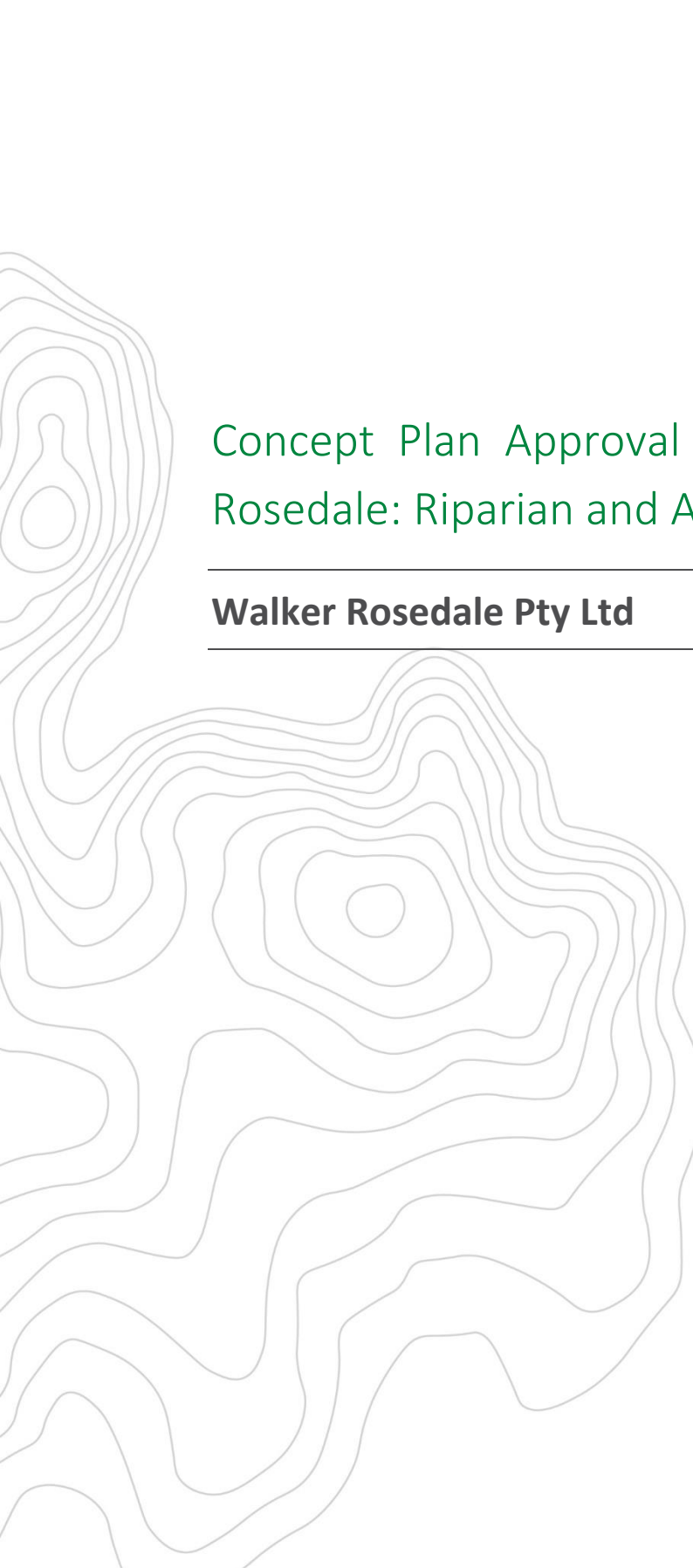


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Concept Plan Approval Modification - Bevia Road, Rosedale: Riparian and Aquatic Assessment

Walker Rosedale Pty Ltd

DOCUMENT TRACKING

Project Name	Concept Plan Approval Modification - Bevia Road, Rosedale: Riparian and Aquatic Assessment
Project Number	22SUT3158
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Status	Final
Version Number	V3
Last saved on	15 April 2025

This report should be cited as 'Eco Logical Australia 2024. *Concept Plan Approval Modification - Bevia Road, Rosedale: Riparian and Aquatic Assessment*. Prepared for Walker Rosedale Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Walker Rosedale Pty Ltd and Enspire Solutions

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Template 2.8.1

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Abbreviations

Abbreviation	Description
DCCEEW	NSW Department of Climate Change, Energy, the Environmental and Water – Water Group
DCP	Eurobodalla Residential Zones Development Control Plan 2011
ELA	Eco Logical Australia Pty Ltd
FM Act	<i>Fisheries Management Act 1994</i>
GPS	Global Positioning System
LEP	Eurobodalla Local Environmental Plan 2012
RC	Riparian Corridor (channel plus VRZ on each side)
VMP	Vegetation Management Plan
VRZ	Vegetated Riparian Zone (measured from top of bank)
WM Act	<i>Water Management Act 2000</i>

1. Introduction

Walker Rosedale Pty Ltd (Walker) propose a modification of the 2008 Concept Plan Approval (application number 05_0199) for a residential subdivision at Bevia Road, Rosedale, NSW. The modification sought is from the Part 3A Concept Approval for a Community Title Subdivision for residential development and ancillary commercial and community facilities, ecological stewardship, public roads and open space areas yielding a total of 792 residential lots (reference number 05_0199), to a Torrens title development that includes residential development and ancillary commercial facilities, public roads, public open areas and residual rural lot yielding a total of 792 residential lots inclusive of the 51 Torrens title residential lots recently constructed and registered as part of stage 1 (DA305/18). For the purposes of the modification, stage 1 is excluded from further consideration.

Eco Logical Australia (ELA) was engaged by Walker to provide a field-validated riparian assessment for their proposed development site at Bevia Road, Rosedale NSW 2536 (Figure 1, the study area). ELA collaborated with the design team to incorporate riparian corridors into the concept plan (Figure 2). This report gives the following information on the study area:

- Riparian impacts relevant to the *NSW Water Management Act 2000* (WM Act)
- Riparian impacts relevant to the Eurobodalla Local Environmental Plan 2012 and Eurobodalla Residential Zones Development Control Plan 2011
- Aquatic impacts relevant to the *NSW Fisheries Management Act 1994* (FM Act) and *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Overall impacts to waterways and coastal wetlands relevant to the *NSW Coastal Management Act 2016* (CM Act) and *State Environmental Planning Policy (Resilience and Hazards SEPP) 2021*
- Recommendations to mitigate potential impacts to the riparian and aquatic habitat during construction and operation.

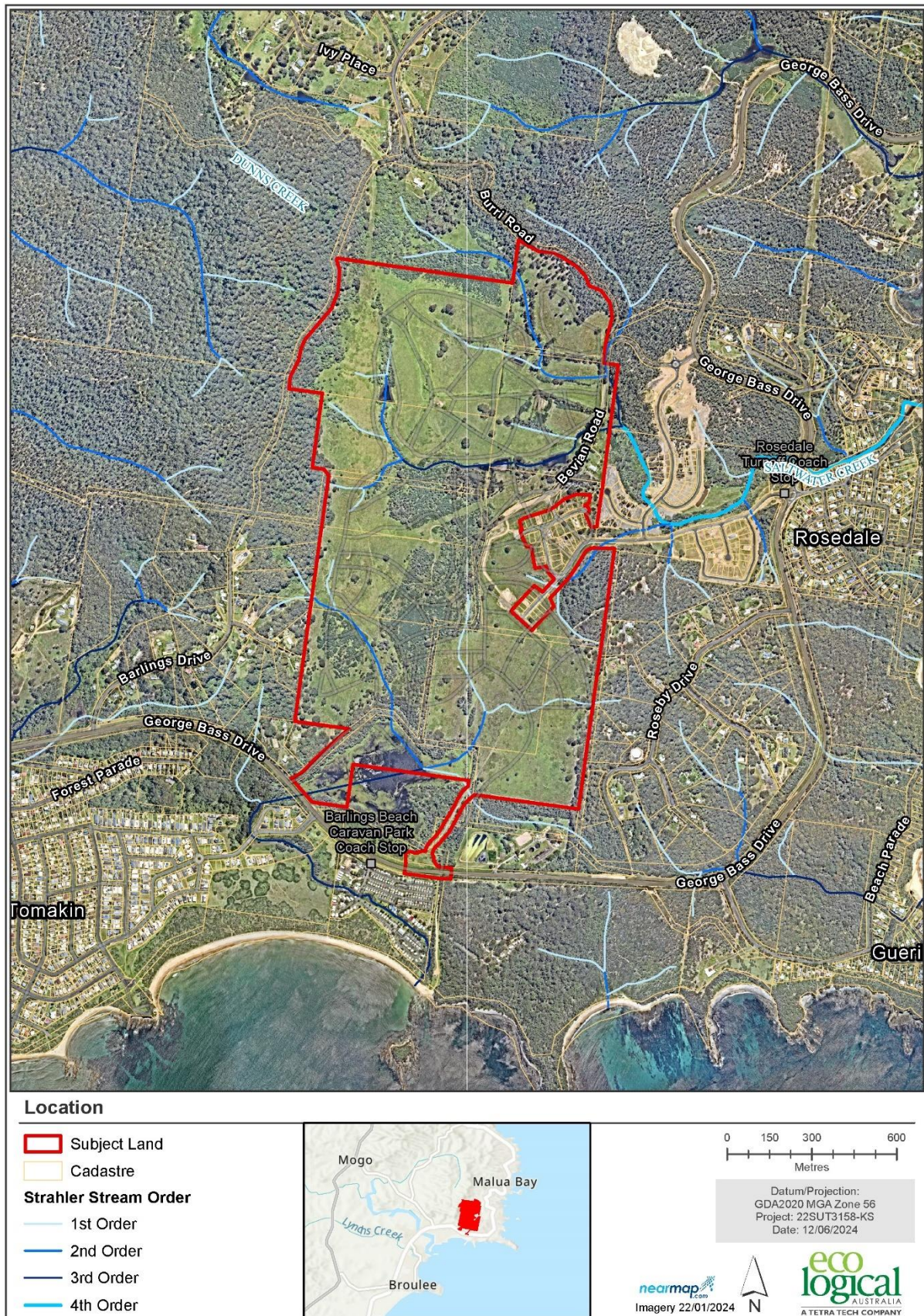


Figure 1: Location of proposed development area (study area)



Figure 2: Proposed concept plan (Drawing number AA_01, April 2025)

2. Statutory context

2.1. Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Under the EPBC Act, the Commonwealth Environment Minister needs to approve any development that is likely to have a significant impact on Matters of National Environmental Significance (MNES). Should such an impact, as defined in the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines (Department of the Environment 2013), be likely, the preparation and submission of a Referral is required. MNES relevant to this study includes threatened ecological communities, flora and fauna species and migratory species that are listed under the act. The proposed work would not cause a significant impact to aquatic species, and therefore a Referral is not recommended for impacts to aquatic species. For terrestrial matters, see the Biodiversity Development Assessment Report (ELA 2024).

2.2. NSW Environmental Planning and Assessment Act 1979 (EP&A Act)

All developments in NSW are assessed in accordance with the provisions of the EP&A Act and the *Environmental Planning and Assessment Regulation 2021*. The EP&A Act provides a system for environmental planning and assessment, including approvals and environmental impact assessment requirements for proposed developments. Implementation of the EP&A Act is the responsibility of the Minister for Planning, statutory authorities and local councils.

2.3. NSW Biodiversity Conservation Act 2016 (BC Act)

Terrestrial biodiversity values, and flora and fauna listed under the BC Act are addressed in the Biodiversity Development Assessment Report (ELA 2024).

2.4. NSW Wetlands Management Policy 2010

The NSW Wetlands Management Policy (DECCW 2010) aims to provide for the protection, ecologically sustainable use and management of NSW wetlands. Wetlands include lakes, lagoons, estuaries, rivers, floodplains, swamps, bogs, billabongs, marshes, coral reefs and seagrass beds. Wetlands within the study area occur within the riparian corridor and Bevia Road coastal wetland.

2.5. NSW Water Management Act 2000 (WM Act)

The WM Act aims to protect and use NSW water in a way that is sustainable and holistic, which will help present generations without harming the ability of future generations to satisfy their needs. The NSW Department of Climate Change, Energy, the Environmental and Water (DCCEEW) – Water Group administers licencing and approvals for controlled activities on ‘waterfront land’, which is defined as the land 40 m from the highest bank of a river, lake or estuary published on the Department’s website (Water Management (General) Regulation 2018 hydroline spatial data 1.0), known as the ‘hydroline’. Apart from the exceptions stated in Schedule 4, Part 2 of the Water Management (General) Regulation 2018, controlled activities are:

- the construction of buildings or carrying out of works
- the removal of material or vegetation from land by excavation or any other means

- the deposition of material on land by landfill or otherwise
- any activity that affects the quantity or flow of water in a water source.

The *Guidelines for Controlled Activities on Waterfront Land—Riparian Corridors* (DPE 2022) outlines the need for a Vegetated Riparian Zone (VRZ) adjacent to the channel to provide a transition zone between the terrestrial environment and watercourse. This vegetated zone helps maintain and improve the ecological functions of a watercourse whilst providing habitat for terrestrial flora and fauna. The VRZ plus the channel (bed and banks of the watercourse to the highest bank) constitute the 'riparian corridor' (Figure 3). VRZ widths are applied to each stream order, using the Strahler system of ordering watercourses calculated from the published 'hydroline' (Table 1).

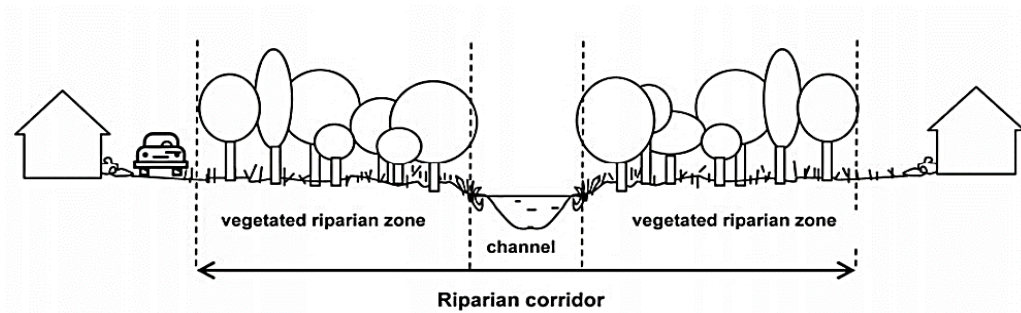


Figure 3: Vegetated riparian zone and watercourse channel comprising the riparian corridor (DPE 2022)

Table 1: Recommended riparian corridor widths relative to Strahler stream order (DPE 2022)

Watercourse type	VRZ width (each side of watercourse)	Total riparian corridor width
1 st order	10 m	20 m + channel width
2 nd order	20 m	40 m + channel width
3 rd order	30 m	60 m + channel width
4 th order and greater (includes estuaries, wetlands and any parts of rivers influenced by tidal waters)	40 m	80 m + channel width

Certain works are permissible within the riparian zone if specific design criteria are met (Table 2 and key below). Non-riparian uses in the outer 50% of the VRZ are permitted as long as compensation (1:1 offset) is achieved within the site using the 'averaging rule' (Figure 4).

Table 2: Riparian corridor (RC) matrix of permissible use (DPE 2022)

Stream order	Vegetated Riparian Zone (VRZ)	RC offsetting for non RC uses	Cycleways and paths	Detention basins		Stormwater outlet structures and essential services	Stream realignment	Road crossings		
				Only within 50% outer VRZ	Online			Any	Culvert	Bridge
1 st	10 m	•	•	•	•	•	•	•		
2 nd	20 m	•	•	•	•	•		•		
3 rd	30 m	•	•	•		•			•	•
4 th +	40 m	•	•	•		•			•	•

Key to riparian corridor matrix

Stream order: The watercourse order as classified under the Strahler system based on Hydroline Spatial Data published on the Department's website¹ when zoomed in at a scale of 2 km or less. A stream may separate and then converge—this is called a 'braided stream'. A braided stream retains the same stream order throughout the braid, as though it were a single stream. For the riparian guidelines, stream order is fixed and is not to be altered if an upstream hydroline is not considered waterfront land.

Vegetated riparian zone (VRZ): The required width of the VRZ measured from the top of the high bank on each side of the watercourse.

Riparian corridor (RC) off-setting for non RC uses: Non-riparian uses, such as bushfire Asset Protection Zones, roads and urban development are allowed within the outer 50% of the VRZ, so long as offsets are provided in accordance with the averaging rule as seen in Figure 4.

Cycleways and paths: Cycleways or paths no wider than four metres total disturbance footprint can be built in the outer 50% of the VRZ.

Detention basins: Detention basins can be built in the outer 50% of the VRZ or online where indicated. Offline detention basins do not need to be offset so long as there is an equivalent VRZ for the corresponding watercourse and they are built in compliance with the department's Guidelines for watercourse crossings and Guidelines for in-stream works. If a proposed basin will not have an equivalent VRZ for the corresponding watercourse, it may still be built in the outer 50% of the VRZ but must be offset. Online basins must:

- be dry and vegetated
- be for temporary flood detention only with no permanent water holding
- have an equivalent VRZ for the corresponding watercourse order
- not be used for water quality treatment purposes.

Stormwater outlet structures and essential services: Stormwater outlets or essential services are allowed in the RC. Works for essential services on a fourth order or greater stream are to be undertaken by directional drilling or tied to existing crossings.

Stream realignment: Indicates that a watercourse may be realigned.

Road crossings: Indicates permitted road crossing methods. Also refer to DPI Fisheries policy and guidelines for fish friendly waterway crossings (Fairfull 2013, discussed below in Section 2.6).

¹ <https://www.industry.nsw.gov.au/water/licensing-trade/hydroline-spatial-data>

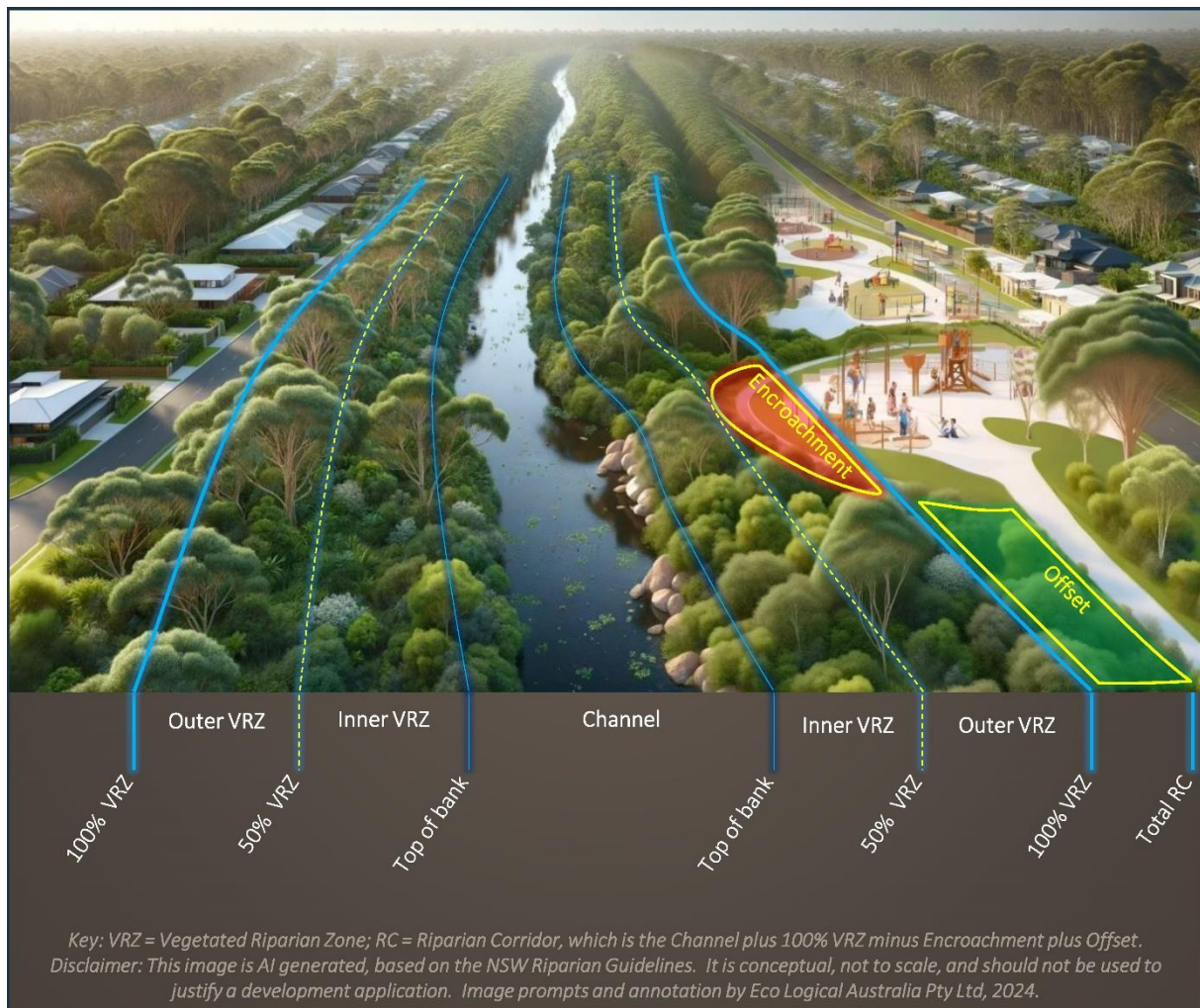


Figure 4: Riparian 'averaging rule' for offsetting encroachment into the outer 50% of the VRZ (adapted from DPE 2022)

2.6. NSW Fisheries Management Act 1994 (FM Act) and Policy and guidelines for fish habitat conservation and management

The FM Act is the principal piece of legislation protecting aquatic habitat in NSW. The act aims to conserve fish stocks, key fish habitat, aquatic vegetation, and threatened species, populations and communities. Threatened aquatic species, populations and communities are listed under Schedules 4, 4A and 5 of the FM Act, while key threatening processes are listed under Schedule 6. If works involve harm to aquatic habitat, then the proponent is required to demonstrate how the design and works have attempted to avoid, minimise and mitigate direct and indirect harm, plus apply the DPI Fisheries' offset policy to ensure there is no net loss of key fish habitat, as described in Section 3.3.3 of the *Policy and Guidelines for Fish Habitat Conservation and Management* (Fairfull 2013).

The *Policy and Guidelines for Fish Habitat Conservation and Management* is a supplementary document that outlines the requirements and obligations under the FM Act and the *Fisheries Management (General) Regulation 2010*, and were developed to maintain and enhance fish habitat and assist in the protection of threatened species. The policy provides a definition of key fish habitat and provides guidance for assigning a classification of waterways for fish passage, which informs the types of

infrastructure suitable for the creekline (Table 3) and sensitivity of the key fish habitat present, which determines the potential disturbance and offsetting required for development (Table 4).

Table 3: Classification of waterways for fish passage and crossing type (Fairfull 2013)

Classification	Characteristics of waterway class and preferred crossing type
CLASS 1 Major key fish habitat	Marine or estuarine waterway or permanently flowing or flooded freshwater waterway (e.g. river or major creek), habitat of a threatened or protected fish species or 'critical habitat'. Recommended crossing type: bridge, arch structure or tunnel. Bridges are preferred to arch structures.
CLASS 2 Moderate key fish habitat	Non-permanently flowing (intermittent) stream, creek or waterway (generally named) with clearly defined bed and banks with semi-permanent to permanent waters in pool or in connected wetland areas. Freshwater aquatic vegetation is present. TYPE 1 and 2 habitats present. Recommended crossing type: bridge, arch structure, culvert ^[1] or ford. Bridges are preferred to arch structures, box culverts and fords (in that order).
CLASS 3 Minimal key fish habitat	Named or unnamed waterway with intermittent flow and sporadic refuge, breeding or feeding areas for aquatic fauna (e.g. fish, yabbies). Semi-permanent pools form within the waterway or adjacent wetlands after a rain event. Otherwise, any minor waterway that interconnects with wetlands or other CLASS 1-3 fish habitats. Recommended crossing type: culvert ^[2] or ford. Box culverts are preferred to fords and pipe culverts (in that order).
CLASS 4 Unlikely key fish habitat	Waterway (generally unnamed) with intermittent flow following rain events only, little or no defined drainage channel, little or no flow or freestanding water or pools post rain events (e.g. dry gullies or shallow floodplain depressions with no aquatic flora present). Recommended crossing type: culvert ^[3] , causeway or ford. Culverts and fords are preferred to causeways (in that order).

Key to crossing type

^[1] High priority given to the 'High Flow Design' procedures presented for the design of these culverts—refer to the "Design Considerations" section of Fairfull and Witheridge 2003.

^[2] Minimum culvert design using the 'Low Flow Design' procedures; however, 'High Flow Design' and 'Medium Flow Design' should be given priority where affordable—refer to the "Design Considerations" section of Fairfull and Witheridge (2003).

^[3] Fish friendly waterway crossing designs possibly unwarranted. Fish passage requirements should be confirmed with NSW DPI.

As noted in Fairfull and Witheridge 2003, there are additional factors that must be taken into consideration by those involved in waterway crossing design and construction, including public safety, social and budgetary constraints. Each crossing is therefore assessed by NSW DPI on a case-by-case basis.

Table 4: Key fish habitat types (Fairfull 2013)

Key fish habitat and associated sensitivity classification scheme (for assessing potential impacts of certain activities and developments on key fish habitat types)	
TYPE 1 – Highly sensitive key fish habitat:	
	<i>Posidonia australis</i> (strapweed)
	<i>Zostera</i> , <i>Heterozostera</i> , <i>Halophila</i> and <i>Ruppia</i> species of seagrass beds >5 m ² in area
	Coastal saltmarsh >5 m ² in area
	Coral communities
	Coastal lakes and lagoons that have a natural opening and closing regime (i.e. are not permanently open or artificially opened or are subject to one off unauthorised openings)
	Marine park, an aquatic reserve or intertidal protected area
	SEPP 14 coastal wetlands*, wetlands recognised under international agreements (e.g. Ramsar, JAMBA, CAMBA, ROKAMBA wetlands), wetlands listed in the Directory of Important Wetlands of Australia
	Freshwater habitats that contain in-stream gravel beds, rocks greater than 500 mm in two dimensions, snags greater than 300 mm in diameter or 3 metres in length, or native aquatic plants
	Any known or expected protected or threatened species habitat or area of declared 'critical habitat' under the FM Act
	Mound springs
TYPE 2 – Moderately sensitive key fish habitat:	
	<i>Zostera</i> , <i>Heterozostera</i> , <i>Halophila</i> and <i>Ruppia</i> species of seagrass beds <5 m ² in area
	Mangroves
	Coastal saltmarsh <5 m ² in area
	Marine macroalgae such as <i>Ecklonia</i> and <i>Sargassum</i> species
	Estuarine and marine rocky reefs
	Coastal lakes and lagoons that are permanently open or subject to artificial opening via agreed management arrangements (e.g. managed in line with an entrance management program)
	Aquatic habitat within 100 m of a marine park, an aquatic reserve or intertidal protected area
	Stable intertidal sand/mud flats, coastal and estuarine sandy beaches with large populations of in-fauna
	Freshwater habitats and brackish wetlands, lakes and lagoons other than those defined in TYPE 1
	Weir pools and dams up to full supply level where the weir or dam is across a natural waterway
TYPE 3 – Minimally sensitive key fish habitat:	
	Unstable or unvegetated sand or mud substrate, coastal and estuarine sandy beaches with minimal or no in-fauna
	Coastal and freshwater habitats not included in TYPES 1 or 2
	Ephemeral aquatic habitat not supporting native aquatic or wetland vegetation

*SEPP 14 coastal wetlands are now named Resilience and Hazards SEPP coastal wetlands

2.7. NSW Coastal Management Act 2016 (CM Act) and State Environmental Planning Policy (Resilience and Hazards SEPP) 2021

The objectives of the CM Act are to manage the coastal environment of NSW in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State. Part 2 of the CM Act identifies objectives related to four coastal management areas of the 'coastal zone':

1. Coastal wetlands and littoral rainforests area
2. Coastal vulnerability area
3. Coastal environment area
4. Coastal use area.

The *State Environmental Planning Policy (Resilience and Hazards) 2021*, maps these four coastal zones, plus a fifth 'land in proximity to coastal wetlands' and provides development controls under Part 2.2. Where zones overlap, the management objectives are resolved in favour of the highest-ranked zone numbered above.

The study area intersects with the 'land in proximity to coastal wetlands' zone, defined as a 100 m buffer around the Bevia Road coastal wetland. No works are proposed within 'coastal wetlands'.

2.8. Eurobodalla Local Environmental Plan 2012

The Eurobodalla Local Environmental Plan 2012 (Eurobodalla LEP) aims to establish local environmental planning provisions for land in Eurobodalla according to the relevant standard environmental planning instrument under section 3.20 of the EP&A Act. Clause 6.7 deals with riparian lands and watercourses, with the objective to conserve and maintain water quality, channel stability, aquatic and riparian habitats, ecological processes and connectivity on lands shown on the Riparian Lands and Watercourses Map. Three categories of watercourses are identified on the map, each with a buffer distance for this clause to be applied. The proposed development area overlaps with the watercourse buffers on the map, and therefore the consent authority must assess impacts listed under Clause 6.7(3) and (4).

Clause 6.8 deals with wetlands, with the objective to ensure that wetlands are preserved and protected from the impacts of development on lands identified as "Wetland" on the Wetlands Map. A wetland is present in the study area but would not be directly impacted. As a safeguard, the consent authority should assess impacts listed under Clause 6.8(3) and (4).

These items are discussed in Section 5.6 below.

2.9. Eurobodalla Residential Zones Development Control Plan 2011

The Eurobodalla Residential Zones Development Control Plan (Residential DCP) was prepared in accordance with Section 3.43 of the EP&A Act. The Residential DCP applies to land zoned as R2 and R3 on the supporting maps, and includes the study area at Rosedale. Chapter 6.3 deals with biodiversity, with the intent to maintain terrestrial and aquatic biodiversity, including:

- protecting native fauna and flora
- protecting the ecological processes necessary for their continued existence
- encouraging the recovery of native fauna and flora and their habitats

- maximising connectivity, and minimising fragmentation, of habitat.

Development controls are triggered where the land is identified as “Native Vegetation” on the Native Vegetation Map. Native vegetation is mapped in the study area and intersects with the development footprint, and therefore the consent authority must consider impacts listed under Development Controls 6.3(A1) and (A2). These items are discussed in Section 5.6 below. Terrestrial matters are discussed in the Biodiversity Development Assessment Report (ELA 2024) prepared for this concept plan.

3. Methods

3.1. Desktop assessment

A review of the following data, background literature and relevant planning instruments and strategic documents was undertaken:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* – Protected Matters Search Tool (10 km radius)
- NSW *Fisheries Management Act 1994*; Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management (2013 update) (Fairfull 2013); key fish habitat mapping; listed protected and threatened species and populations, including species profiles; ‘Primefact’ publications and expected distribution maps (Riches et al 2016).
- NSW *Water Management Act 2000* and Guidelines for Controlled Activities on Waterfront Land – Riparian Corridors (DPE 2022), referred to here as the DCCEEW riparian guidelines
- Water Management (General) Regulation 2018 hydroline spatial data 1.0
- NSW Wetlands Management Policy 2010 (DECCW 2010)
- Online Zoological Collections of Australian Museums (OZCAM) and Atlas of Living Australia (ALA) – individual species searches to determine likelihood of occurrence of threatened species
- NSW River styles database (DPE 2023)
- Chapter 2 – Coastal Management of the State Environmental Planning Policy (Resilience and Hazards SEPP) 2021
- Eurobodalla Local Environmental Plan 2012 (Eurobodalla LEP)
- Eurobodalla Residential Zones Development Control Plan 2011 (Residential DCP)
- Top of bank mapping, estimated on ArcMap using a combination of Nearmap imagery (10 March 2022) and 1 m lidar contours.

3.2. Field survey

Two ELA aquatic ecologists walked and used a small drone to do field work on 22 and 23 June 2023. The aim of the field work was to validate watercourses against the definition of a ‘river’ used in the WM Act and the DCCEEW riparian guidelines, and to ground-truth/adjust the desktop top of bank mapping. For watercourses that were proposed for removal or realignment, a rapid assessment of aquatic and riparian condition was used to describe the value of those watercourse.

3.2.1. River validation

A ‘river’, as termed in the WM Act, is a watercourse shown on the state hydroline map and one that has a defined bed, bank and evidence of geomorphic processes (erosion and deposition). A river may generally have some aquatic habitat features, either ephemeral or permanent, and may be discontinuous along its length. A watercourse may have portions of its length that do not display evidence of a river but if there are defining features upstream of that reach, then it must be classed as a river for its full length (as measured down from the uppermost part that has defining characteristics). Under the DCCEEW riparian guidelines, should a watercourse not be defined as a river, then the downstream Strahler stream order cannot be altered. That is, the Strahler stream order is a fixed calculation from the state hydroline map, regardless of whether the river exists, or has been engineered, or is proposed to be engineered (i.e. piped or filled for development).

3.2.2. Top of bank mapping

Target areas were walked and mapped using a GPS-enable tablet loaded with aerial imagery, Lidar contours and desktop mapping. Linework was adjusted based on site observations, then corrected in ArcMap following field work.

3.2.3. Habitat assessment

For reaches proposed to be removed or potentially realigned, notes on its condition were taken to describe geomorphic condition, riparian vegetation and aquatic habitat.

3.3. Riparian corridors

Once linework was finalised, a riparian buffer (VRZ width) was applied to its corresponding stream order in accordance with the DCCEEW riparian guidelines (Table 1). Any encroachment to the outer 50% VRZ by non-permissible riparian uses (Table 2) was offset within the study area to maintain the average VRZ width, as per the riparian averaging rule (Figure 4). Offset areas were positioned on existing or proposed cleared land to increase the vegetated area post earthworks, with priority applied to enhancing connectivity with nearby bushland.

4. Results

4.1. Desktop review

The study area and adjacent waterfront land consists of sixteen 1st order, six 2nd order, two 3rd order, and one 4th order streams, plus a freshwater coastal wetland (Figure 1, Figure 5). The southern third of the study area flows south into Barlings Beach in the Batemans Marine Park – General Use Zone. The northern two-thirds of the study area flows east into Saltwater Creek and Rosedale Beach in the Batemans Marine Park – Habitat Protection Zone. Between these two zones is the Burrewarra Sanctuary Zone (Figure 6).

The upper segment of Saltwater Creek (Reaches 1E and 2C, Figure 1) has a River Style that is “confined, bedrock margin-controlled, headwater, bedrock bed” and its geomorphic condition is good (assessed in January 2012) (DPE 2023). No other watercourses in the study area were assessed by DPE.

The study area or areas downstream of it, contain 3rd and 4th order streams and a coastal wetland, which DPI Fisheries (Fairfull 2013) defines as key fish habitat. Coastal wetlands are classed as Type 1 – highly sensitive key fish habitat. This wetland flows south to Barlings Beach, where there is a small patch of *Posidonia* seagrass (Type 1 key fish habitat) protected by a rocky headland (Riches et al 2016).

The major waterways within 10 km of the study area have a good to fair status for their freshwater fish community, according to DPI Fisheries (Riches et al 2016).

The nearest expected threatened fish species listed under the FM Act is *Prototroctes marena* (Australian Grayling), modelled to occur in the Moruya River, Buckenbowra River and Clyde River catchments (Riches et al 2016). Other threatened species may occur offshore in the Batemans Marine Park, such as four species of pelagic sharks. Within 10 km of the study area, the MNES search tool indicates appropriate habitat for another two finfish, two sharks and five turtles, all marine species. Freshwater species are assessed further in Appendix A, which concluded no threatened fish are expected to occur in the study area.

The study area intersects with lands shown on the Riparian Lands and Watercourses Map and the Wetlands Map of the Eurobodalla LEP (Figure 7), and the Native Vegetation Map of the Residential DCP (Figure 8). The wetland shown is the Bevia Road coastal wetland, also mapped under the Resilience and Hazards SEPP (Figure 9).

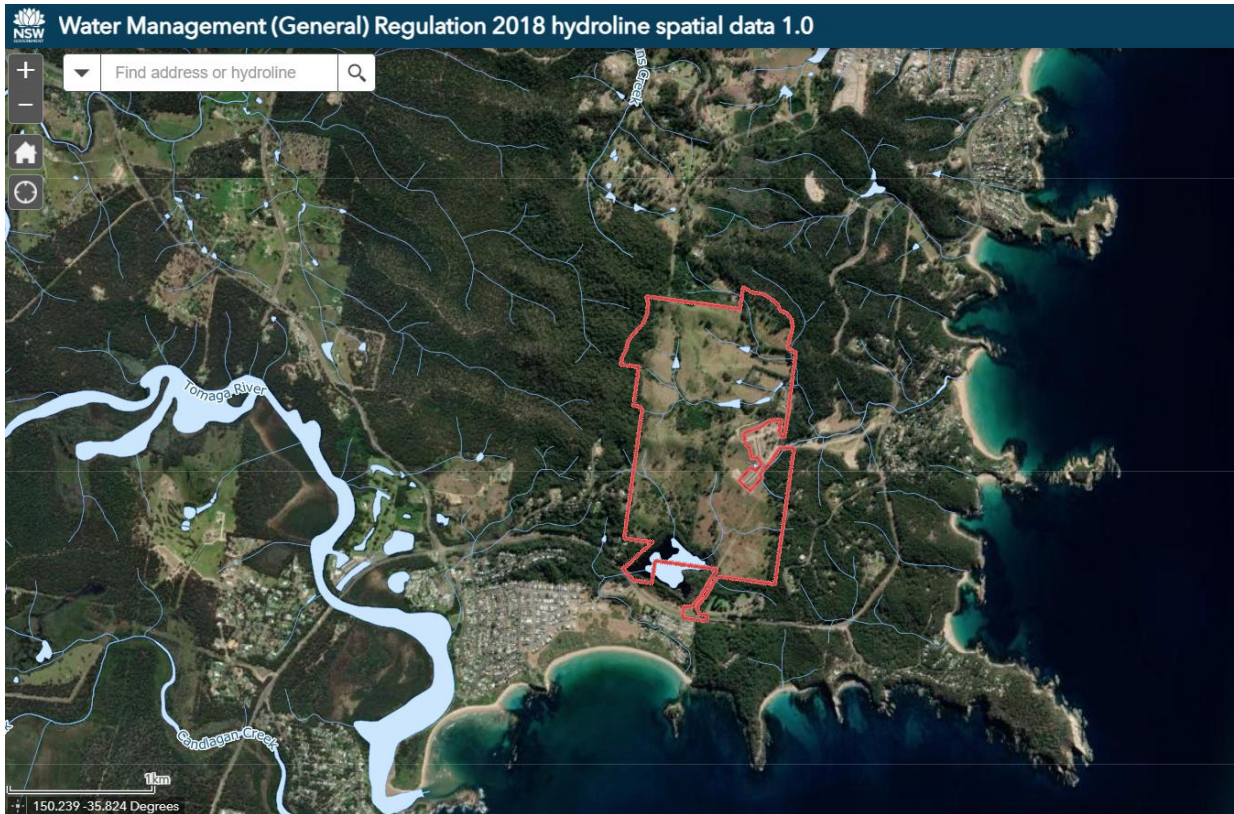


Figure 5: WM (General) Regulation 2018 hydroline, source NSW Department of Industry – Lands and Water – Water

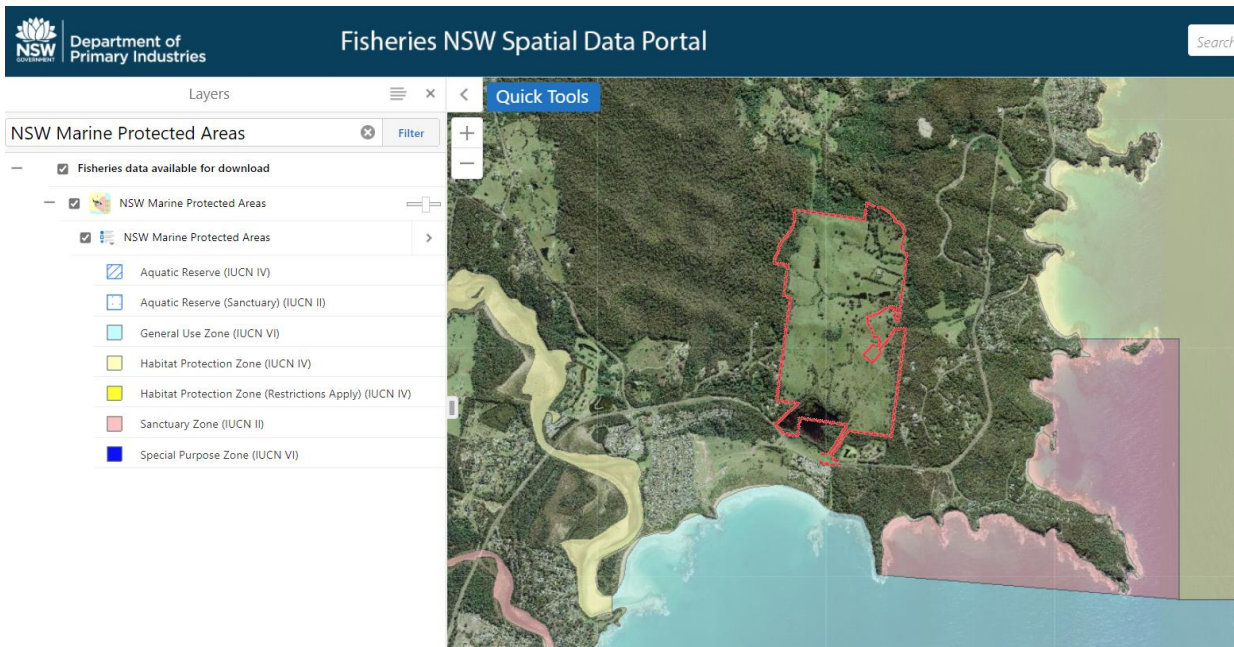


Figure 6: NSW Marine Parks, source DPI Fisheries Spatial Data Portal

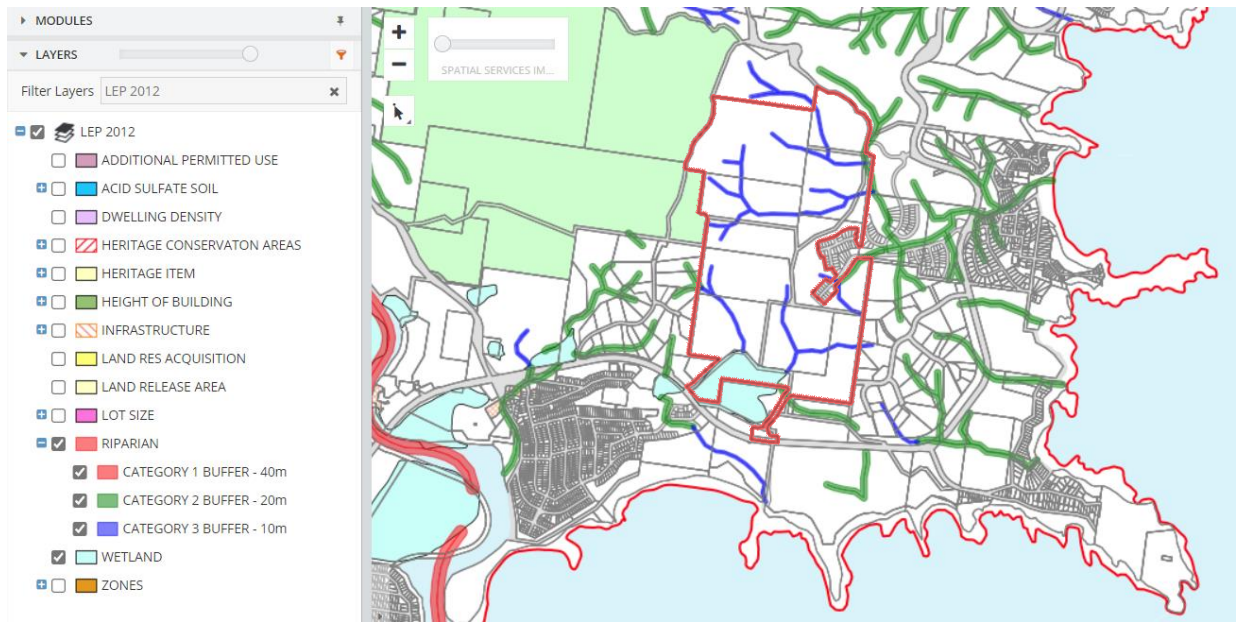


Figure 7: Eurobodalla LEP – Wetlands Map and Riparian Lands and Watercourses Map, source Eurobodalla Council IntraMaps

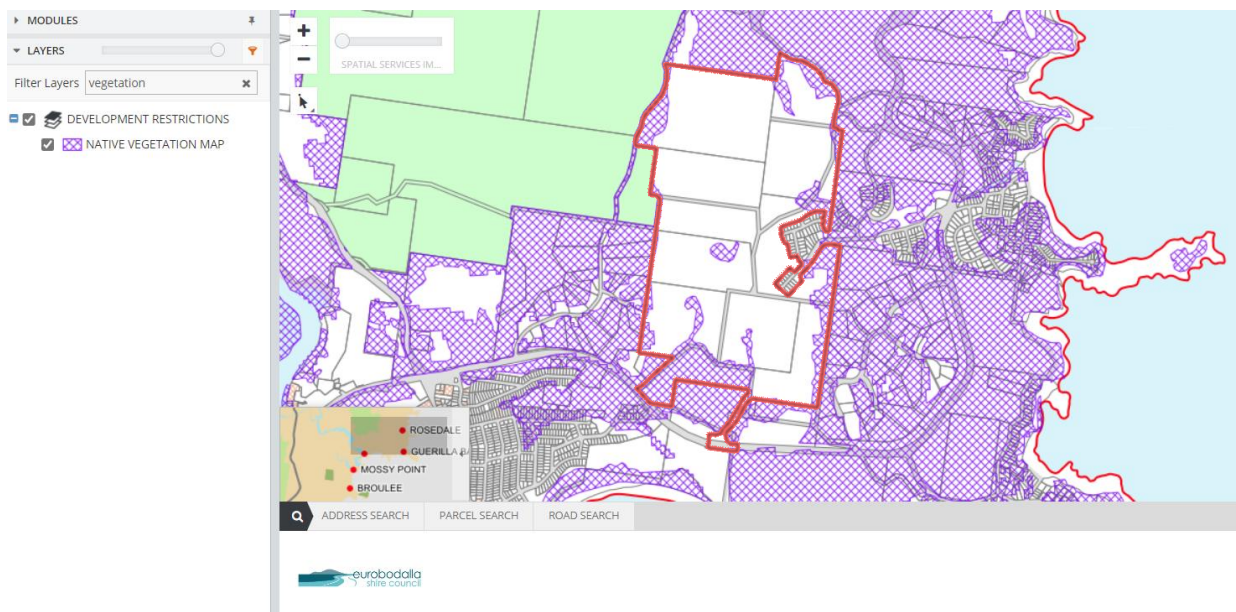


Figure 8: Residential DCP – Native Vegetation Map, source Eurobodalla Council IntraMaps

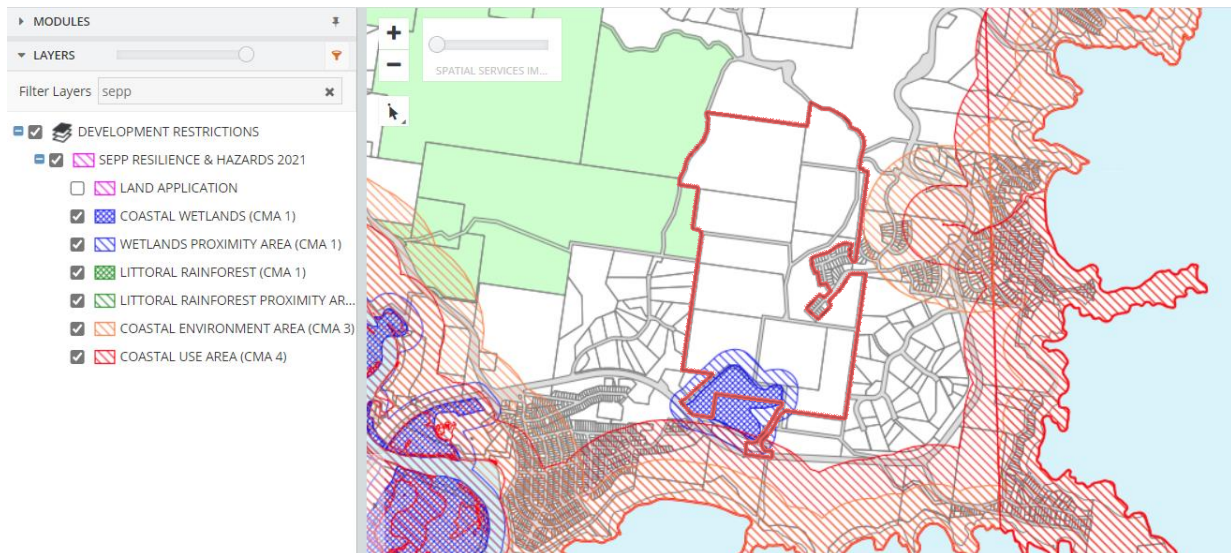


Figure 9: Resilience and Hazards SEPP – coastal management areas, source Eurobodalla Council IntraMaps

4.2. River validation and top of bank mapping

The field survey results indicated that Reaches 1B, 1F, 1G, 1I, 1K, 1L and 1O had no channel features or signs of geomorphic activity along their entire or most of their length. These reaches, marked by a red dashed line on Figure 10, do not meet the definition of 'rivers' or 'waterfront land' under the WM Act and do not require riparian offsets if they are removed. Some reaches, especially Reach 2E and 2D, had sections of overland flow with no distinct channel, but they were classified as 'rivers' where an upstream section of hydroline had a channel with bed, banks and geomorphic evidence. All other hydrolines in the study area had well defined channels. Figure 10 shows the final top of bank map based on field validation.

4.3. Riparian and aquatic condition

The condition of the riparian zones varied from poor to good, usually depending on whether native canopy was present or not. When the canopy was well connected, other desirable features were also present, such as plants in the middle and lower layers, regeneration, large wood debris, leaf litter and low weed invasion. Several online dams and road crossings have interfered with flows and fish movement.

No threatened fish species are known to occur, or expected to occur in the study area, or upstream of the study area. An assessment of their likelihood of occurrence is provided in Appendix A.

The 3rd order streams matched the description of 'Class 2 – moderate key fish' habitat because of intermittent flows, semi-permanent pools and freshwater aquatic vegetation. The 1st and 2nd order streams were 'Class 3 – minimal key fish habitat' because of intermittent flow, sporadic refuge, breeding or feeding areas for aquatic fauna. The Bevia Road coastal wetland is classed as 'Type 1 highly sensitive key fish habitat'. This wetland wasn't assessed in detail, but appears to have expansive shallow fringes. An analysis of this wetland by Civile (2024) found that it is subject to significant wetting and drying cycles, with vegetation growth responding to changes in water level. The wetland is freshwater/slightly brackish, independent of groundwater (clay cap) and acts as a local nutrient sink, with water quality 100

times higher than ANZECC guidelines for slightly disturbed ecosystems, and double the typical concentrations of urban stormwater runoff.

Streams that met the definition of a 'river' under the WM Act and that are proposed to be removed or realigned were in poor condition and modified by historic grazing practices. They provide low aquatic and riparian value in their current state, and their loss will be offset elsewhere within the study area to provide better riparian outcomes in more important areas. Summary descriptions and photos are in Table 5 and Figure 11.

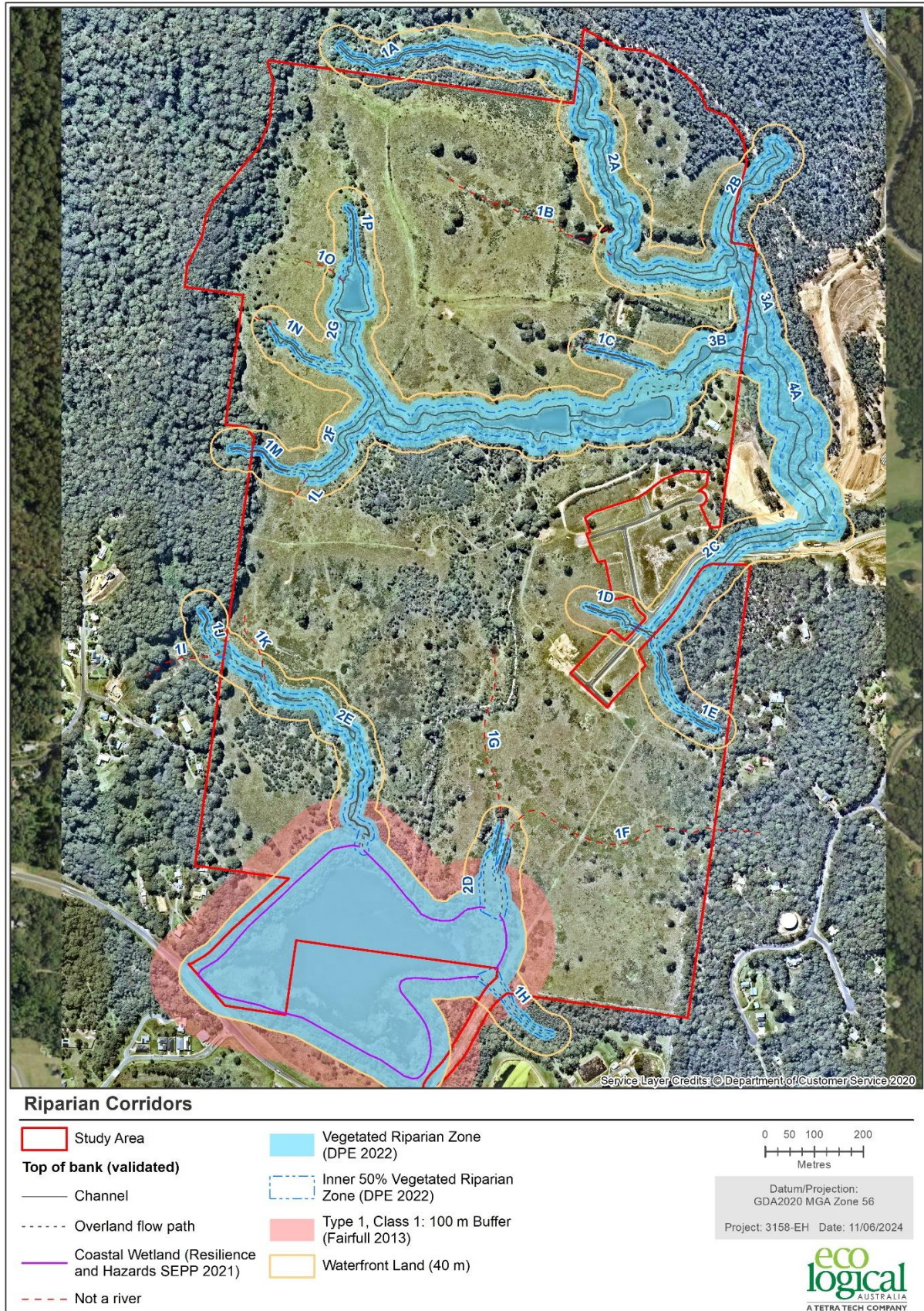


Figure 10: Field-validated top of bank mapping, river status and vegetated riparian zones required under DCCEW riparian guidelines (reach number = stream order)

Table 5: Riparian and aquatic condition assessed in field

Reach label (Figure 10)	Stream order	WM status	Act	Condition (photos in Figure 11)
1B, 1K, 1L, 1O	1 st	Not a river		Poor condition. Overland flows across pasture grasses and terrestrial shrubs. 1B had two online dams. No bed, banks, erosion or sediment deposits. Proposed not to be treated as 'waterfront land'.
1C	1 st	River		Poor condition. Upper part had an online dam. Middle part was a narrow channel through shrubs, lower part overland flows across pasture. The narrow channel appeared to have been dug to follow a property boundary, and it had no aquatic value. Proposed to be removed and offset elsewhere on site.
1D	1 st	River		Moderate condition from VMP works. This reach was originally protected with a VMP under the adjacent stage 1 development. It mostly has a defined channel and planted VRZ, flowing into an online basin near the road. Proposed to be removed and offset elsewhere on site.
1F, 1G	1 st	Not a river (part)		Poor condition. Both reaches were similar, with overland flows through bushland and pasture for several hundred meters before forming into a tree-lined channel. That channel had small ephemeral pools, but was mostly dry, unvegetated silty-sands for about 70 m in length before dispersing as broad overland flow with no channel. The upper parts classed as 'not a river' are not proposed to be treated as 'waterfront land'. The lower parts classed as 'river' and 'overland flow path' are proposed to be removed for a basin and offset elsewhere on site.
2A	2 nd	River		Moderate to good condition. The lower part (moderate condition) had scattered trees, regenerating shrubs and weedy understorey, with pockets of aquatic vegetation. It is proposed to be widened and realigned in a similar location for flood mitigation, accommodate offline basins and connect with tributaries around the road upgrade and improved crossing. The upper part (good condition) had a fully structured, but narrow, vegetated riparian corridor, with pockets of aquatic vegetation in an ephemeral grassy channel. One road crossing is proposed here, with consideration required to protect the bends from erosion.
2B	2 nd	River		Poor condition. Mostly a broad grassy channel with small pockets of aquatic vegetation. Proposed to have its channel formalised in a similar location to allow for road upgrades and new crossings around the intersection.
2D	2 nd	River		Poor condition. This reach was a continuation of the broad overland flows from Reaches 1F and 1G. broad overland flows across pasture and forested wetland. Flows dispersed across flat pasture and forest into the coastal wetland, without any defined channel. Proposed to be removed as a basin and offset elsewhere on site.

Reach label (Figure 10)	Stream order	WM status	Act	Condition (photos in Figure 11)
2E	2 nd	River		Poor to moderate condition. The channel alternated between shallow channels and broad overland flows. Dense shrub regrowth made it difficult to find a preferential flow path. Where a channel existed, there was little aquatic habitat, but a decent amount of riparian vegetation. Proposed to be reconstructed with a formal channel and basins and road crossings.
3B	3 rd	River		Poor to moderate condition. The lower part (poor condition) was a string of three online dams. The upper part (good condition) had a well-defined channel and dense riparian vegetation. Small pools with macrophytes occurred and would support aquatic fauna. The lowest dam near Bevia Road is proposed to be removed and realigned to reconstruct a natural channel and formalise a new road crossing (it currently floods over the road). The other two dams and remaining channel would be retained. The northern side of the dams would have a modified VRZ to accommodate passive recreation/parkland.



Reach 1B: top of catchment facing upslope (left) and downslope (right) – not a 'river'



Reach 1B: middle of catchment facing downslope (left) and bottom of catchment facing downslope (right) – not a 'river'



Reach 1C: start of channel upslope (top left and right) and overland flow without channel downslope (bottom) – ‘river’



Reach 1D: Revegetated riparian corridor from stage 1 – ‘river’



Reach 1E: facing upstream (left) and downstream (right) with mixed channel form – ‘river’



Reach 1F: upper catchment with no defined channel, facing upslope (left) and downslope (right) – not a ‘river’



Reach 1F: middle catchment with no defined channel, facing upslope (left) and downslope (right) – not a ‘river’



Reach 1F: lower catchment transition from paddock (left – not a ‘river’) to channel and trees (right – start of ‘river’)



Reach 1G: upper catchment with no defined channel, facing upslope (left) and downslope (right) – not a ‘river’



Reach 1G: middle catchment with no defined channel, facing upslope (left) and downslope (right) – not a 'river'



Reach 1G: channel forming within trees – start of 'river'



Reach 1H: swampy channel within trees (left) and dispersion into lake (right) – 'river'



Reach 1I: overland flows – not a 'river'



Reach 1J: overland flows and channel upslope – 'river'



Reach 1K: no bed or banks, facing upslope (left) and downslope (right) – not a 'river'



Reach 1L: no bed or banks, facing upslope (left) and downslope (right) – not a 'river'





Reach 1M: narrow channel with dense understorey, facing upslope (left) and downslope (right) – 'river'



Reach 1N: narrow channel and overland flows, facing upslope (left) and downslope (right) – 'river'



Reach 1O: no bed or banks, facing upslope (left) and downslope (right) – not a 'river'



Reach 1P: well formed channel with fully structured riparian vegetation – ‘river’



Reach 2A: broad channel with pockets of aquatic vegetation and scattered to dense trees – ‘river’



Reach 2B: broad channel with pockets of aquatic vegetation – ‘river’



Reach 2D: Overland flows downstream of confluence of two 1st order streams – ‘river’



Reach 2D: overland flows with pockets of aquatic vegetation close to lake – ‘river’





Reach 2E: mix of channel and overland flow, from upstream (top series) to downstream (bottom series) – ‘river’



Reach 2F: broad channel with pockets of aquatic vegetation – ‘river’



Reach 3B: dam/channel proposed to be realigned before crossing Bevia Road



Reach 3B: dam proposed to be reduced in size (bottom of left photo and right photo) and proposed crossing between dams (left)



Reach 3B: dam and vegetated channel upstream of proposed crossing, with proposed parkland on right side of photos



Bevan Road Wetland – Coastal Wetlands #233951 (Resilience and Hazards SEPP)

Figure 11: Representative photos of watercourses assessed (see Figure 10 for location)

5. Impact assessment

5.1. Avoid, minimise and mitigate

Various policies, guidelines and development controls require evidence that the proposed development has attempted to avoid impacts to sensitive or valuable habitat. If avoidance isn't possible, the design or operation should then aim to minimise harm and mitigate impact. Walker has provided the following statement to address this.

The proponent has engaged Water Quality, Biodiversity and Aquatic Ecologist consultants and to assess and map the current biodiversity of the Site, review the specialist reports that supported the 2008 Concept Approval, the SEARS requirements, current relevant legislation and best practices, and advise an appropriate approach to development in the vicinity of the Bevia Wetland, Saltwater Creek and associated riparian corridors. Part of the strategy to minimise impact to Bevia Wetland, Riparian Vegetation, Saltwater Creek and connectivity from east to west include (but are not limited to):

- *A significantly reduced development footprint from the 2008 Concept Approval of from 128.6 (concept approval) to 104 ha in the previous draft modification (dated 2024) and now 98.9 ha (current modification), with 75 ha now designated as retained managed lands.*
- *Adhering to the Department of Planning and Environment's 'Controlled activities – Guidelines for riparian corridors on waterfront land' that includes ground truthing, mapping, assessment of impact, and appropriate offsetting of impacted watercourses and associated vegetated riparian corridors*
- *Appropriate setbacks of development from the Bevia Wetland including no development (where possible) within 50 m of the wetland vegetated riparian zones – some encroachment required for the entry road to avoid clearing of TEC PTC4056*
- *Entry Road design width was minimised past the eastern side of the Bevia Wetland to minimise impact on important ecology while satisfying traffic and engineering requirements for the entry road*
- *Proposed implementation of a Vegetation/Biodiversity Management Plan to rehabilitate retained and offsetted riparian vegetation corridors*
- *Honouring the 2008 Concept Approval alignment of the entry road between the Bevia Wetland and Tomakin Sewer Treatment Plant by aligning it on the preferred eastern side of Bevia Wetland, but utilising the existing cleared water and electrical easement area to minimise impact on important ecology*
- *Honouring the 2008 Concept Approval alignment of the 40 m habitat corridor connection from Bevia Wetland to the Mogo State Forest*
- *Implementing best practice stormwater runoff detention and water quality treatment before releasing into receiving Bevia Wetland and Saltwater Creek waters*
- *Striking the appropriate balance between ecology and bushfire safety to prioritise the important to ecology, while also putting forward a compelling design that satisfies both bushfire asset protection zone and firefighting access requirements for resident safety*

- *Retaining and enhancing the riparian and habitat corridors including both the Saltwater Creek and Bevia Wetland watercourses to provide ample habitat corridors the connect the east of the Site to the west (Figure 1)*
- *Proposing primarily trees, understorey and groundcover planting of local prominence in the landscaped areas to ensure no invasive species impact the local flora community and fauna habitats.*



LANDSCAPE MASTERPLAN

The proposed residential development creates a planned community nestled into a breathtaking landscape that offers residents and visitors a relaxed lifestyle disconnected from a typical subdivision. The masterplan works with the existing landscape typologies and topography to create a series of precincts surrounded by the sites existing riparian zones, adjoining State Forest and Bevia Wetland, ensuring majority of the residential lots have long landscape vistas.

BEVIAN ROAD, ROSEDALE

DWG NO PG-10

24.02.2025



Figure 12: Landscape masterplan with habitat corridors

5.2. Guidelines for Controlled Activities on waterfront land—Riparian corridors

Riparian averaging across the study area is possible, as there is sufficient space to offset any non-permissible uses of the riparian corridor. Offsets are to be 1:1 compensation for encroaching the VRZ, with the aim to provide an average width that meets the VRZ widths shown in Table 1. For such a large-scale urban renewal project, offsets may occur on a different watercourse within the study area. The averaging rule was applied, rounded to the nearest square metre. Large stands of native vegetation that are protected for other reasons were not used as offsets.

Mapping rules were applied to meet the DCCEEW riparian guidelines as much as possible:

- Non-permissible impacts must stay outside of the 50% VRZ and avoid stands of native riparian vegetation.
- Offsets should be located on cleared areas if possible, with the aim to restore previous disturbed riparian land, rather than offsetting overtop of vegetation protected for other purposes.
- Permissible impacts do not need offsetting, unless they do not meet the design criteria (e.g., online basins require a VRZ around them, but if this is not possible then the basin area needs to be offset).
- Watercourses not meeting the definition of a river do not need to be offset or treated as waterfront land.
- Removal of defined rivers require offsets and concurrence from DCCEEW.

A recommended indicative riparian corridor is shown in Figure 13 and Figure 14, where non-permissible encroachment of the VRZ (red shading = 2.47 ha) is offset elsewhere (green shading = 3.23 ha) to adhere to the DCCEEW riparian averaging rule (Figure 4). For creek reconstruction or realignment, impacts and offsets are calculated against the future VRZ to achieve a minimum 1:1 compensation. Modification to the design, if required, may change the encroachment and offset areas. In total, 32.81 ha of riparian corridor is proposed across the Subject Land.

A summary of the proposed treatment of each reach is provided below in Table 6.

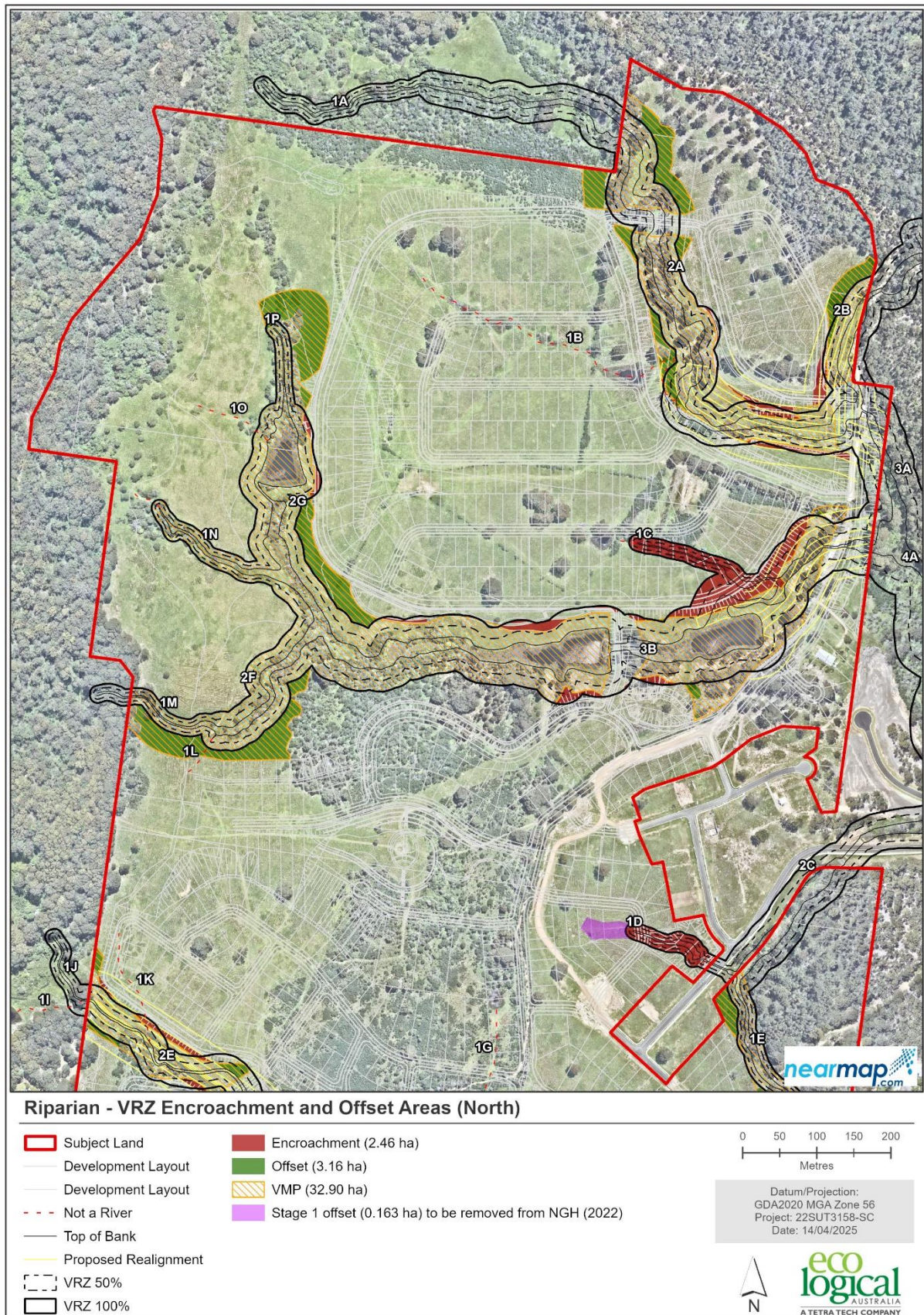


Figure 13: Northern half, proposed riparian corridor and averaging rule to meet the DCCEEW riparian guidelines

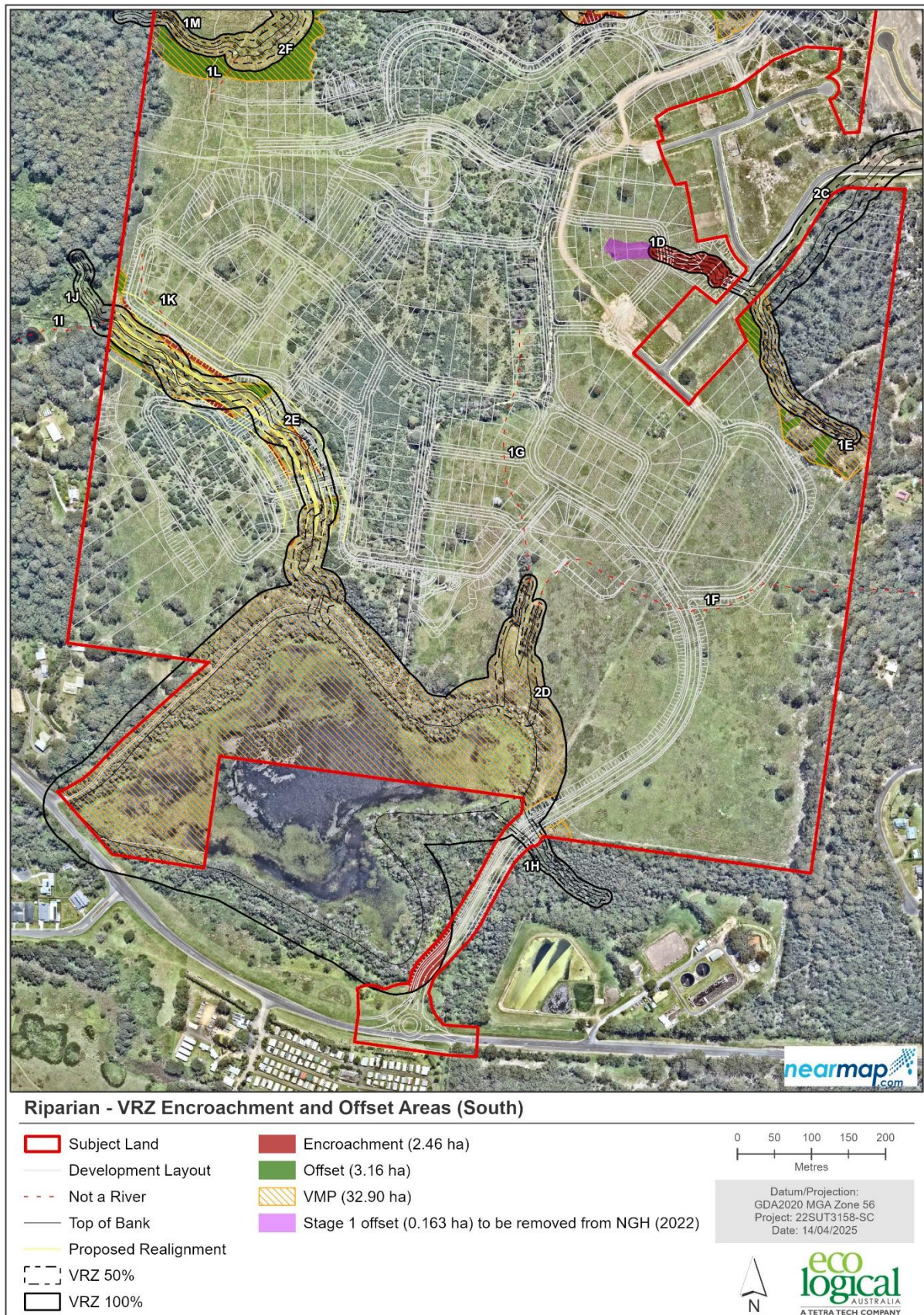


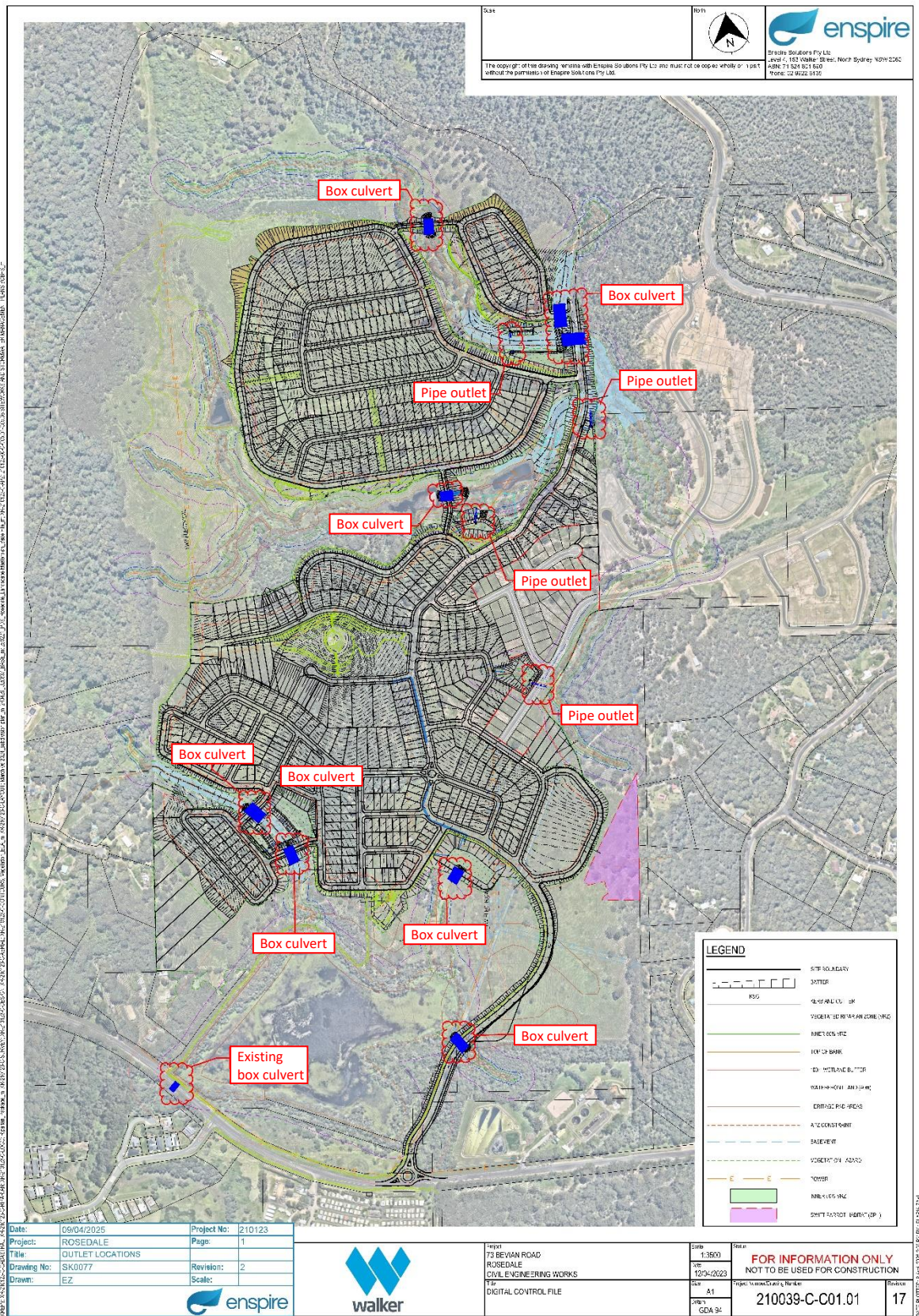
Figure 14: Southern half, proposed riparian corridor and averaging rule to meet the DCCEEW riparian guidelines

Table 6: Proposed riparian corridors in the Rosedale master plan

Reach name (number refers to Strahler order)	Status and proposed treatment	Consistency with riparian guidelines (DPE 2022)
1A	Offsite, no waterfront land in subject land.	NA
1B	Not a 'river' under WM Act. Full removal proposed.	Removal is consistent with the guidelines, because the absence of a 'river' means there is no waterfront land.
1C	'River' under WM Act, with poorly defined banks in places. Full removal proposed, with offsets applied elsewhere in the subject land.	Merit assessment required due to removal of a 'river'. See section 4.3 of ELA 2024 for reach description and photos.
1D	'River' under WM Act, and had been planted as an offset for previous works in Stage 1 (development by others). Full removal proposed, with an online basin, no VRZ, and offsets applied elsewhere in the subject land.	Merit assessment required due to removal of a 'river'. See section 4.3 of ELA 2024 for reach description and photos.
1E	'River' under WM Act. Full retention and extension of the VMP zones from Stage 1 DA.	Consistent with guidelines.
1F	Mid and upper part not a 'river' and lower part a 'river' under WM Act. Full removal proposed, with offsets applied elsewhere in the subject land for the lower part that is a 'river'.	Removal of the mid and upper part is consistent with the guidelines, because the absence of a 'river' means there is no waterfront land. Lower part requires a merit assessment due to removal of a 'river'. See section 4.3 of ELA 2024 for reach description and photos.
1G	Mid and upper part not a 'river' under WM Act. Full removal proposed, with offsets applied elsewhere in the subject land for the lower part that is a 'river'.	Removal of the mid and upper part is consistent with the guidelines, because the absence of a 'river' means there is no waterfront land. Lower part requires a merit assessment due to removal of a 'river'. See section 4.3 of ELA 2024 for reach description and photos.
1H	'River' under WM Act. One crossing proposed for the short part that is within the subject land.	Consistent with guidelines.
1I	Offsite, no waterfront land in study area.	NA
1J	Offsite, no waterfront land in study area.	NA
1K	Not a 'river' under WM Act. Full removal proposed.	Removal is consistent with the guidelines, because the absence of a 'river' means there is no waterfront land.
1L	Not a 'river' under WM Act. Full removal proposed.	Removal is consistent with the guidelines, because the absence of a 'river' means there is no waterfront land.

Reach name (number refers to Strahler stream order)	Status and proposed treatment	Consistency with riparian guidelines (DPE 2022)
1M	'River' under WM Act. Full retention proposed.	Consistent with guidelines.
1N	'River' under WM Act, except the very top part where there is no channel. Full retention of 'river' proposed.	Consistent with guidelines.
1O	Not a 'river' under WM Act. No works in this area, except a hiking track. No VMP needed.	No VMP is consistent with the guidelines, because the absence of a 'river' means there is no waterfront land.
1P	'River' under WM Act. Full retention proposed.	Consistent with guidelines.
2A	'River' under WM Act. Proposed retention of upper part, plus a crossing. Proposed realignment and offline basins of lower part. Encroachment of VRZs to be offset elsewhere in the subject land.	Merit assessment required due to realignment of a 2 nd order stream. See section 4.3 of ELA 2024 for reach description and photos.
2B	'River' under WM Act. Proposed realignment. Encroachment of VRZs to be offset elsewhere in the subject land.	Merit assessment required due to realignment of a 2 nd order stream. See section 4.3 of ELA 2024 for reach description and photos.
2C	'River' under WM Act. No works in this reach. A VMP was applied under Stage 1 DA (by others).	NA
2D	'River' under WM Act. The confluence of two 1 st order streams is much further downstream than the State Hydroline shows, and forms broad overland flows within the 40 m buffer around Lake Duncan. Full retention proposed.	Consistent with guidelines.
2E	'River' under WM Act, with segmented channel. Proposed for reconstruction with a realigned channel, online basins and road crossings, with offsets applied elsewhere in the subject land.	Merit assessment required due to realignment of a 2 nd order stream. See section 4.3 of ELA 2024 for reach description and photos.
2F	'River' under WM Act. Full retention proposed.	Consistent with guidelines.
2G	'River' under WM Act. Full retention proposed.	Consistent with guidelines.
3A	'River' under WM Act. Proposed minor realignment due to road crossing upgrade and realignment of confluence of 2A and 2B. Remainder of reach is offsite.	Merit assessment required due to realignment of a 3 rd order stream. See section 4.3 of ELA 2024 for reach description and photos.

Reach name (number refers to Strahler stream order)	Status and proposed treatment	Consistency with riparian guidelines (DPE 2022)
3B	'River' under WM Act. Proposed retention of upper part, plus a crossing. Proposed realignment of lower part downstream of dam. Encroachment of VRZs to be offset elsewhere in the subject land.	Merit assessment required due to realignment of a 3 rd order stream. See section 4.3 of ELA 2024 for reach description and photos.
Lake Duncan (Coastal Wetland SEPP)	Proposed minimum 40 m VRZ, with the exception of upgrading an existing unsealed track into a sealed road and crossing of a tributary 1H.	Complies with recommended wetland VRZ width.



5.3. DPI Fisheries policy and guidelines for fish habitat conservation (FM Act)

DPI Fisheries' Policy and Guidelines for Fish Habitat Conservation and Management (Fairfull 2013) outline requirements for assessing impact of waterfront development to ensure the sustainable management, and 'no net loss', of KFH in NSW (Table 6). Part 7 of the FM Act addresses the protection of aquatic habitats and works that requires a permit.

Table 7: Assessment requirements under DPI Fisheries' Policy and Guidelines for Fish Habitat Conservation

Assessment	Response	Comment
Has the proposal attempted to avoid impact to sensitive and valuable habitat, minimise unavoidable impact and mitigate severity of direct or indirect impact, offset with environmental compensation.	☒ Yes ☐ Potential ☐ No	The proponent has made a statement supporting this approach in Section 5.1. We recommend a staged approach to earthworks to allow effective management of sediment runoff.
Will the proposed works directly or indirectly impact threatened species, populations or communities?	☐ Yes ☐ Potential ☒ No	None have the potential to occur in or nearby the site (Appendix A).
Will the proposed works harm protected vegetation (seagrass, macroalgae, mangroves or saltmarsh)?	☐ Yes ☒ No	Site is freshwater, approximately 1 km upstream from the nearest intertidal zone. Sediment controls and staging during construction would be required to avoid indirect impacts to seagrass and macroalgae in the downstream marine environment.
Are the proposed works in or near critical habitat for the Grey Nurse Shark (Part 7A of FM Act)?	☐ Yes ☒ No	Nearest habitat is 8 km away at Tollgate Islands.
Will the proposed works impact aquaculture leases or commercial fisheries?	☐ Yes ☒ No	The nearest lease is over 2 km away in the Tomaga River.
Are the works categorised as a key threatening process (as per Schedule 6 of the FM Act): • Current shark meshing program in NSW waters • Hook and line fishing in areas important for survival of threatened fish species • Human-caused climate change • Instream structures and other mechanisms that alter the natural flow • Introduction of non-indigenous fish and marine vegetation to the coastal waters of NSW • Introduction of fish to fresh waters within a river catchment outside their natural range • Removal of large woody debris from NSW rivers and streams • Degradation of native riparian vegetation along NSW watercourses.	☐ Yes ☒ No	The concept plan aims to improve riparian condition through restoring vegetated riparian zones.

Assessment	Response	Comment
Will the works result in a 'net loss' of key fish habitat?	☐ Yes ☒ No	Key fish habitat is located on two 3rd order streams in the centre of the study area, and at the Bevia Rd coastal wetland. Instream works on the 3rd order streams are for minor realignment where online dams and road crossing occur. Works are to improve fish passage where barriers are removed and new crossings installed. Crossing types are shown in Figure 15. The coastal wetland is outside of the development footprint. Indirect impact is discussed in Table 9, concluding the impact during construction and operation would not harm the wetland (Civille 2025).
Do the works require a permit or consultation under Part 7 of the FM Act? Permits relate to: - Harming marine vegetation - Dredging and/or reclamation of bed or bank - Obstruction of fish passage - Relocation of threatened species.	☐ Yes ☒ Potential ☐ No	Instream works on the two 3rd order streams are classed as 'dredging and/or reclamation'. A Part 7 permit would be required during an Integrated Development Application, unless consent is given under a State Significant Development Application or a Controlled Activity Approval for works on waterfront land.

5.4. Matters of National Environmental Significance (MNES)

The following MNES (Table 7) were returned from the database search for a 10 km radius around the site. The assessment in Appendix A concluded that no aquatic species require an Assessment of Significance.

Table 8: Potential impacts to matters of National Environmental Significance

Matter of NES	Count	Comment	Impact Assessment
World Heritage Properties	None	NA	NA
National Heritage Places	None	NA	NA
Wetlands of International Importance (Ramsar Wetlands)	None	NA	NA
Great Barrier Reef Marine Park	None	NA	NA
Commonwealth Marine Areas	1	In buffer area	No direct impact. Indirect impacts from water quality leaving the site are addressed in the Integrated Water Management Plan (Civille 2025), concluding the runoff can meet adopted guidelines for the development.
Listed Threatened Ecological Communities	9	Terrestrial species excluded – see BDAR (ELA 2024).	No impact (Appendix A).

Matter of NES	Count	Comment	Impact Assessment
Listed Threatened Species	93	Terrestrial species excluded – see BDAR (ELA 2024).	No impact (Appendix A).
Listed Migratory Species	65	Terrestrial species excluded – see BDAR (ELA 2024).	No impact (Appendix A).

5.5. Resilience and Hazards SEPP requirements

The development occurs on one type of coastal management areas listed under Chapter 2 of the Resilience and Hazards SEPP, which is assessed below in Table 9.

Table 9: Assessment of controls triggered under the Resilience and Hazards SEPP

Item	Impact assessment
Clause 2.8 Development on land in proximity to coastal wetlands	<i>(1) 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> <i>(a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest.</i> Biophysical and ecological integrity – the definitions of these attributes overlap. ‘Ecology’ or ‘biophysics’ is understanding how the biotic component (flora and fauna) interact with the abiotic component (water, fire, soil, nutrients, sunlight etc). The integrity of the biota can be protected by avoiding direct impacts (clearing) and ensuring indirect impacts are managed (e.g. weeds, erosion, and water quality), ensuring the adjacent wetland can provide functions and processes to support its ecosystem. The Integrated Water Management Plan (Civille 2025) prepared for this development demonstrates that development mitigation measure would ensure the wetland’s water quality would not be impacted beyond the adopted criteria of 80% reduction for total suspended solids, 45% reduction for total phosphorus and 45% reduction for total nitrogen. Hydrological – the development would not impede the hydrology within the wetland or obstruct connectivity with another watercourse. Flows leaving the site and entering the wetland would be similar before and after development. The Integrated Water Management Plan (Civille 2025) prepared for this development demonstrates that the development would not interfere with the wetland’s natural wetting-drying hydrology, and mean annual runoff volume post development would not be greater than pre-development. <i>(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.</i> The Integrated Water Management Plan (Civille 2025) prepared for this development describes the hydrology of the wetland. There is no strong connection with groundwater due to a subsurface clay cap, and its processes are a response to local surface water flows. Civille’s assessment states the development would have: - no increase in the post development mean annual runoff volume (MARV) compared to the pre-development MARV - no increase in the post-development 80th percentile flow into the wetland (to preserve the wetland drying hydrology) compared to the pre-development 80th percentile flow into the wetland. Suitable vegetation would be assigned for open space and restored areas to slow and filter runoff, and protect the wetland’s processes, achieved by: - Implementing a Vegetation Management Plan for riparian areas. - Avoiding planting deciduous trees within 40 m of waterways, or in areas where excessive leaf drop cannot be contained from stormwater runoff. Seasonal leaf drop can have detrimental effects on the aquatic ecology, such as decreased dissolved oxygen due to leaf decomposition, and irregular food sources for detritivores that support the food web. - Avoiding planting species that may become weeds in the adjacent riparian corridor.

5.6. Eurobodalla LEP and Residential DCP

An assessment of the proposal against the Eurobodalla LEP and Residential DCP is provided below for riparian lands and watercourses (Table 10), wetlands (Table 10) and biodiversity (Table 11).

Table 10: Assessment of controls triggered under the Eurobodalla LEP

Item	Impact assessment
Clause 6.7 Riparian lands and watercourses	<i>(3) Before determining a development application to carry out development on land to which this clause applies, the consent authority must consider whether or not the development—</i> <i>(a) will cause any adverse impact on the following—</i> <i>(i) water quality and flows within a watercourse,</i> <i>(ii) aquatic and riparian species, habitats and ecosystems,</i> <i>(iii) the stability of the bed, shore and banks of a watercourse,</i> <i>(iv) the free passage of fish and other aquatic organisms within or along a watercourse,</i> <i>(v) any future rehabilitation of the watercourse and riparian areas, and</i> <i>(b) will increase water extraction from a watercourse.</i> The Integrated Water Management Plan (Civille 2025) demonstrates the development can comply with the adopted water quality and flow guidelines. Aquatic habitat, riparian zones and channel/bank stability will be improved as a result of the development through implementation of a vegetation management plan and restoring fish passage in parts (dam removal, channel construction and fish friendly crossings). No water extraction is proposed. <i>(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—</i> <i>(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or</i> <i>(b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or</i> <i>(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.</i> The proponent has made a statement supporting this approach in Section 5.1.

Item	Impact assessment
Clause 6.8 Wetlands	<i>(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider—</i> <i>(a) whether or not the development is likely to have any significant adverse impact on the following—</i> <i>(i) the condition and significance of the existing native fauna and flora on the land,</i> <i>(ii) the provision and quality of habitats on the land for indigenous and migratory species,</i> <i>(iii) the surface and groundwater characteristics of the land, including water quality, natural water flows and salinity, and</i> <i>(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.</i> The proponent's statement (Section 5.1) explains how the development has been positioned away from the wetland, followed suggestions and actions to prevent or reduce impacts, and plans to apply best practice stormwater runoff capture and water quality improvement before discharging into the wetland. This protection would ensure that the development does not affect the biodiversity values of the wetland. Other considerations for the coastal wetland are discussed in Table 9 (Resilience and Hazards SEPP). <i>(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—</i> <i>(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or</i> <i>(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or</i> <i>(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.</i> The proponent has made a statement supporting this approach in Section 5.1.

Table 11: Assessment of controls triggered under the Residential DCP

Item	Impact assessment
Chapter 6.3 Biodiversity	<i>(A1) Before determining a development application for development on land identified as “Native Vegetation” on the Native Vegetation Map, the consent authority must consider any adverse impact of the proposed development on the following:</i> <i>(a) native ecological communities,</i> <i>(b) the habitat of any threatened species, populations or ecological community,</i> <i>(c) regionally significant species of fauna and flora or habitat,</i> <i>(d) habitat elements providing connectivity.</i> The proponent has made a statement supporting this approach in Section 5.1. <i>(A2) Development consent must not be granted to development on land identified as “Native Vegetation” on the Native Vegetation Map, unless the consent authority is satisfied that:</i> <i>(a) the development is designed, sited and will be managed to avoid any adverse environmental impact, or</i> <i>(b) if that impact cannot be avoided—the development is designed, sited and will be managed to minimise that impact, or</i> <i>(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.</i> The proponent has made a statement supporting this approach in Section 5.1.

6. Conclusion and recommendations

This report has reviewed the potential impact to riparian and aquatic ecosystems, regarding published guidelines and legislative requirements. In summary, the concept proposal:

- Avoids harm to key fish habitats, by applying development setbacks and limiting channel realignment to disturbed and modified watercourses.
- Improves key fish habitat by restoring riparian corridors and removing some barriers to fish passage.
- Adopts suitable water quality controls to protect sensitive wetlands, estuaries and marine values downstream of the development.
- Would not have an impact on any threatened species, populations or communities listed under the FM Act or aquatic matters under the EPBC Act.
- Adheres to state and local riparian guidelines and controls by minimising use of the 'averaging rule', assigning offsets in cleared areas to improve connectivity, and defining a large riparian corridor for restoration and maintenance under a future Vegetation Management Plan.

The development would proceed gradually in stages, thus lowering the chance of accidentally creating sediment and turbid water that could flow into wetlands and estuaries downstream after heavy rain events. As earthworks would occur on steep terrain and instream, careful planning and effective sediment controls are required. During earthworks, we recommend monitoring of sediment controls, temporary basin levels and water quality of receiving watercourses (Saltwater Creek and tributaries of the Bevia Road coastal wetland).

The concept plan assessed in this report provides an overarching riparian corridor to be protected under a Vegetation Management Plan. Future staged Development Applications should acknowledge how the development is consistent with the overall riparian corridor, and whether any additional encroachment requires offsetting in other staged areas.

The proposed crossing of Reach 2A at the northern end of the site requires further design due to its location on two bends. As no creek realignment is proposed or assessed, the future detailed designs should position revetment walls or batters out of the creek bed, with sufficient armouring to deflect water into the culvert without long-term impact to the creek's geomorphology upstream and downstream of the crossing.

DPI Fisheries reviewed an earlier version of this report and recommend that a Vegetation Management Plan (VMP) is necessary to outline how the restoration or rehabilitation will be carried out within and adjacent to the impacted KFH. The VMP should include native in-stream vegetation and snags where appropriate. Local native riparian vegetation species should be used across the riparian buffer zone to improve riparian habitat values.

7. References

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Appendix A – Presence or likelihood of threatened and protected species, populations and communities

If a species has suitable habitat present on site AND is likely to use this habitat AND the species or its habitat would be directly or indirectly impacted, THEN an Assessment of Significance is required. Such species, if any, are highlighted in the table below. This list excludes terrestrial and marine species.

Table 12: Likelihood of threatened aquatic species occurring in the study area

Scientific name	Common name	FM Act	EPBC Act	Habitat associations	10 km ALA records	Likelihood of occurrence and impact
<i>Prototroctes maraena</i>	Australian Grayling	E	V	This species spends only part of its lifecycle in freshwater, mainly inhabiting clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops. Grayling migrates between freshwater streams and the ocean and as such it is generally accepted to be a diadromous species.	0	No, no suitable habitat. The nearest modelled distribution is in the Moruya River, Buckenbowra River and Clyde River catchments. No further assessment of significance required.

Key: ALA = Atlas of Living Australia records within 10 km; E = Endangered; V= Vulnerable

