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*Supplied by email*

9 February 2024

**Re: Ecological Constraints Assessment, 251, 260R, 278 and 280-282 Captain Cook Drive, Kurnell, NSW**

Dear Duncan,

This updated Ecological Constraints Assessment (ECA) report has been prepared by Ecoplanning to accompany a Proponent Initiated Planning Proposal (Planning Proposal) that proposes to amend the *State Environmental Planning Policy (Precincts – Central River City) 2021* (SEPP Precincts) and *Sutherland Shire Local Environment Plan 2015* (SSLEP 2015).

In March 2023 the proponent submitted a Scoping Proposal to Sutherland Shire Council (Council) to commence the formal Planning Proposal process, in accordance with the LEP Making Guidelines. The Scoping Proposal provided a comprehensive 'status update,' outlining the concept master plan, the intended development outcome, the proposed planning controls and the environmental considerations which were to be further resolved.

As part of the Scoping Proposal process, Council referred the Scoping Proposal package to the DPE, State agencies, and several internal Council teams for review and comment. The advice received from these stakeholders has provided clear directives on the necessary updates and key focus areas within the technical documentation (refer to Attachment B for responses relevant to the proposed widening of Captain Cook Drive).

Separate to the Scoping Proposal package, extensive and ongoing engagement with relevant State Agencies has occurred since November 2022, with the objective of clarifying and resolving any of the outstanding considerations

This report has been prepared for the proposed widening of Captain Cook Drive, Kurnell, NSW, between Elouera Road and the track to Boat Harbour ('the project'; **Figure 2**). The update is based on desktop information and does not rely on new field data. Previous ECA's have been used to further refine the concept road design and reduce the potential impact of the proposal on the environment, whilst also satisfying road safety and capacity requirements.

The land to which this planning proposal relates is 251, 260R, 278, and 280-282 Captain Cook Drive, Kurnell and is located within the Sutherland Shire Local Government Area (LGA).

The key features of the site are summarised in **Table 1**.

**Table 1: Site description**

Feature	Lot 2 North	Lot 2 South	Lot 8	Lot 9
Street address	251 Captain Cook Drive, Kurnell	280-282 Captain Cook Drive, Kurnell	278 Captain Cook Drive, Kurnell	260R Captain Cook Drive Kurnell
Legal description	Lot 2 DP1030269	Lot 2 DP559922	Lot 8 DP586986	Lot 9 DP 586986
Site area	16 ha	160 ha	34.5 ha	82 m <sup>2</sup>
	Total area: Approximately 210.5 ha			
Local Government Area	Sutherland Shire			

This ECA discusses the known ecological values and features of the project area and the broader Kurnell Peninsula, the likely requirements for further assessment, and ecological constraints that should be avoided. The ECA also estimates potential offset requirements based on the concept design.

The format of this ECA is based on the Biodiversity Assessment Method (BAM; DPIE 2020). This format has been adopted as the project is likely to require clearing of native vegetation on land mapped on the Biodiversity Values Map (DPE 2023a). Under the NSW *Biodiversity Conservation Act 2016* (BC Act) and the NSW *Biodiversity Conservation Regulation 2017* (BC Reg), where clearing of native vegetation is proposed on land identified on the Biodiversity Values Map, the Biodiversity Offset Scheme (BOS) established under Part 6 of the BC Act is triggered. Triggering of the BOS requires the preparation of Biodiversity Development Assessment Report (BDAR) prepared in accordance with the BAM. The following sections outline the relevant considerations which would need to be included within a BDAR prepared in accordance with the BAM.

This ECA has been based upon a literature review and some previously collected site data. Following the receipt of Gateway Determination, and once the parameters for the design of the concept civil design has been agreed, further design surveys can be undertaken to confirm the extent of impact. Additionally, it is noted that this ECA represents a broad assessment of ecological values and, although it has adopted elements of specific assessment techniques associated with the BAM, does not represent a complete impact assessment in accordance with the BAM. Further survey and assessment would be required, including an assessment of the impact of the project on matters of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), *Fisheries Management Act 1994* and *Marine Estate Management Act 2014*. The potential extent of impact will be refined at the detailed design stage.

The ECA has identified the known ecological values within the Captain Cook Drive Road reserve and within the Project Area, which is the area required to support the road widening.

Ecoplanning have provided advice and guidance to Diversi Consulting in preparing the concept road design to ensure that the retention of significant ecological values remains the highest



priority in the design of the road and impacts to biodiversity are avoided and minimised, wherever possible.

Based on the preliminary assessment, the project area requires the removal of 3.584 ha of native vegetation along a 4 km stretch of road. The native vegetation is in low to moderate/good condition with VI scores ranging between 36.8 and 64.2 out of 100. More disturbed areas dominated by exotic vegetation are in very low condition, with a VI score of 8.

As the application is at the pre-gateway stage in the planning process, further detailed investigations will be undertaken at the relevant stage and prior to any approvals for the road, as required under the relevant legislation.

The purpose and outcomes of this report is to confirm the extent of direct impact on the vegetation and threatened species within the project area.



## Legislative context

**Table 2** summarises legislation relevant to terrestrial and aquatic ecology.

**Table 2: Statutory matters**

Legislation	Relevance
<p>Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)</p>	<p>A Referral will be needed if Matters of National Environmental Significance (MNES) are likely to be affected. MNES include EPBC Act listed migratory species, threatened species and ecological communities, and Ramsar wetlands.</p> <p>The Referral form template is available <a href="#">online</a> and requires submission of:</p> <ul style="list-style-type: none"> <li>• A map of the project</li> <li>• Recent data and surveys (less than 5 years old)</li> <li>• Details of community consultation, including with Indigenous people</li> <li>• Other reports and studies</li> <li>• Recent report from the Protected Matters Search Tool</li> </ul> <p>Under the EPBC Act an action will require approval from the Commonwealth Minister if the action has, will have, or is likely to have, a significant impact on a MNES. Assessment criteria are provided in the <a href="#">MNES Significant Impact Guidelines</a> (Department of the Environment 2013).</p> <p>Once a referral is submitted, the Commonwealth Minister can use the assessment bilateral agreement with the NSW Government to inform an assessment of any eligible action e.g., biodiversity offsetting requirements.</p> <p>Depending on timing, the road widening proposal may be subject to EPBC Act reforms currently under consideration. MNES are expected to still be relevant, but the assessment process and requirements may change.</p>

Legislation	Relevance
<p>State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021</p>	<p>Under the <a href="#">NSW Road Network Classifications</a>, Captain Cook Drive is a regional road (7031) and the road authority is Sutherland Shire Council. Council would therefore need to be the proponent for the proposed road upgrades.</p> <p>Clause 2.109(1) of the Transport and Infrastructure SEPP states:</p> <p><i>Development for the purpose of a road or road infrastructure facilities may be carried out by or on behalf of a public authority [i.e. Sutherland Shire Council] without consent on any land. However, such development may be carried out without consent on land reserved under the National Parks and Wildlife Act 1974 only if the development—</i></p> <ul style="list-style-type: none"> <li><i>(a) is authorised by or under the National Parks and Wildlife Act 1974, or</i></li> <li><i>(b) is, or is the subject of, an existing interest within the meaning of section 39 of that Act, or</i></li> <li><i>(c) is on land to which that Act applies over which an easement has been granted and is not contrary to the terms or nature of the easement.</i></li> </ul> <p>The proposed road works would not require development consent; however, the determining authority (Sutherland Shire Council) would need to have authorisation from the NSW Department of Climate Change, Energy, the Environment and Water for activities that would affect Towra Point Nature Reserve. Other permits or licences (e.g. from the Department of Primary Industries – Fisheries) may also be needed.</p>
<p>NSW <i>Environmental Planning and Assessment Act 1979</i> (EP&amp;A Act)</p>	<p>While the proposed road widening is permissible with development consent it can be undertaken without consent as provided for under SEPP Transport and Infrastructure and assessed in accordance with Part 5 of the EP&amp;A Act. There are two potential assessment pathways under Part 5 of the EP&amp;A Act, outlined below. It is understood that the proposed road widening will be assessed in accordance with Division 5.1 of the EP&amp;A Act as Besmaw is not seeking to include the road widening in the amended Kurnell Peninsula SEPP as State Significant Infrastructure.</p> <p><b>Division 5.1</b></p> <p>Section 5.1 of the EP&amp;A Act indicates that a determining authority must ‘examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity’.</p> <p>The <a href="#">Guidelines for Division 5.1 Assessments</a> (Department of Planning and Environment 2022) state that a Biodiversity Development Assessment Report (BDAR) and/or Species Impact Statement (SIS) will be needed if the activity is likely to significantly affect threatened species or ecological communities, or their habitats (refer to <b>Figure 1</b>). The Guidelines note that ‘if the activity is likely to have significant impacts on both terrestrial and</p>

Legislation	Relevance
	<p>aquatic threatened species, populations or ecological communities, both a BDAR and a SIS may be required'. Significance needs to be assessed via the test of significance in accordance with Section 7.3 of the BC Act. This significance test would be undertaken on the road widening works at the relevant time post gateway determination.</p> <p><b>Division 5.2</b></p> <p>State Significant Infrastructure (SSI) is infrastructure that is important to the State for economic, environmental or social reasons. Under the EP&amp;A Act, development can become SSI in two ways: a declaration in a SEPP or a declaration in an order made by the Minister. Refer to the <a href="#">SSI Guidelines</a> (Department of Planning and Environment 2022) for further information. A BDAR is required for SSI projects, unless otherwise agreed by the Minister.</p>
<p>Environmental Planning and Assessment Regulation 2021 (EP&amp;A Regulation)</p>	<p>Section 171(2) of the EP&amp;A Regulation lists environmental factors to consider in an impact assessment, including:</p> <ul style="list-style-type: none"> <li>• <i>Any environmental impact on the ecosystems of the locality</i></li> <li>• <i>Any impact on the habitat of protected animals (within the meaning of the BC Act)</i></li> <li>• <i>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air</i></li> </ul> <p>It is unclear at this stage if a Review of Environmental Factors (REF) or an Environmental Impact Statement (EIS) will be prepared for the proposed road widening. In either case, ecological matters need to be comprehensively assessed.</p>
<p>NSW <i>Biodiversity Conservation Act 2016</i> (BC Act)</p>	<p>Further to the planning process illustrated in Figure 2.1, Section 7.2 of the BC Act states that a Part 5 activity is deemed 'likely to significantly affect threatened species' if indicated by the Section 7.3 test of significance or if the activity is 'carried out in a declared area of outstanding biodiversity value'. There are no declared areas of outstanding biodiversity value in or near the Kurnell Peninsula.</p> <p>Section 7.3 of the BC Act prescribes the test (matters that must be considered) to determine whether a proposed activity is likely to significantly affect threatened species or ecological communities, or their habitats.</p> <p>Section 7.8 of the BC Act states that:</p>

Legislation	Relevance
	<p>(1) <i>This section applies to environmental assessment under Part 5 of the Environmental Planning and Assessment Act 1979.</i></p> <p>(2) <i>For the purposes of Part 5 of the Environmental Planning and Assessment Act 1979, an activity is to be regarded as an activity likely to significantly affect the environment if it is likely to significantly affect threatened species.</i></p> <p>(3) <i>In that case, the environmental impact statement under Part 5 of the Environmental Planning and Assessment Act 1979 is to include or be accompanied by—</i></p> <p>(a) <i>a species impact statement, or</i></p> <p>(b) <i>if the proponent so elects—a biodiversity development assessment report.</i></p> <p>(4) <i>If the likely significant effect on threatened species is the only likely significant effect on the environment, an environmental impact statement may be dispensed with and Part 5 of the Environmental Planning and Assessment Act 1979 applies as if references to an environmental impact statement were references to a species impact statement or biodiversity development assessment report.</i></p> <p>Section 7.15 of the BC Act sets requirements for biodiversity assessment and offsets for Part 5 activities.</p> <p>Division 5 of Part 7 of the BC Act sets out the required form and content of a SIS and Division 3 of Part 6 sets out the required form and content of a BDAR.</p>
<p>Biodiversity Conservation Regulation 2017 (BC Regulation)</p>	<p>Clause 7.1 of the BC Regulation sets the thresholds that trigger entry to the Biodiversity Offsets Scheme (BOS), and include clearing of native vegetation on land mapped on the <a href="#">Biodiversity Values Map</a> (DPE 2023). Vegetation within Towra Point Nature Reserve is on the Biodiversity Values map.</p> <p>Requirements under the BOS are set in Part 6 of the BC Regulation, and Division 6.2 includes requirements for preparation of a BDAR in accordance with the <a href="#">Biodiversity Assessment Method</a> (BAM). The BDAR must be prepared by an accredited assessor and will identify if the proposed activity is likely to have serious and irreversible impacts. If the activity is determined to proceed, the credit obligation and any other actions required will be set by the determining authority. If the credit obligation does not match what is identified in the BDAR, the determining authority must provide reasons. The proponent must meet the credit obligation before the biodiversity impacts occur.</p>

Legislation	Relevance
<p>NSW <i>Fisheries Management Act 1994</i> (FM Act)</p>	<p>Under section 220ZW of the FM Act, a licence is needed to harm threatened species, population or ecological community or damage habitat.</p> <p>Schedules 4, 4A and 5 of the FM Act list threatened species, populations (e.g., endangered population of <a href="#">Posidonia australis</a> at Towra Point) and ecological communities to be considered in an aquatic biodiversity test of significance. Section 220ZZ of the FM Act identifies matters to be considered in determining ‘whether the action proposed is likely to significantly affect threatened species, populations or ecological communities, or their habitats’. Further information is available in the <a href="#">Threatened Species Assessment Guidelines - The Assessment of Significance</a> (Department of Primary Industries 2008).</p> <p>Division 6 Subdivision 2 of the FM Act sets requirements for the form and content of an SIS.</p>
<p>NSW <i>Marine Estate Management Act 2014</i> (MEM Act)</p>	<p>Towra Point Aquatic Reserve is declared in the <a href="#">Marine Estate Notification 2020</a>.</p> <p>The general purposes of aquatic reserves are listed in section 33 of the FM Act.</p> <p>The <a href="#">Towra Point Nature Reserve Plan of Management</a> (NPWS 2001) includes management objectives and strategic actions for the Nature Reserve and Aquatic Reserve.</p> <p>Section 55 of the MEM Act states a determining authority must not carry out, or grant approval to carry out, an activity within the meaning of Part 5 of the EP&amp;A Act within a marine park or an aquatic reserve unless they have taken into consideration:</p> <ul style="list-style-type: none"> <li><i>(i) if there are management rules for the marine park or aquatic reserve, the purposes of the zone within which the area concerned is situated as specified in those management rules, and</i></li> <li><i>(ii) the permissible uses of the area concerned under the regulations or the management rules, and</i></li> <li><i>(iii) if a management plan for the marine park or aquatic reserve has been made, the objectives of the marine park or aquatic reserve, and</i></li> <li><i>(iv) any relevant marine park or aquatic reserve notifications, and</i></li> </ul> <p>Section 56(3) of the MEM Act states:</p> <p><i>A determining authority must not carry out, or grant an approval to carry out, an activity on land that is in the locality of a marine park or an aquatic reserve in purported compliance with Part 5 of the Environmental Planning and Assessment Act 1979 unless—</i></p>



Legislation	Relevance
	<p>(a) <i>the determining authority has taken into consideration the purposes of marine parks or aquatic reserves, the regulations and any advice given to it by the relevant Ministers on the impact on the marine park or aquatic reserve of the carrying out of an activity in the locality, and</i></p> <p>(b) <i>if the determining authority is of the opinion that the proposed activity is likely to have an effect on the plants or animals within the marine park or aquatic reserve or their habitat, the determining authority has consulted with the relevant Ministers.</i></p>
<p>Marine Estate Management Regulation 2017</p>	<p>Section 9 of the Regulation prescribes the assessment criteria for ‘deciding whether or not to give consent to the carrying out of any activity in a marine park or an aquatic reserve’.</p> <p>Section 10 and 11 of the Regulation identify circumstances where consent must or may be refused. For example: <i>The relevant Ministers must not give consent to the carrying out of any activity in a marine park or an aquatic reserve that, in the opinion of the relevant Ministers, is inconsistent with the objects of the Act or the purposes of marine parks and aquatic reserves.</i></p> <p>If consent is given, it will be in the form of a permit (Section 12).</p>
<p><i>National Parks and Wildlife Act 1974 (NPW Act)</i></p>	<p>The <a href="#">Information Sheet on Ramsar Wetlands 2009-12</a> states that the Ramsar site boundary is the Towra Point Nature Reserve boundary, as gazetted on 6 August 1982, 8 March 1991, 29 March 1996 and 4 April 2008.</p> <p>Section 30J of the NPW Act identifies the general purpose and principles for managing nature reserves. Further general requirements for care, control and management of nature reserves are provided in Division 6 of the NPW Act.</p> <p>The <a href="#">Towra Point Nature Reserve Plan of Management</a> (NPWS 2001) includes management objectives and strategic actions for the Nature Reserve and Aquatic Reserve.</p> <p>Further background is provided in the <a href="#">Towra Point Nature Reserve Ramsar Site Ecological Character Description</a> (Department of Environment, Climate Change and Water (2010)).</p> <p>Under the NPW Act, the <a href="#">Revocation, recategorisation and road adjustment policy</a> states that: <i>Lands reserved under the National Parks and Wildlife Act 1974 (NPW Act) will generally only be revoked as a last resort and where no other practical options are available. Only the government (via a Cabinet proposal) and ultimately the NSW Parliament (via an Act of Parliament) can decide if land reserved under the NPW Act can be revoked. The reasons for requiring a revocation vary but most commonly arise as a result of:</i></p>

Legislation	Relevance
	<ul style="list-style-type: none"> <li>• <i>boundary errors occurring at the time of reservation</i></li> <li>• <i>boundary encroachments occurring after reservation</i></li> <li>• <i>non-permissible development proposals that require revocation to proceed.</i></li> </ul>
<p><i>Coastal Management Act 2016</i> (CM Act)</p>	<p>Part 2 of the CM Act identifies and sets objectives for the following four coastal management areas that comprise the coastal zone:</p> <ul style="list-style-type: none"> <li>• coastal wetlands and littoral rainforests area</li> <li>• coastal vulnerability area</li> <li>• coastal environment area</li> <li>• coastal use area.</li> </ul>
<p>State Environmental Planning Policy (Resilience and Hazards) 2021</p>	<p>Chapter 2 of the Resilience and Hazards SEPP supports the CM Act with detailed mapping of the coastal management areas. It replicates and supersedes the 2018 Coastal Management SEPP.</p> <p><b>Figure 3</b> indicates much of the area adjacent Captain Cook Drive is mapped as coastal wetlands, littoral rainforest or proximity areas (100 m buffer zones to ‘manage impacts of adjacent development’).</p> <p>Part 2.2 of the Resilience and Hazards SEPP sets development controls for coastal management areas, including proximity areas. For example, clause 2.8(1) states:</p> <p><i>Development consent must not be granted to development on land identified as “proximity area for coastal wetlands” or “proximity area for littoral rainforest” on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on—</i></p> <p><i>(a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or</i></p> <p><i>(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.</i></p>

Legislation	Relevance
Local Planning Directions	Direction 4.2 Coastal Management applies when a planning proposal authority prepares a planning proposal that applies to land that is within the coastal zone, as defined under the CM Act and as identified by chapter 2 of the Resilience and Hazards SEPP.

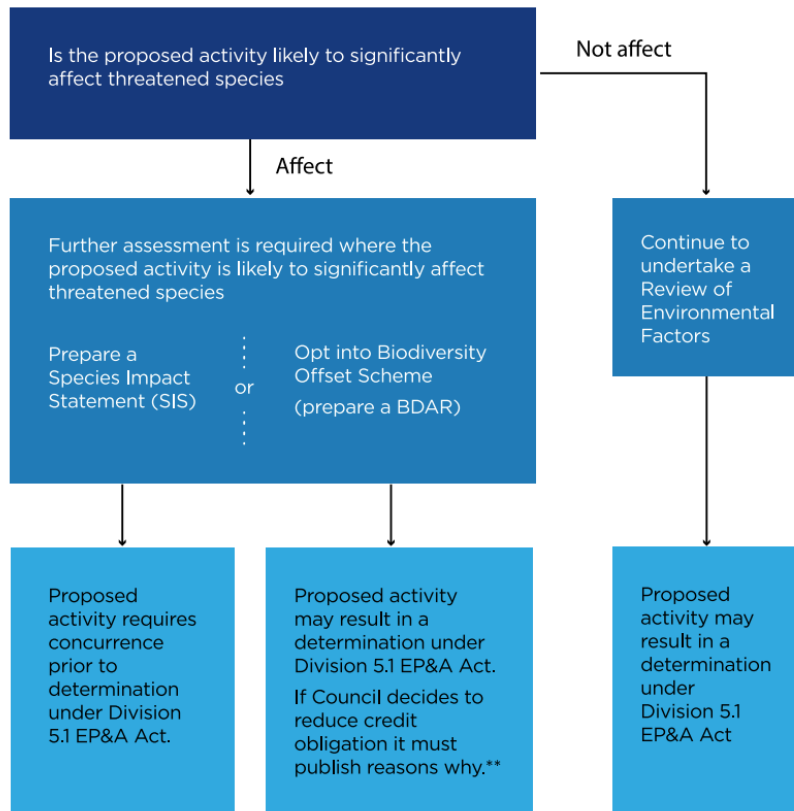


Figure 1: Pathways to assess biodiversity impacts under Division 5.1 (DPE 2022)

## The subject land

The subject land for the ECA includes the concept road design (Project Area) of Captain Cook Drive, between the intersection with Elouera Road and the track to Boat Harbour (**Figure 2**). It is noted that for the purposes of assessing impacts in accordance with the BAM, the subject land would be determined from detailed plans for the proposed road widening and would need to account for all direct and indirect impacts including the footprint of the proposed widened road as well as areas likely to be impacted indirectly by erosion, sedimentation or other indirect impacts. For the purposes of this ECA, the subject land has been identified as the Project Area, which is the current concept design (Diversi Consulting, dated 11/8/2023). Indirect impacts, including noise and light, will need to be assessed in the context of increased road use.

## Landscape context

In accordance with the BAM, a number of landscape features are assessed within the subject land (and a 500 m buffer around the subject land). These landscape features are used to identify biodiversity values that are important for the subject land and inform the habitat suitability of the subject land for threatened species. The following landscape features are relevant to the subject land:

- **IBRA region and subregion:** The Interim Biogeographic Regionalisation of Australia (IBRA; DoEE 2016) represents a landscape- based approach to classifying the land surface, including attributes of climate, geomorphology, landform, lithology, and characteristic flora and fauna species present. The Project Area is wholly located within the 'Sydney Basin' IBRA bioregion and the 'Pittwater' subregion (IBRA version 7).
- **NSW Landscape (Mitchell Landscapes):** The NSW (Mitchell) Landscapes are landscapes identified based upon geologic, geomorphic and pedologic mapping. These landscapes are used for a variety of purposes including the determination of over-cleared landscapes. The Project Area is wholly located within the 'Sydney - Newcastle Barriers and Beaches' landscape.
- **Rivers Stream and Wetlands:** The 500 m buffer around the subject land includes significant waterbodies including portions of Woollooware Bay, Weeney Bay and Quibray Bay. The Project Area also includes a portion of Weeney Bay. As the subject land is within 40 m of the mean high water mark of the estuary, the project would represent a controlled activity under the NSW *Water Management Act 2000* and approval must be sought from the Department of Industry - Water.  
The Project Area incorporates the margins of Towra Point Nature Reserve, which is a defined RAMSAR Wetland, and would constitute an 'Important Wetland' under the BAM. Additionally, areas of 'local wetlands' are present adjacent to the Project Area.
- **Native vegetation cover:** Under the BAM native vegetation cover is used as a surrogate to assess the habitat suitability of the subject land for threatened species. Within the 500 m buffer surrounding the subject land, approximately 53% (288 ha) of the 540 ha area supports native vegetation. The remainder of the buffer area includes areas of disturbed land or open water.
- **Patch size:** Patch size as defined by the BAM as the area of native vegetation within the subject land and areas of native vegetation separated by a gap of less than 100 m. All



native vegetation within the subject land is connected to large areas of native vegetation extending south-west and north-east along Captain Cook Drive. Consequently, all vegetation within the subject land has a patch size of greater than 100 ha.

## Background information

In accordance with section 5.2.1.5 of the BAM, existing information relevant to the native vegetation of the Project Area and the 500 m buffer area has been reviewed. Ecological assessments reviewed include:

- Flora and Fauna Survey, Lot 8 Captain Cook Drive, Kurnell (Wildsearch 1997)
- Flora Assessment, Sand Extraction Proposal Lot 8 // DP 586986 Captain Cook Drive, Kurnell (HWR 2004)
- The native vegetation of the Sydney Metropolitan Area (OEH 2016) and the updated NSW State Vegetation Type Map (DPE 2022)
- Biodiversity Assessment Report for Lot 2 DP 1030269 and Lot 2 DP 559922 (Cumberland Ecology 2023)
- Threatened Species Records (BioNet Atlas, DPE 2023b).
- Australian Environmental Surveys (2023). A letter dated 6 December 2023 outlining a specialist assessment of Lots 251, 260R, 278 and 280-282 Captain Cook Dr for Green and Golden Bell Frog.

## Vegetation communities

The Kurnell Peninsula has been subject to sand mining and other disturbances for more than 150 years. Land uses, and past clearing have resulted in a highly modified environment, although less disturbed areas of native vegetation are present in association with Towra Point Nature Reserve and Kamay Botany Bay National Park (**Figure 2**). Despite the widespread clearing and disturbance across much of the Kurnell Peninsula, five threatened ecological communities listed under the BC Act and/or the EPBC Act occur on the Kurnell Peninsula (OEH 2016) including:

- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions ('Swamp Oak Floodplain Forest')
- Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions ('Littoral Rainforest')
- Kurnell Dune Forest in the Sutherland Shire and City of Rockdale ('Kurnell Dune Forest')
- Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions ('Coastal Saltmarsh')
- Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions ('Freshwater Wetlands').

Additionally, the 'Estuarine Mangrove Forest', as identified by OEH (2016) across large areas of the Kurnell Peninsula, is protected under the NSW *Fisheries Management Act 1994* (FM Act).

The Kurnell Peninsula and, in particular, Towra Point Nature Reserve is recognised as supporting the largest wetland of its type in the greater Sydney region and supports 60% of



the Coastal Saltmarsh community and 40% of the Estuarine Mangrove Forest communities in the Sydney region (DECCW 2010).

### *Threatened species*

There are few records on the Kurnell Peninsula of threatened flora species listed under the BC Act and/or EPBC Act (DPE 2023b), with only two threatened species previously recorded in proximity to the subject land (DPE 2023b), namely *Syzygium paniculatum* (Magenta Lilly Pilly) and *Senecio spathulatus* (Coast Groundsel). These two species are associated with littoral rainforest and frontal dune vegetation, respectively.

A number of threatened fauna species listed under the BC Act and/or EPBC Act have previously been recorded on the Kurnell Peninsula, in particular a large number of migratory shore bird species, waterbirds and other avifauna (DECCW 2010; DPE 2023b). Both wetland and terrestrial habitats within Towra Point Nature Reserve and sandy beach habitats on the southern side of the peninsula have been identified as habitat for threatened avifauna (DECCW 2010; Cumberland Ecology 2019; DPE 2023b).

In addition to threatened avifauna, the Kurnell Peninsula has been identified as representing habitat for hollow and cave roosting bat species including the Greater Broad-nosed Bat (*Scoteanax rueppellii*), Eastern Bent-winged Bat (*Miniopterus orianae oceanensis*), and Little Bent-winged Bat (*Miniopterus australis*; Wildsearch 1997; DECCW 2010; Cumberland Ecology 2019; DPE 2023b). Additionally, the Kurnell Peninsula supports both foraging and roosting habitat for the Grey-headed Flying-fox (GHFF; *Pteropus poliocephalus*). A GHFF camp has previously been recorded on the Kurnell Peninsula on the southern side of Captain Cook Drive (Wildsearch 1997; Cumberland Ecology 2019), approximately 500 m south-east of the eastern edge of the subject land. The National Flying-fox monitoring viewer (DCCEEW 2023) identifies that a camp containing less than 500 individuals was recorded at this location in August 2016. Ongoing monitoring of this camp has recorded small numbers of GHFF intermittently occupying this camp in 2019 (Kurtis Lindsay pers. comm. 2019).

Two threatened amphibians have been recorded on the Kurnell Peninsula, the Wallum Froglet (*Crinia tinnula*) and Green and Golden Bell Frog (GGBF; *Litoria aurea*). There are several records of the Wallum Froglet from the Kurnell Peninsula, most commonly from Kamay Botany Bay National Park, including records as recently as 2021 (DPE 2023b). Similarly, there are numerous records of the GGBF from the Kurnell Peninsula, and the population of GGBF in this area was recognised as a key population of the species and the second largest population of the species in the Sydney Region (DECC 2007). However, the population on the Kurnell Peninsula is likely to have decreased in recent years with the species not recorded from the Kurnell Peninsula for almost a decade between 2011 and 2020 including during monitoring of previously known breeding sites (Veolia 2017; Cumberland Ecology 2019). Nonetheless, the species was recorded within 600 m of the subject land as recently as 2021 (DPE 2023b).

## Native vegetation

Native vegetation mapping for the subject land (DPE 2022) was reviewed and field validated in Ecoplanning (2020) to identify Plant Community Types (PCTs), including their broad condition classes, within the Project Area, road corridor and adjacent areas. PCTs have recently been reclassified through eastern NSW (DPE 2022) and this updated classification is applied in this report, along with the legacy PCTs. Based upon vegetation mapping, the vast majority of the Project Area supports cleared or heavily disturbed land associated with the existing road and the mown road verge (which rarely supports any native vegetation). Within the 15.494 ha Project Area an area of 3.584 ha of native vegetation was mapped with areas of exotic grassland (2.483 ha) and planted vegetation including landscaped areas (0.471 ha) also identified.

A total of five PCTs were identified within the Project Area with one additional PCT located less than 2 m outside the Project Area (**Figure 4** and **Figure 5**). Identification of PCTs was in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification (DPE 2023b). The BioNet Vegetation Classification database was used to determine the most appropriate PCT for the vegetation community within the subject land and identify/confirm PCT types which matched the geographic distribution (based on IBRA subregions), vegetation formation and floristics of vegetation within the subject land. The data, including vegetation formation, descriptive attributes and distribution information were reviewed to determine the most appropriate PCT for each vegetation community sampled within the subject land.

**Table 3** lists the PCTs identified within the Project Area as well as corresponding Threatened Ecological Communities (TECs) listed under the BC Act and/or EPBC Act. Of the six PCTs identified within or adjacent to the Project Area, four are equivalent to TECs listed under the BC Act and/or the Commonwealth EPBC Act. Additionally, one PCT (Grey Mangrove – River Mangrove Forest, PCT 4091) is also protected under the FM Act (**Figure 6** and **Figure 7**).

The vegetation integrity of PCTs identified within the Project Area were assessed in accordance with the BAM. Vegetation Integrity (VI) scores were determined from plot-based surveys including at least one plot within each PCT. It is noted that for a full BDAR additional plots would be required for PCTs with areas greater than 2 ha and additional delineation of PCTs based upon vegetation condition may be required. Generally, vegetation within the Project Area was highly modified and impacted by previous disturbances including clearing, weed invasion and nutrient laden run-off. These disturbances were reflected in the VI score calculated for each PCT with scores out of 100 (representing undisturbed or pristine vegetation) ranging from 36.8/100 to 64.2/100 (**Table 3**). In general terms, this suggests the vegetation is in low/moderate to moderate/good condition. Areas mapped as exotic grasslands had a VI score of 8/100, which is vegetation in very low condition.

**Table 3: PCTs recorded in the Project Area**

PCT	Legacy PCT	Area in Project Area (ha)	VI score	Corresponding TEC
Estuarine Swamp Oak Twig-rush Forest (PCT 4028)	1234	0.737	50.1	BC Act - <i>Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> EPBC Act - <i>Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community</i>
Sydney Coast Tuckeroo Littoral Rainforest (PCT 3133)	910	0.086	64.2	BC Act - <i>Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> EPBC Act - <i>Littoral rainforests and coastal vine thickets of eastern Australia</i>
Coastal Sands Littoral Scrub-Forest (PCT 3546)	661	2.406	36.8	BC Act - <i>Kurnell Dune Forest in the Sutherland Shire and City of Rockdale</i>
Coastal Foredune Wattle Scrub (PCT 3788)	772	0.143	51.9	Not a TEC
Grey Mangrove – River Mangrove Forest (PCT 4091)	920	0.000#	51.5	Protected Marine vegetation under the FM Act
Samphire Saltmarsh (PCT 4097)	1126	0.004	63.1	BC Act - <i>Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> EPBC Act - <i>Subtropical and Temperate Coastal Saltmarsh</i>
N/A – Cleared land		8.956	N/A	N/A
N/A - Plantings		0.483	N/A	N/A
N/A – Exotic grasslands		2.472	8.0	N/A
<b>Total</b>		<b>15.494*</b>		-

\* rounding errors may occur

#PCT not present within the Project Area, but present adjacent to the Project Area with potential to be indirectly impacted.



## Threatened species

Under the BAM, threatened species are separated into two classes, 'ecosystem' and 'species' credit species. Those threatened species where the likelihood of occurrence of a species or elements of the species' habitat can be predicted by vegetation surrogates and landscape features, or for which a targeted survey has a low probability of detection, are identified as 'ecosystem' credit species. Targeted surveys are not required for ecosystem species and potential impacts to these species are assessed in conjunction with impacts to PCTs. No further assessment beyond mapping of PCTs is required to assess impacts to these species.

Threatened species where the likelihood of occurrence of a species or elements of suitable habitat for the species cannot be confidently predicted by vegetation surrogates and landscape features and can be reliably detected by survey are identified as 'species' credit species. A targeted survey or an expert report is required to confirm the presence or absence of these species on the subject land. Under the BAM, threatened species that require assessment are initially identified based upon the distribution of the species, any geographic constraints of the distribution of the species, PCT with which the species is associated, the native vegetation cover surrounding the subject land and the patch size for PCTs within the subject land. Based upon these attributes, species credit species predicted to occur within or in proximity to the Project Area have been determined using the BAM Calculator. A total of 16 flora species and 56 fauna species credit species have been identified as potentially occurring within the subject land based upon the attributes listed above (**Appendix A**).

In accordance with section 5.2.3 of the BAM, a candidate species credit species can be considered unlikely to occur within the subject land where habitat is substantially degraded such that the species is unlikely to use area. As discussed above, much of the vegetation within the road reserve has been disturbed as a result of its location adjacent to the existing road including vegetation clearing and weed invasion. Assessment of whether species credit species are likely to use the degraded habitat within the Project Area has been informed by records of species credit species from the BioNet Atlas (BioNet; DPE 2023b) within 5 km of the subject land. Based upon species credit species predicted by the BAM, records of threatened species within 5 km of the Project Area and the habitat available, the following species credit species have potential to be impacted by the proposal (either directly or indirectly) and may require further assessment:

- *Syzygium paniculatum*: Six individuals were tentatively identified within, or adjacent to, the Project Area. Without surveyor drawings, or on ground delineation of the Project Area, it is not possible to identify the exact number of individuals present within the Project Area. It is also noted that identification of this species as part of this ECA is tentative as no fruiting material was present, however, this species has previously been recorded within the Project Area (DPE 2023b). Target survey, in accordance with the survey guidelines for threatened flora, would be required for a BDAR, which may observe more individuals of the species.
- Green and Golden Bell Frog (*Litoria aurea*): recorded within 100 m of the subject land and recorded within 600 m as recently as 2021 (DPE 2023b). No breeding habitat within the Project Area, however, potential for this species to be indirectly impacted by changes to water quality. A recent inspection of the area by Ross Wellington, who is a BAM accredited expert for the species, identified potential dispersal habitat for the Green and Golden Bell Frog in the vicinity of the road in table drains and culverts. The BAM would



require a target survey or an expert report to identify the presence of the species and its habitat and, where required, to draw a species polygon upon which credit calculations will be based.

- White-fronted Chat (*Epthianura albifrons*): recorded within 500 m of the subject land and recorded within 5 km as recently as 2014 (DPE 2023b). Only very marginal habitat for this species for this species occurs within the Project Area. The species has the potential to be impacted by vehicle collisions (noting that this is an existing threat associated with Captain Cook Drive, but the chance of being struck by a vehicle may increase with a wider road and increased traffic).

Target survey, or preparation of an expert report, may also be required for other candidate species in the BDAR.

### *Locally significant species*

Three locally significant flora species, as identified by SSC (2019) were recorded within or in proximity to the Project Area, namely: *Cupaniopsis anacardioides* (Tuckeroo), *Ficus coronata* (Sandpaper Fig) and *Maclura cochinchinensis* (Cockspur Thorn). One additional species was observed outside the Project Area, *Synoum glandulosum* (Scentless Rosewood). All of the locally significant flora species were recorded in association with the Littoral Rainforest (PCT 3133) vegetation community and occurred regularly throughout this vegetation community. However, *Cupaniopsis anacardioides* was recorded within all vegetation communities with the exception of areas of Mangrove Forests (PCT 4091), Saltmarsh (PCT 4097) and exotic grasslands.

A number of other locally significant flora species have been identified by SSC (2019) as occurring within the Kurnell Peninsula. Habitats present within the road reserve and adjacent areas including swamp margins, freshwater wetlands and coastal rainforests represent potential habitat for the following locally significant species:

- *Telmatoblechnum indicum* (syn. *Blechnum indicum*) (Swamp Water Fern)
- *Cladium procerum*,
- *Myriophyllum gracile* var. *linear* (Slender Water-milfoil)
- *Nymphoides geminata* (Entire Marshwort)
- *Livistona australis* (Cabbage Tree Palm).

### **Priority weeds**

Under the NSW *Biosecurity Act 2015* all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable. In addition to this general duty, additional requirements are identified for priority weeds. A total of nine priority weeds for the Sutherland Shire LGA were recorded in the Project Area (**Table 4**), seven of which are also Weeds of National Significance (WoNS; **Table 4**).

**Table 4: Priority weeds within the Project Area**

Species	WoNS	Duty
<i>Arundo donax</i> Giant Reed		<b>Regional Recommended Measure:</b> Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment.
<i>Asparagus aethiopicus</i> Ground Asparagus	Y	<b>Prohibition on dealings:</b> Must not be imported into the State or sold.
<i>Asparagus asparagoides</i> Bridal Creeper	Y	<b>Prohibition on dealings:</b> Must not be imported into the State or sold.
<i>Asparagus scandens</i> Snakefeather	Y	<b>Prohibition on dealings:</b> Must not be imported into the State or sold.
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush	Y	<b>Prohibition on dealings:</b> Must not be imported into the State or sold. <b>Within the Biosecurity Zone:</b> This weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone
<i>Lantana camara</i> Lantana	Y	<b>Prohibition on dealings:</b> Must not be imported into the State or sold.
<i>Olea europaea</i> subsp. <i>cuspidata</i> African Olive		<b>Regional Recommended Measure:</b> Exclusion zone: Land managers prevent spread from their land where feasible. Land managers reduce impacts from the plant on priority assets.
Blackberry <i>Rubus fruticosus</i> species aggregate	Y	<b>Prohibition on dealings:</b> Must not be imported into the State or sold.
Fireweed <i>Senecio madagascariensis</i>	Y	<b>Prohibition on dealings:</b> Must not be imported into the State or sold.

## Wetlands

The BAM defines a 'wetland' as an area "...of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle". As outlined above, the Project Area incorporates the margins of Towra Point Nature Reserve, which is a defined RAMSAR Wetland, and would constitute an 'Important Wetland' under the BAM. Areas of 'local wetlands' are present adjacent to the Project Area and would include areas supporting Swamp Oak swamp forest (PCT 4028). Approximately 0.284 ha of the RAMSAR wetland lies within the Project Area (**Figure 9** and **Figure 10**).



A desktop review of aquatic and terrestrial GDE mapping generated by the Groundwater Dependent Ecosystem Atlas (BOM 2019), which is the most comprehensive inventory of the location and characteristics of potential GDEs for Australia, does not map aquatic GDEs within the subject land. Aquatic GDEs are ecosystems that rely on the surface expression of groundwater, whereas terrestrial GDEs are those ecosystems which rely on the subsurface presence of groundwater. The BOM (2019) mapping indicates the presence of high and low potential terrestrial GDEs across the subject land. The potential GDEs identified by BOM (2019) within the subject land are noted as occurring in association with foredune and coastal sand vegetation types, estuarine vegetation types, floodplain vegetation, littoral rainforest and thicket vegetation and sandstone woodland vegetation.

Based upon the definition of wetlands under the BAM, wetland areas within the Project Area and 500 m buffer are shown in **Figure 8**. No areas of open water were identified within the Project Area, although open water associated with Weeney Bay, Quibray Bay and artificial wetlands are located in proximity to the Project Area. Those areas of open water which could be seen from the Project Area did not support any threatened aquatic species listed under the BC Act or EPBC Act, or any aquatic weeds listed as 'Water weeds' by the NSW Department of Primary Industries (DPI 2019).

## Assessment of impacts

Assessment of impacts to biodiversity in accordance with the BAM includes impacts related to the clearing of native vegetation which can be quantified based upon vegetation integrity and the area of vegetation clearing proposed. A second category of impacts are 'prescribed impacts' which are impacts to biodiversity which are in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. Each of these impacts associated with the proposal are discussed below.

### *Clearing of native vegetation*

Under the BAM, the impacts of vegetation clearing are quantified and measured in biodiversity credits. The application of the BAM calculates the number of biodiversity credits which will be impacted by a development and an equal number of biodiversity credits must be generated to 'offset' impacts to ensure that development has no net loss of biodiversity credits. There are multiple ways to generate credits under the BC Act including through establishment of a Biodiversity Stewardship Agreement (BSA) over an area of land, or through payment into the Biodiversity Conservation Trust (BCT). To provide an indication of likely offset requirements, preliminary offset calculations have been undertaken for ecosystem credits (based upon PCTs) and threatened flora species within the Project Area. **Table 5** outlines the quantum of biodiversity credits which would be required to offset the impacts to each of the PCTs within the Project Area.

**Table 5: Preliminary offset calculations for the project**

<b>Ecosystem credits</b>			
<b>PCT</b>	<b>Area (ha)</b>	<b>VI score</b>	<b>Credits required</b>
Estuarine Swamp Oak Twig-rush Forest (PCT 4028)	0.737	50.1	19
Sydney Coast Tuckeroo Littoral Rainforest (PCT 3133)	0.086	64.2	3
Coastal Sands Littoral Scrub-Forest (PCT 3546)	2.406	36.8	45
Coastal Foredune Wattle Scrub (PCT 3788)	0.143	51.9	3
Grey Mangrove – River Mangrove Forest (PCT 4091)	0.000#	51.5	0#
Samphire Saltmarsh (PCT 4097)	0.004	63.1	1
<b>Species credits</b>			
<b>Species</b>	<b>No. of individuals</b>	<b>Credits required</b>	
<i>Syzygium paniculatum</i>	6	12	

#PCT not present within the Project Area, but present adjacent to the Project Area with potential to be indirectly impacted.

### *Prescribed impacts*

Prescribed biodiversity impacts are defined under clause 6.1 of the BC Reg and include impacts on biodiversity values in addition to, or instead of, impacts from clearing vegetation and/or loss of habitat. Two prescribed impacts identified within the BC Reg could result from the proposal, namely:

- impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities,
- the impacts of vehicle strikes on threatened species of animals or on animals that are part of a threatened ecological community.

The BAM does not provide an approach to determine the number and class of biodiversity credits that are required under a BDAR for a prescribed impact. However, the additional prescribed impacts on biodiversity may be taken into account by a consent authority when they determine the biodiversity credits required to be retired. Generally, the impacts associated with increase vehicle strike would be considered relatively minor given that the proposal would involve widening of an existing road. Impacts of the proposed development on water quality and water bodies is considered a potential risk for the proposal given the proximity of the Project Area to sensitive waterbodies which sustain threatened species and ecological communities. Consequently, the avoidance of impacts to water quality, water bodies and

hydrological processes must be a high priority as part of detailed planning for the proposed footprint of the proposal.

One of the primary objects of the FM Act is to conserve 'key fish habitats' (KFH). The '*Policy and guidelines for fish habitat conservation and management - Update 2013*' (DPI 2013) identifies three types of KFH based upon their sensitivity, with 'Type 1 – Highly sensitive KFH' relevant to the subject land including Coastal Saltmarsh, RAMSAR wetlands and Important Wetlands (as defined under the BAM). Type 2 - Moderately sensitive KFH of relevance to the subject land includes Mangroves and stable intertidal sand/mud flats, coastal and estuarine sandy beaches with large populations of in-fauna. DPI (2013) identifies that approval will generally not be given to developments or activities that do not incorporate foreshore buffer zones of 50-100 m width adjacent to TYPE 1 marine vegetation and at least 50 m width adjacent to TYPE 2 marine vegetation. **Figure 11** shows the location of KFH habitat buffers (100 m for Type 1 and 50 m for Type 2 habitats) which apply to the majority of the subject land and in particular those areas in proximity to Weeney Bay and Quibray Bay. It is not possible to completely avoid impacts to KFH buffers as the existing road is located within the buffer areas. However, any further incursion into KFH buffers should be avoided. Any proposed impacts within KFH buffers should occur on the side of Captain Cook Drive furthest from the relevant KFH feature (generally the eastern or southern side of Captain Cook Drive).

### *Serious and irreversible impacts*

As outlined above, vegetation within the subject land contains several TECs listed under the BC Act and EPBC Act. Under the BAM, there is a requirement to determine whether any impacts to biodiversity represent a '*Serious and Irreversible Impact* (SAIL). Where a proposal involves impacts to biodiversity which are a SAIL, the determining authority must:

- Refuse the development application (where Council is the determining authority)
- take those impacts into consideration and to determine whether there are any additional and appropriate measures that will minimise those impacts if consent or approval is to be granted (where the project is State Significant Infrastructure and the Minister for Planning is the determining authority).

Ultimately, the determination of whether impacts to biodiversity are SAIL is made by the consent authority in accordance with the principles set out in the BC Reg. To assist the consent authority, the *Guidance to assist a decision-maker to determine a serious and irreversible impact* (OEH 2018b) identifies threatened species and ecological communities which are candidate species, or communities, for SAIL. None of the TECs identified within the study area, or species considered likely to occur, are identified as candidate SAIL communities within the relevant guidelines (OEH 2018b). The proposal is unlikely to involve impacts to TECs which are SAIL in accordance with the BAM.

### *Aquatic ecology*

The Towra Point Aquatic Reserve is adjacent to Captain Cook Drive. Under the *Marine Estate Management Act 2014*, the primary purpose of the reserve is to protect biological diversity. There is potential for indirect impacts to affect the Towra Point Aquatic Reserve, such as through runoff, that may affect water quality.



The proposed duplication impacts some parts of the RAMSAR wetland (**Figure 9** and **Figure 10**). While these impacts are mostly “slivers”, the proposal must seek to avoid impacts to the wetland and minimise indirect impacts (e.g. run-off).

## EPBC Act

The application of the BAM represents the current legislated process for determining impacts to biodiversity within NSW. There is currently no bilateral agreement between NSW and the Commonwealth which allows the Commonwealth Minister for the Environment to rely on the BAM to assess actions under Commonwealth legislation (the EPBC Act). Where impacts are proposed to species, or ecological communities listed under EPBC Act, additional approval may be required. Given the proximity of Captain Cook Drive to the RAMSAR wetland, and the number of matters of NES close to the road, it is likely that it will be recommended that the project be referred to the Commonwealth.

## Ecological constraints

It is a requirement of the BAM that impacts to biodiversity are avoided and minimised and avoidance measures should be targeted towards areas of highest ecological value. Following the first ECA, the road design has been modified in an attempt to avoid biodiversity values and reduce impacts. This has brought the road further south east away from Towra Point and the RAMSAR wetland, however, not all impacts can be avoided.

Identified ecological constraints within the Project Area and adjacent areas are categorised as high, medium and low as shown in **Figure 12** and as follows:

- High ecological constraint
  - Declared RAMSAR wetlands
  - Wetlands and waterbodies
  - High integrity TECs (outside Project Area)
  - The presence of threatened species
- Medium ecological constraint
  - Low quality TECs (within Project Area)
- Low ecological constraints
  - Non TEC vegetation
  - Exotic grasslands
  - Cleared land

Direct and indirect impacts to areas of high ecological values should be avoided. Based upon the distribution of high ecological constraints additional clearing of vegetation should be avoided or minimised on the northern and western sides of the existing Project Area. Areas of lesser ecological value are present on the eastern and southern sides of the existing Project Area. Much of the areas identified as being of medium to high ecological significance are located in areas where the road reserve is greater than 45 m wide. This means that there are opportunities to avoid impacts to areas of high to moderate ecological constraint whilst also allowing for the construction of the proposed 30 m wide carriageway.

## Conclusions and recommendations

The majority of the existing Project Area for the project supports cleared land or mown exotic grasslands on the verge of the existing road. A narrow band of native vegetation is present along portions of the existing Project Area, although much of this vegetation is heavily disturbed from previous clearing and weed invasion. Despite the disturbed nature of the native vegetation within the Project Area, the ecological value of this vegetation ranges from low to high, with higher ecological values associated with TECs which represent habitat for threatened and locally significant species and which form buffers around KFH downslope of the Project Area. In particular, low-lying areas to the west and north of the Project Area include TECs and threatened species habitat which is associated with particular hydrological regimes. While the project has the potential to alter water quality, volume or hydrological regimes that may adversely impact existing biodiversity values, the detailed design will include measures that will result in a neutral or beneficial impact to water quality.

The existing road corridor varies in width from 29.2 m to 79.6 m. The proposed widening requires a 30 m wide carriage way, on average. Wherever possible, the road width will be minimised to avoid impacts to biodiversity values. The proposed widening can largely occur within the existing road reserve and there are opportunities to avoid impacts to areas identified as being of high ecological value. Based upon the biodiversity values of the Project Area significant impacts to biodiversity values could be avoided by designing a project footprint which: avoids impacts to areas identified as being of high ecological value; minimises impacts to areas of moderate and low ecological values; and mitigates potential indirect impacts. The following recommendations should be considered as part of further project planning to avoid and minimise impacts to biodiversity values:

- An ecologist should continue to liaise with the detailed design team to minimise and avoid impacts to biodiversity.
- A qualified ecologist should be consulted during the detailed road design phase to provide advice on options to avoid, minimise and mitigate potential ecological impacts.
- Habitat for Green and Golden Bell Frog within the proposed Project Area is composed or constructed table drains and culverts. These may serve as effective dispersal pathways for GGBF. Duplication of Captain Cook Drive should incorporate similar features to facilitate GGBF dispersal and temporary habitat. While mitigation should not precede avoidance and minimisation in the BAM hierarchy, consultation with a species expert will help design effective constructed habitat for the species.
- The concept design impacts 0.284 ha of the RAMSAR wetland. Direct impacts to the RAMSAR wetland must be avoided, and indirect impacts avoided, minimised and mitigated.
- The project footprint should be designed and located to avoid or minimise impacts to all areas of native vegetation. During construction, areas of native vegetation outside of the subject land should be identified as 'No Go-Zones' for people and machinery and should be clearly delineated. Plant, equipment and stockpiles are to be placed in designated site compounds and will avoid areas of native vegetation.
- The project footprint should be designed and located to avoid any impacts to areas identified as being of 'high' biodiversity value. Specifically, the project should avoid any impacts to areas identified as Mangrove Forests (PCT 4091), Saltmarsh (PCT 4097) or local or important wetlands. Further, impacts to areas of Littoral Rainforest (PCT 3133)





and higher quality areas of Swamp Oak Swamp Forest (PCT 4028) on the western side of Captain Cook Drive should be avoided due to the habitat for locally significant flora species within this area.

- The detailed design should include improvements to control and manage runoff through improved drainage design and water treatment and management.
- The proposal is unlikely to involve impacts to TECs which are SAIL in accordance with the BAM.
- The project should be designed to avoid any further incursion into KFH buffers. Any proposed impacts within KFH buffers should occur on the side of Captain Cook Drive furthest from the relevant KFH feature (generally the eastern or southern side of Captain Cook Drive).
- The project should be designed and located to avoid any indirect impacts to water quality within downstream environments. The project should aim to have a neutral or beneficial impact on water quality downstream and should be assessed with reference to the '*Neutral or Beneficial Effect on Water Quality Assessment Guideline*' of SCA (2015). In accordance with this guideline, it can only be assumed that a development will have no identifiable potential impact on water quality if the development is unlikely to result in:
  - a concentration of flow of water
  - the impedance of flow of water
  - discharge of effluent, dust pollutants or stormwater, and
  - other matters considered to result in a water quality impact, such as the potential for contamination.
- All exotic biomass cleared within the project footprint should be removed from the subject land and disposed of at an approved facility. In particular any clearing of priority weeds (**Table 4**) should ensure weedy propagules are not allowed to spread. A Vegetation Management Plan (VMP) should be prepared and implemented which aims to prevent any indirect impacts associated with 'edge effects' by controlling exotic vegetation within, and adjoining, the subject land. Additionally, the VMP would guide the rehabilitation of any areas of bare soil created as part of the proposed works. Rehabilitation should utilise local native flora species and should occur as soon as practicable to avoid off-site transport of eroded sediments into nearby water courses and the establishment of exotic species.
- Following attempts to avoid and minimise impacts to native vegetation, all residual impacts to native vegetation should be offset with 'like-for-like' biodiversity credits to achieve the 'no-net-loss' standard as established by the BAM and/or in accordance with DPI (2013). Offsets options may include establishment of a Biodiversity Stewardship Agreement (BSA) across land adjacent to the subject land, purchase of equivalent biodiversity credits from the open market or payment into the Biodiversity Conservation Fund (BCF). The mechanism(s) for meeting the offset requirement of the project can not be finalised until the final project footprint is designed, however it is likely to include a combination of the options outlined above. Investigations into the feasibility of land to act as a suitable offset site (BSA) are currently ongoing.
- All equipment and plant brought into the subject land and site compounds are to be washed/cleaned so that it is free of soil, mud, debris or vegetation which may inadvertently introduce weeds and/or pathogens into the study area and adjacent vegetated areas. Measures will be taken to prevent tracking of soils/sediments from work sites to roadways as a result of work vehicle/machinery movement.



A detailed assessment of the proposed road will be required with a development application. Given that the BOS is likely to be triggered, a BDAR will be required to describe the proposal, identify the measures to avoid and minimise impacts to biodiversity, and the type and quantum of biodiversity credits required to offset the impact of the proposal. The BDAR should also include an assessment under the EPBC Act, FM Act and other relevant legislation and planning policies. However, if the BOS is not triggered, the project can be assessed via a Flora and Fauna Assessment.

Yours sincerely



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Figure 2: Project area

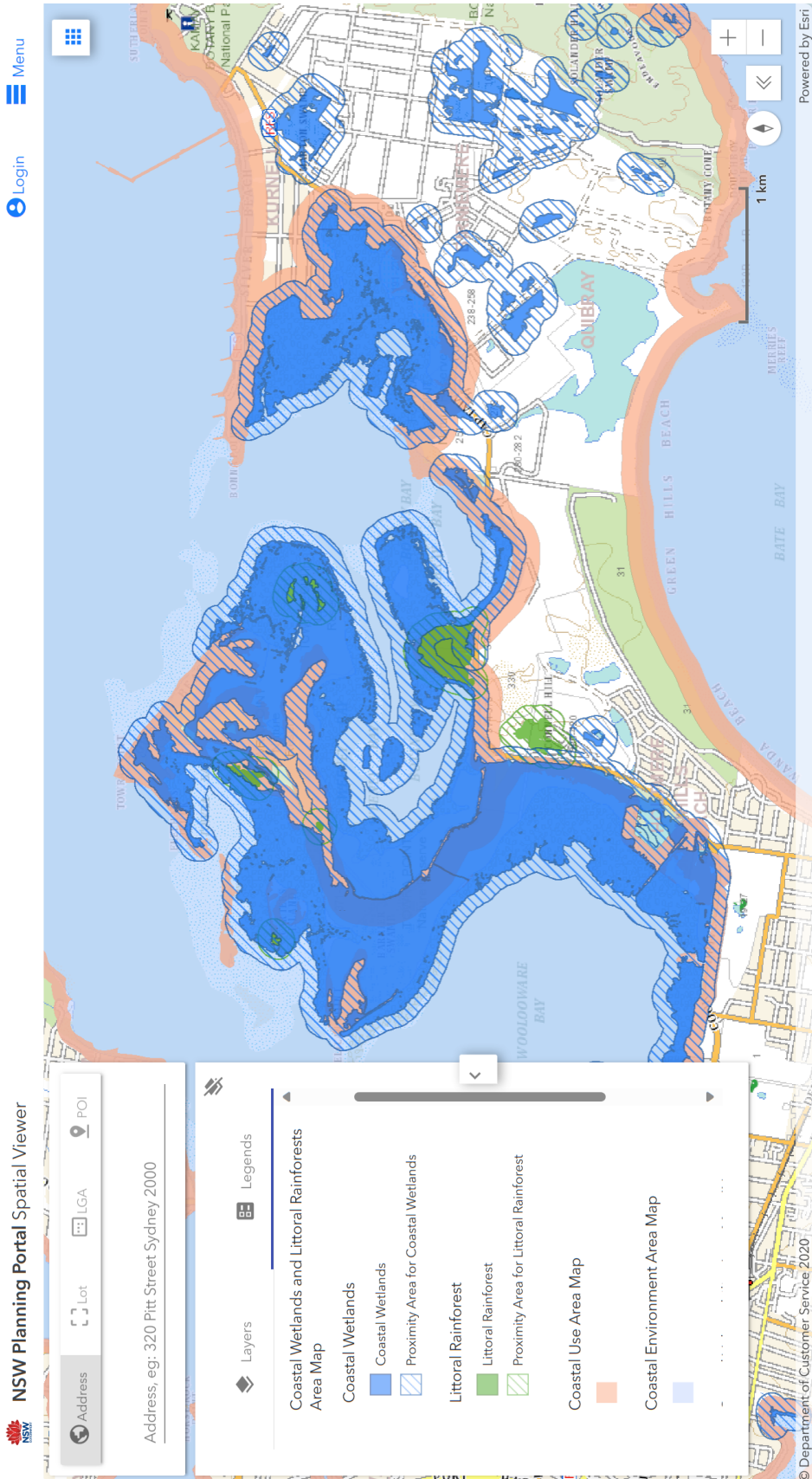


Figure 3: Coastal Wetlands and Littoral Rainforests Area Map under the Resilience and Hazards SEPP

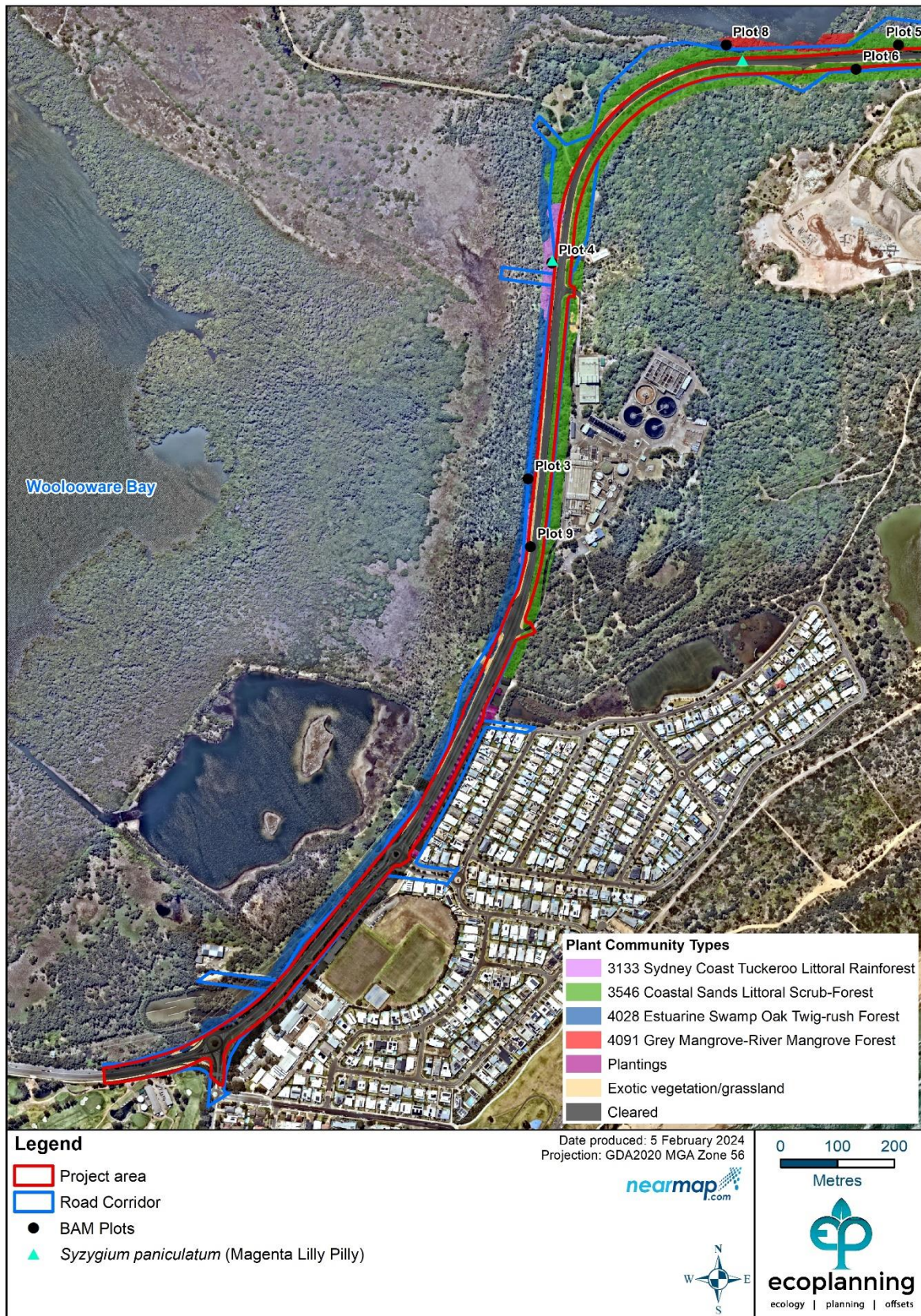


Figure 4: Plant community types within the Project Area (south)

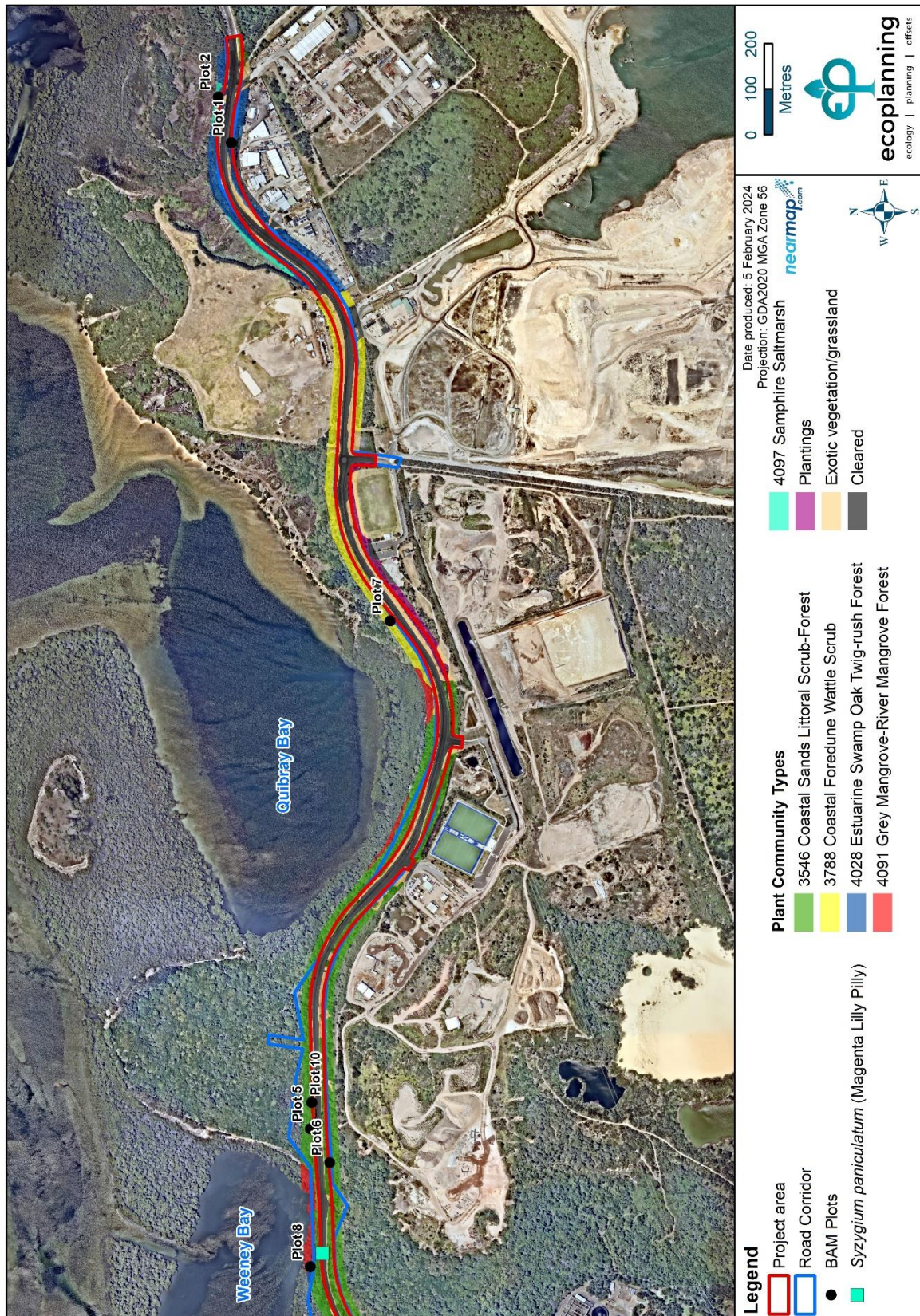


Figure 5: Plant community types within the Project Area (east)



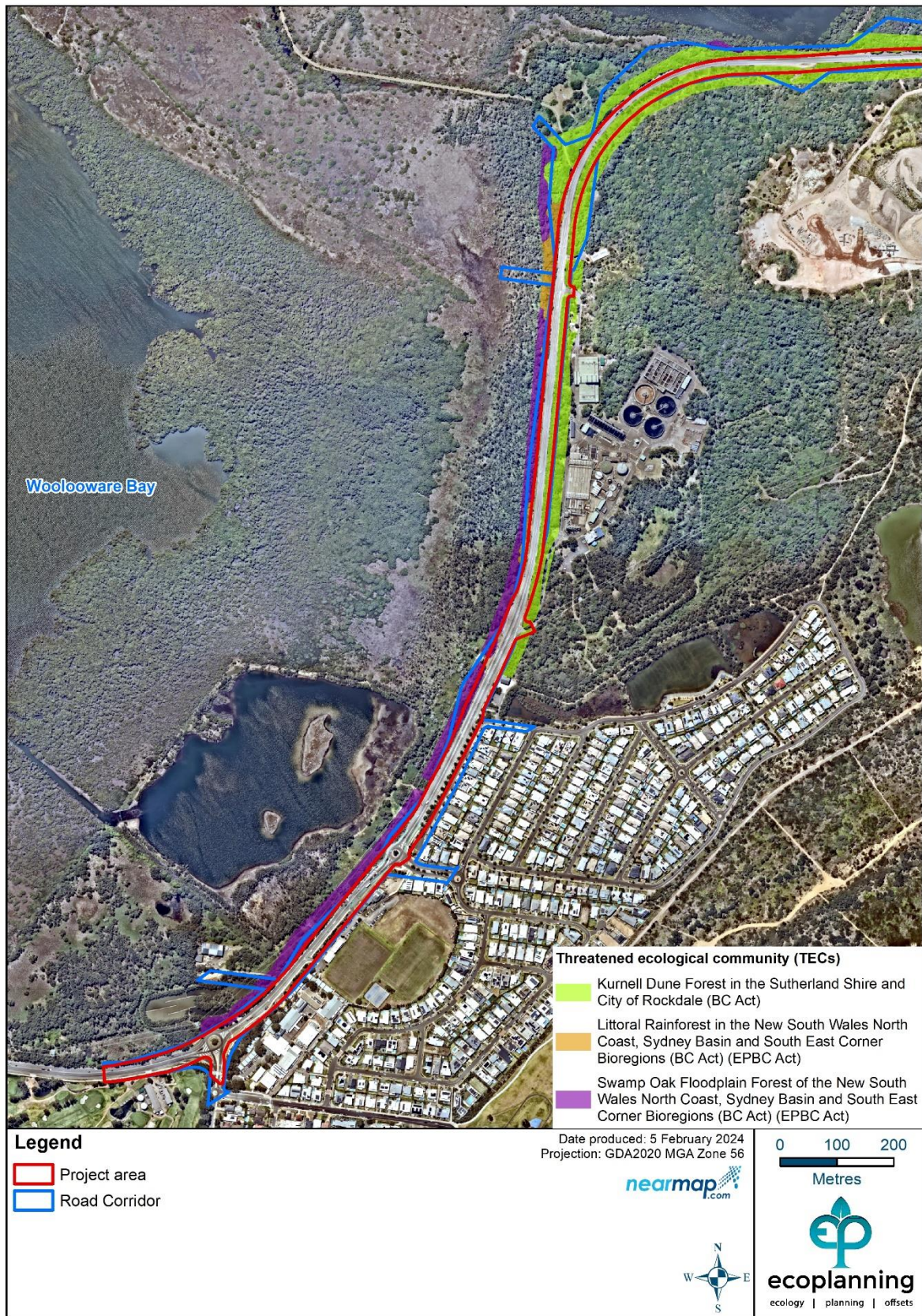


Figure 6: Threatened ecological communities within and adjacent to the Project Area (south)

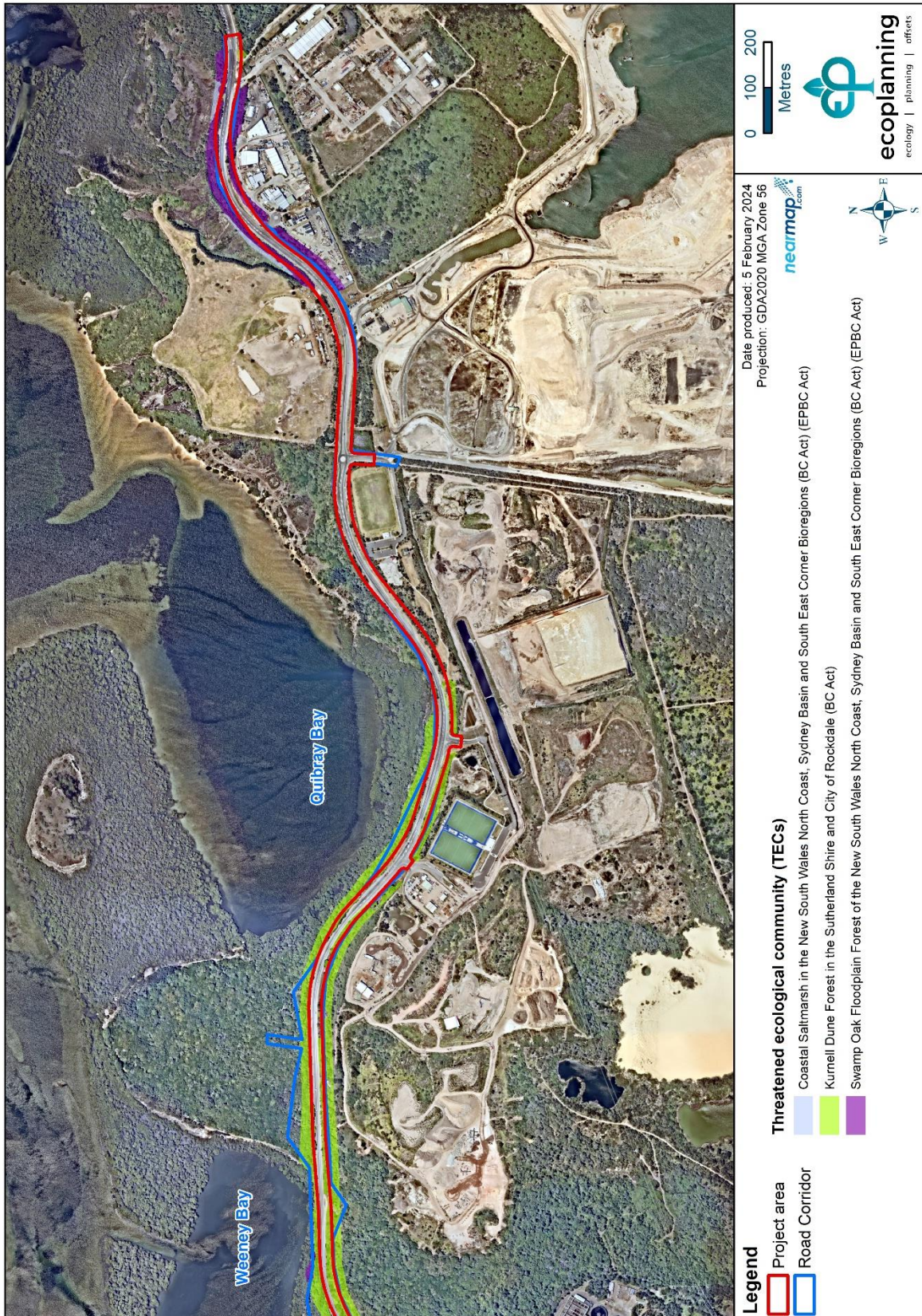


Figure 7: Threatened ecological communities within and adjacent to the Project Area (east)



Figure 8: Wetlands within the Project Area and adjacent areas

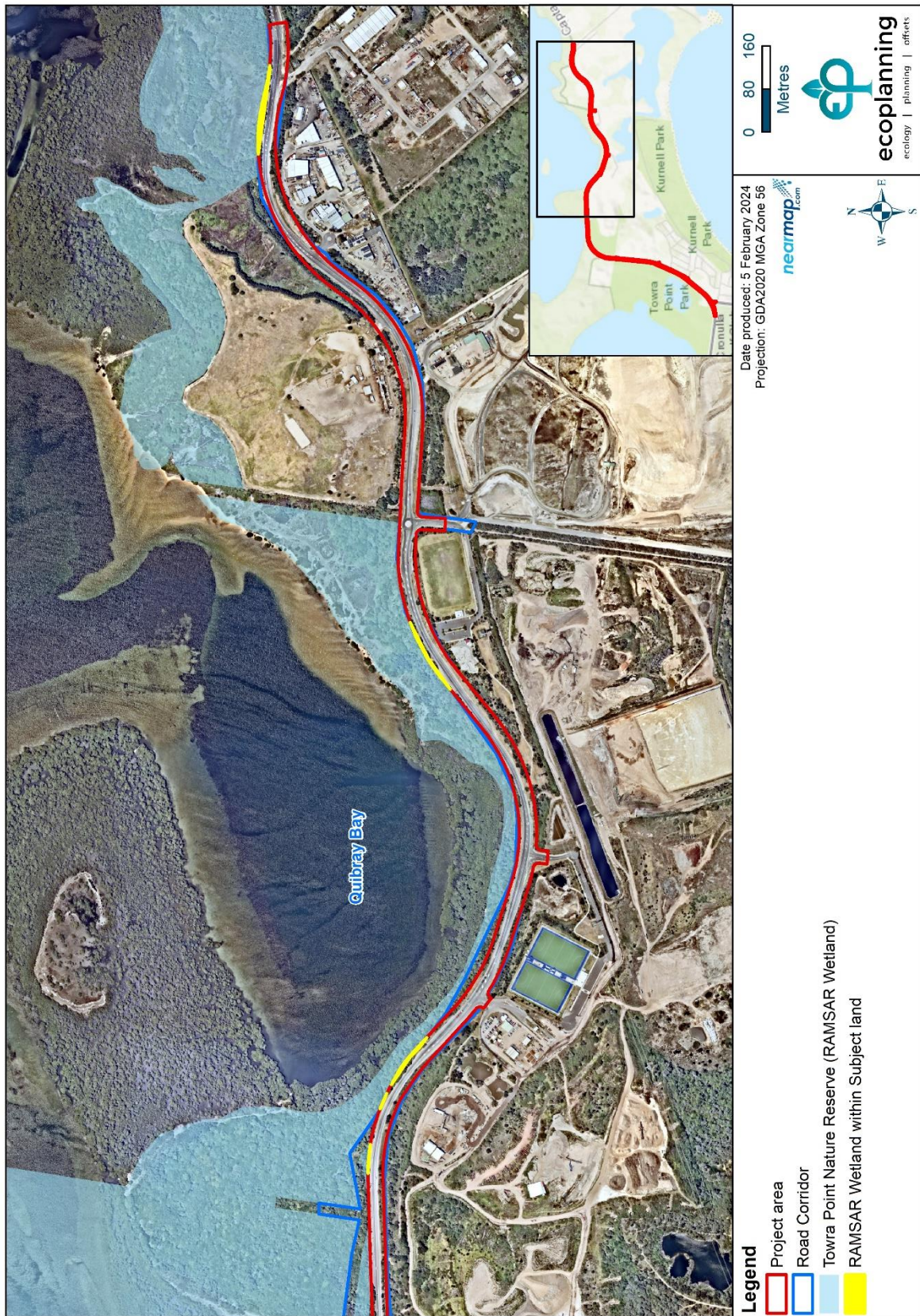


Figure 9: Encroachments in the RAMSAR site (east)



Figure 10: Encroachments in the RAMSAR site (south)



Figure 11: Key fish habitat buffers



Figure 12: Biodiversity values within the Project Area

**Attachment A - Threatened species credit species predicted to occur within PCTs identified within the subject land**

Species	Common name	Distance to nearest record
<b>Flora species</b>		
<i>Acacia terminalis</i> subsp. eastern Sydney	Sunshine Wattle	1.9 km
<i>Ancistrachne maidenii</i>		Not recorded within 5 km
<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	3.2 km
<i>Callistemon linearifolius</i>	Netted Bottle Brush	3.1 km
<i>Chamaesyce psammogeton</i>	Sand Spurge	1 km
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	Not recorded within 5 km
<i>Epacris purpurascens</i> var. <i>purpurascens</i>		2.6 km
<i>Eucalyptus scoparia</i>	Wallangara White Gum	5 km
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	Not recorded within 5 km
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	Not recorded within 5 km
<i>Pterostylis</i> sp. Botany Bay	Botany Bay Bearded Orchid	3.2 km
<i>Senecio spathulatus</i>	Coast Groundsel	0.2 km
<b><i>Syzygium paniculatum</i></b>	<b>Magenta Lilly Pilly</b>	<b>Recorded within subject land</b>
<i>Thelymitra atronitida</i>	Black-hooded Sun Orchid	3.2 km
<i>Wilsonia backhousei</i>	Narrow-leafed Wilsonia	Not recorded within 5 km
<i>Zannichellia palustris</i>		Not recorded within 5 km
<b>Fauna species</b>		
<i>Anthochaera phrygia</i> - breeding	Regent Honeyeater	0.5 km
<i>Ardenna carneipes</i>	Flesh-footed Shearwater (EPBC Act)	0.7 km
<i>Burhinus grallarius</i>	Bush Stone-curlew	1.8 km
<i>Calidris alba</i> – important habitat	Sanderling	1.9 km
<i>Calidris canutus</i> – important habitat	Red Knot	0.1 km
<i>Calidris ferruginea</i> – important habitat	Curlew Sandpiper	0.3 km
<i>Calidris tenuirostris</i> – important habitat	Great Knot	0.3 km
<i>Callocephalon fimbriatum</i> -breeding	Gang-gang Cockatoo	0.5 km
<i>Calyptorhynchus lathami</i> -breeding	Glossy Black-Cockatoo	Not recorded within 5 km
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	4.6 km
<i>Chalinobus dwyeri</i>	Large-eared Pied Bat	Not recorded within 5 km
<i>Charadrius leschenaultii</i> – important habitat	Greater Sand-plover	1.7 km
<i>Charadrius mongolus</i> – important habitat	Lesser Sand-plover	0.7 km



Species	Common name	Distance to nearest record
<i>Crinia tinnula</i>	Wallum Froglet	1.6 km
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	Not recorded within 5 km
<b><i>Epthianura albifrons</i></b>	<b>White-fronted Chat population in the Sydney Metropolitan Catchment Management Area</b>	<b>0.5 km</b>
<i>Esacus magnirostris</i> - breeding	Beach Stone-curlew	2.4 km
<i>Gygis alba</i>	White Tern	3.3 km
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	0 km
<i>Haematopus longirostris</i>	Pied Oystercatcher	0 km
<i>Haliaeetus leucogaster</i> - breeding	White-bellied Sea-Eagle	0 km
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Not recorded within 5 km
<i>Hieraaetus morphnoides</i> - breeding	Little Eagle	Not recorded within 5 km
<i>Hirundapus caudacutus</i>	White-throated Needletail (EPBC Act)	1.4 km
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	Not recorded within 5 km
<i>Hoplocephalus bungaroides</i> - breeding	Broad-headed Snake	Not recorded within 5 km
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	Not recorded within 5 km
<i>Lathamus discolor</i> - breeding	Swift Parrot	0.2 km
<i>Limicola falcinellus</i> - breeding	Broad-billed Sandpiper	1.8 km
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit	4.1 km
<i>Limosa limosa</i> - breeding	Black-tailed Godwit	0.2 km
<b><i>Litoria aurea</i></b>	<b>Green and Golden Bell Frog</b>	<b>0 km</b>
<i>Litoria brevipalmata</i>	Green-thighed Frog	Not recorded within 5 km
<i>Lophoictinia isura</i> - breeding	Square-tailed Kite	0 km
<i>Meridolum maryae</i>	Maroubra Woodland Snail	1.8 km
<i>Miniopterus australis</i> - breeding	Little Bent-winged Bat	0.1 km
<i>Miniopterus schreibersii oceanensis</i> - breeding	Eastern Bent-winged Bat	0.7 km
<i>Myotis macropus</i>	Southern Myotis	0.7 km
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	Not recorded within 5 km
<i>Ninox connivens</i> - breeding	Barking Owl	Not recorded within 5 km
<i>Ninox strenua</i> - breeding	Powerful Owl	0.2 km
<i>Numenius madagascariensis</i>	Eastern Curlew	0 km
<i>Onychoprion fuscata</i>	Sooty Tern	0.7 km
<i>Pandion cristatus</i> - breeding	Eastern Osprey	0.1 km
<i>Petaurus norfolcensis</i>	Squirrel Glider	Not recorded within 5 km
<i>Pezoporus wallicus wallicus</i>	Eastern Ground Parrot	Not recorded within 5 km
<i>Phascolarctos cinereus</i> - breeding	Koala	2.4 km

Species	Common name	Distance to nearest record
<i>Pseudophryne australis</i>	Red-crowned Toadlet	3.6 km
<i>Pteropus poliocephalus</i> - breeding	Grey-headed Flying-fox	Recorded within subject land
<i>Puffinus assimilis</i>	Little Shearwater (EPBC Act)	1.9 km
<i>Sternula albifrons</i>	Little Tern	0 km
<i>Thinornis cucullatus cucullatus</i>	Eastern Hooded Dotterel	0.4 km
<i>Tyto novaehollandiae</i> - breeding	Masked Owl	1.3 km
<i>Tyto tenebricosa</i> - breeding	Sooty Owl	Not recorded within 5 km
<i>Vespadelus trougtoni</i>	Eastern Cave Bat	Not recorded within 5 km
<i>Xenus cinereus</i> - breeding	Terek Sandpiper	0.2 km



**Attachment B: Response to agency comments relevant to the widening of Captain Cook Drive**

**Table 6: Agency comments relevant to the proposal widening of Captain Cook Drive**

Agency comment		Response
Issue	Documentation	
<b>NSW National Parks &amp; Wildlife Service</b>		
<p>1. Towra Point Nature Reserve (TPNR)</p> <ul style="list-style-type: none"> <li>• A wetland of international significance. Australia has obligations under four international agreements to protect the wetlands and its birdlife</li> <li>• Assessments must identify the potential direct, indirect and cumulative impacts on the ecological character of the TPNR</li> <li>• Increased human activity</li> <li>• The planning Proposal should address the relevant strategic documents               <ul style="list-style-type: none"> <li>- The Towra Point Nature Reserve Plan of Management (NPWS 2001)</li> <li>- The Towra Point Nature Reserve Ramsar site: Ecological character description (DECCW 2010)</li> </ul> </li> <li>• The Ramsar site boundaries show in Figure 5 of the Captain Cook Drive Ecological Constraints Assessment is not consistent with the Australia Government's Mapping</li> </ul>	<p>Revised Planning Proposal, Planning Report, Masterplan and other documents that:</p> <ul style="list-style-type: none"> <li>• Correctly depicts the boundaries of the TPNR Ramsar Site</li> <li>• Consider relevant strategic documents applicable to TPNR</li> <li>• Are informed by the results of adequate technical studies in considering the direct, indirect and cumulative impacts of the proposed document on the internationally important wetland and its value</li> </ul> <p>These documents should be supported by an assessment of the impacts on the Ramsar site, consistent with the Australian Government's <i>Significant Impact Guidelines 1.1 – Matters of National Environmental Significance</i></p>	<p>Mapping has been updated. Refer to figures above.</p> <p>The ECA was a high level constraints assessment for the proposed concept design to widening of Captain Cook Drive.</p> <p>An impact assessment (i.e. FFA or BDAR) will address the direct, indirect and cumulative impacts of the detailed design to widen Captain Cook Drive and other relevant strategic documents.</p>

Agency comment		Response
Issue	Documentation	
<p>5. Biodiversity assessments</p> <ul style="list-style-type: none"> <li>• NPWS supports statements made by the Biodiversity Conservation Division, identifying discrepancies and deficiencies in the ecological assessment and proposed widening of Captain Cooks Drive</li> <li>• NPWS advises the following concerns <ul style="list-style-type: none"> <li>- The mapping of threatened species in the SEPP Amendment, the Biodiversity Assessment report and the Captain Cook Drive ECA are not correct and do not appear to be based on publicly available information from BioNet. Current BioNet data reveal several more species being recorded in proximity to Captain Cook Drive and the development site</li> <li>- Notable examples include Little Terns (known to breed on Lot 2 south), Eastern Osprey and a wide range of shorebirds (recorded in Lot 2 South) and White-fronted Chat (recorded in Towra Point Nature Reserve)</li> <li>- Road widening of Captain Cook Drive is likely to destroy more than 6 Magenta Lilly Pilly trees identified in the assessments – this species occurs along a more extensive area of roadside than indicated</li> </ul> </li> </ul>	<p>Updated surveys carried out in accordance with BAM survey guidelines (including but not limited to the “NSW survey guide for threatened frog species) and as required by Stage 1 of the BAM</p>	<p>The ECA has updated information on threatened species, and includes records of the species named, along with additional species.</p> <p>A limited amount of survey was conducted to inform the ECA at the concept design stage. The ECA acknowledges that more survey is likely to be required to inform a FFA or BDAR at the detailed design stage.</p> <p>For some candidate species, input from a BAM accredited species expert may be sought in the absence of survey. Ross Wellington (Australian Environmental Surveys) has written a letter describing the habitat value and likely occurrence of Green and Golden Bell Frog. Ross is a BAM accredited expert for Green and Golden Bell Frog.</p>



Agency comment		Response
Issue	Documentation	
<p>in Figure 2 of the ECA, Captain Cook Drive</p> <ul style="list-style-type: none"> <li>- Wet conditions experienced in the past few years may have assisted the spread of Green and Golden Bell Frogs in the local area, and that targeted survey (last conducted in 2018 but not to the effort required under public guidelines) should be repeated.</li> </ul>		
<p>6. Referral to Australian Government</p> <ul style="list-style-type: none"> <li>• Development of this site is likely to be identified as a controlled action under the Commonwealth EPBC Act due to potential impacts on: <ul style="list-style-type: none"> <li>- The ecological integrity of the adjacent Ramsar Site</li> <li>- Important roosting and foraging habitat for migratory species listed in international agreements.</li> </ul> </li> </ul>	<p>Referral to the Australian Government should be recommended.</p>	<p>An assessment of the detailed design of the proposal will recommend if the project should be referred to the Commonwealth DCCEEW. If the project is referred to the Commonwealth, the Commonwealth Minister will determine if the project is a controlled action, non-controlled action particular manner, or a non-controlled action</p>
<p><b>SUTHERLAND COUNCIL – Environmental Science Unit</b></p>		
<p>8. While Lot 2 South has little remnant vegetation, the required widening of Captain Cook Drive will require removal of significant vegetation, including endangered ecological communities. Provision of any required offsets shall be written within the Kurnell</p>		<p>A FFA or BDAR will be prepared to assess the impact at the detailed design stage.</p> <p>A BDAR will document the measures to avoid and minimise impacts to native vegetation, mitigation measure and the</p>



Agency comment		Response
Issue	Documentation	
peninsula, particularly within Lot 2 and areas of Lot 2 South, rather than at a remote site under the BOS.		<p>number of credits required to offset impacts that cannot be avoided or minimised, determined by the BAM-C. While there are standard rules concerning the purchase and retiring of credits, the consent authority can condition additional requirements.</p> <p>The quantum of credits that may be required to offset impacts, and the credit generation potential of a stewardship site on the Kurnell Peninsula are yet to be determined. A landscape master plan will be prepared that outlines the areas where native vegetation, consistent with native vegetation of the Kurnell Peninsula, will be located.</p>
10. The Conservation Area is also home to threatened microbat species, including Eastern Bentwing, Little Bentwing, and Southern Myotis, and the endangered Green and Golden Bell Frog		<p>The impact assessment of the detailed design for the proposal road widening will address impact to these species.</p> <p>A letter report by Ross Wellington (Australian Environmental Surveys), BAM accredited expert for Green and Golden Bell Frog, described the area of suitable habitat along the Project Area and measures to mitigate the impact of the proposed road widening. He considered poor quality habitat and movement corridors adjacent to Captain Cook Drive.</p>



Agency comment		Response
Issue	Documentation	
13. <i>Petalura gigantea</i> (giant dragonfly) is an endangered species, listed under the BC Act in NSW. The Australian Museum has records of this species at TPNR ( <b>Figure 3</b> ). This species is not reference in any of the biodiversity reports.		There are not records in BioNet within 5 km of the proposal.
14. Appropriate buffers shall be provided to wetlands in accordance with the Resilience and Hazardous SEPP as well as Council's DCP Chapter 39 Natural Resources Management		Captain Cook Drive lies within the proximity area for coastal wetlands.
65. Where practical, vegetation that includes a mix of shrubs and trees shall be provided along all roads to help "filter" dust and particulars, as well as provide amenity and reduce heat island impacts.		A planting palette can be provided in mitigation measures in the impact assessment report for the proposed road widening based on adjoining PCTs.
<b>Biodiversity Conservation Division</b>		
<p>3 Biodiversity Assessment Captain Cook Drive</p> <p>Key deficiencies with the updated ECA for the proposed widening of Captain Cook Drive, Kurnell, NSW .....dated 20 February 2020</p> <ul style="list-style-type: none"> <li>Inadequate survey of <i>Syzygium paniculatum</i> and survey and identification of TECs</li> <li>The existing assessment does not consider the proposed development and the induced large increase in vehicle traffic</li> <li>EHG has concerns with drainage and runoff from the road in terms of water quality and</li> </ul>	<p>Biodiversity Assessment undertaken in accordance with Stage 1 and 2 of the BAM.</p> <p>Updated surveys carried out in accordance with BAM survey guidelines (including but not limited to the NSW survey guide for threatened frog species) and as required by Stage 1 of the BAM.</p>	<p>The ECA has not been prepared to satisfy Stage 1 of the BAM. It provides a high level assessment of the concept stage for the proposed widening of Captain Cook Drive</p> <p>A FFA or BDAR will be prepared at the detailed design stage of the project. The assessment is likely to require further survey and assessment in accordance with Stage 1 of the BAM.</p>

Agency comment		Response
Issue	Documentation	
<p>quantity and that the proposed road widening would extend beyond the existing road reserve</p> <ul style="list-style-type: none"> <li>• The maps describing threatened species are incorrect. Threatened species maps identify multiple species in the area</li> <li>• TPNR is a no access reserve set aside for conservation and research. Having these developments adjoining the reserve could create irreversible damage to the reserve due to the increased urban pressures and allowing access to the Ramsar Site</li> <li>• Impacts to Ramsar Site TPNR have not been adequately addressed</li> <li>• Potential indirect impacts on adjacent ecological sensitive receivers (such as estuarine and marine ecological communities, including Ramsar-listed areas and species) are most concerning. EHG disagrees that indirect impacts including those associated with noise and light would be minor. There are adjacent sensitive receivers such as estuarine and marine ecological communities, including Ramsar-listed areas and species. An adequate assessment of such impacts must be undertaken</li> <li>• Impacts to threatened species and ecological communities have not been adequately identified or assessed.</li> </ul>		





Agency comment		Response
Issue	Documentation	
<ul style="list-style-type: none"> <li>The road widening of Captain Cook Drive would destroy several endangered Magenta Lilly Pilly trees that are not currently mapped or identified in the assessment.</li> </ul>		
<b>NSW Department of Primary Industries - Fisheries</b>		
<p>1. The Department of Primary Industries, Fisheries is responsible for the <i>Marine Estate Management Act 2014</i> (MEM Act) and the <i>Fisheries Management Act 1994</i> (FM Act). Neither of these Acts have been considered in this proposal and DPI Fisheries has not been consulted on the scoping proposal or the masterplan. This proposal triggers the MEM Act and is also likely to trigger the FM Act.</p> <p>2. Application of the <i>Environmental Planning and Assessment Act 1979</i> for development affecting and/or in the locality of aquatic reserves is set out in s.56 of the <i>Marine Estate Management Act 2014</i>, including obligations for consent authorities and determining authorities.</p> <p>3. Two aquatic reserves exist adjacent to the site – Towra Point Aquatic Reserve and Boat Harbour Aquatic Reserve. Under the MEM Act, the primary purpose of aquatic reserves is to protect the biological diversity in these areas or components of biological diversity (such as specific ecosystems, communities or species). The MEM Act states that other purposes are secondary and must be consistent with the primary</p>	<p>Marine Estate Management Act 2014 and the Fisheries Management Act 1994.</p> <p>Policy and guidelines for fish habitat conservation and management (2013)</p> <p>All planning and technical documents must identify and consider the presence of the aquatic reserves adjacent to this site. This needs to include an outline of the direct, indirect and cumulative impacts on the values of the aquatic reserves and threatened and protected species, communities and populations.</p> <p>The aquatic reserves, adjacent foreshore communities, Ramsar wetland and the SEPP-identified buffer zones need to be part of any mapping presented and particularly maps of the 'ecological assets'.</p> <p>Federal and NSW threatened species legislation and listings of relevant species, communities and populations.</p>	<p>This ECA identifies the need to consider the matters described.</p> <p>The ECA recommends that the proposed widened road avoid sensitive environments north and west of the existing road.</p> <p>The impact assessment for the proposed widening must address the direct, indirect and cumulative impacts on the environment.</p>

Agency comment		Response
Issue	Documentation	
<p>purpose. Any proposals to develop the land adjacent to an aquatic reserve or proposals intending to access the aquatic reserves must be consistent with the primary purpose of aquatic reserves.</p> <p>5. In particular, the northern section of the proposed site is adjacent to Quibray Bay which is a Sanctuary Zone within Towra Point Aquatic Reserve. This zone includes and is adjacent to numerous sensitive, threatened and protected species, communities and populations, and key fish habitat including fish nurseries. These are important socially and economically as well as environmentally for a range of reasons including the importance of fish habitat to local fisheries. Many of the species protected here do not tolerate disturbance. The Sanctuary Zone also links with a Ramsar wetland, the only one in the Sydney region.</p>	<p>Ramsar wetland implications.</p> <p>Coastal Management SEPP. Aquatic Reserves and SEPP Coastal Wetlands are considered TYPE 1 key fish habitat.</p>	
<p>6. Best practice development of this site should ensure the conservation and improvement of aquatic biodiversity by:</p> <ul style="list-style-type: none"> <li>Protecting all aquatic habitats including intertidal habitats.</li> <li>Protecting and improving foreshore communities to enhance the biodiversity values of the aquatic reserves.</li> <li>Allowing for setbacks/buffer zones from the aquatic reserves and Towra Point Nature</li> </ul>	<p>As above</p>	<p>As above.</p>

Agency comment		Response
Issue	Documentation	
<p>Reserve by dedicating land adjacent to the aquatic reserves and nature reserve, to NP&amp;WS or Council. This would involve rezoning to E1 and E2. This would help protect and enhance the biodiversity and fish habitat values of these important wetland areas and allow for upslope movement of protected aquatic and foreshore communities with sea level rise (SLR). Currently, with different SLR mapping scenarios, there will be a significant loss of valuable wetland communities in Botany Bay and dedicated retreat areas are needed to reduce this loss.</p> <ul style="list-style-type: none"> <li>• Planning for ecological connectivity between freshwater, groundwater, land and estuarine/marine environments. Noting that some estuarine species rely on groundwater flows, particularly saltmarsh communities fringing Quibray Bay.</li> <li>• Protecting or improving water quality through water sensitive urban design, adequate stormwater treatment and best practice erosion and sediment control measures during construction.</li> <li>• Keeping stormwater treatment structures, pathways, cycle paths and other infrastructure etc outside the buffer zones mentioned above to maximise biodiversity values and therefore</li> </ul>		



Agency comment		Response
Issue	Documentation	
set back more than 100 m from the aquatic reserves.		
8. It has been identified in the document “Ecological Constraints Assessment, Captain Cook Drive, Kurnell” that road widening activities may impact marine vegetation such as mangroves and saltmarsh. It is unclear if upgrades to services such as power, sewer and water may also impact marine vegetation. Harm to marine vegetation is a prohibited activity and would not be permitted within aquatic reserves. Harm in adjacent areas is not appropriate due to a reduction in biodiversity and fish habitat values within the locality of an aquatic reserve and loss of areas for retreat with SLR. Alternative designs need to be determined. Permits for harm to marine vegetation would be required under the FM Act.	As above	As above
<b>Transport for NSW</b>		
There is limited biodiversity information presented in the material provided. On the face of the information at hand, the proposal has the potential to have biodiversity impacts at both NSW and Commonwealth level	Kurnell Peninsula Planning Captain Cook Drive Widening Assessment, Road Widening Designs (Diversi Consulting Revision B, 4 September 2023)	Correct. The ECA identifies a number of location, state, national and international ecological values. An impact assessment is required to assess the direct, indirect and cumulative impacts of the proposal on these matters.
Road design options would best avoid impacts on Taren Point Nature Reserve which appear to cover the SEPP wetlands at this location.	Kurnell Peninsula Planning Captain Cook Drive Widening Assessment, Road Widening Designs (Diversi Consulting Revision B, 4 September 2023)	The ECA recommends avoiding environmentally sensitive areas north and west of the existing road.

Agency comment		Response
Issue	Documentation	
Impacts to the Nature Reserve will likely require parliamentary revocation. Impacts to the SEPP wetlands will likely require an Environmental Impact Statement and likely trigger the NSW Biodiversity Offset Scheme.		The ECA indicates the likely assessment pathway, which includes a BDAR to assess the impacts of the proposal on the environment.

