptocarya obovata*) is also present.	(as above – derived)
2	Mangrove forest dominated by Grey Mangrove (*Avicennia marina*); within the drain regrowth River Mangrove (*Aegiceras corniculatum*) and infrequent Milky Mangrove (*Excoecaria agallocha*) occur. Occasional Cottonwood (*Hibiscus tiliaceus*) occur on the fringes, with infrequent Swamp Lily (*Crinum pedunculatum*) in the ground layer.	PCT 4090 Far North Estuarine Mangrove-Swamp Oak Forest
3	Grassland – dominated by Setaria*.	n/a

*introduced species

3.2.2 Threatened communities

Vegetation alongside the drain is a highly degraded form of the threatened ecological community (TEC) 'Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions' as listed in the BC Act (consistent with PCT 3993).

This community is not characteristic of the EPBC Act listed equivalent TEC 'Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland' due to the high levels of weed invasion and poor native diversity and structure – condition thresholds are not met.

3.2.3 Threatened flora

No threatened flora species were recorded; given the highly disturbed nature of the site there is little likelihood of threatened flora occurring.

3.2.4 Condition

As noted, drainside vegetation is disturbed, weedy and degraded and has very low frequencies of native species. Riverside mangrove vegetation is in good condition and is relatively undisturbed.

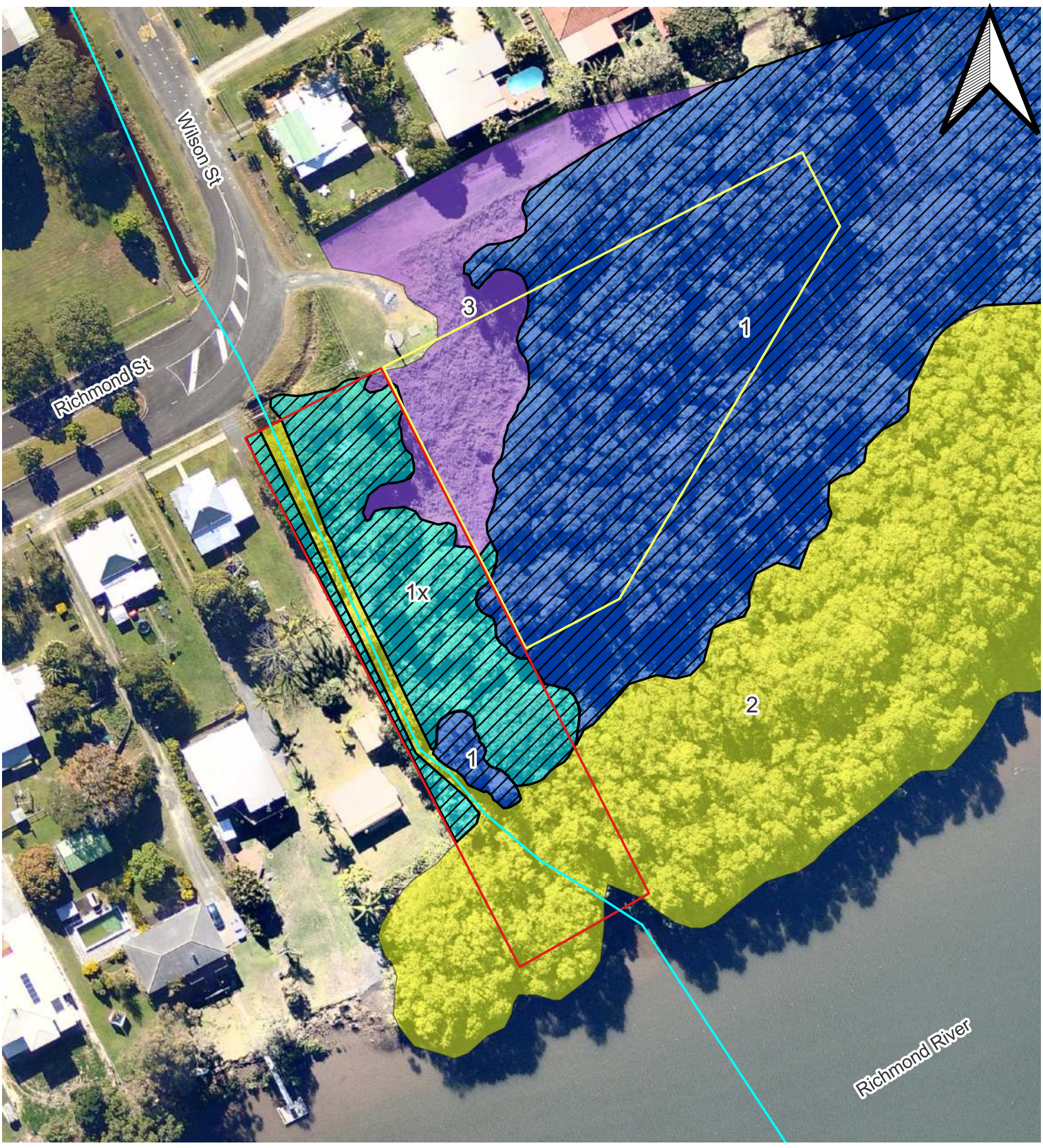

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Figure 2: Vegetation plan

Author: LD
Date: March 2023

0 25 50 m

- Drainage Line
- Subject Site
- Crown Land

Vegetation

- PCT3993: Far North Swamp Oak-Paperbark Tidal Forest
- PCT3993: Derived
- PCT4090: Far North Estuarine Mangrove-Swamp Oak Forest
- Grassland
- Threatened Ecological Community (PCT3993)

4 Fauna Habitat Assessment

4.1 Desktop assessment

4.1.1 BioNet

BioNet searches returned confirmed records of 63 threatened fauna species within 5km of the site (refer **Appendix C**; **Table 4.1**).

Table 4.1 *BioNet results - threatened fauna*

Scientific Name	Common Name	BC Act	EPBC Act	Records
Invertebrates				
Nurus atlas	Atlas Rainforest Ground-beetle	E		23
Phyllodes imperialis southern subspecies	Southern Pink Underwing Moth	E	E	92
Reptiles				
Cacophis harriettae	White-crowned Snake	V		1
Caretta caretta	Loggerhead Turtle	E	E	6
Chelonia mydas	Green Turtle	V	V	2
Eretmochelys imbricata	Hawksbill Turtle		V	6
Amphibians				
Crinia tinnula	Wallum Froglet	V		65
Litoria olongburensis	Olongburra Frog	V	V	3
Birds				
Amaurornis moluccana	Pale-vented Bush-hen	V		1
Anseranas semipalmata	Magpie Goose	V		1
Burhinus grallarius	Bush Stone-curlew	E		1
Calidris ferruginea	Curlew Sandpiper	E	CE	2
Calidris tenuirostris	Great Knot	V	CE	1
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	V	1
Carterornis leucotis	White-eared Monarch	V		9
Circus assimilis	Spotted Harrier	V		4
Coracina lineata	Barred Cuckoo-shrike	V		4
Daphoenositta chrysoptera	Varied Sittella	V		1
Ephippiorhynchus asiaticus	Black-necked Stork	E		6
Erythrotriorchis radiatus	Red Goshawk	CE	V	1
Esacus magnirostris	Beach Stone-curlew	CE		1
Glossopsitta pusilla	Little Lorikeet	V		2
Grus rubicunda	Brolga	V		2
Haematopus fuliginosus	Sooty Oystercatcher	V		3
Haematopus longirostris	Pied Oystercatcher	E		246
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		40
Hieraaetus morphnoides	Little Eagle	V		1
Hirundapus caudacutus	White-throated Needletail		V	8
Irediparra gallinacea	Comb-crested Jacana	V		11
Ixobrychus flavicollis	Black Bittern	V		1
Limosa limosa	Black-tailed Godwit	V		1
Menura alberti	Albert's Lyrebird	V		17

Scientific Name	Common Name	BC Act	EPBC Act	Records
Ninox strenua	Powerful Owl	V		4
Numenius madagascariensis	Eastern Curlew		CE	1
Pandion cristatus	Eastern Osprey	V		24
Pezoporus wallicus wallicus	Eastern Ground Parrot	V		1
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V		3
Pterodroma solandri	Providence Petrel	V		2
Ptilinopus magnificus	Wompoo Fruit-Dove	V		10
Ptilinopus regina	Rose-crowned Fruit-Dove	V		12
Ptilinopus superbus	Superb Fruit-Dove	V		3
Sternula albifrons	Little Tern	E		11
Turnix maculosus	Red-backed Button-quail	V		2
Tyto longimembris	Eastern Grass Owl	V		15
Tyto novaehollandiae	Masked Owl	V		1
Xenus cinereus	Terek Sandpiper	V		1
Mammals				
Dasyurus maculatus	Spotted-tailed Quoll	V	E	1
Dugong dugon	Dugong	E		2
Miniopterus australis	Little Bent-winged Bat	V		9
Miniopterus orianae oceanensis	Large Bent-winged Bat	V		1
Nyctophilus bifax	Eastern Long-eared Bat	V		5
Petaurus norfolcensis	Squirrel Glider	V		23
Phascogale tapoatafa	Brush-tailed Phascogale	V		1
Phascolarctos cinereus	Koala	E	E	359
Physeter macrocephalus	Sperm Whale	V		3
Planigale maculata	Common Planigale	V		4
Potorous tridactylus	Long-nosed Potoroo	V	V	77
Pseudomys novaehollandiae	New Holland Mouse		V	1
Pseudomys oralis	Hastings River Mouse	E	E	1
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	20
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V		1
Scoteanax rueppellii	Greater Broad-nosed Bat	V		1
Syconycteris australis	Common Blossom-bat	V		4

V = Vulnerable; E = Endangered; CE = Critically Endangered

4.1.2 Wildlife corridors

The site is not within any mapped wildlife corridors (NPWS, Ballina DCP), however partly lies within a NE NSW Climate change corridor ('Uralba-Tuckean swamp') which provides a linkage across floodplains and coastal sites, with focal species being Albert's Lyrebird and the Koala.

4.1.3 Fish habitat

The Fisheries NSW Spatial Data Portal maps the Richmond River and most of the site as Key Fish Habitat (refer **Plate 2**). No potential habitat for threatened freshwater fish species is mapped.

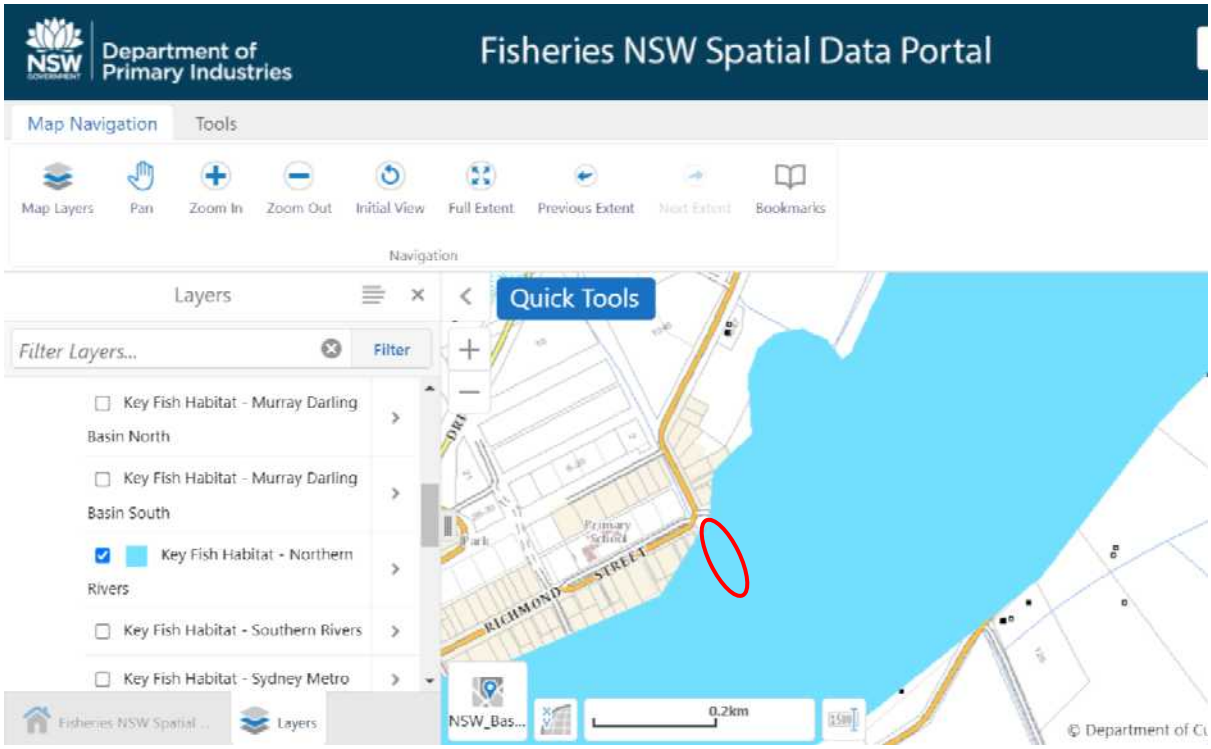


Plate 2 *Key Fish Habitat mapping; site circled in red*

A site assessment and project review was completed between Council officer Christine Pitman and DPI Fisheries representative Jonathon Yantsch on 28/3/23. Following the assessment and discussion of the works:

- Mr Yantsch confirmed that he did not consider the section of drain above the mean high water mark to be key fishery habitat. The mangroves and pneumatophores in the upper section of the drain occur due to sediment build up.
- The area of key consideration is the below the mean high water mark, this is the area where the biodiversity assessment for compensatory requirement is required.
- DPI Fisheries require a design plan of works including survey levels.
- Fisheries have an area that may be suitable for compensatory planting near the old ferry ramp in South Ballina. There will be some requirements to make sure the application and approvals ensure that compensatory works are completed as soon as possible to the time of impact.

4.2 Results of field assessment

4.2.1 Terrestrial habitat values

The site locality provides moderate quality habitat due to the mix of several well-developed and structurally diverse communities. While a range of relatively common bird species were opportunistically observed during field assessment, this represents a small snapshot of the greater numbers which may occur during seasonal and climatic variations. A Brush Turkey mound occurs mid-way along the drain, ~ 7 m from the bank (outside the works zone). A range of microbat species would be expected to use the site and surrounds as foraging habitat, including a number of threatened species.

Habitat along the drain is very poor and unlikely to be important in a local context. No hollow-bearing trees or Koala feed trees occur within the works footprint.

4.2.2 Threatened fauna

No threatened fauna species were recorded.

4.2.3 Potential occurrence assessment

Based on the BioNet search results (refer **Table 4.1**), a potential occurrence assessment has been completed (refer **Appendix D**). The assessment determined suitable habitat occurs for several threatened fauna to occur on an opportunistic or seasonal basis. The following species have been subject to a Test of Significance as per s7.3 of the BC Act (refer **Section 6.2**):

- Black Bittern
- Pale-vented Bush-hen
- Large Bent-winged Bat
- Little Bent-winged Bat
- Yellow-bellied Sheathtail-bat.

5 Impacts & Mitigation

5.1 Impacts

Biodiversity impacts of the works may include:

- Loss of native vegetation – the works may require the removal of up to 14 native trees >3 m height for construction of the access track, none of which are mature trees (refer **Table 5.1**). Minor regrowth seedlings/saplings of Guioa and Pepperberry would also be impacted. Works within the drain and proximate to the Richmond River may require the removal of to 32 mature Grey Mangrove and an estimated 220 immature mangroves (both Grey and River Mangroves). A small patch of Cumbungi (~ 1 m²) would also require removal from within the minor drain at the entry point for the access track for pipe installation.
- Impacts to a ~ 220 m² of marine vegetation (mangroves) including regrowth removal at Richmond River at the drain mouth and within the drain.
- Impacts to ~ 400 m² of highly degraded Swamp Oak Floodplain Forest TEC – all Swamp Oak along the drain bank will be retained.
- Short term noise and disturbance to local fauna from plant, trucks and personnel.
- Potential for weed invasion following access track works.

Table 5.1 *Terrestrial trees requiring removal*

Botanical name	Common name	No.	Comments
Cupaniopsis anacardioides	Tuckeroo	12	Immature trees of dbh < 12 cm; typical height 8 – 10m
Archontophoenix cunninghamiana	Bangalow Palm	2	Small palms of < 4 height.
	TOTAL	**14**	

5.2 Mitigation

The following prescriptions apply to avoid and minimise biodiversity impacts:

1. Minimise the extent of clearing wherever possible.
2. All trees removed should be chipped on site and this material stockpiled for use in other Council projects.
3. All mature trees on the drain bank shall be retained in-situ to stabilise the bank. Camphor Laurel should be cut back and poisoned.
4. Weed hygiene measures must be practiced during all works to ensure propagules are not spread during clearing works.
5. All weedy vegetation within the balance of the road reserve should be mechanically removed as part of the works and the vacant ground utilised for compensation plantings (refer **Section 5.3**). Prior to this occurring, a suitably qualified person shall clearly mark the few native trees within the road reserve (eh. Brown Kurrajong) with flagging tape so they are easily identified for retention.
6. Any adjacent Cockscomb Coral Tree in the road reserve should be stem injected to reduce future sources of infestation, or mechanically removed and mulched/composted.
7. A pre-clearing inspection must be completed by an ecologist or spotter-catcher prior to clearance in the event that fauna are present.
8. The Brush Turkey mound along the drain must be retained and protected by temporary fencing during works.

5.3 Compensation

Terrestrial vegetation compensation

Vegetation to be removed for the works shall be offset via addressing Council's Biodiversity – Compensatory Habitat and Offsets Policy. Compensatory habitat offset ratios are to be applied having regard for the following:

- A compensatory habitat offset is a replacement of habitat removed as a result of development or works.
- The offset ratios set a defined replacement rate and are expressed as number/area replaced to number/area removed (e.g. 5:1 means an offset must be provided at a rate of 5ha or trees for every 1ha or tree removed).
- Calculation of offsets is based on the number of trees or area of habitat lost or both. The extent to which area and/or individual trees is to be used as the basis for calculating an offset is to be determined as part of the assessment of a development proposal.
- Area based calculations are to be rounded to the nearest square metre.
- Where an area of habitat to be offset is comprised of a mixture of conservation categories, the higher offset ratio will be applied.
- Offsets should be located on the same property where the impact occurs. If an offset is to be provided on an alternate site, the proponent must demonstrate why:
  - it is not practical to achieve this; or
  - a suitable biodiversity outcome cannot be achieved on the site; or
  - a better outcome can be achieved on a different site.
- Proposals for off-site offsets must demonstrate security of tenure or other appropriate mechanism suitable to enable the required offset works, and associated monitoring and management works, to be undertaken as well as long term retention of the offset works. This is best achieved through legal mechanisms that are permanent and secure.
- As a first principle offsets are to be provided for on a like for like basis (i.e. loss of one vegetation type should be compensated for by the same vegetation type). Where this can be demonstrated to Council's satisfaction that this cannot be reasonably achieved, an offset based on a different vegetation type, but of the same biodiversity values category, can be applied.
- Required offsets must be provided for within Ballina Shire.
- Offsets relating to koala habitat must be undertaken in accordance with the Ballina Shire Koala Management Strategy (including the Koala Habitat Compensation Policy contained within the strategy).
- Public works undertaken by or on behalf of Council and development primarily for the purpose of affordable housing are subject to a reduced offset rate.

Table 2 of the Policy sets out the rates at which the compensatory offset ratio is applied to public works projects, (refer **Table 5.2**).

Table 5.2 *Compensatory Habitat Offset Ratio Rates for Public Works – Maintenance Works*

Conservation Category	**Offset Ratio Rate** **(Maintenance works associated with public assets undertaken by or on behalf of Council)**
Very High Biodiversity Value	5:1
High Biodiversity Value	2.5:1
Koala Habitat	15:1
Threatened Flora	5:1
Important Habitat Features	2:1

On this basis, the terrestrial tree loss required for the works shall be in accordance with Table 2 of the Policy (as per **Table 5.1**). While the drain line vegetation is highly degraded, the 2.5 multiplier for High Biodiversity Value will be applied – such that 35 native trees must be planted to compensate for the 14 terrestrial trees to be removed.

As noted, woody weeds within the road reserve will be mechanically removed as part of the works and the bare ground created will be suitable for compensation plantings. The following species are recommended for replanting:

- Swamp Oak (*Casuarina glauca*)
- Tuckeroo (*Cupaniopsis anacardioides*)
- Brown Kurrajong (*Commersonia bartramia*)
- Guioa (*Guioa semiglauca*)
- Willow Bottlebrush (*Callistemon salignus*)
- Cheese Tree (*Glochidion ferdinandi*)
- Cottonwood (*Hibiscus tiliaceus*).

Marine vegetation compensation

As noted, consultation with DPI Fisheries (refer **Section 4.1.3**) confirmed a suitable area for compensatory planting occurs near the old ferry ramp in South Ballina and that there would be a requirement to make sure the project approvals ensure that compensatory works are completed as soon as possible to the time of impact.

Requirements

On the basis of the above, vegetation compensation is required and progression of this matter (and approvals) remains the responsibility of Council. The following matters are required:

1. Terrestrial tree planting of minimum 35 trees within the road reserve at the site. Tree species should be consistent with and augment Swamp Oak Floodplain Forest (ie. 'like for like' – refer above). Any other relevant matters in Council's Offset policy must also be satisfied.
2. Further liaison is required with DPI Fisheries (and a copy of the REF and all appendices provided) with regard to confirming the offsets required and identifying the receiving site for the works. Any requirements of DPI Fisheries will need to be accommodated.

6 Statutory Requirements

6.1 Introduction

The proposal requires assessment with regard to the following legislation/policies:

- *Biodiversity Conservation Act 2016*
- *Fisheries Management Act 1994*
- *Environment Protection and Biodiversity Conservation Act 1999*.

6.2 Biodiversity Conservation Act 2016 (BC Act)

Section 7.3 of the BC Act prescribes a test (the 'Test of Significance') for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. A Test of Significance has been completed for known/predicted threatened entities (refer **Section 4.2.3**); refer **Appendix E**. The results of the tests concluded that the proposal would not significantly affect threatened species or ecological communities, or their habitats. On this basis, the Biodiversity Offsets Scheme established in the BC Act is not triggered, and a *Biodiversity Development Assessment Report* (BDAR) is not required. Council has the opportunity to 'opt in' to the BOS and prepare a BDAR if they choose to.

6.3 Fisheries Management Act 1994 (FM Act)

The proposal is unlikely to impact on habitat for any threatened species or communities listed in the FM Act and the works will nominally impact poor quality habitat within a constructed drain; an assessment of significance is not required.

As mangroves require removal for the works a permit from NSW Fisheries under Part 7 of the FM Act is required to 'harm marine vegetation'.

6.4 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act considers nine matters of national environmental significance (MNES):

- World heritage properties
- National heritage places
- Wetlands of international importance ('Ramsar' wetlands)
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

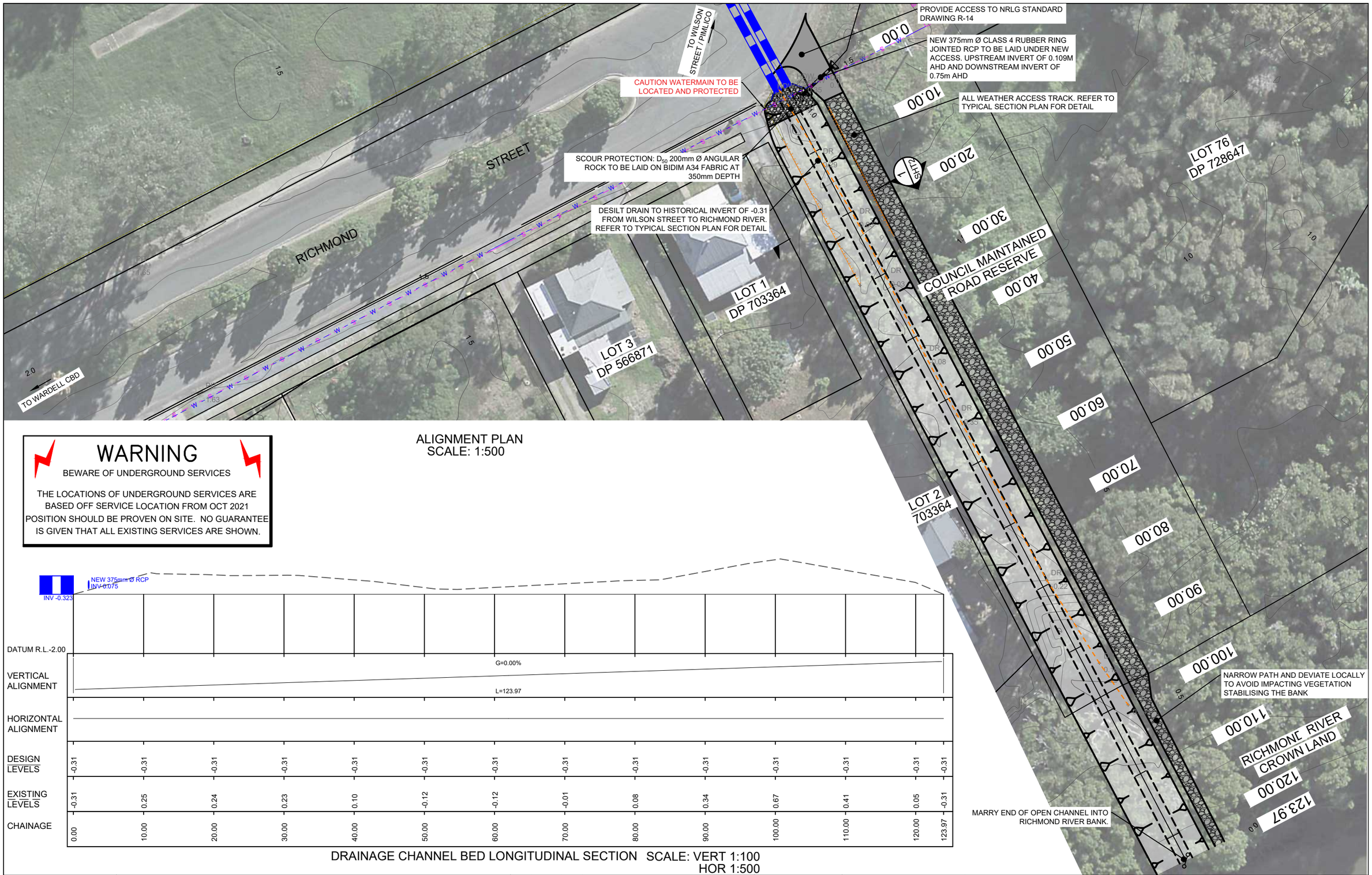
Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (MNES) require approval from the Minister for the Environment. Based on a search using the PMST tool (refer **Appendix C**), MNES are summarised at **Table 6.1**.

The impacts of the works on MNES are not significant and referral of the project is not required.

Table 6.1 *MNES assessment*

MNES	Impact
Any impact on a World Heritage property?	
No World Heritage properties occur within the locality.	Nil
Any impact on National heritage places?	
No National heritage places occur within the locality.	Nil
Any impact on wetlands of international importance?	
No wetlands of international importance occur within the locality.	Nil
Any impact on nationally threatened species and ecological communities?	
Habitat for six threatened ecological communities (TECs) and 102 threatened species is identified within the locality. No threatened flora species were recorded or are likely to occur. Vegetation impacted by the works is not characteristic of any federally listed TECs. Several listed threatened fauna species may use the subject site and surrounds on an opportunistic or seasonal basis (eg. Grey-headed Flying-fox); the works would not result in the removal of any important habitat for these species.	Negligible
Any impact on migratory species?	
Habitat for 79 migratory species is identified within the locality. The subject site is small in area and unlikely to provide significant for any migratory species in a local context, particularly given the substantial area of foraging habitat along the entire Richmond Rover for migratory shorebirds.	Negligible
Any impact on Commonwealth marine areas?	
No Commonwealth marine areas occur within the locality.	Nil
Any impact on the Great barrier Reef?	
Not applicable.	Nil
Does the activity involve a nuclear action (including uranium mining)?	
Not applicable.	Nil
Any impact on a water resource from coal seam gas development or a large coal mining development?	
Not applicable.	Nil

Appendix A - Concept



ALIGNMENT PLAN
SCALE: 1:500

WARNING

BEWARE OF UNDERGROUND SERVICES

THE LOCATIONS OF UNDERGROUND SERVICES ARE BASED OFF SERVICE LOCATION FROM OCT 2021 POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DRAINAGE CHANNEL BED LONGITUDINAL SECTION SCALE: VERT 1:100
HOR 1:500

N

LEGEND

(EXISTING)	(PROPOSED)	(SERVICES)
EDGE OF BITUMEN	CHANNEL CTRL LINE	WATER EXISTING (LOCATED)
TOP OF BATTER	TOP OF BATTER	WATER EXISTING (DBYD)
BOTTOM OF BATTER	BOTTOM OF BATTER	NBN OPTIC FIBRE (LOCATED)
ROAD CENTERLINE	EXTENT OF DESILT	O/HEAD POWER (LOCATED)
PROPERTY BOUNDA	SCOUR PROTECTION	U/GROUND POWER (LOC'D)
SURVEY SPOT HEIG	MAINTENANCE TRACK	SEWER RISING MAIN (LOC'D)
LIDAR CONTOURS	NEW STORMWATER	UNKNOWN SERVICE
		STORMWATER EXISTING DPY/GIN & SSM/PM

NO.	DATE	BY	CHANGE	X'D
0	APR 23	SA	ISSUED FOR REVIEW	

AMENDMENTS

ballina shire council

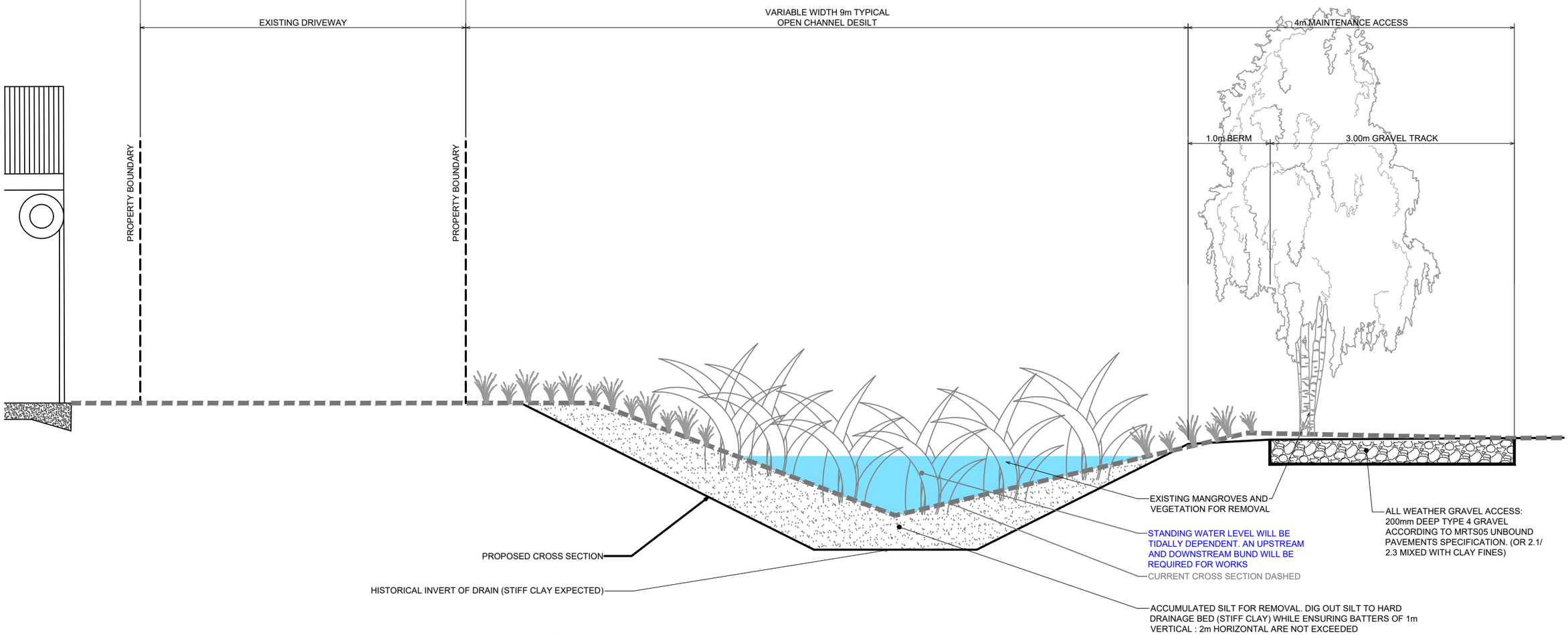
SURVEY	WARD 2-MGA SEG	DESIGNED	SJA
DATE	APR 23	DRAWN	SJA
F.B.	L.B.	CHECKED	PC
DATUM	AHD	APPROVED	PC
DRAWING	WILSON ST TO RICHMOND RIVER OPEN ..DWG		

SHEET 1 OF 2

BALLINA SHIRE COUNCIL

WILSON ST - DRAINAGE CHANNEL DESILT
ALIGNMENT PLAN AND LONGITUDINAL SECTION
CH0 TO CH123.97

Scale	Plan No.	
HOR; 1:250 VERT; 1:50	D50009	A1



1
SHT 1

TYPICAL CROSS SECTION OF DRAINAGE DESILT

SCALE: 1:25 @ A1, 1:50 @ A3

No.	Date	By	Change	X'd
0	APR 23	SA	ISSUED FOR REVIEW	

Amendments

ballina shire council

SURVEY	WARD 2-MGA SEG	DESIGNED	SJA
DATE	APR 23	DRAWN	SJA
F.B.	L.B.	CHECKED	PC
DATUM	AHD	APPROVED	PC
DRAWING	WILSON ST TO RICHMOND RIVER OPEN ..DWG		

SHEET 2 OF 2

BALLINA SHIRE COUNCIL

WILSON ST - DRAINAGE CHANNEL DESILT
TYPICAL SECTION

Scale HOR; 1:25

Plan No. D50009

A1

Appendix B - Photographs

	*Plate 1. Drain looking south from Wilson Street; access track to go to left of chevron sign*
	*Plate 2. Mangrove regrowth and pneumatophores within the drain*
	*Plate 3. Drain outlet to Richmond River; circled area shows regrowth removal*

	*Plate 4. Drain outlet at Richmond River with low growth of River Mangrove and emergent Grey Mangrove*
	*Plate 5. Mature Swamp Oak at crossing point which will be retained*
	*Plate 6. Typical disturbed/degraded vegetation along the drain which will be removed*

	*Plate 7. Brush Turkey mound along the drain – to be retained and protected*
	*Plate 8. Adjacent pasture grass behind nearby residences for ancillary facilities/office/laydown etc; no native vegetation present*

Appendix C – BioNet/PMST Search Results

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inve
contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. C
State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2
Commonwealth listed Plants in selected area [North: -28.90 West: 153.42 East: 153.52 South: -29.00] returned a total of 1,312 records of 25 species.
Report generated on 23/03/2023 2:23 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status
Plantae	Flora	Apocynaceae	1233	*Marsdenia longiloba*		Slender Marsdenia	E1	V
Plantae	Flora	Apocynaceae	1176	*Ochrosia moorei*		Southern Ochrosia	E1	E
Plantae	Flora	Corynocarpaceae	6662	*Corynocarpus rupestris subsp. rupestris*		Glenugie Karaka	V	V
Plantae	Flora	Cunoniaceae	10943	*^^Davidsonia jerseyana*		Davidson's Plum	E1,2	E
Plantae	Flora	Cunoniaceae	10944	*Davidsonia johnsonii*		Smooth Davidson's Plum	E1	E
Plantae	Flora	Euphorbiaceae	9466	*Acalypha eremorum*		Acalypha	E1	
Plantae	Flora	Fabaceae (Mimosoideae)	7757	*Archidendron hendersonii*		White Lace Flower	V	
Plantae	Flora	Lauraceae	3477	*Cryptocarya foetida*		Stinking Cryptocarya	V	V
Plantae	Flora	Lauraceae	3491	*Endiandra hayesii*		Rusty Rose Walnut	V	V
Plantae	Flora	Lauraceae	8480	*Endiandra muelleri subsp. bracteata*		Green-leaved Rose Walnut	E1	
Plantae	Flora	Lindsaeaceae	8126	*Lindsaea brachypoda*		Short-footed Screw Fern	E1,3	
Plantae	Flora	Menispermaceae	3691	*Tinospora tinosporoides*		Arrow-head Vine	V	
Plantae	Flora	Myrtaceae	4283	*Rhodamnia rubescens*		Scrub Turpentine	E4A	CE
Plantae	Flora	Myrtaceae	4284	*Rhodomyrtus psidioides*		Native Guava	E4A	CE
Plantae	Flora	Myrtaceae	4290	*Syzygium hodgkinsoniae*		Red Lilly Pilly	V	V
Plantae	Flora	Orchidaceae	7077	*^^Oberonia titania*		Red-flowered King of the Fairies	V,P,2	
Plantae	Flora	Orchidaceae	4479	*^^Peristeranthus hillii*		Brown Fairy-chain Orchid	V,P,2	
Plantae	Flora	Orchidaceae	4480	*^^Phaius australis*		Southern Swamp Orchid	E1,P,2	E
Plantae	Flora	Poaceae	4776	*Arthraxon hispidus*		Hairy Jointgrass	V	V

Plantae	Flora	Polygonaceae	5280	*Persicaria elatior*	Tall Knotweed	V	V
Plantae	Flora	Polypodiaceae	8154	*Belvisia mucronata*	Needle-leaf Fern	E1	
Plantae	Flora	Proteaceae	5354	*Floydia praealta*	Ball Nut	V	V
Plantae	Flora	Proteaceae	5446	*Macadamia tetraphylla*	Rough-shelled Bush Nut	V	V
Plantae	Flora	Rutaceae	6457	*Acronychia littoralis*	Scented Acronychia	E1	E
Plantae	Flora	Rutaceae	12433	*Coatesia paniculata*	Axe-Breaker	E1	

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inve
contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. C
State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2
Commonwealth listed Animals in selected area [North: -28.90 West: 153.42 East: 153.52 South: -29.00] returned a total of 1,166 records of 63 species.
Report generated on 23/03/2023 2:24 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P	
Animalia	Amphibia	Hylidae	3202	*Litoria olongburensis*		Olongburra Frog	V,P	V
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E
Animalia	Reptilia	Cheloniidae	2007	*Chelonia mydas*		Green Turtle	V,P	V
Animalia	Reptilia	Cheloniidae	2008	*Eretmochelys imbricata*		Hawksbill Turtle	P	V
Animalia	Reptilia	Elapidae	2645	*Cacophis harriettae*		White-crowned Snake	V,P	
Animalia	Aves	Anseranatidae	0199	*Anseranas semipalmata*		Magpie Goose	V,P	
Animalia	Aves	Columbidae	0025	*Ptilinopus magnificus*		Wompoo Fruit-Dove	V,P	
Animalia	Aves	Columbidae	0021	*Ptilinopus regina*		Rose-crowned Fruit-Dove	V,P	
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P	
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*		White-throated Needletail	P	V,C,J,K
Animalia	Aves	Procellariidae	0971	*Pterodroma solandri*		Providence Petrel	V,P	
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*		Black-necked Stork	E1,P	
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*		Black Bittern	V,P	
Animalia	Aves	Accipitridae	0218	*Circus assimilis*		Spotted Harrier	V,P	
Animalia	Aves	Accipitridae	0223	*^^Erythrotriorchis radiatus*		Red Goshawk	E4A,P,2	V
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*		White-bellied Sea-Eagle	V,P	
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*		Little Eagle	V,P	
Animalia	Aves	Accipitridae	8739	*Pandion cristatus*		Eastern Osprey	V,P,3	
Animalia	Aves	Gruidae	0177	*Grus rubicunda*		Brolga	V,P	
Animalia	Aves	Rallidae	0053	*Amaurornis moluccana*		Pale-vented Bush-hen	V,P	
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*		Bush Stone-curlew	E1,P	

Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*	Beach Stone-curlew	E4A,P	
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P	
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P	
Animalia	Aves	Jacanidae	0171	*Irediparra gallinacea*	Comb-crested Jacana	V,P	
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*	Curlew Sandpiper	E1,P	CE,C,J,K
Animalia	Aves	Scolopacidae	0165	*Calidris tenuirostris*	Great Knot	V,P	CE,C,J,K
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*	Black-tailed Godwit	V,P	C,J,K
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*	Eastern Curlew	P	CE,C,J,K
Animalia	Aves	Scolopacidae	0160	*Xenus cinereus*	Terek Sandpiper	V,P	C,J,K
Animalia	Aves	Turnicidae	0013	*Turnix maculosus*	Red-backed Button-quail	V,P	
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P	C,J,K
Animalia	Aves	Cacatuidae	0265	*^^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2	V
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*	Little Lorikeet	V,P	
Animalia	Aves	Psittacidae	8913	*Pezoporus wallicus wallicus*	Eastern Ground Parrot	V,P,3	
Animalia	Aves	Strigidae	0248	*Ninox strenua*	Powerful Owl	V,P,3	
Animalia	Aves	Tytonidae	0252	*Tyto longimembris*	Eastern Grass Owl	V,P,3	
Animalia	Aves	Tytonidae	0250	*Tyto novaehollandiae*	Masked Owl	V,P,3	
Animalia	Aves	Menuridae	0351	*Menura alberti*	Albert's Lyrebird	V,P	
Animalia	Aves	Pomatostomidae	8388	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P	
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P	
Animalia	Aves	Campephagidae	0428	*Coracina lineata*	Barred Cuckoo-shrike	V,P	
Animalia	Aves	Monarchidae	0376	*Carterornis leucotis*	White-eared Monarch	V,P	
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E
Animalia	Mammalia	Dasyuridae	1017	*Phascogale tapoatafa*	Brush-tailed Phascogale	V,P	
Animalia	Mammalia	Dasyuridae	1045	*Planigale maculata*	Common Planigale	V,P	

Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	E1,P	E
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P	
Animalia	Mammalia	Potoroidae	1175	*Potorous tridactylus*	Long-nosed Potoroo	V,P	V
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V
Animalia	Mammalia	Pteropodidae	1294	*Syconycteris australis*	Common Blossom-bat	V,P	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P	
Animalia	Mammalia	Vespertilionidae	1336	*Nyctophilus bifax*	Eastern Long-eared Bat	V,P	
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P	
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*	Little Bent-winged Bat	V,P	
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P	
Animalia	Mammalia	Muridae	1455	*Pseudomys novaehollandiae*	New Holland Mouse	P	V
Animalia	Mammalia	Muridae	1464	*Pseudomys oralis*	Hastings River Mouse	E1,P	E
Animalia	Mammalia	Dugongidae	1558	*Dugong dugon*	Dugong	E1,P	
Animalia	Mammalia	Physeteridae	1578	*Physeter macrocephalus*	Sperm Whale	V,P	
Animalia	Insecta	Carabidae	I009	*Nurus atlas*	Atlas Rainforest Ground-beetle	E1,3	
Animalia	Insecta	Noctuidae	I021	*Phyllodes imperialis southern subspecies*	Southern Pink Underwing Moth	E1	E

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 23-Mar-2023

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	102
Listed Migratory Species:	79

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	109
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	6
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Grey box-grey gum wet forest of subtropical eastern Australia	Endangered	Community may occur within area	In buffer area only
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In buffer area only
FISH			
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Nannoperca oxleyana Oxleyan Pygmy Perch [64468]	Endangered	Species or species habitat may occur within area	In buffer area only
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat may occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat may occur within area	In buffer area only
INSECT			
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In buffer area only
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
PLANT			
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area	In feature area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area	In feature area
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat may occur within area	In feature area
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Clematis fawcettii Stream Clematis [4311]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Corynocarpus rupestris subsp. rupestris Glenugie Karaka [19303]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
Davidsonia jerseyana Davidson's Plum [67219]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Davidsonia johnsonii Smooth Davidsonia, Smooth Davidson's Plum, Small-leaved Davidson's Plum [67178]	Endangered	Species or species habitat known to occur within area	In buffer area only
Desmodium acanthocladum Thorny Pea [17972]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Diploglottis campbellii Small-leaved Tamarind [21484]	Endangered	Species or species habitat may occur within area	In buffer area only
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat likely to occur within area	In feature area
Endiandra hayesii Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat known to occur within area	In feature area
Floydia praealta Ball Nut, Possum Nut, Big Nut, Beefwood [15762]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Gossia fragrantissima Sweet Myrtle, Small-leaved Myrtle [78867]	Endangered	Species or species habitat may occur within area	In buffer area only
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area	In feature area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ochrosia moorei Southern Ochrosia [11350]	Endangered	Species or species habitat known to occur within area	In feature area
Olax angulata Minnie Waters Olax [10666]	Vulnerable	Species or species habitat may occur within area	In feature area
Owenia cepiodora Onionwood, Bog Onion, Onion Cedar [11344]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area	In feature area
Rhodamnia maideniana Smooth Scrub Turpentine [20665]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rutidosis heterogama Heath Wrinklewort [13132]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea			
Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Calonectris leucomelas			
Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Diomedea antipodensis			
Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora			
Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans			
Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel			
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding known to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area	In feature area
Calidris alba Sanderling [875]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris subminuta Long-toed Stint [861]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Limicola falcinellus Broad-billed Sandpiper [842]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa incana Wandering Tattler [831]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11291]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11287]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area	In feature area
Calidris alba Sanderling [875]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Calidris subminuta Long-toed Stint [861]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stercorarius skua as Catharacta skua Great Skua [823]		Species or species habitat may occur within area	In buffer area only
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Tringa incana as Heteroscelus incanus Wandering Tattler [831]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area	In buffer area only
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In buffer area only
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In buffer area only
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In buffer area only
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In buffer area only
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In buffer area only
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In buffer area only
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In buffer area only
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In buffer area only
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In buffer area only
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In buffer area only
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In buffer area only
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area
Reptile			
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In buffer area only

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			

Current Scientific Name	Status	Type of Presence	Buffer Status
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Species or species habitat may occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Tursiops truncatus s. str.			
Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Little Pimlico Island	Nature Reserve	NSW	In buffer area only
Ngunya Jargoon	Indigenous Protected Area	NSW	In buffer area only
Uralba	Nature Reserve	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade, NSW	2012/6394	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus			
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur	In feature area
Marine Turtles			
Caretta caretta Loggerhead Turtle [1763]	Internesting	Likely to occur	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur	In buffer area only
Sharks			
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In buffer area only
Whales			
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur	In buffer area only

Bioregional Assessments

SubRegion	BioRegion	Website	Buffer Status
Clarence-Moreton	Clarence-Moreton	BA website	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Appendix D – Potential Occurrence Assessment

Threatened Species Potential Occurrence Assessment

Note: migratory/pelagic and marine species identified in the search results are not assessed as no suitable habitat occurs at the site

Species	BC Act	EPBC Act	Habitat Requirements (DPE/SPRAT)	Potential Occurrence/Test of Significance
Invertebrates				
Atlas Rainforest Ground-beetle	✓		Low-elevation rainforest and wet eucalypt forest with a well-developed rainforest understorey. Other habitat requirements may be relatively undisturbed old-growth forests on highly productive soils and consistently high moisture levels.	Nil
Southern Pink Underwing Moth	✓	✓	Subtropical rainforest below about 600 m elevation.	Nil
Reptiles				
White-crowned Snake	✓		Favours low to mid-elevation dry eucalypt forest and woodland, particularly areas with a varied and well-developed litter layer	Low
Amphibians				
Wallum Froglet	✓		Paperbark swamps and sedge swamps of the coastal wallum country characterised by acidic water bodies.	Nil
Olongburra Frog	✓	✓	Coastal sandplain wallum swamps.	Nil
Birds				
Albert's Lyrebird	✓		Mixed rainforest and open wet forest frequently dominated by Brush Box.	Nil
Barred Cuckoo-shrike	✓		Rainforest, eucalypt woodlands, swamp woodlands and timber along watercourses.	Low
Beach Stone-curlew	✓		Intertidal zone of beaches and estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock, and among mangroves.	Low
Black Bittern	✓		Dense vegetation fringing and in streams, swamps, tidal creeks and mudflats, particularly amongst swamp she-oaks and mangroves.	**Potential foraging habitat - Test of Significance completed**
Black-necked Stork	✓		Swamps, mangroves, mudflats, dry floodplains.	Low
Brolga	✓		Shallow swamps, floodplains, grasslands and pastoral lands, usually in pairs or parties.	Low
Bush Stone-curlew	✓		Open forests and woodlands with a sparse grassy ground-layer and fallen timber.	Low
Comb-crested Jacana	✓		Among vegetation floating on slow-moving rivers and permanent lagoons, swamps, lakes and dams.	Nil
Eastern Grass Owl	✓		Areas of tall grass, including tussocks in swampy areas, grassy plains, swampy heath, cane grass, sedges on flood plains.	Low
Eastern Ground Parrot	✓		Occurs in high rainfall coastal and near coastal low heathlands and sedgelands, generally below one metre in height and very dense.	Nil
Eastern Osprey	✓		Fresh, brackish or saline waters of rivers, lakes, estuaries with	May forage along the Richmond River, but no

Species	BC Act	EPBC Act	Habitat Requirements (DPE/SPRAT)	Potential Occurrence/Test of Significance
			suitable nesting sites nearby.	foraging or breeding habitat impacted; Test of Significance not required.
Glossy Black-Cockatoo	✓	✓	Open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of She-oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur.	Nil
Grey-crowned Babbler (eastern subspecies)	✓		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.	Low
Little Eagle	✓		Open eucalypt forest, woodland or open woodland. She oak or acacia woodlands and riparian woodlands of interior NSW are also used.	Low
Little Lorikeet	✓		Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used.	Low
Magpie Goose	✓		Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	Low
Masked Owl	✓		Dry eucalypt forest and woodlands.	Low
Pale-vented Bush-hen	✓		Inhabits tall dense understorey or ground-layer vegetation on the margins of freshwater streams and natural or artificial wetlands, usually within or bordering rainforest, rainforest remnants or forests.	**Potential foraging habitat - Test of Significance completed**
Pied Oystercatcher	✓		Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish.	Low
Powerful Owl	✓		Woodland and open sclerophyll forest to tall open wet forest and rainforest.	Low
Red Goshawk	✓	✓	Dry open forest and mixed rainforest-eucalypt forest.	Nil
Red-backed Button-quail	✓		Grassland, sedgelands near creeks. Swamps and wetlands.	Low
Rose-crowned Fruit-Dove	✓		Subtropical and dry rainforest, moist eucalypt forest and swamp forest.	Low
Sooty Oystercatcher	✓		Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	Low
Spotted Harrier	✓		Grassy open woodland, inland riparian woodland, grassland and shrub steppe.	Low
Superb Fruit-Dove	✓		Subtropical and dry rainforest, moist eucalypt forest and swamp forest.	Low
Varied Sittella	✓			Low

Species	BC Act	EPBC Act	Habitat Requirements (DPE/SPRAT)	Potential Occurrence/Test of Significance
White-bellied Sea-Eagle	✓		Coastal habitats and around terrestrial wetlands characterised by the presence of large areas of open water (larger rivers, swamps, lakes, ocean).	May forage along the Richmond River, but no foraging or breeding habitat impacted; Test of Significance not required.
White-eared Monarch	✓		Rainforest, especially drier types, such as littoral rainforest, as well as wet and dry sclerophyll forests, swamp forest and regrowth forest.	Low
White-throated Needletail		✓	Aerial foraging generally over woodland and forest.	Low - assessed under EPBC Act
Wompoo Fruit-Dove	✓		Rainforests, low-elevation moist eucalypt forest, and Brush Box forests.	Low
Mammals				
Brush-tailed Phascogale	✓		Drier forests and woodlands with hollow-bearing trees and sparse ground cover.	Low
Common Blossom-bat	✓		Littoral rainforest and feed on flowers in adjacent heathland and paperbark swamps.	Low
Common Planigale	✓		Rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas with surface cover close to water.	Low
Eastern Long-eared Bat	✓		Lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest.	Low
Greater Broad-nosed Bat	✓		Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest; most commonly found in tall wet forest.	Low
Grey-headed Flying-fox	✓	✓	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Low
Hastings River Mouse	✓	✓	A variety of dry open forest types with dense, low ground cover and a diverse mixture of ferns, grass, sedges and herbs at elevations 300m to 1100m.	Low
Koala	✓	✓	Appropriate food trees in forests and woodlands and treed urban areas.	Nil - no koala food trees present
Large Bent-winged Bat	✓		Forest or woodland, roost in caves, old mines and stormwater channels.	**Moderate - foraging habitat only; Test of significance completed.**
Little Bent-winged Bat	✓		Moist eucalypt forest, rainforest and dense coastal scrub.	**Moderate - foraging habitat only; Test of significance completed.**
Long-nosed Potoroo	✓	✓	Coastal heaths and dry and wet sclerophyll forests.	Low
New Holland Mouse		✓	Open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.	Low - assessed under EPBC Act
Spotted-tailed Quoll	✓	✓	Dry and moist eucalypt forests and rainforests, fallen hollow logs,	Low

Species	BC Act	EPBC Act	Habitat Requirements (DPE/SPRAT)	Potential Occurrence/Test of Significance
			large rocky outcrops.	
Squirrel Glider	✓		Blackbutt, bloodwood and ironbark eucalypt forest with heath understorey in coastal areas, and box-ironbark woodlands and River Red Gum forest inland.	Nil
Yellow-bellied Sheathtail-bat	✓		Forages in most habitats across its very wide range, with and without trees.	**Moderate - foraging habitat only; Test of significance completed.**

Appendix E – Test of Significance

The threatened species test of significance is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. It is applied as part of the Biodiversity Offsets Scheme entry requirements and for Part 4 activities under the *Environmental Planning and Assessment Act 1979*. The test of significance is set out in s.7.3 of the *Biodiversity Conservation Act 2016*.

The following species have been assessed based on the potential occurrence assessment at **Appendix D** (refer species profiles in **Table E.1**):

- Black Bittern
- Pale-vented Bush-hen
- Large Bent-winged Bat
- Little Bent-winged Bat
- Yellow-bellied Sheathtail-bat.

The following Threatened Ecological Communities have been assessed:

- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions ('Swamp Oak Floodplain Forest').

Table E.1 Conservation status, ecology, habitat and threats for each species included in the assessment (NSW Environment, 2023)

Scientific Name	Common Name	Habitat and Ecology * #	Threats * #
Amaurornis moluccana	Pale-vented Bush-hen	• Inhabits tall dense understorey or ground-layer vegetation on the margins of freshwater streams and natural or artificial wetlands, usually within or bordering rainforest, rainforest remnants or forests. • Also occur in secondary forest growth, rank grass or reeds, thickets of weeds, such as Lantana (*Lantana camara*), and pastures, crops or other farmland, such as crops of sugar cane, and grassy or weedy fields, or urban gardens where they border forest and streams or wetlands, such as farm dams. Can also occur in and around mangroves, though rarely do so, if at all, in NSW. • Key elements of their habitat are dense undergrowth 2 to 4 metres tall and within 300 metres of water. • The diet consists of seeds, plant matter, earthworms, insects and some frogs, taken from ground cover or by wading at edges of streams or wetlands. • The breeding season is from spring to early autumn, October to April. • The nest is a shallow bowl or cup of grass stems, often partly hooded, built close to water in thick ground vegetation such as dense Blady Grass (*Imperata cylindrica*), mat rush (Lomandra) or reeds, often under or growing through shrubs or vine or beneath a tree. • Birds lay 4 to 7 eggs in a clutch and will re-lay after a successful breeding attempt and make multiple attempts after nesting failures. • The incubation period is about 3 weeks. The hatchlings are precocial and can run soon after hatching; they are probably dependent on their parents for 4 to 5 weeks after hatching.	• Clearing, filling and draining of wetlands for agricultural, residential and industrial development. • Pollution of wetlands from agricultural, urban and industrial run-off, including herbicides and pesticides. • Changes to wetlands caused by weed invasion, often associated with sedimentation or grazing. • Predation by introduced, feral and domestic predators, particularly Red Foxes (Vulpes vulpes) and Cats (Felis catus). • Destruction of habitat and predation by feral Pigs (Sus scrofa). • Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands. • Loss of dense and rank understorey vegetation near streams and wetlands with clearing associated with urban and semi-rural developments.
Ixobrychus flavicollis	Black Bittern	• Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. • Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps and crayfish, with most feeding done at dusk and at night. • During the day, roosts in trees or on the ground amongst dense reeds. When disturbed, freezes in a characteristic bittern posture (stretched	• Clearing of riparian vegetation. • Predation by foxes and feral cats on eggs and juveniles. • Grazing and trampling of riparian vegetation by stock. • Lack of knowledge about habitat use and the distribution of breeding activity.

Scientific Name	Common Name	Habitat and Ecology * #	Threats * #
		tall, bill pointing up, so that shape and streaked pattern blend with upright stems of reeds), or will fly up to a branch or flush for cover where it will freeze again. • Generally solitary, but occurs in pairs during the breeding season, from December to March. • Like other bitterns, but unlike most herons, nesting is solitary. Nests, built in spring are located on a branch overhanging water and consist of a bed of sticks and reeds on a base of larger sticks. Between three and five eggs are laid and both parents incubate and rear the young.	
Miniopterus australis	Little Bent-winged Bat	• 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. • Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. • They often share roosting sites with the Large Bentwing-bat and, in winter, the two species may form mixed clusters. • In NSW the largest maternity colony is in close association with a large maternity colony of Large Bentwing-bats and appears to depend on the large colony to provide the high temperatures needed to rear its young. • Maternity colonies form in spring and birthing occurs in early summer. Males and juveniles disperse in summer. • Only five nursery sites /maternity colonies are known in Australia.	• Disturbance of colonies, especially in nursery or hibernating caves, may be catastrophic. • Extractive mining activity that destroys or disturbs caves and resident bats. Includes maternity, staging and over-wintering roosting caves. • Illegal extraction of guano causing disturbance to resident bats • Changes to habitat, especially surrounding maternity/nursery caves and winter roosts. • Pesticides on insects and in water consumed by bats bio accumulates, resulting in poisoning of individuals. • Predation from foxes, particularly around maternity caves, winter roosts and roosts within culverts, tunnels and under bridges. • Predation from feral cats, particularly around maternity caves, winter roosts and roosts within culverts, tunnels and under bridges • Woody weeds such as Lantana or blackberry that can overgrow cave entrances and block access or provide an entanglement risk • Introduction of exotic pathogens such as the White-nosed fungus. • Hazard reduction and wildfire fires during the breeding season. • Large scale wildfire or hazard reduction can impact on foraging resources. • Poor knowledge of reproductive success and population dynamics.
Miniopterus orianae oceanensis	Large Bent-winged Bat	• Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	• Disturbance by recreational cavers and general public accessing caves and adjacent areas particularly during winter or breeding. • Loss of high productivity foraging habitat.

Scientific Name	Common Name	Habitat and Ecology * #	Threats * #
		• Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. • Maternity caves have very specific temperature and humidity regimes. • At other times of the year, populations disperse within about 300 km range of maternity caves. • Cold caves are used for hibernation in southern Australia. • Breeding or roosting colonies can number from 100 to 150,000 individuals. • Hunt in forested areas, catching moths and other flying insects above the tree tops.	• Introduction of exotic pathogens, particularly white-nose fungus. • Cave entrances being blocked for human health and safety reasons, or vegetation (particularly blackberries) encroaching on and blocking cave entrances. • Hazard reduction and wildfire fires during the breeding season. • Predation by feral cats.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	• Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. • When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. • Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. • Breeding has been recorded from December to mid-March, when a single young is born. • Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.	• Disturbance to roosting and summer breeding sites. • Foraging habitats are being cleared for residential and agricultural developments, including clearing by residents within rural subdivisions. • Loss of hollow-bearing trees; clearing and fragmentation of forest and woodland habitat. • Pesticides and herbicides may reduce the availability of insects, or result in the accumulation of toxic residues in individuals' fat stores.

Sources:
* NSW Government Office of Environment and Heritage (OEH), 2022. Threatened species profiles. Accessed from https://www.environment.nsw.gov.au/threatenedspeciesapp/

Key: E = Endangered; V = Vulnerable; CE = Critically Endangered

Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Pale-vented Bush-hen, Black Bittern

The proposed works are unlikely to have an adverse effect on the life cycle of these species such that a viable local population of the species is likely to be placed at risk of extinction as:

- The footprint of the impact is minor in comparison to available habitat.
- Habitat to be affected is degraded and/or small in area
- The habitat to be impacted provides marginal habitat value for the species' in a local context.
- Works will not restrict the movement of these mobile species.

Microbats: Little Bent-winged Bat, Large Bent-winged Bat, Yellow-bellied Sheathtail-bat

The proposal is unlikely to have an adverse impact on the life cycle of these species such that the viable local population of the species is likely to be placed at risk of extinction for the following reasons:

- The proposal will not directly impact any bats or exclude them from currently available habitat as the works will not reduce foraging habitat or impact upon roosting habitat.
- The proposal will not disturb any breeding or maternity roosts and will not limit the ability of the bats to breed.
- The ongoing operation of the access road will not alter foraging roosting habitat following works.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Swamp Oak Floodplain Forest

Vegetation along the drainline is a highly degraded form of Swamp Oak Floodplain Forest. The proposed works are unlikely to affect the extent or composition of this community to the extent that it is likely to be placed at risk of extinction as:

- Impacts to ~ 400 m² of highly degraded Swamp Oak Floodplain Forest ('SOFF') is negligible in the context of an extensive patch of high quality SOFF adjacent to the site.
- Native tree loss within the SOFF at the site is limited to 14 trees, with the majority of vegetation removed being woody weeds.

(c) In relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The minor nature of the works (site occupation, minor vegetation loss, noise and disturbance) would not result in the significant loss or modification of habitat for any of the subject species.

Degraded SOFF is in poor condition, and all Swamp Oak trees will be retained. The loss of vegetation is negligible in the context of adjacent SOFF forest within Crown Land.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The relatively minor nature of the works (occupation of the river, tree pruning, noise and disturbance) would not fragment habitat for any of the subject species. The proposal will not restrict the dispersal of threatened

species across the landscape, therefore there will be no ongoing impacts on the ability of individuals to disperse, socialise and breed.

Swamp Oak Floodplain Forest

The site is already fragmented/disturbed from previous works. The proposal would not result in SOFF along the Richmond River becoming substantially fragmented or isolated by the proposed works.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The vegetation to be removed of low importance with regard to foraging, roosting or breeding habitat for any of the subject species.

Swamp Oak Floodplain Forest

SOFF at the site is highly degraded and dominated by woody weeds – this habitat is not important in a local context.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

There are no declared areas of outstanding biodiversity value within Ballina LGA.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A threatening process is defined under the *Biodiversity Conservation Act 2016* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes (KTPs) and whether the Proposal constitutes any KTPs, is summarised in **Table E.2**.

Table E.2 *Impact of proposed work as a Key Threatening Process*

Listed Key Threatening Processes (as described in the final determination of the Scientific Committee to list the threatening process)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
	Likely	***Possible***	***Unlikely***
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bush rock removal			✓
Clearing of native vegetation	✓		
Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*)			✓
Competition and habitat degradation by feral goats (C*apra hircus*)			✓
Competition from feral honey bees (*Apis mellifera*)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses			✓
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Herbivory and environmental degradation caused by feral deer			✓
Importation of red imported fire ants (*Solenopsis invicta*)			✓
Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓

Listed Key Threatening Processes (as described in the final determination of the Scientific Committee to list the threatening process)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
	Likely	***Possible***	***Unlikely***
Introduction of the large earth bumblebee (*Bombus terrestris*)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch broom (*Cytisus scoparius*)			✓
Invasion and establishment of the cane toad (*Bufo marinus*)			✓
Invasion of native plant communities by African Olive *Olea europaea L. subsp. cuspidata*			✓
Invasion, establishment and spread of Lantana camara			✓
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the yellow crazy ant (*Anoplolepis gracilipes* (Fr. Smith) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees			✓
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation of feral dogs (*Canis lupus familiaris*)			✓
Predation by the European red fox (*Vulpes vulpe*s)			✓
Predation by the feral cat (*Felis catus*)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (plague minnow or mosquito fish)			✓
Predation by the ship rat (*Rattus rattus*) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)			✓
Removal of dead wood and dead trees			✓

As noted, up to 14 native trees would be removed within an area of ~ 400m² along the drain with an estimated 220 m² of mangroves requiring removal for the works. The KTP 'clearing of native vegetation' defines clearing as *"…the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands".* The minor nature of the works would not result in the loss, or long term modification of the structure, composition and ecological function of any native vegetation in proximity to the site.

Conclusion:

It is the conclusion of this assessment that the proposal is unlikely to result in a significant impact on the local occurrence of the subject species' or community. Consequently, further consideration in the form of a BDAR is not required.