Transport for NSW

Gallows Beach Sand Transfer System

Minor works review of environmental factors

November 2023

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Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which the Gallows Beach Sand Transfer System is proposed.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.

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Report Review Tracking

Draft No.	Date	Reviewed by	Comments
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2	6/11/23	J Burgess B Fletcher L Piggott	Comments addressed. Please proceed to finalisation.

Approval and authorisation

Approved by	Julian Burgess
Signed	
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1. Introduction

The purpose of the minor works review of environmental factors (REF) is to describe the proposal, to document the likely impacts of the proposal on the environment, to detail mitigation measures to be implemented and to determine whether or not the proposal can proceed. For the purposes of this work Transport for NSW (Transport) is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The description of the proposed works and assessment of associated environmental impacts has been undertaken in the context of section 171 of the Environmental Planning and Assessment Regulation 2021*,* Guidelines for Division 5.1 Assessments (DPE, 2022), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act) and the *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (EPBC Act).

In doing so the REF helps to fulfil the requirements of section 5.5 of the EP&A Act including that Transport examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report.
- The potential for the proposal to significantly impact a matter of national environmental significance, including nationally listed threatened biodiversity matters, or the environment of Commonwealth land. Where a significant impact is considered likely on nationally listed biodiversity matters, either the proposal must be reconsidered or a project REF must be prepared.

2. The proposal

2.1 Description

2.1.1 Proposal location

Table 2-1: Proposal location details

Location details	
Title	Gallows Beach Sand Transfer System
Local government area	Coffs Harbour City
Transport for NSW region	Maritime Infrastructure Delivery Office (MIDO)

2.1.2 Proposal description

Transport proposes to install and operate a system that transfers sand from the Coffs Harbour Regional Boat Ramp approximately 150m south to Gallows Beach. The proposal is shown indicatively below.

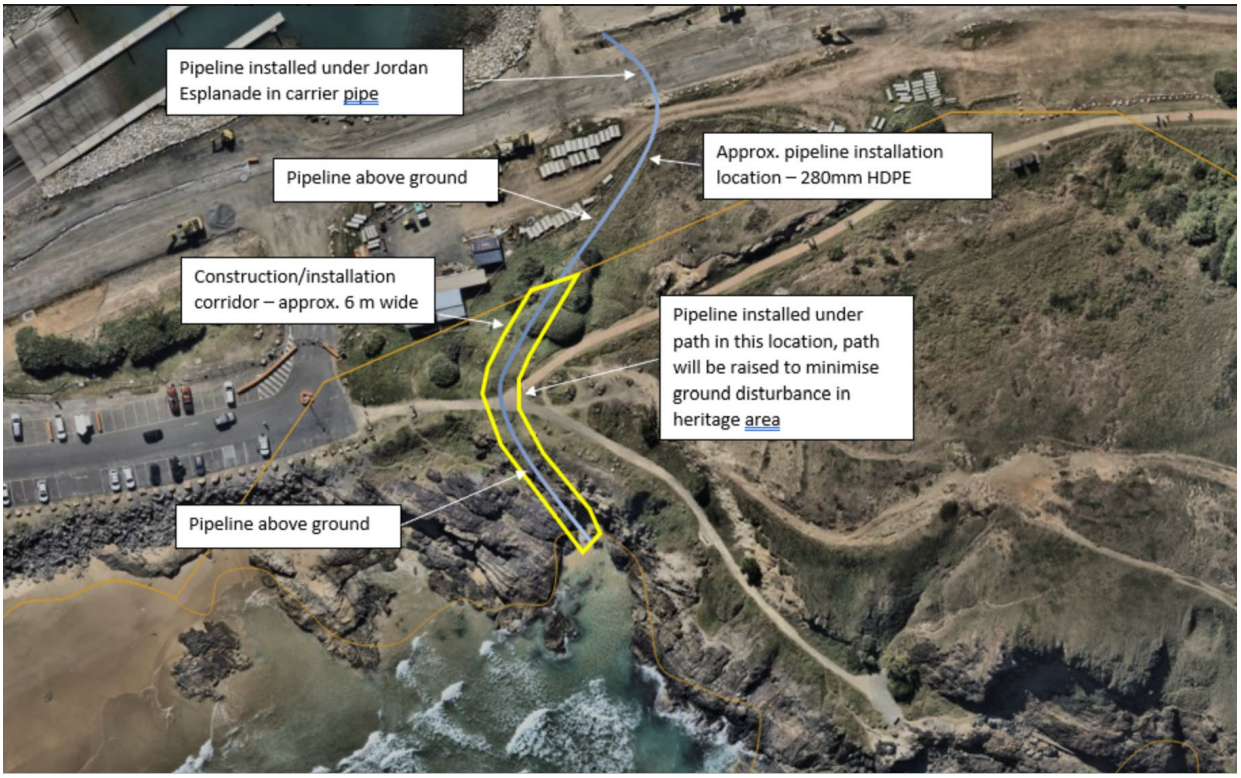

Figure 1: Indicative footprint of pipeline and works.

The proposal is a pipeline which would transfer sand from the jet pumps already operating in the Coffs Harbour regional boat ramp navigation channel which is experiencing sand build-up. The pipeline would transfer the sand to Gallows Beach, to the south. The proposal would improve the operation and safety of the boat ramp, ensuring it can remain open at all times, and that sand is placed back into the natural sediment transport pathway.

Four jet pumps were installed in the boat ramp navigation channel in early 2023, as a more efficient alternative to dredging of the channel, and are currently pumping sand to a de-watering area adjacent the boat ramp before transporting it to a western stockpile area. Due to the time constraints and expense of trucking the sand to other locations, Transport has determined that this method of sand transfer is not sustainable in the long term.

Construction:

The appointed contractor would confirm the final construction activities by agreement with Transport. Therefore, this section only indicates a likely method and work plan as it may vary due to the identification of additional constraints before work starts, detailed design refinements, community and stakeholder feedback, and contractor requirements and limitations. Should the work method differ from what is proposed in this REF, the contractor would consult Transport to determine if additional assessment is needed.

The proposal would involve the re-direction of the existing discharge pipe that currently pumps sand to the dewatering bund adjacent the boat ramp, to a new pipe that would be located to the east of the boat ramp basin. The pipe would be made of high density polyethylene, approximately 280mm in diameter, in 12m sections with flanged connections. The total length of the pipe is approximately 150m. The pipes would be installed primarily with hand-held tools and a small excavator.

The pipe would pass under Jordan Esplanade through an existing 425mm concrete carrier pipe, then run aboveground through the grassed foreshore reserve south of Jordan Esplanade. Depending upon the amount of excavation required, the pipe would cross the existing paved footpath near the junction of the two paths and a pedestrian ramp would be installed on the footpath (over the pipe) to allow the pipe to remain aboveground.

The pipe would then be placed on the rocky area of the headland and discharge sand into a small inlet immediately north of Gallows Beach around the mid-tide zone.

Construction access will be from the eastern end of the Gallows Beach carpark and carried out during weekdays. Works will not be left incomplete across a weekend. A small excavator will be used to assist in the assembly of the HDPE pipe and feeding down to the discharge point. No permanent attachments will be made to existing ground or rock, though some additional rock may be used to secure the pipe near the discharge point.

It is expected that the construction and installation of the pipe would take approximately 5 days, with the majority of the work around the footpath crossing. Pedestrian traffic would be managed via the new path along Jordan Esplanade while the work is taking place, or alternatively a diversion provided around the work. If the system needs to be decommissioned, it is expected that it would take up to 2 days.

The construction works would be undertaken during standard working hours as follows:

7am to 6pm Monday to Friday; and

8am to 1pm on Saturday.

No work would be undertaken on Sundays or public holidays. The closure of public places would be minimised wherever possible.

The photos below show the works footprint.

Photo 1: The existing pipeline transferring sand from the channel to the de-watering bund would be used for the first part of the pipeline.

Photo 2: The pipeline would be extended in an easterly direction in this location towards Jordan Esplanade.

Photo 3: The pipeline would be fed through an existing carrier pipe beneath Jordan Esplanade in this location.

Photo 4: The pipeline would be installed on top of the grass through the foreshore in this location.

Photo 5: The pipeline would be installed on top of the existing footpath and the footpath would be ramped up over the pipe in this location to provide unhindered pedestrian access.

Photo 6: The pipeline would discharge sand at this small, rocky inlet at Gallows Beach.

Operation:

Pumping times would be typically selected based upon the times when the area is least used by the community. Each time pumping occurs, a safety spotter would be located close to the discharge area, to ensure that pedestrians remain clear of the pump and that the system can be instantaneously switched off if needed. The frequency and duration of pumping would depend entirely upon the weather and ocean conditions and the amount of sand that needs to be removed from the navigation channel.

The sand pumps are currently operating once a month for up to three hours. The expectation is that under periods of strong wind and heavier swells the sand build up will be quicker and pumping may be more frequent and run for longer periods. It is not expected that the pumping would occur for more than 6 hours per week, even under the most extreme sand build-up conditions. Between April and October 2023 1431m^3 of sand has been pumped from the navigation channel. Under regular weather conditions, it is expected that ongoing volumes would be similar.

2.1.3 Proposal objectives

The objectives of the proposal are:

- To ensure that the Coffs Harbour boat ramp navigation channel remains navigable at all times.
- To put sand back into the sediment transport system to assist with nourishing beaches further north that are experiencing coastal erosion.
- To implement an efficient and cost effective sand transfer system with the minimum amount of community and environmental disruption.

2.1.4 Ancillary facilities

No additional ancillary facilities will be required as the existing compound site would be used.

Table 2-2: Ancillary facilities

Ancillary facilities		
Will the proposal require the use or installation of a compound site? The compound area for the stage 2 boat ramp works will still be in place and would be used by the contractor for installation of the STS.	Yes ☐	No ☒
Will the proposal require the use or installation of a stockpile site?	Yes ☐	No ☒
Are any other ancillary facilities required (e.g., temporary plants, parking areas, access tracks)? It is anticipated that up to two light vehicles and one small truck may be required on site intermittently. Dut to the short duration of the works (approximately 5 days) the nearby public car park and stage 2 works compound could be used.	Yes ☐	No ☒

2.1.5 Proposed date of commencement

It is likely that construction of the proposal will commence in late 2023.

2.1.6 Estimated length of construction period

It is likely that the proposal will be constructed over a period of approximately 5 days.

2.2 Need and options

2.2.1 Options considered

The options considered for the proposal included:

Option 1 – Do nothing

Without a sand transfer system in place, the boat ramp navigation channel will need to be continuously dredged or will infill and prevent access to the boat ramp. Continuous dredging is expensive and disruptive to boat ramp users. Continuous trucking of sand is also expensive and disruptive to the local road network. This option is not considered suitable as the impacts on the community and environment are unacceptable.

Option 2 – Pumping to an on-site bunded area before trucking elsewhere

This option is currently in place as a short-term solution whilst long-term solutions are being considered. The system is a diesel powered system which has a single slurry pump that transfers sand to a bunded de-watering area. Four jet pumps extract the sand from the navigation channel and pump it to a bunded de-watering area before being transported by truck to a local quarry and then transported by truck to local developments or Park Beach on an intermittent basis.

Due to the requirements for trucking, quarry storage, and associated costs and environmental impacts, this option is not considered to be feasible in the long term. This option is currently in place as a short-term solution and has been approved under a separate REF.

Option 3 – Pumping to Park Beach

This option would include a sand pumping transfer system that would draw sand from the boat ramp navigation channel via the existing jet pumps and then into a high density polyethylene transfer pipeline that would run in an east-west direction along the rock wall at the southern end of Jetty Beach and then in a south-north direction along the footpath in Jetty Foreshores Park. The pipeline would cross under Marina Drive, through Veteran's Park and North Wall Beach, be buried under Coffs Creek and run north to approximately 300m north of the Coffs Harbour Surf Life Saving Club (CHSLSC) where the sand would be discharged; a distance of around 3km. The pipeline would be buried at least 80cm below the ground. Construction would take around 6 months to complete.

A series of specialist reports were prepared to consider the potential impacts of this option. The potential impacts identified were:

- Clearing of approximately 85m^2 of the Endangered Ecological Community (EEC), *Littoral Rainforest in the NSW North Coast, Sydney Basin, and Southeast Corner Bioregions* listed under the *Biodiversity Conservation* (BC) *Act*, and the Commonwealth EEC *Littoral Rainforests and coastal vine thickets of Eastern Australia* listed under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act*. The loss of this area of EEC would require offsetting in accordance with the Transport *No Net Loss Guidelines*. Such an offset would place additional costs on the project.
- Potential impacts to *Sophora tomentosa* (Silverbush) listed as Endangered under the BC Act.
- Presence of shorebird roosting habitat at Coffs Creek that may be disturbed during pipeline installation.
- The Registered Aboriginal Parties consulted during the Cultural Heritage Assessment for this option stated that they will not support the pipeline being installed in the dune area south of Coffs Creek due to the largely undisturbed nature of that area and the likelihood of the presence of burials, middens, and artefacts.
- The entire vegetated area north of Marina Drive was identified as a Potential Archaeological Deposit (PAD). Before an Aboriginal Heritage Impact Permit (AHIP) can be granted for the works, alternatives to the proposal must be fully considered to avoid any potential impacts on the PAD. Given the size of the PAD and its potential significance, the associated costs and time of obtaining and AHIP are likely to be significant, and there is likely to be a high degree of dissatisfaction within the local Aboriginal community. There is also a high chance that the AHIP would not be granted.
- An alternative to the pipeline route was considered to be the ARTC rail corridor on the western side of Jordan Esplanade. Discussions with ARTC have confirmed that the rail corridor is not available for use due to the recent sale of part of the corridor and subsequent narrowing of the land available, making it unsuitable for use for the pipeline.
- An alternative to the pipeline installation method was considered to be above-ground installation; to avoid cultural heritage impacts. The Visual Impact Assessment undertaken for the REF noted that the impacts of the proposal were only acceptable if the pipeline was to be buried. The foreshore area is highly valued for its amenity and scenic significance and has been masterplanned to leverage off and improve those values. Constructing the pipeline aboveground would be likely to have an unacceptable visual impact on the foreshore. If placed above ground, the pipeline is likely to be subject to damage and vandalism. Additionally, it's efficiency is reduced if placed aboveground due to the effects of temperature on the pipe.

Due to the potential environmental impacts of this option, it was not considered to be feasible.

Option 4 – Pumping to Gallows Beach

Similar to option 3, this is a sand pumping transfer system which would remove sand from the Coffs Harbour regional boat ramp (the boat ramp), and place it on Gallows Beach, approximately 150m to the south.

This option involves the re-direction of the existing discharge pipe that currently pumps sand to the dewatering bund adjacent the boat ramp, to a new pipe that would be located to the west of the boat ramp basin. The total length of the pipe is approximately 150m. The pipes would be installed primarily with hand-held tools and a small excavator.

The pipe would pass under Jordan Esplanade through an existing 425mm concrete carrier pipe, then run aboveground through the grassed foreshore reserve south of Jordan Esplanade and across the existing footpath, which would be ramped to allow continued pedestrian access.

The pipe would then be anchored to the rocks and discharge sand into a small inlet immediately north of Gallows Beach around the mid-tide zone. The frequency and duration of pumping would depend entirely upon the weather and ocean conditions and the amount of sand that needs to be removed from the navigation channel.

It is expected that the construction and installation of the pipe would take approximately 1 week, with the majority of the work around the footpath crossing. Pedestrian traffic would be managed via the new path along Jordan Esplanade while the work is taking place, or alternatively a diversion provided around the work. If the system needs to be decommissioned, it is expected that it would take up to 2 days.

Preferred option

Option 4 is considered to be the preferred option as it:

- Achieves the objectives of the proposal.
- Has the least environmental and social impacts of the four options.
- Is the lowest cost of the four options.
- Can be constructed with the most minimal amount of disruption of the four options and easily removed.

2.2.2 Justification for the proposal

The proposal is required to:

- Provide a more efficient and less disruptive way of maintaining the navigation channel at the boat ramp to a suitable depth.
- Place sand back into the longshore sediment transport system to provide opportunity to nourish beaches further north as shown in the figure below, taken from Appendix I of the Coffs Harbour Boat Ramp Project REF (TfNSW, 2020).

Figure 2: Modelled Coffs Harbour Local Sediment Budget. (TfNSW, 2020)

The potential impacts of the proposal can be adequately mitigated to reduce impacts to an acceptable level. On balance, it is considered that the proposal is in the public interest.

2.3 Statutory and planning framework

2.3.1 Environmental Planning and Assessment Act 1979

The proposal is consistent with the objects of the Act as it promotes the social and economic welfare of the community by ensuring that the Coffs Harbour boat ramp remains available for the community's enjoyment and safety. It also contributes to

beach nourishment by placing sand back into the longshore sediment transport system which moves sand north to beaches that are experiencing coastal recession.

It promotes a better environment through the proper management and opportunistic use of a natural resource (dredged sand) and protects the natural environment through the implementation of safeguards.

Part 5 – Infrastructure and environmental impact assessment

Subdivision 2 Duty of determining authorities to consider environmental impact of activities

Clause 5.5(1) of the Act requires that a determining authority in its consideration of an activity shall fully consider all matters affecting or likely to affect the environment by reason of that activity. This REF fulfills that requirement.

2.3.2 Environmental Planning and Assessment Regulation 2021

Clause 171 of the Regulations requires the determining authority to consider several environmental factors when considering the likely impact of an activity on the environment. This REF considers those factors in detail and Appendix A provides a summary of how the proposal complies with the Regulations.

2.3.3 Coastal Management Act 2016

The objects of the Coastal Management Act (CM Act) are to 'manage the coastal environment of New South Wales 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.

The proposed works are in the coastal zone, as defined by the CM Act 2016. The proposed works are consistent with the objects of the CM Act 2016 as they contribute to maintaining the coastal zone as a vital economic zone and to supporting a sustainable coastal economy by mitigating the impacts and risks of coastal hazards.

Part 3 of the CM Act 2016 applies to any public authority that exercises functions in connection with the coastal zone. Division 4 Clause 23 states:

> *(1) Public authorities (other than local councils) are to have regard to coastal management programs to the extent that those programs are relevant to the exercise of their functions.*

A Coastal Zone Management Plan (CZMP) (WBM, 2019) has been prepared for Coffs Harbour. This proposal has regard to the CZMP, proposing beach nourishment.

2.3.4 Fisheries Management Act 1994

The objectives of the Fisheries Management Act 1994 (FM Act) are to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations.

To meet the Acts objectives, Part 7 of the FM Act outlines legislative provisions to protect fish habitat and Part 7A outlines provisions to conserve threatened species of fish and marine vegetation and their habitat.

An assessment of the potential impacts of the proposal on marine ecology is included at Appendix B. The assessment concludes that the proposal is unlikely to have a significant impact on any threatened species, marine vegetation, or habitat provided that the recommended safeguards, monitoring and management measures are implemented during the proposed works.

Under Section 205 of the FM Act, a permit is required to harm (cut, remove, damage, destroy, shade, etc.,) marine vegetation including saltmarshes, mangroves, seagrass, and seaweeds. The proposal is unlikely to involve any harm to marine vegetation and a Section 205 permit will not be needed for the proposal.

2.3.5 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) focuses on environmental protection and provisions for the reduction of water, noise and air pollution and the storage, treatment, and disposal of waste. The POEO Act introduces licensing provisions for scheduled activities that are of a nature and scale that have a potential to cause environmental pollution. It also includes measures to limit pollution and manage waste. This Act is administered by the NSW Environment Protection Authority (EPA) who were consulted as part of this REF.

Schedule 1 Clause 39 of the POEO Act lists waste disposal (application to land) as a scheduled activity.

Subclause (2)(e) states that this Clause does not apply to sites where only virgin excavated natural material (VENM) is received from off site and applied to land.

The POEO Act defines virgin excavated natural material (VENM) as 'natural material (such as clay, gravel, sand, soil or rock fines):

n. that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities, and

o. that does not contain any sulfidic ores or soils or any other waste, and

p. includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.'

The dredged stockpiled sand from the navigation channel has been classified as Excavated Natural Material (ENM). The proposal includes only transfer of clean marine sand from one part of the sediment compartment (the harbour), to another (Gallows Beach). The material is not considered to be "waste". A beach nourishment project does not require an Environment Protection Licence (EPL) under the POEO Act because it's not a scheduled activity under the Act. However, Transport may voluntarily apply for an EPL as a non-scheduled activity to regulate water pollution and to provide a defence against accidental pollution of waters as a precaution.

The EPA may not issue an EPL if they believe there's a low risk of pollution. In the case of the proposed project, monitoring, controls and thresholds would be in place to ensure that there will be only a low likelihood of water pollution occurring.

If the controls set out in the relevant guidelines and quality assurance specifications, and additional controls detailed in Chapter 6, are implemented, and monitored, there is unlikely to be any material water, noise, or air pollution impact.

Schedule 1 of the POEO Act lists scheduled activities. A scheduled activity is an activity for which a licence is required for the premises at which it is carried out. Extractive activities are listed under Schedule 1 and include maintenance dredging of a navigation channel for vessels carried out by or on behalf of a public authority—30,000m3 of extractive materials per year. The dredging component of the activity has been considered under a separate REF assessing the potential impacts of the jet pumps, approved by Transport in early 2023. It was determined that sand extracted from the navigation channel would not exceed 30,000m3 per year.

2.3.6 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) provides for the protection of Aboriginal heritage values, national parks and ecological values. The Act makes it an offence to harm Aboriginal objects, places or sites without approval. An Aboriginal Heritage Impact Permit (AHIP) will not be needed for the proposal as the proposal itself, when the southern area assessed in the ACHA is considered, is not expected to disturb any known items. If any sites are discovered during works, works at that location will cease and the National Parks and Wildlife Service will be contacted to ensure the appropriate management of these sites.

The project has been assessed as being unlikely to have an impact on Aboriginal cultural heritage. This is discussed further in section 3.5.

2.3.7 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (BC Act) provides for legal protections of biodiversity and threatened species in NSW. Specifically, it provides for the following:

- A process for declaring and protecting areas of outstanding biodiversity value.
- The listing of threatened species, populations and ecological communities, with critically endangered, endangered and vulnerable species under Schedule 1.
- The listing of critically endangered, endangered and vulnerable ecological communities under Schedule 2.
- The listing of extinct species, species extinct in the wild and collapsed ecological communities of animals and plants under Schedule 3.
- Requirements for the preparation of a species impact statement (SIS).
- Determining where the Biodiversity Offset Scheme (BOS) applies to proposals.

The BC Act sets the criteria for determining whether a proposal is likely to have a significant impact on threatened biodiversity listed under the BC Act. If significant impacts are identified, it would necessitate the preparation of a SIS.

An assessment of the likely impacts of the proposal on threatened species and communities is included at Appendix B. No significant impact on threatened biodiversity is expected to occur as a result of the proposal.

2.3.8 Heritage Act 1977

The Heritage Act 1977 provides for the protection or conservation of buildings, works, maritime heritage (wrecks), archaeological relics and places of heritage value through their listing on various State and local registers. The Act makes it an offence to harm any non-Aboriginal heritage values without approval.

There is one heritage item located within the footprint of the works; the line of the former rail tracks (Item I8 on Coffs Harbour LEP 2013). The pipeline crosses the tracks at the foreshore footpath. The pipeline will be installed aboveground and will not impact upon the item.

2.3.9 Marine Pollution Act 2012

The Marine Pollution Act 2012 sets out provisions to prevent pollution in the marine environment.

The proposal is unlikely to result in any oil, noxious liquid, pollutant, sewage, or garbage discharge as controlled under this Act, provided that standard controls are implemented and monitored as described in Chapter 6.

2.3.10 Environment Protection and Biodiversity Conservation Act 1999

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) a referral is required to the Australian Government for proposed 'actions that have the potential to significantly impact on matters of national environmental significance (MNES) or the environment of Commonwealth land'.

The provisions of this Act are considered in Appendix B and in chapter 3 of this REF. The assessment of the proposal's impact on MNES and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of Agriculture, Water and Environment under the EPBC Act.

2.3.11 Crown Land Management Act 2016

The Crown Land Management (CLM) Act 2016 provides for the ownership, use and management of Crown land of NSW. Under Section 2.18 and Division 5.6 of the CLM Act the Minister may grant a licence authorising the use or occupation of Crown land for any purpose that the Minister thinks fit.

It is anticipated that Transport will apply for a long-term licence over the Crown land within Lot 206 DP739570 as shown in the yellow dotted line in the plan below.

Figure 3: LOT 206 will require a Crown Land licence. Source: ePlanning Spatial Viewer.

That land is within licence number R140102 for Environmental Protection and Public Recreation managed by Coffs Harbour City Council. Outside of Lot 206, MIDO holds a licence over the area known as "Coffs Harbour Breakwater". There is an existing licence held by MIDO over the land to the north.

Section 1.3 outlines the objects of the CLM Act:

(a) to provide for the ownership, use and management of the Crown land of New South Wales, and

(b) to provide clarity concerning the law applicable to Crown land, and

(c) to require environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown land, and

(d) to provide for the consistent, efficient, fair and transparent management of Crown land for the benefit of the people of New South Wales, and

(e) to facilitate the use of Crown land by the Aboriginal people of New South Wales because of the spiritual, social, cultural and economic importance of land to Aboriginal people and, where appropriate, to enable the co-management of dedicated or reserved Crown land, and

(f) to provide for the management of Crown land having regard to the principles of Crown land management.

The proposal is consistent with the objects of the CLM Act as this REF has taken into consideration the environmental, social, cultural heritage and economic considerations of the use of Crown land for the proposal. It also provides for the management of Crown land in accordance with section 1.4 of the CLM Act which sets out the principles of Crown land management as addressed below:

(a) that environmental protection principles be observed in relation to the management and administration of Crown land, and

(b) that the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible, and

(c) that public use and enjoyment of appropriate Crown land be encouraged, and

(d) that, where appropriate, multiple use of Crown land be encouraged, and

(e) that, where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity, and

(f) that Crown land be occupied, used, sold, leased, licensed or otherwise dealt with in the best interests of the State consistent with the above principles.

The proposal seeks to re-instate areas of important public space in such a way that both the land and its resources are sustained in perpetuity.

2.3.12 State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 2 – Coastal Management: The aim of this Chapter is to promote an integrated and coordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area.

The Resilience and Hazard SEPP prevails over the Transport and Infrastructure SEPP for the purpose of coastal protection works.

Chapter 2 Coastal management defines coastal protections works to be:

(a) beach nourishment activities or works, and

(b) activities or works to reduce the impact of coastal hazards on land adjacent to tidal waters, including (but not limited to) seawalls, revetments and groynes.

The proposed work meets the definition of coastal protection works (a) beach nourishment activities.

Section 2.16 Coastal protection works identifies:

(2) Coastal protection works by public authority Development for the purpose of coastal protection works may be carried out on land to which this Chapter applies by or on behalf of a public authority:

(a) without development consent—if the coastal protection works are—

(i) identified in the relevant certified coastal management program, or

(ii) beach nourishment, or

(iii) the placing of sandbags for a period of not more than 90 days, or

(iv) routine maintenance works or repairs to any existing coastal protection works, or

(b) with development consent—in any other case.

Beach nourishment is not a defined term, however the activity is considered to generally be the addition of sand to restore eroding beaches. Although Gallows Beach is not identified as an eroding beach, the beaches to the north are (WBM, 2019). Longshore sediment transport at Coffs Harbour takes sand north from the deposition location, indicating that the sand from the pipeline would move back into the longshore sediment transport system and eventually back in to the harbour and on to beaches to the north.

Part 2.2, Divisions 1 to 4 provide development controls for areas included on the NSW Government's Coastal Wetlands and Littoral Rainforests Area map, Coastal Vulnerability Area map, Coastal Use Area map and Coastal Environment Area map.

There are no mapped littoral rainforests within, or in proximity to, the development footprint. The development is not located within a coastal wetland or littoral rainforest proximity area.

The proposal is mapped as being located within the Coastal Environment Area, Coastal Use Area and Coastal Vulnerability Area. Although development consent is not required for the proposal, the development controls for those areas are considered below as the proposal would be undertaken in a sensitive coastal location.

Clause 2.9 Development on land within the coastal vulnerability area

Consideration / control	Comment
(a) if the proposed development comprises the erection of a building or works—the building or works are engineered to	NA. The proposal is a small, flexible pipe. The pipe can be removed within 48 hours if adverse weather conditions require it.

withstand current and projected coastal hazards for the design life of the building or works,	
(b) the proposed development— (i) is not likely to alter coastal processes to the detriment of the natural environment or other land, and (ii) is not likely to reduce the public amenity, access to and use of any beach, foreshore, rock platform or headland adjacent to the proposed development, and (iii) incorporates appropriate measures to manage risk to life and public safety from coastal hazards,	The proposal is moving sand from one part of the sediment compartment to another, where it will re-join the longshore sand transport system. Presently the sand volumes being removed from the channel are approximately 100m^3 / month, with maximum volumes expected to be 1200m^3 / month in extreme ocean conditions. It is not expected that those volumes would reduce public amenity or access or alter coastal processes. Safeguards will be in place to cease the proposal if detrimental impacts (such as sand build up at the inlet) are experienced.
(c) measures are in place to ensure that there are appropriate responses to, and management of, anticipated coastal processes and current and future coastal hazards.	Safeguards will be in place to cease the works if detrimental impacts (such as sand build up at the inlet) are experienced. This includes safety spotters at each end of the pipeline. The sand pumps can be immediately switched off if necessary.

Clause 2.10 Development on land within the coastal environment area

Consideration / control	Comment
(a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,	The proposal area is within an active coastal environment that is likely to have a high level of integrity and resilience.
(b) coastal environmental values and natural coastal processes,	The area is of high coastal environmental value with dynamic natural coastal processes.
(c) the water quality of the marine estate	The local water quality is high.
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands, and rock platforms,	The development will avoid areas of marine vegetation, native vegetation and fauna and their habitats. The development will be undertaken within an undeveloped headland and rock platform, though the intrusion is minor.
(e) existing public open space and safe access to and along the foreshore, beach, headland, or rock platform for members of the public, including persons with a disability,	There will be temporary changes to the use of public open space whilst works are being undertaken in the vicinity of the footpath, however access will still be available for pedestrians and vehicles.
(f) Aboriginal cultural heritage, practices, and places,	The proposal is unlikely to impact on any Aboriginal cultural heritage, practice, or place.
(g) the use of the surf zone.	The proposal is unlikely to affect the surf zone as the sand is being deposited in a small inlet off the headland, in relatively small amounts.

Clause 2.11 Development on land within the coastal use area

Consideration / control	Comment
(a) existing, safe access to and along the foreshore, beach, headland, or rock platform for members of the public, including persons with a disability,	There will be temporary changes to the use of public open space in the vicinity of the footpath, however access will still be available for pedestrians and vehicles.
(b) overshadowing, wind funnelling and the loss of views from public places to foreshores,	The proposal would not result in any overshadowing, wind funnelling or the loss of views from public places to any foreshore.
(c) the visual amenity and scenic qualities of the coast, including coastal headlands,	The proposal would have a minor negative impact on the visual amenity and scenic quality of the area, but the benefits of a systematic method of sand removal are expected to outweigh the negative impacts.
(d) Aboriginal cultural heritage, practices, and places,	The proposal is unlikely to impact on any Aboriginal cultural heritage, practice, or place.
(e) cultural and built heritage.	The proposal would be undertaken within the vicinity of a locally listed heritage item. As there will be minimal ground disturbance, the proposal is unlikely to affect the item, which is currently buried beneath the footpath.

2.4 Community engagement and agency consultation

2.4.1 SEPP (Transport and Infrastructure) consultation

Part 2.2 of the SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. This is detailed below:

Table 2-3: Consultation required with Council

Is consultation with Council required under sections 2.10 - 2.12 and 2.14 of the SEPP (Transport and Infrastructure)?		
Are the works likely to have a substantial impact on the stormwater management services which are provided by council? No stormwater management infrastructure would be affected.	Yes ☐	No ☒
Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area? A small number of light vehicles and a small rigid truck would be the only vehicles required during construction.	Yes ☐	No ☒
Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of the system?	Yes ☐	No ☒
Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	Yes ☐	No ☒
Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow? Although the footpath through the foreshore may be temporarily closed, diversions would be in place to allow continued pedestrian movement. It is not expected that the footpath would be closed for more than 3 days. No impacts to vehicular flow are expected.	Yes ☐	No ☒
Will the works involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance? The pipe would pass under Jordan Esplanade, a Local road, through an existing 425mm concrete carrier pipe, then run aboveground through the grassed foreshore reserve south of Jordan Esplanade. A pedestrian ramp would be installed on the footpath (over the pipe) to allow the pipe to remain aboveground. It is expected that the construction and installation of the pipe would take approximately 5 days, with the majority of the work around the footpath crossing. It would not be necessary to close Jordan Esplanade. Pedestrian traffic would be managed via the new path along Jordan Esplanade while the work is taking place, or alternatively a diversion provided around the work. If the system needs to be decommissioned, it is expected that it would take up to 3 days.	Yes ☐	No ☒
Is there a local heritage item (that is not also a state heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential? The line of the former rail tracks for the Coffs Harbour Breakwaters and Foreshore are located in proximity to where the pipe would cross the footpath on the foreshore. The item is of local heritage significance and is listed on the Coffs Harbour Local Environmental Plan 2013 as Item I8. The pipe would be installed aboveground and would not impact upon any buried archaeological items. No disturbance of the item is likely.	Yes ☒	No ☒
Is the proposal within the coastal vulnerability area and consistent with a certified coastal management program applying to that land?	Yes ☒	No ☐

Note: See interactive map at Coastal management - (nsw.gov.au). Note the coastal vulnerability area has not yet been mapped. Note: a certified coastal zone management plan is taken to be a certified coastal management program. The proposal is located within a mapped coastal vulnerability area. As the proposal contributes to beach nourishment, it is not inconsistent with the relevant coastal management plan. The proposal will not increase the vulnerability of the coastline to coastal processes.		
Are the works located on flood liable land? If so, will the works change flooding patterns to more than a minor extent?	Yes ☐	No ☒

Table 2-4: Consultation with other public authorities

Is consultation with a public authority (other than Council) required under sections 2.13, 2.15 and 2.16 of the SEPP (Transport and Infrastructure)?		
Are the works located on flood liable land? (to any extent)	Yes ☐	No ☒
Are the works adjacent to a national park, nature reserve or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	Yes ☐	No ☒
Are the works on land in Zone C1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	Yes ☐	No ☒
Do the works include a fixed or floating structure in or over navigable waters?	Yes ☐	No ☒
Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land?	Yes ☐	No ☒
Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	Yes ☐	No ☒
Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	Yes ☐	No ☒
Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	Yes ☐	No ☒
Are the works on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region Work Heritage Property?	Yes ☐	No ☒
Are the works within a Western City operational area specified in Schedule 2 of the *Western Parkland City Authority Act 2018* with a capital value of $30 million or more?	Yes ☐	No ☒

Table 2-5: Notification of council and occupiers of adjoining land

Do Council and occupiers of adjoining land need to be notified under section 2.111 of the SEPP (Transport and Infrastructure)?		
Does the proposal include a car park intended for the use by commuters using regular bus services?	Yes ☐	No ☒
Does the proposal include a bus depot?	Yes ☐	No ☒

Does the proposal include a permanent road maintenance depot or associated infrastructure, such as garages, sheds, tool houses, storage yards, training facilities and workers amenities?	Yes ☐	No ☒

2.4.2 Other agency and community engagement

This section outlines formal consultation that has been undertaken with various government agencies and stakeholders including:

- Department of Planning, Industry and Environment – Crown Lands
- Department of Planning, Industry and Environment – Biodiversity Conservation Division
- Department of Primary Industries – Fisheries and Marine Parks
- Coffs Harbour and District Local Aboriginal Land Council
- Native Title Search Corporation
- Port Authority of NSW
- Transport for NSW – Maritime Compliance
- Coffs Harbour City Council

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NSW Department of Planning Industry and Environment - Crown Lands	No written response was received, however Transport held a meeting with Crown Lands, where it was advised that a Crown Land Licence would be required for the project within Lot 206.	A Crown Land Licence will be sought for the use of Lot 206.
NSW Department of Primary Industries – Fisheries and Marine Parks	The proposed works meet the definition of dredging and reclamation works under the FM Act and will trigger the associated provisions listed in the table above. A permit under section 200/201 or consultation under section 199 (for a public authority other than a local authority) of the FM Act will need to be obtained prior to the commencement of the proposed works. For any works likely to cause harm to marine vegetation a permit under section 205 of the FM Act will need to be obtained prior to the commencement of works.	The proposal does not include any dredging. The impacts of the sand removal from the navigation channel are not being assessed within this REF as they were assessed by Transport in the Minor Works REF (December 2022) for the installation of the jet pumps. That REF advised that notification to the Minister should be undertaken prior to any dredging works. In addition, a letter was received from DPI Fisheries and Marine Parks, during the preparation of the Project REF for the Coffs Harbour Boat Ramp Upgrade, advising that "*As TfNSW is a public authority the provisions of s199 of the FM Act apply and a permit is not required for the dredging and reclamation works contingent upon TfNSW consulting with DPI Fisheries prior to undertaking the works and having regard to concerns or recommendations made*". The FM Act (198A Definitions) defines reclamation work to be "*any work that involves* *(a) using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber or rocks) to fill in or reclaim water land, or* *(b) depositing any such material on water land for the purpose of*

Agency	Issue raised	Response
		constructing anything over water land (such as a bridge), or *(c) draining water from water land for the purpose of its reclamation*". The proposal is not seeking to reclaim any land. The works will move a small volume of sand from one part of the sediment compartment to another, where it will be carried northwards by natural littoral drift processes. If at any time the sand builds up around the outlet, pumping will cease. The Aquatic Ecology Assessment at Appendix B concludes that no harm to marine vegetation is expected as a result of the proposal.
	Key fish habitats are defined within the DPI Fisheries P&G and are graded by 'type' on the basis of their sensitivity, or their importance to the survival of fish (refer to section 3.2 of DPI Fisheries P&G for further information). The DPI Fisheries impact mitigation hierarchy is to first avoid impacts to key fish habitats. Where impacts to key fish habitats cannot be avoided, the preference is to impact less sensitive key fish habitats over more highly sensitive key fish habitats. All unavoidable impacts should be appropriately mitigated and offset.	The proposal is unlikely to have an impact on key fish habitats. This is considered in detail in Appendix B and Chapter 3 of this REF.
	DPI Fisheries' standard minimum information requirements for environmental assessment are clearly detailed in section 3.3 of the DPI Fisheries P&G. Please ensure that these requirements are addressed in the environmental studies. This will facilitate an effective assessment of the proposal and reduce delays.	This REF and the Aquatic Ecology Assessment at Appendix B meet the requirements of the DPI Fisheries P&G.
	Highlight how the proposal will seek to avoid impacts to "undisturbed areas" and seek to preferentially impact pre-existing impacted areas;	The Marine Biodiversity Assessment at Appendix B details measures to avoid impacts to undisturbed areas. These have been incorporated into the safeguards in section 3.7 of this REF.
	Identify measures to minimise impacts to mature native vegetation, the footprint of structures located within or over water, and the use of hard protection measures in structures such as rock;	The proposal will not disturb mature vegetation. No structures will be located within or over water.
	Detail the sediment characteristics and volumes of material that is to be dredged and transferred, including turbidity plumes associated with the discharge;	Chapters 2 and 3 of this REF detail the sediment characteristics and volume of material to be transferred. Part 3.2 details water quality safeguards.
	Provide justification as to why the specific dredging and disposal methods were chosen and detail alternative options that were discounted;	Part 2.2 of this REF details the need and options considered.

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	Details of mitigation measures that will be implemented to avoid and minimise impacts to fish and fish habitats, including seagrass and other sensitive receptors, during both the dredging and disposal components of the work, and a discussion on likely impacts to water quality from the proposed activity;	The dredging component of the works has been covered in separate REFs. The potential impacts of the deposition on fish habitats, sensitive receptors and water quality are detailed in parts 3.2 and 3.7 of this REF.
	Identify all unavoidable impacts to marine vegetation including the extent, vegetation types and whether these are located within SEPP Coastal Wetland areas;	No impacts to coastal wetlands are likely. All potential impacts have been considered in the Aquatic Ecology Assessment at Appendix B.
	Propose viable rehabilitation and compensation measures for all unavoidable impacts to marine vegetation in accordance with section 3.3.3 of the DPI Fisheries P&G;	The proposal does not trigger any offsetting requirements.
	Identify the potential impacts of the proposed sand transfer on the long-shore drift and coastal transportation of sand within that sediment compartment, including information on the likely sand migration pathways and volumes from the disposal site;	Sediment transport modelling was undertaken for the Coffs Harbour Boat Ramp Upgrade Project REF (Appendix I). It identified northerly longshore drift of sand. The local sediment budget from the study is illustrated in Figure 2 of this REF.
	Describe the potential contribution of the proposal to cumulative impacts on fish and fish habitat in the vicinity of the proposal	The Marine Biodiversity Assessment at Appendix B details the cumulative impacts on fish and fish habitat. Safeguards to mitigate those potential impacts are included in Parts 3 and 4 of this REF.
	Detailed monitoring programs, including methods to detect the success of techniques used to ameliorate impacts on fish and fish habitat in the vicinity of the proposal.	Appropriate monitoring programs have been recommended in the Aquatic Ecology Assessment and included in the safeguards in Chapter 3.
Coffs Harbour City Council (CHCC)	Council resolved at the meeting of 13 October 2022: That Council advises the NSW State Government through the local member that it: 1. Supports Transport for NSW's investigation of a long term sand removal solution for the harbour. 2. Supports in principle sand removal solutions consistent with the adopted and gazetted Coffs Harbour Coastal Zone Management Plan 2019, such as the deposition of sand on Park Beach in the intertidal zone. 3. Does not support the deposition of sand south of the harbour on Boambee and/or Gallows Beaches as this is inconsistent with the Coffs Harbour Coastal Zone Management Plan 2019.	A long-term solution to sand removal from the harbour is currently being considered by the NSW Government. This is a separate project to the proposal. Large-scale sand removal from the harbour may reduce the need for the proposed sand transfer system to Gallows Beach. Although direct deposition of sand on to Park Beach may align more directly with the objectives of the CZMP, it has been proven to be infeasible, given the small amount of sand (approx. 1,200m3 since March 2023) that is dredged from the navigation channel and the extremely high environmental and economic costs associated with transporting it over 3km north to Park Beach. Transport considers that placing the sand from the navigation channel back into the northward's natural sediment

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		transport pathway at Gallows Beach still contributes to the achievement of the objectives of the CZMP.
	The City understands that sand from the Coffs Harbour Boat Ramp, that was being stockpiled for return to the coastal system, has been classified as waste under the POEO Act and has been used for developments in nearby suburbs. Removal of sand from the coastal system is inconsistent with the gazetted Coffs Harbour Coastal Zone Management Plan 2019 (CZMP) and results in depletion of much needed sand supply to the beaches to the north of the Harbour. The proposal is contradictory to the CZMP, will supply sand to Gallows Beach which is accreting and further lead to a coastal erosion crisis by stealing the sand from nourishing the beaches north of the Harbour.	This proposal will place sand back into the northward's natural sediment transport pathway at Gallows Beach. Although much of the sand will move back into the harbour over a long period of time, modelling suggests that a small amount (approximately 30%) will bypass the harbour and travel north, consistently with the objectives of the CZMP (TfNSW, 2020).
	The City has not provided permission for the pipeline to pass through / over a section of City managed land. Please provide a copy of the permission giving you the right to proceed over this section of land.	A Crown License is being sought for the pipeline to pass through Lot 206. Crown Lands will consult with Council as part of its decision-making process.
	Please provide your plan to successfully manage the following environmental considerations such as: • Potential impacts on marine life and ecosystems. • Investigation and potential management of contaminated sediments (if present) and quality control of material being discharged onto Gallows Beach. • Avoiding damage to existing native terrestrial vegetation. • Appropriate erosion and sediment control measures during construction. • Potential impact on sand budgets, sand transport and local sand storage.	Safeguards to mitigate and manage biodiversity impacts are included in Appendix B and Chapters 3 and 4 of the REF. Since commencing removal of sand from the navigation channel the sand has been regularly tested for the presence of contaminants and ASS. This is discussed in part 3.2 of the REF. No native terrestrial vegetation will be damaged or removed for the proposal. Part 3.1 of the REF details the erosion and sediment control measures that will be in place during installation of the pipeline. The purpose of the pipeline is to keep the navigation channel open. Deposition in the littoral transport system of Gallows Beach is the most economically and environmentally feasible option. As shown in Figure 2 of the REF, it is expected that much of the sand placed on to Gallows Beach will eventually move back into the harbour under the current conditions. However, some of the sand will continue to be transported further north, consistently with the CZMP.
	Please clarify the duration of the proposed sand transfer and identify when you are intending to provide a	As noted above, the proposal is not considered to contravene the CZMP; in fact, it contributes to the achievement

Agency	Issue raised	Response
	solution that does not contravene the CZMP.	of its objectives. It is intended that the system will remain in place until a comprehensive and effective broader harbour dredging campaign and strategy is implemented.
	Please provide a copy of the community engagement undertaken to support the proposed option.	This REF will be placed on public exhibition and the community will be informed of the proposal via the project website.
	The City is disappointed by TfNSW's proposal and intent to deliver an unsustainable solution that is in contravention to the CZMP, is suboptimal and is compromising the community's and coastal environment needs. The transportation of sand from the Coffs Harbour Boat Ramp to Gallows Beach is not supported and the City strongly affirms its request in previous correspondence sent to TfNSW dated 5 April 2023 to not proceed with this option. The City requests to see a plan that takes into consideration the above, doesn't permanently remove sand from the system and therefore lead to permanent damage to coastal properties north of the Harbour.	As noted above, the proposal is not considered to contravene the CZMP. The proposal is the most economically and environmentally sustainable solution. Other options have been assessed to have unacceptable economic and environmental impacts.
	The City also advise that it has commenced Stage 1 of a new Coastal Management Program (CMP) for the open coastline of the Coffs Harbour Local Government Area, this will look at the issue of sand management in more detail, however this CMP will not be finalised for some years. In the meantime, the City requests proactive conversations regarding the use of the sand removed from the Coffs Harbour Boat Ramp, and the need to discuss both short and longer term solutions for the sand management consistent with the CZMP to maintain sand supply in the northern littoral drift.	Noted. Transport and CHCC have been engaging via a working group throughout the duration of the project. It is intended that this arrangement will continue.
	Our discussions with TfNSW on 29th March 2023 were not reflective of the proposed strategy, as recorded in your letter and specifically these two sections: ii. Medium term – (6-24 months) Installation of a pipeline and pump sand south to Gallows beach and, iii. Long term – (24- months – indefinite) investigate and scope a major dredge campaign of the basin. It was requested at our meeting that the "medium" term in section (ii) above be updated to a short term of 9-12 months, but this does not seem to have been reflected in your proposal. Pumping sand at Gallows Beach is not	The proposal is the most economically and environmentally sustainable solution. Other options have been assessed to have unacceptable economic and environmental impacts. The broader harbour dredging strategy and campaign may address the build-up of sand in the navigation channel, which would mean that the Gallows Beach sand transfer system could be decommissioned. It is still the NSW Government's intention to investigate a broader dredging Strategy and campaign to address the sand accretion in the

Agency	Issue raised	Response
	a realistic or acceptable medium term proposal. Section (iii) is unsatisfactory as it does not provide TfNSW's express commitment to implement a harbour dredging campaign but instead it leaves the proposed "medium" term as an indefinite solution by way of keeping the "long term" an indefinite investigation. This is not reflective of the discussion that was had at the meeting and of the adopted Coffs Harbour Zone Management Plan 2019 and cannot be supported.	harbour and beach nourishment consistent with Council's CZMP.
	The City has an urgent need for beach replenishment north of the harbour. There is no need to increase the rate of growth of Boambee Beach. And this proposal is in direct contradiction to the scientific body of work that has determined that sand travels north and therefore any back passing of sand is not a realistic or proactive solution for a key regional City such as Coffs Harbour.	The purpose of the pipeline is to help keep the navigation channel open. Deposition in the sedimentation transport pathway at Gallows Beach is the most economically and environmentally feasible option. As shown in Figure 2 of the REF, it is expected that much of the sand placed at Gallows Beach will eventually move back into the harbour under the current conditions. However, some of the sand will continue to be transported northerly, to be deposited at least in part on Park Beach, consistently with the CZMP.
NSW Department of Planning Industry and Environment - Biodiversity Conservation Division	The potential direct or indirect impacts on areas of Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions Endangered Ecological Community, which has been recorded close to the proposed pipeline route.	The pipeline will be laid on top of the grassy area on the foreshore, in a previously disturbed area, outside of any area of known EEC. No impact on any terrestrial EEC is likely.
	Potential direct or indirect impacts on threatened flora species, silverbush (*Sophora tomentosa*) and coast headland pea (*Pultenaea maritima*), which are known to occur close to the proposed pipeline route.	No native vegetation would be damaged or removed for the proposal.
	Potential impacts on ecosystems at the extraction and receival sites, and surrounding areas if a plume of sediment is expected to occur, which may include upper beach, intertidal and subtidal species and ecosystems.	The potential impacts of the jet pumps have been assessed in a separate REF (TfNSW, 2022). No significant impacts have been experienced at the extraction site in the navigation channel. The marine biodiversity assessment at Appendix B notes that no significant impact on the marine ecosystems near the deposition site are expected. Monitoring of the deposition site will occur, and pumping will cease if turbidity plumes are experienced in excess of a nominated threshold. The water quality monitoring plan will determine appropriate thresholds.
	Potential impacts on the foraging and/or nesting habitat of threatened	Results of the 5-Part Test for threatened shorebirds concluded that Sooty and Pied Oystercatchers that

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	shorebirds such as the pied oystercatcher and sooty oystercatcher.	may at times utilise habitat in the vicinity of the pipeline are unlikely to be significantly affected by the proposed activity due to the small volumes of sand and the infrequent pumping. Modification to foraging habitat in the Study Area comprises a very small foraging area in the locality, with ample similar habitat available along Gallows Beach, Coffs Harbour and in the adjacent SIMP.
	Potential impacts on marine turtle nesting habitat.	A 5-Part Test and Assessment of Significance was conducted for these species. These tests concluded that individuals that may potentially utilise habitat in the vicinity of the proposal are unlikely to be significantly affected by the proposed activity. Habitat use in the vicinity of the Study Area is likely to be very occasional, with limited foraging value and any nesting considered unlikely on adjacent areas of Gallows Beach.
	Compatibility of the sand from the extraction site with sand at the receiving site, particularly in terms of colour, odour, and particle size.	The sand at the extraction site is clean marine sand. Some discoloration occurs due to organic material decay. Although there is currently no organic material discoloration at Gallows Beach, the dewatering operations currently being undertaken at the boat ramp site show that organic material is quick to settle out of the dredged material.
	Appropriate distribution and placement of the sand/water mix discharged from the pipe on to Gallows Beach. When determining the system design and operation, the proponent should consider successful sand placement systems used at locations such as Noosa Heads and Surfers Paradise for sand re-circulation. We recommend the proponent also consult with the beaches team at the City of Gold Coast and Noosa Council for their experience/advice on this practice.	Similar systems have been considered in designing the proposal. The contractor responsible for designing the Gallows Beach proposal has been involved in the installation and operation of similar systems in Queensland and other places in NSW.
	Consistency and appropriate alignment of the adopted solution with the Coffs Harbour Open Coast Coastal Management Program (CMP), whose Scoping Study is currently in progress. We also recommend TfNSW undertake to work with the City of Coffs Harbour on the development of the CMP for Open Coast and review and amend the adopted approach as necessary to reflect the recommendations of the CMP once finalised.	Transport has been engaging with Council since the beginning of the project. Although it is not Council's preference to pump sand to Gallows Beach, it is necessary as the most effective solution in the short to medium term. A broader long-term dredging and beach nourishment strategy is currently being considered by Transport in consultation with Council.
	Potential impacts of climate extremes to infrastructure and operations, which may include impacts of storm tide inundation, beach inundation due to	The system has been designed to be flexible enough to be decommissioned and removed within 2 days if required. It is not expected that climate

Agency	Issue raised	Response
	waves, beach erosion and estuarine flooding caused by rainfall.	extremes will affect the operation of the system.
	Potential impact on surf amenity and other water-based activities.	Due to the minor amount of sand being transferred, it is not expected that the proposal will have an impact on surf amenity or other water-based activities.
	A monitoring program to assess the effectiveness of the sand bypass system in maintaining boat ramp access and channel navigability and track the evolution of the shoreline and sand profile at the disposal site at Gallows Beach.	A monitoring program will be in place to assess the effectiveness of the system. This will include bathymetric surveys, which have already commenced to provide baseline data.
	Evidence of consultation with the City of Coffs Harbour and other relevant stakeholders to ensure the proposal is consistent with the Coastal Management Programs, which are in preparation and due to be finalised in December 2024	Transport has been engaging with Council since the beginning of the project. Although it is not Council's preference to pump sand to Gallows Beach, it is necessary as the most effective solution in the short to medium term. A broader long-term dredging and beach nourishment strategy is currently being considered by Transport in consultation with Council.
Port Authority of NSW	No response received.	n/a
Transport for NSW Maritime Operations and Compliance	No response received.	n/a
Environment Protection Authority	The nearby Solitary Islands Marine Park is of high conservation value and supports environmental values important to the protection of water quality including aquatic ecosystem health, primary and secondary contact recreation, and recreational fishing. It is therefore essential that water quality is protected and that the REF assesses how water quality impacts will be prevented in all construction and operational stages of the project. The REF must clearly detail how the following issues will be managed to prevent water pollution: • Mobilised sediments from land and marine excavation works; • Dewatering of marine sediments; • Stormwater generated on and around project construction sites; • Fuels, hydraulic oils, chemicals etc involved with the construction and operational works; The REF should also provide detail on the management practices that will be implemented to ensure water quality issues are detected and promptly acted upon to prevent impacts.	The potential impacts on water quality and the proposed safeguards are detailed in Appendix B and parts 3.2 and 3.7 of this REF.
	The potential risks to human health from exposure to airborne particulates	Part 3.4 of this REF addresses potential air quality impacts and proposed

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	(from uncontrolled dust emissions) must be assessed. This is of particular importance given the proximity of the extraction and project construction sites to high public use areas. Dust control measures must be detailed, with the aim to prevent any movement of dust off-site.	safeguards. No impacts on air quality are expected.
	The REF must assess potential impacts from noise generated from all potential construction and operational noise sources and also detail any potential noise attenuation works that are needed to address these impacts. The REF should also consider the recommended standard hours of operation:	Part 3.3 of this REF addresses potential noise impacts and proposed safeguards. The construction works will be undertaken during standard hours. The operation of the project is expected to occur only during standard hours, except for when tidal conditions or conditions related to high pedestrian use of the foreshore require out of hours works.
	The REF should estimate volumes of waste generated on the site and identify waste streams and disposal options for all waste including liquid waste and wastes classified as hazardous. Waste management should consider the prevention of pollution, minimising resource use, improving the recovery of materials from the waste stream and ensuring the appropriate disposal of waste.	Part 3.11 of this REF addresses potential waste impacts and proposed safeguards.

3. Environmental assessment

This chapter provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted upon by the proposal are considered. This includes consideration of the factors specified in s171 of the Environmental Planning and Assessment Regulation 2021.

The matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) are also considered in Appendix A. Site-specific safeguards are provided to ameliorate the identified potential impacts.

3.1 Soils

Table 3-1: Soil

Description of existing environmental and potential impacts		
Are there any known occurrences of salinity or acid sulfate soils in the area? The area of works includes Class 2 acid sulfate soils. The pipeline will be located aboveground and does not involve excavation of more than 1 tonne of soil. Soil disturbance will be limited. No acid sulfate soils are likely to be disturbed for the installation of the pipeline. Results from a geotechnical investigation undertaken in 2023 (Hydrosphere, 2023) indicate that sediments within the vicinity of the proposed sand pumps may contain sulfur from decaying organic material however the material also contains sufficient natural buffering capacity to neutralise the potential sulfuric acidity. As such, any acidity generated from the oxidation of the sulfur during the pumping process would be sufficiently neutralised by carbonates present in the material. Further, the seawater fraction of the slurry and as the receiving seawater at Gallows Beach would provide	Yes ☒	No ☐

further buffering capacity. Therefore, no impacts to water quality arising from acid sulfate/potential acid sulfate soils are expected during operation of the proposed system.		
Does the proposal involve the disturbance of large areas (e.g., >2ha) for earthworks? Soil disturbance will be limited.	Yes ☐	No ☒
Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors? Although the site slopes up from the boat ramp and then sharply down towards the deposition site, the requirement for erosion and sediment controls is minimal as the pipe will be located aboveground. A small amount of soil disturbance may be required around the footpath, and erosion controls will be in place until the area is stabilised.	Yes ☐	No ☒
Are there any sensitive receiving environments that are located in or nearby the likely proposal area or that would likely receive stormwater discharge from the proposal? Although the sand will be discharged into the marine environment, the discharge point is located over 1km from the Solitary Islands Marine Park.	Yes ☐	No ☒
Is there any evidence within or nearby the likely footprint of potential contamination? Several sediment studies investigating contaminants within sediment from within the vicinity of the proposed pumping area did not detect elevated levels of any contaminants except for tributyltin (TBT). TBT was detected in one sample in RGS (2020) from within close proximity of the proposed pumping location. TBT is a biocide historically used for antifouling coating of marine vessel hulls which was commonly applied in paint form. TBT is often associated with fines and located sporadically when present. The distribution of TBT within the vicinity of the boat ramp channel is likely to be dispersed and random. This may affect water quality, which is addressed below in part 3.2. The sand taken from the boat ramp is tested regularly for contamination and the presence of acid sulfate soils. The most recent testing results from Southern Cross University (12/09/23) are: In regard to the analysis of 7 soil samples taken from the dredged material: *The material is NOT classified as an Acid Sulfate Soil based on Net Acidity and CRS, but noting the values are very close to guidelines.* *With further validation using incubation, the pH is very alkaline (i.e., pH 8.18 – 8.60) and maintained that alkalinity and high pH throughout the incubation trial (i.e., pH 7.88 – 8.51).* *We see no reason why this material cannot be reused in any manner required on or offsite, but being aware that the small amounts of pyrite (i.e., even though under the guidelines) could produce some iron oxide leachate that may require site management to bund and manage the visual impact*	Yes ☐	No ☒
Is the likely proposal footprint in or nearby highly sloping landform?	Yes ☐	No ☒
Is the proposal likely to result in more than 2.5ha (area) of exposed soil?	Yes ☐	No ☒
The works will disturb only a small amount of soil for the pipeline. Erosion and sediment controls will be in place to limit the potential impacts of this.		

Safeguards

Safeguards to be implemented are:

E1. Erosion and sediment control measures are to be implemented and maintained to:

- Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets.
- Reduce water velocity and capture sediment on site.
- Minimise the amount of material transported from site to surrounding pavement surfaces.
- Divert clean water around the site.

(in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)).

E2. Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.

E3. Erosion and sediment control measures are not to be removed until the works are complete, and areas are stabilised.

E4. Potential or actual acid sulphate soils are to be managed in accordance with the Roads and Maritime Services Guidelines for the Management of Acid Sulphate Materials 2005.

3.2 Water quality

Table 3-2: Waterways and water quality

Description of existing environmental and potential impacts		
Is the proposal located within, adjacent to or near a waterway? The proposal is located within the Coffs Harbour boat ramp and Gallows Beach.	Yes ☒	No ☐
Is the location known to flood or be prone to water logging?	Yes ☐	No ☒
Is the proposal located within a regulated catchments covered by chapter 6 of State Environmental Planning Policy (Biodiversity and Conservation) 2021 (SEPP (Biodiversity and Conservation))?	Yes ☐	No ☒
Would the proposal be undertaken on a bridge or ferry?	Yes ☐	No ☒
Is the proposal likely to require the extraction of water from a local water course (not mains)?	Yes ☐	No ☒
During operation there are several key water quality risks as follows: • Generation of turbidity at the deposition site. If the pump intakes remain above the identified clay layer the risk of significant turbidity generation is considered to be low. Monitoring of dredged material at the boat ramp indicates that the jet pumps have not disturbed the clay layer underlying the boat ramp. Although, due to the presence of low levels of fines in the material, some turbidity may be evident at the point of deposition. Turbidity testing in the dewatering area indicates low levels of turbidity (averaging 87 NTU in the most recent testing results). Any turbidity impact is expected to be temporary and localised to the nearshore zone of the discharge site. Monitoring of the discharge area would be undertaken to ensure excessive fines/turbidity is not being discharged at Gallows Beach. • Mobilisation of tributyltin. Sediment sampling results indicate that tributyltin may periodically occur within the sediments to be pumped. Overall, concentrations are likely to be low as tributyltin is as often associated with fines. Monitoring is to be undertaken to ensure tributyltin levels are acceptable. • Release of stagnant water. Issues relating to stagnant water after a period of no pumping are likely to be short-lived due to dilution at the discharge site by freshly pumped water at commencement of operations, aeration of the discharge running across the beach face and significant mixing and aeration within the surf zone. Further, experience from similar schemes at Noosa and Woorim operated by the same contractor has indicated no issues despite use on popular public beaches, where such issues would become readily apparent due to public scrutiny. It is concluded that overall, the risk to water quality from water stagnation is low and any impact would be temporary and localised. Monitoring of the pipeline water is required when pumping occurs after long outages to confirm this. Detailed monitoring of the discharge water is required to ensure that any of the identified potential water quality issues are identified and characterised and is essential to the effective management of water quality at the deposition site. If the recommended water quality monitoring is undertaken and adaptive measures are implemented to address any identified issues the proposal is not expected to have any significant negative impacts on water quality.		

Safeguards

Safeguards to be implemented are:

W1. A Water Quality Management Plan (WQMP) would be developed to detail the turbidity monitoring required for the proposal.

W2. All fuels, chemicals and liquids are to be stored in an impervious bunded area a minimum of 50 metres away from:

- Rivers, creeks or any areas of concentrated water flow
- Flooded or poorly drained areas
- Slopes above 10%.

W3. Refuelling of plant and equipment is to occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways.

W4. All machinery should be routinely checked for leaks, with an emergency spill kit to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use. If an incident (e.g., spill) occurs, the Roads and Maritime Services Environmental Incident Classification and Reporting Procedure is to be followed and the Contract Manager notified as soon as practicable.

W5. Emergency contacts will be kept in an easily accessible location on vehicles, vessels, plant and site office. All workers will be advised of these contact details and procedures.

W6. Vehicles, vessels and plant must be properly maintained and regularly inspected.

W7. Visual monitoring of local water quality (i.e., turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis at the dredge site to identify any potential spills. Water quality monitoring will occur daily within the dewatering area to measure turbidity using nephelometric turbidity units (NTU) to provide a measure of turbidity in real-time. If turbidity thresholds are reached, dredging operations would be suspended until the turbidity is reduced to acceptable levels. A dredge log would be maintained which would include a record of visual observations and NTU monitoring results, as well as any measures put in place to reduce turbidity.

W8. Appropriate site and project inductions/training detailing potential water quality impacts and relevant construction measures and spill and emergency response procedures are to be used.

3.3 Noise and vibration

Table 3-3: Noise and vibration

Description of existing environmental and potential impacts		
Are there any residential properties or other noise sensitive areas near the location of the proposal that may be affected by the work (i.e., church, school, hospital)?	Yes ☐	No ☒
Is the proposal going to be undertaken only during standard working hours? Standard working hours: • Monday-Friday: 7:00am to 6.00pm • Saturday: 8.00am to 1.00pm • Sunday and Public Holidays: no work The total construction time is likely to be approximately 5 days. Hours and duration of sand pumping will vary greatly, depending on the amount of sand that is building up in the navigation channel. It is likely that the pumps would operate no more than once per week for not more than 2 hours each time. During calm weather conditions this would be significantly less, and during weather patterns that result in more extreme sand movement, the pumps may operate twice each week for up to 3 hours. Pumping would mostly be undertaken during standard working hours but may require occasional work outside of standard hours where tidal conditions require it.	Yes ☒	No ☐
Is any explosive blasting required for the proposal?	Yes ☐	No ☒
Would construction noise or vibration from the proposal affect sensitive receivers? The site is located at a significant distance from any sensitive receiver, with the closest residential receiver being an isolated dwelling 180m north-west of the boat ramp. The nearest residential street is Camperdown Street which is located approximately 450m north-west of the proposal site.	Yes ☐	No ☒

Would operation of the proposal alter the noise environment for sensitive receivers? This might include, but not be limited to, altering the line or level of an existing carriageway, changing traffic flow, adding extra lanes, increasing traffic volume, increasing the number of heavy vehicles, removing obstacles that provide shielding including changing the angle of view of the traffic, changing the type of pavement, increasing traffic speeds by more than 10 kilometres per hour or installing audio-tactile line markings.	Yes ☐	No ☒
Would the proposal result in vibration being experienced by any surrounding properties or infrastructure during operation? There are no components of the proposal that would cause vibration. Only small machinery and hand tools would be used during construction.	Yes ☐	No ☒
During peak periods, such as school holidays, special events and weekends, the background noise levels of the site and surrounds are likely to be moderate to high due to vehicles travelling along Jordan Esplanade and watercraft using the boat ramp. At these times it is likely that the day-time background noise levels would be approximately 50 - 60dBA. Outside of peak times they may be as low as 40dBA. The site is located at a significant distance from any residential receiver, with the closest residential receiver being an isolated dwelling 180m north-west of the boat ramp and approximately 100m north-west of the location proposed for roadworks. The nearest residential street is Camperdown Street which is located approximately 450m north-west of the proposal site. The closest non-residential receiver is the RED-C Events Centre located in the former Deep Sea Fishing Club premises on Jordan Esplanade opposite the boat ramp at a distance of approximately 60m from the proposed roadworks at the intersection of the Centre and the boat ramp.		

Safeguards

Safeguards to be implemented are:

N1. Works to be carried out during normal work hours (i.e., 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work that is performed outside normal work hours or on Sundays or public holidays must have measures in place to minimise noise impacts.

N2. Loading and unloading of materials/deliveries is to occur as far away as possible from sensitive receivers.

3.4 Air quality

Table 3-4: Air quality

Description of existing environmental and potential impacts		
Is the proposal likely to result in large areas (>2ha) of exposed soils? Only small areas of soil would be exposed during construction.	Yes ☐	No ☒
Are there any dust-sensitive receivers located within the vicinity of the proposal during the construction period? Although the area is used for recreation, and would be sensitive to dust generation, it is unlikely that the proposal would generate any dust.	Yes ☐	No ☒
Is there likely to be an emission to air during construction? Only small machinery and hand-held tools would be used. No emissions to air or any changes in air quality are likely.	Yes ☐	No ☒
Potential air quality impacts include emissions of CO, NO2 and SO2 associated with combustion of diesel fuel and petrol from construction vehicles and equipment. Based on the short duration of works, the number of emission sources and the scheduling of machinery (i.e., not all machinery would be operating simultaneously), potential emissions affecting air quality are expected to be minimal and would not affect the overall air amenity in the vicinity of the proposal.		

Safeguards

Safeguards to be implemented are:

A1. Measures are to be used to minimise or prevent air pollution and dust.

A2. All plant and equipment is to be maintained in good working order according to the manufacturer's instructions. Where plant or equipment is generating excessive fumes, it would be switched off and repaired prior to starting up again.

A3. Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.

3.5 Aboriginal cultural heritage

Table 3-5: Aboriginal cultural heritage

Description of existing environmental and potential impacts		
Would the proposal involve disturbance in any area that has not been subject to previous ground disturbances? The proposal is being undertaken in a highly modified and urbanised area of high pedestrian, vehicle and watercraft traffic.	Yes ☐	No ☒
Has an online Aboriginal Heritage Information Management System (AHIMS) search been completed? The AHIMS search did indicate moderate to high concentrations of Aboriginal objects or places in the study area.	Yes ☒	No ☐
Is there potential for the proposal to impact on any items of Aboriginal cultural heritage? Although the study area contains landscape features indicating the presence of Aboriginal objects, the proposal has a light footprint and would involve little ground disturbance.	Yes ☐	No ☒
Would the proposal involve the removal of mature native trees? No native vegetation would be removed for the proposal.	Yes ☐	No ☒
Is the proposal consistent with the requirements of Transport's *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI)? A Stage 1 PACHCI assessment has been undertaken for the proposal. The project, as described in the Stage 1 assessment, was assessed as being unlikely to have an impact on Aboriginal cultural heritage. The PACHCI assessment is included at Appendix D.	Yes ☒	No ☐
The Stage 1 PACHCI assessment notes that the cultural heritage potential of the study area appears to be reduced due to past disturbance and there is an absence of sandstone rock outcrops likely to contain Aboriginal art.		

Safeguards

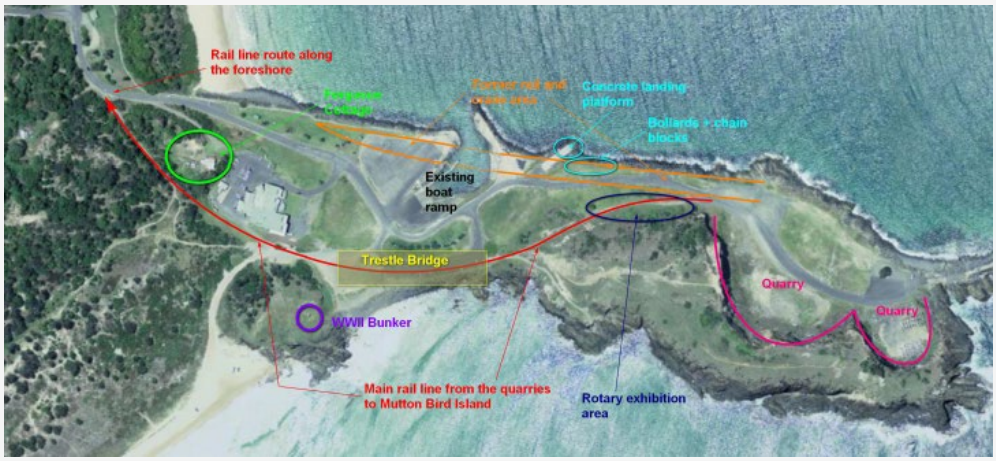
Safeguards to be implemented are:

AH1. If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Roads and Maritime Services Aboriginal cultural heritage officer and regional environment manager contacted immediately. Steps in the Roads and Maritime *Standard Management Procedure: Unexpected Heritage Items* must be followed.

AH2. If the scope of the proposal changes the relevant Aboriginal Community and Heritage Partner and Environmental Advisor must be contacted to determine whether the changed scope can proceed without further cultural heritage investigations.

3.6 Non-Aboriginal heritage

Table 3-6: Non-Aboriginal heritage

Description of existing environmental and potential impacts		
Have online heritage database searches been completed? • Transport (including legacy Roads and Maritime) section 170 register • NSW Heritage database • Commonwealth Heritage List, established under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) • Maritime heritage database • Australian Heritage Places Inventory • Local Environmental Plan(s) heritage items. An Historic Heritage Assessment was prepared for the Boat Ramp Upgrade project in September 2020. That assessment noted one archaeological item (buried rail line) in the vicinity of the proposal as shown below:  	Yes ☒	No ☐
Are there any items of non-Aboriginal heritage or heritage conservation areas listed on relevant heritage databases/registers that are located within the vicinity of the proposal? The route of the main rail line (red) crosses the site and follows the foreshore line that then links across to the breakwall linking Mutton Bird Island. This item is listed on Coffs Harbour LEP 2013 as Item I18. This item is buried beneath the existing footpath.	Yes ☒	No ☐
Is the proposal likely to impact trees that form part of a heritage listing or have other heritage value? No vegetation would be removed for the proposal.	Yes ☐	No ☒
Is the proposal likely to occur in or near features that indicate potential archaeological remains? As the pipe will be overlaid on top of the existing footpath, it is not expected that the item (I18) would be damaged or disturbed.	Yes ☒	No ☐
The land use history of the site and historical research undertaken for the Coffs Harbour Boat Ramp Upgrade REF (CoAssociates, 2020) indicates the presence of former structures in the project area. Potential archaeological features were observed during the site inspection for that REF. The proposal works area is therefore considered to have some archaeological potential, albeit that the area is highly disturbed, and arcaheological significance has been partially reduced.		

Safeguards

Safeguards to be implemented are:

H1. If unexpected heritage items are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Roads and Maritime Services Standard Management Procedure: Unexpected Heritage Items must be followed. Roads and Maritime Services Senior Environment Specialist - Heritage must be contacted immediately.

H2. The existing heritage item in the vicinity of the works (Tramway Line Item 18 on Coffs Harbour LEP 2013) is to be protected to prevent any damage or disturbance. This includes no ground disturbance where the pipeline crosses the item.

H3. A site induction is to be provided to all workers to make them aware of the location of the buried heritage item in the vicinity of the pipeline. The induction is to include controls to be implemented to prevent damage to the item.

3.7 Biodiversity

Table 3-7: Biodiversity

Description of existing environmental and potential impacts		
Have relevant database searches been carried out? Relevant databases were searched during October 2023, applying a 10 km radius around the Project Area at Gallows Beach (Locality) to identify threatened biodiversity, migratory species and MNES that may potentially occur at the locality. The following databases and information sources were searched: • Bionet, Atlas of NSW Wildlife (last 20 years), • Atlas of Living Australia - Selected species, • Birdata (Birdlife Australia), • NSW DPI Fisheries Threatened species lists (NSW DPI 2022b); and • EPBC Act Protected Matters Report tool. Mapping of existing ecological features important to this assessment was reviewed using the following online tools: • Fisheries NSW Spatial Data Portal – Mapping of Estuarine Macrophytes, Aquaculture, Marine Protected Areas, and Resilience and Hazards SEPP layers, • Biodiversity Values and Threshold Tool – Biodiversity values, • High resolution aerial imagery from Nearmap that has been captured since 2018, • Sea floor bathymetry (topography) mapping provided by the Seabed NSW Program. Details of all database searches are included in the Aquatic Ecology Assessment at Appendix B.	Yes ☒	No ☐
Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna, or migratory species in or within the vicinity of the proposed works? Both Commonwealth and State listed matters must be considered. Searches of the Bionet database identified sightings data for 28 items listings under the BC Act within a 10 km radius of the Project Area (Appendix 2). These included: • 20 Threatened marine birds and/or shorebirds, • 4 Threatened marine mammals; and • 4 Threatened marine reptiles. In addition, four shark, three fish species and one marine brown alga listed under the FM Act may also occur within the 10 km of the Project Area. The EPBC Protected Matters Report Search identified the following MNES relevant to this study (i.e., marine/estuarine species or those that use marine/estuarine habitat) within 10 km radius of the Project Area: • 46 Listed Threatened species; and • 57 Listed Migratory species. In addition to the above, the EPBC Protected Matters Report Search identified 74 protected marine species that include certain species of fish, along with some marine birds, reptiles and mammals. A total of nine marine mammals were identified as part of protected listings for cetaceans. Of the Commonwealth listed threatened and/or migratory species, the following were identified for consideration as part of this assessment: • 47 marine birds and shorebirds, • Nine marine mammals, • Five marine turtles, • Nine sharks and rays; and	Yes ☒	No ☐

• Four fish. In total 50 marine birds and shorebirds (including waders), 10 marine mammals, 5 marine reptiles, 9 sharks and rays, 4 fish and 1 macroalgae considered threatened and/or migratory species were identified to require further consideration. Detailed mapping and assessment of endangered ecological communities, threatened flora and threatened or protected fauna, as well as migratory species in or within the vicinity of the proposed works have been described, mapped and assessed in detail in the Aquatic Ecology Assessment at Appendix B.		
Does the proposal involve pruning, trimming or removal of any tree/s?	Yes ☐	No ☒
Is the proposal likely to impact nationally listed threatened species, ecological communities or migratory species? The proposal is considered unlikely to have a significant impact on State and/or Commonwealth listed threatened biodiversity.	Yes ☐	No ☒
Would the proposal require the removal of any other vegetation?	Yes ☐	No ☒
Would the proposal require the removal of any tree hollows?	Yes ☐	No ☒
Are there any known areas of outstanding biodiversity value or areas mapped as 'littoral rainforest' or 'coastal wetland' under chapter 2 of SEPP (Resilience and Hazards) in or within the vicinity of the proposed work?	Yes ☐	No ☒
Would the proposal provide any additional barriers to the movement of wildlife?	Yes ☐	No ☒
Would the proposal disturb any natural waterways or aquatic habitat? The proposal will affect the marine environment. The Aquatic Ecology Assessment at Appendix B notes that the proposal is considered unlikely to have a significant impact on State and/or Commonwealth listed threatened biodiversity.	Yes ☒	No ☐
Would the proposal impact (directly or indirectly) any potential microbat roosting or breeding habitat such as on bridges and culverts?	Yes ☐	No ☒

Direct impacts from the proposal will include some localised and short-term sedimentation or smothering of intertidal and shallow subtidal areas in the study area, potentially resulting in the loss of common sessile invertebrates or slow-moving invertebrates in both intertidal and subtidal rocky habitat. These losses are not expected to detrimentally impact on the wider populations and communities of invertebrates at an ecologically significant level, with species expected to recolonise on adjacent substrata. The smothering of these species in rocky intertidal areas will reduce a small amount of foraging habitat used by shorebirds and marine birds in the locality, however, given the small impact area relative to the vast availability of this is not considered to detrimentally impact shorebird and marine bird species.

The deposition of sand may result in short-term impacts on water quality in the form of elevated levels of turbidity, with potential sedimentation in the vicinity of the pipe outlet and increased sediment accretion in some rocky reef edge habitat to the northeast during pump operation. It is possible that some threatened marine fauna and flora, particularly the Black Rockcod and Marine Brown Alga (*N. lophocladia*), may occur in areas of rocky reef habitat along Corambirra Headland, the South Breakwater and waters around Muttonbird Island, although habitat in this area is considered very marginal for these species. In instances where large volumes of sand are deposited from the pipe outlet, there is potential that some of these habitats may be impacted by short-term increases in sediment accretion and decreases in habitat quality. However, given the high swell energy of subtidal areas in close proximity to Corambirra Headland and the South Breakwater and considering the estimated 30,000 m^3 of sediment accretion per annum in these areas from the northward littoral drift along Boambee Beach, short-term impacts from the proposal are likely to be consistent with those disturbances that occur as part of natural sand movements in the locality and are unlikely to result in disturbances that are of ecological significance. The monitoring of sand movement and the establishment of trigger values for sand volumes will be essential to identify any potential for the proposal to have wider impacts on adjacent habitats and species, in order to inform the need for the slowing or reduction in volume of pumping operations.

The proposal is considered unlikely to have a significant impact on State and/or Commonwealth listed threatened biodiversity. As such, referral to the Department of the Environment under the EPBC Act is not required. Similarly, the preparation of a Species Impact Statement (SIS) based on the provisions of the BC and FM Act should not be required.

Based on the NSW Policy and guidelines for fish habitat conservation and management, a Section 205 – permit to harm (cut, remove, damage, destroy, shade etc.) marine vegetation (saltmarshes, mangroves, seagrass and seaweeds) will not be required.

To manage the potential risks that this proposal may pose to marine habitat, flora and fauna and the potential for impacts to adjacent habitat from increased sediment accretion and reduced water quality, a series of recommendations have been provided in the Aquatic Ecology Assessment at Appendix B.

Safeguards

Safeguards to be implemented are:

Pre-Construction/Operation:

The following actions are to be completed prior to construction and operation of the proposal:

B1. Inspection of the sandy and rocky intertidal habitat at the northern end of Gallows Beach for evidence of nesting marine birds, shorebirds and marine turtles within 4 weeks prior to the construction of the pipe outlet and prior to the commencement of pump operation by an experienced ecologist. Should nesting fauna be found, further consultation and the preparation an appropriate management plan will need to be negotiated with DPIE and/or NPWS.

B2. Bathymetric survey of the locality, including the northern end of Gallows Beach and subtidal areas adjacent to Corambirra Headland, to provide a baseline understanding of the seabed profiles before pumping of sand to this locality.

Construction of Pipe Outlet:

The following actions are to be completed during construction of the proposal at intertidal habitat at Gallows Beach.

B3. Pipe outlet will be placed and directed in a manner that minimises changes to the natural beach profiles of Gallows Beach.

B4. Should shorebirds be foraging in intertidal areas within 50m of active construction works, reasonable care should be taken to ensure that the birds are not harmed in any way.

B5. If any marine or shorebirds are found to be nesting, or Fur-seals resting within 100m of the project area during construction works, the works should cease immediately and the local NPWS office notified.

B6. The contractor should liaise monthly with the local NPWS office to ensure no nesting turtles are using Gallow Beach.

B7. Visual turbidity monitoring will be implemented during sand pumping, and records of results retained.

Operation of Pipe Outlet:

The following actions will be undertaken during operation of the proposal:

B8. Implementation of a sand monitoring program to determine where the sand moves to and at what volumes. This would include modelling to identify volume-based triggers for potential changes in current accretion and scouring along coastal areas north of Coffs Harbour.

B9. Monitoring of sand volumes pumped per month to inform volumes exceeding a nominated trigger value. Volumes exceeding the nominated trigger value will initiate protocols to protect marine habitat.

B10. Bathymetric Monitoring undertaken will be undertaken at least annually and more regularly as required based on volume-based triggers.

3.8 Traffic and transport

Table 3-8: Traffic and transport

Description of existing environmental and potential impacts		
Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction? For a period of approximately one week, it is likely that diversions to pedestrian traffic would be necessary for construction of the pipeline over the footpath.	Yes ☒	No ☐
Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation? Once the pipeline is in place, pedestrian access will be fully reinstated.	Yes ☐	No ☒
Is the proposal likely to affect any other transport nodes or transport infrastructure (e.g., bus stops, bus routes) in the surrounding area? Or result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?	Yes ☐	No ☒
Diversions around the footpath will be necessary whilst the pipeline is being installed through the foreshore area. These will be temporary and unlikely to cause significant disruption.		

Safeguards

Safeguards to be implemented are:

T1. Where possible, current traffic movements and property accesses are to be maintained during the works. Any disturbance is to be minimised to prevent unnecessary traffic delays.

T2. Where possible, current vessel movements and public accesses to the waterway and foreshore are to be maintained during works. Any disturbance is to be minimised as much as practicable.

T3. Pedestrian traffic will be diverted around the works site while the pipe installation is taking place.

3.9 Socio-economic

Table 3-9: Socio-economic

Description of existing environmental and potential impacts		
Is the proposal likely to impact on local business?	Yes ☐	No ☒
Is the proposal likely to require any property acquisition? All works would be undertaken on Crown Land. A Crown Land licence would be sought.	Yes ☐	No ☒
Is the proposal likely to alter any access for properties (either temporarily or permanently)?	Yes ☐	No ☒
Is the proposal likely to alter any on-street parking arrangements (either temporarily or permanently)? Parking for work vehicles would be provided in the existing works compound area.	Yes ☐	No ☒
Is the proposal likely to change pedestrian movements or pedestrian access (either temporarily or permanently)? Diversions around the footpath will be necessary whilst the pipeline is being installed through the foreshore area. These will be temporary and unlikely to cause significant disruption.	Yes ☒	No ☐
Is the proposal likely to impact on any items or places of social value to the community (either temporarily or permanently)?	Yes ☒	No ☐

The foreshore area of Gallows Beach is popular for recreation. Temporary disruption, for around one week, is likely to impact on usage during that time.		
Is the proposal likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?	Yes ☐	No ☒
Is the proposal likely to impact trees planted by a community group, Landcare group or by council or a tree that is a memorial or part of a memorial group e.g., has a plaque? No native vegetation would be removed for the proposal.	Yes ☐	No ☒
Is the proposal likely to impact trees that form part of a streetscape, an avenue or roadside planting? NO trees or shrubs would be removed for the proposal.	Yes ☐	No ☒
Although there would be temporary disruption within a recreation area during the construction of the pipeline, there would be long-term socio-economic benefits associated with a system that efficiently and consistently removes sand from the boat ramp navigation channel. The benefits of this outweigh the short-term negative socio-economic impacts.		

Safeguards

Safeguards to be implemented are:

C1. Notification is to be given to affected community members prior to the works taking place. The notification is to include:

- Details of the proposal
- The duration of works and working hours
- Any changed traffic or access arrangement
- How to lodge a complaint or obtain more information
- Contact name and details.

Notification should be a minimum of 7 calendar days prior to the start of works.

C2. All complaints are to be recorded on a complaints register and attended to promptly.

3.10 Landscape character and visual amenity

Table 3-10: Landscape character and visual amenity

Description of existing environmental and potential impacts		
Is the proposed work over or near an important physical or cultural element or landscape? (For example, heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc.) The line of the former rail tracks (Item I8 in Coffs Harbour LEP) is located near the footpath and would be crossed by the pipeline. The item is of local archaeological significance. The pipeline would not disturb the item as it will be constructed aboveground.	Yes ☒	No ☐
Would the proposal obstruct or intrude upon the character or views of a valued landscape or urban area? (For example, locally significant topography, a rural landscape or a park, a river, lake or the ocean or a historic or distinctive townscape or landmark) The Gallows Beach foreshore area is of high scenic value. The pipeline would result in a slight reduction in the quality of the landscape. The reduction is expected to be minor, and the associated benefits are considered to outweigh the negative impacts associated with a reduction in landscape quality.	Yes ☒	No ☐
Would the proposal require the removal of mature trees or stands of vegetation, either native or introduced? No trees or shrubs are required to be removed for the proposal.	Yes ☐	No ☒

Would the proposal result in large areas of shotcrete visible from the road or adjacent properties? No shotcrete would be used.	Yes ☐	No ☒
Would the proposal involve new noise walls or visible changes to existing noise walls?	Yes ☐	No ☒
Would the proposal involve the removal or reuse of large areas of road corridor, landscape, either verges or medians? The proposal would only require a narrow linear strip of foreshore area. Although the use of the foreshore by pedestrians would be affected during installation, the area would be reinstated so that full pedestrian use is available once works have been completed.	Yes ☐	No ☒
Would the proposal involve substantial changes to the appearance of a bridge (including piers, girders, abutments and parapets) that are visible from the road or residential areas?	Yes ☐	No ☒
If involving lighting, would the proposal create unwanted light spillage on residential properties at night (in construction or operation)? No lighting would be required. All works would be undertaken during daylight hours.	Yes ☐	No ☒
Would any new structures or features to be constructed, result in over shadowing to adjoining properties or areas?	Yes ☐	No ☒
The introduction of a pipeline on to the foreshore would reduce the visual amenity of the area. To preserve the archaeological value of the foreshore it is necessary to install the pipeline aboveground. Maintaining the pipeline aboveground would also allow less disruption during installation and future decommissioning. Interpretive signage would be installed close to the pipeline where it crosses the footpath, to generate public interest. On balance, it is considered that the reduction in visual amenity is minor compared to the benefits of the proposal.		

Safeguards

Safeguards to be implemented are:

L1. No native vegetation is to be disturbed for the works.

L2. All works areas are to be reinstated upon completion.

L3. Interpretive signage is to be installed close to the footpath to inform pedestrians of the purpose of the pipeline.

3.11 Waste

Table 3-11: Waste

Description of existing environmental and potential impacts		
Is the proposal likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)? No waste is expected to be generated by the proposal.	Yes ☐	No ☒
Is the proposal likely to require a licence from EPA? The dredged material being transferred to Gallows Beach is unlikely to amount to more than 30,000m3 of dredged material per year.	Yes ☐	No ☒
Is the proposal likely to require the removal of asbestos?	Yes ☐	No ☒
The proposal is a small, low impact activity that is not expected to generate any waste material.		

Safeguards

Safeguards to be implemented are:

M1. Resource management hierarchy principles are to be followed:

- Avoid unnecessary resource consumption as a priority
- Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery).
- Disposal is undertaken as a last resort.

M2. There is to be no disposal or re-use of construction waste on to other land.

M3. Waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed.

M4. Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. Adequately manage and store waste products and material in designated areas on the site. All construction work locations are to have designated litter disposal bins to avoid potential for marine debris.

M5. If the amount of material being deposited on to Gallows Beach significantly increases, the EPA is to be engaged to determine the requirement for a licence.

3.12 Climate change and greenhouse gas emissions

Table 3-12: Climate change and greenhouse gas emissions

Description of existing environmental and potential impacts		
Is the proposal located in an area likely to be permanently or tidally inundated in the future or subject to increased duration and intensity of flooding? Although the proposal is located in a mapped coastal vulnerability area, it is not likely to be tidally inundated or subject to flooding. Should there be a need to remove the system due to unexpected weather events, it would take approximately three days to decommission the system.	Yes ☐	No ☒
Have opportunities for reduced energy consumption during construction and operation been considered. The opportunities for reduced energy consumption were considered during the REF for the jet pumps. Significant reductions in the use of fossil fuels and emissions has been gained by using the jet pumps over dredging by machinery.	Yes ☒	No ☐
Greenhouse gas emissions sources during construction and operation are likely to be largest from the operating system for the jet pumps. These have been considered under a separate REF.		

Safeguards

Safeguards to be implemented are:

G1. Where possible, procure recycled content construction materials and use lower embodied energy concrete for lower-strength applications where feasible.

G2. Select the most fuel-efficient plant, equipment and vehicles available.

G3. Alternative fuel and power sources (such as biodiesels and ethanol blends) will be used wherever practicable.

3.13 Cumulative impact

Table 3-13: Cumulative impact

Description of existing environmental and potential impacts		
Are there other projects and developments in the study area which could add to potential impacts in both construction and operation? The Coffs Harbour boat ramp works Stage 2 are currently underway. These are causing minor intermittent disruptions to traffic flow, parking and pedestrian movements. The additional works for the proposal will increase those impacts for a short period. Due to the short duration of the proposed works, the potential impacts are considered to be minor.	Yes ☒	No ☐

Safeguards

Safeguards to be implemented are:

Z1. The existing Communication Plans and protocols will include ongoing communication with stakeholders and the community to ensure that the cumulative impacts of the various works being undertaken in the area are understood.

4. Summary of safeguards and environmental management measures

4.1 Safeguards and environmental management measures

This section provides a summary of the site-specific environmental safeguards and management measures identified in described in chapter 3 of this minor works REF. These safeguards will be implemented to reduce potential environmental impacts throughout construction and operation. A framework for managing the potential impacts is provided with reference to environmental management plans and relevant Transport QA specifications. Any potential licence and/or approval requirements required prior to construction are also listed.

Table 4-1: Summary of site-specific safeguards for proposed work

Factor	Safeguards
Soil	E1. Erosion and sediment control measures are to be implemented and maintained to: • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets. • Reduce water velocity and capture sediment on site. • Minimise the amount of material transported from site to surrounding pavement surfaces. • Divert clean water around the site. (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)). E2. Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request. E3. Erosion and sediment control measures are not to be removed until the works are complete, and areas are stabilised. E4. Potential or actual acid sulphate soils are to be managed in accordance with the Roads and Maritime Services Guidelines for the Management of Acid Sulphate Materials 2005.
Waterways and water quality	W1. A Water Quality Management Plan (WQMP) would be developed to detail the turbidity monitoring required for the proposal. W2. All fuels, chemicals and liquids are to be stored in an impervious bunded area a minimum of 50 metres away from: • Rivers, creeks or any areas of concentrated water flow • Flooded or poorly drained areas • Slopes above 10%. W3. Refuelling of plant and equipment is to occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways. W4. All machinery should be routinely checked for leaks, with an emergency spill kit to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use. If an incident (e.g., spill) occurs, the Roads and Maritime Services Environmental Incident Classification and Reporting Procedure is to be followed and the Contract Manager notified as soon as practicable. W5. Emergency contacts will be kept in an easily accessible location on vehicles, vessels, plant and site office. All workers will be advised of these contact details and procedures. W6. Vehicles, vessels and plant must be properly maintained and regularly inspected. W7. Visual monitoring of local water quality (i.e., turbidity, hydrocarbon spills/slicks) is to be undertaken on a regular basis at the dredge site to identify any potential spills. Water quality monitoring will occur daily within the dewatering area to measure turbidity using nephelometric turbidity units (NTU) to provide a measure of turbidity in real-time. If turbidity thresholds are reached, dredging operations would be suspended until the turbidity is reduced to acceptable levels. A dredge log would be maintained which would include a record of visual observations and NTU monitoring results, as well as any measures put in place to reduce turbidity.

	W8.	Appropriate site and project inductions/training detailing potential water quality impacts and relevant construction measures and spill and emergency response procedures are to be used.
Noise and vibration	N1.	Works to be carried out during normal work hours (i.e., 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work that is performed outside normal work hours or on Sundays or public holidays must have measures in place to minimise noise impacts.
	N2.	Loading and unloading of materials/deliveries is to occur as far away as possible from sensitive receivers.
Air quality	A1.	Measures are to be used to minimise or prevent air pollution and dust.
	A2.	All plant and equipment is to be maintained in good working order according to the manufacturer's instructions. Where plant or equipment is generating excessive fumes, it would be switched off and repaired prior to starting up again.
	A3.	Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.
Aboriginal cultural heritage	AH1.	If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Roads and Maritime Services Aboriginal cultural heritage officer and regional environment manager contacted immediately. Steps in the Roads and Maritime *Standard Management Procedure: Unexpected Heritage Items* must be followed.
	AH2.	If the scope of the proposal changes the relevant Aboriginal Community and Heritage Partner and Environmental Advisor must be contacted to determine whether the changed scope can proceed without further cultural heritage investigations.
Non-Aboriginal heritage	H1.	If unexpected heritage items are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Roads and Maritime Services Standard Management Procedure: Unexpected Heritage Items must be followed. Roads and Maritime Services Senior Environment Specialist - Heritage must be contacted immediately.
	H2.	The existing heritage item in the vicinity of the works (Tramway Line Item 18 on Coffs Harbour LEP 2013) is to be protected to prevent any damage or disturbance. This includes no ground disturbance where the pipeline crosses the item.
	H3.	A site induction is to be provided to all workers to make them aware of the location of the buried heritage item in the vicinity of the pipeline. The induction is to include controls to be implemented to prevent damage to the item.
Biodiversity	Pre-Construction/Operation:	
	B1.	Inspection of the sandy and rocky intertidal habitat at the northern end of Gallows Beach for evidence of nesting marine birds, shorebirds and marine turtles within 4 weeks prior to the construction of the pipe outlet and prior to the commencement of pump operation by an experienced ecologist. Should nesting fauna be found, further consultation and the preparation an appropriate management plan will need to be negotiated with DPIE and/or NPWS.
	B2.	Bathymetric survey of the locality, including the northern end of Gallows Beach and subtidal areas adjacent to Corambirra Headland, to provide a baseline understanding of the seabed profiles before pumping of sand to this locality.
	Construction of Pipe Outlet:	
	B3.	Pipe outlet will be placed and directed in a manner that minimises changes to the natural beach profiles of Gallows Beach.
	B4.	Should shorebirds be foraging in intertidal areas within 50m of active construction works, reasonable care should be taken to ensure that the birds are not harmed in any way.
	B5.	If any marine or shorebirds are found to be nesting, or Fur-seals resting within 100m of the project area during construction works, the works should cease immediately and the local NPWS office notified.
	B6.	The contractor should liaise monthly with the local NPWS office to ensure no nesting turtles are using Gallow Beach.
	B7.	Visual turbidity monitoring will be implemented during sand pumping, and records of results retained.

	Operation of Pipe Outlet: B8. Implementation of a sand monitoring program to determine where the sand moves to and at what volumes. This would include modelling to identify volume-based triggers for potential changes in current accretion and scouring along coastal areas north of Coffs Harbour. B9. Monitoring of sand volumes pumped per month to inform volumes exceeding a nominated trigger value. Volumes exceeding the nominated trigger value will initiate protocols to protect marine habitat. B10. Bathymetric Monitoring undertaken will be undertaken at least annually and more regularly as required based on volume-based triggers.
Traffic and transport	T1. Where possible, current traffic movements and property accesses are to be maintained during the works. Any disturbance is to be minimised to prevent unnecessary traffic delays. T2. Where possible, current vessel movements and public accesses to the waterway and foreshore are to be maintained during works. Any disturbance is to be minimised as much as practicable. T3. Pedestrian traffic will be diverted around the works site while the pipe installation is taking place.
Socio-economic	C1. Notification is to be given to affected community members prior to the works taking place. The notification is to include: • Details of the proposal • The duration of works and working hours • Any changed traffic or access arrangement • How to lodge a complaint or obtain more information • Contact name and details. Notification should be a minimum of 7 calendar days prior to the start of works. C2. All complaints are to be recorded on a complaints register and attended to promptly.
Landscape character and visual amenity	L1. No native vegetation is to be disturbed for the works. L2. All works areas are to be reinstated upon completion. L3. Interpretive signage is to be installed close to the footpath to inform pedestrians of the purpose of the pipeline.
Waste	M1. Resource management hierarchy principles are to be followed: • Avoid unnecessary resource consumption as a priority • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery). • Disposal is undertaken as a last resort. M2. There is to be no disposal or re-use of construction waste on to other land. M3. Waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed. M4. Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. Adequately manage and store waste products and material in designated areas on the site. All construction work locations are to have designated litter disposal bins to avoid potential for marine debris. M5. If the amount of material being deposited on to Gallows Beach significantly increases, the EPA is to be engaged to determine the requirement for a licence.
Climate change and greenhouse gas emissions	G1. Where possible, procure recycled content construction materials and use lower embodied energy concrete for lower-strength applications where feasible. G2. Select the most fuel-efficient plant, equipment and vehicles available. G3. Alternative fuel and power sources (such as biodiesels and ethanol blends) will be used wherever practicable.
Cumulative impacts	Z1. The existing Communication Plans and protocols will include ongoing communication with stakeholders and the community to ensure that the cumulative impacts of the various works being undertaken in the area are understood.

4.2 Licensing and approvals

Table 4-2: Summary of licensing and approvals required

Instrument	Requirement	Timing
Protection of the Environment Operations Act 1997 (s.48 and S122)	Environment protection licence (EPL)	An EPL is not presently required as the works are not anticipated to cause pollution or exceed the threshold for extractive activities. Should the works result in water pollution or exceed the threshold (30,000m^3 per year), TfNSW would need to engage with the EPA to discuss the potential requirement for a licence.
Crown Land Management Act 2016 (Divisions 3.4, 5.5 and 5.6)	Lease or licence to occupy areas of Crown land.	Prior to start of the activity.

5. Certification, review and determination

5.1 Certification

This minor works REF provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses, to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposal.

Prepared by:

Signature

Name:	Lisa Proctor
Position:	Director
Company name:	Blue Sky Planning and Environment Pty Ltd
Date:	05 November 2023

Minor works REF reviewed by:

Signature

Name:	Lester Piggott
Position:	Environmental & Sustainability Manager
Company name:	Transpoort for New South Wales
Date:	06 November 2023

5.2 Environment and sustainability staff review

The minor works REF has been reviewed and considered against the requirements of sections 5.5 and 5.7 of the EP&A Act.

In considering the proposal this assessment has examined and taken into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity as addressed in the minor works REF and associated information. This assessment is considered to be in accordance with the factors required to be considered under section 171 of the Environmental Planning and Assessment Regulation 2021.

The proposal described in this minor works REF will have some environmental impacts which can be ameliorated satisfactorily. Having regard to the safeguards and management measures proposed, this assessment has considered that these impacts are unlikely to be significant and therefore an approval for the proposal does not need to be sought under Division 5.2 of the EP&A Act.

The assessment has considered the potential impacts of the activity on areas of outstanding value and on threatened species, ecological communities or their habitats for both terrestrial and aquatic species as defined by the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994*.

The proposal described in the minor works REF will not affect areas of outstanding value. The activity described in the minor works REF will not significantly affect threatened species ecological communities or their habitats. Therefore, a species impact statement is not required.

The assessment has also addressed the potential impacts of the activity on matters of national environmental significance and any impacts on the environment of Commonwealth land and concluded that there will be no significant impacts. Therefore, there is no need for a referral to be made to the Australian Government Department of Climate Change, Energy, the Environment and Water for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the *Environment Protection and Biodiversity Conservation Act 1999*.

The minor works REF is considered to meet all relevant requirements.

5.3 Environment and Sustainability staff recommendation

It is recommended that the proposal to install a sand transfer system at Gallows Beach Coffs Harbour as described in this minor works REF proceed subject to the implementation of all safeguards identified in the minor works REF and compliance with all other relevant statutory approvals, licences, permits and authorisations.

The minor works REF has examined and taken into account to the fullest extent possible all matters likely to affect the environment by reason of the activity in accordance with the EP&A Act, EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation. The minor works REF has established that the activity is not likely to significantly affect the environment or threatened species, ecological communities or their habitats.

The minor works REF has concluded that there will be no significant impacts on matters of national environmental significance or any impacts on the environment of Commonwealth land.

If the proposal has not commenced within two years of the determination date the SMES must be consulted to identify any new or updated assessment or approval requirements.

Recommended by:		**Noted by:**	
Signature		Signature	
Name:	Lester Piggott	Name:	Julian Burgess
Position:	Environmental & Sustainability Manager	Position:	Project Manager
Date:	6 November 2023	Date:	6 November 2023

5.4 Decision statement

In accordance with the above recommendation, I certify that I have reviewed and endorsed the contents of this minor works REF, and to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Section 170 of the EP&A Regulation, and the information is neither false nor misleading.

I determine that Transport for NSW may proceed with the activity.

Signature

Name: Nicole Watts

Position: Director – Maritime Infrastructure Delivery Office

Date: 8th November 2023

5.5 EP&A Regulation publication requirement

Table 5-1: EP&A Regulation publication requirement

Requirement		
Does this minor works REF need to be published under section 171(4) of the EP&A Regulation?	Yes ☐	No ☐

Appendix A: Consideration of State and Commonwealth environmental factors

Environmental Planning and Assessment Regulation 2021 section 171(2) factors

The following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with sections 5.5 and 5.7 of the EP&A Act.

Table A1: Consideration of section 171 of the EP&A Regulation factors

Factor	Description of impact	Duration and extent
a) Environmental impact on the community.	• There would be a disruption to pedestrian flows during construction of the pipeline. • There would be an improved system in place for maintaining the navigation channel.	Short term negative (minor) Long-term positive (major).
b) The transformation of the locality.	• There would be a reduction in the scenic quality of the foreshore.	Long term negative (minor)
c) Any environmental impact on the ecosystems of the locality.	• The proposal is unlikely to significantly impact on the ecosystems of the locality provided that the recommended safeguards are implemented.	Long term negative (minor)
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	• There would be a reduction in the scenic quality of the foreshore.	Long term negative (minor)
e) Any effect on any locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.	• An item of local archaeological significance (buried railway line) is located within the footprint of the proposal. The pipeline would be constructed aboveground to avoid any impacts on the item.	Nil
f) Any impact on the habitat of protected fauna (within the meaning of the Biodiversity and Conservation Act 2016).	• Provided that the safeguards are implemented on site, only minor impacts on protected fauna are likely.	Long term negative (minor)
g) Any endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air.	• The propoal is unlikely to endanger any species of animal, plant or other form of life.	Nil

Factor	Description of impact	Duration and extent
h) Any long-term effects on the environment	• The long term effects on the environment are likely to be limited to water quality and marine biodiversity impacts when sand volumes are high. As the system can be switched off when sand volumes are too high, the impacts is likely to be minor only, as it can be controlled.	Long term negative (minor)
i) Any degradation of the quality of the environment.	• The propoal would transfer clean marine sand. Measures will be in place to prevent fines or contamination from being deposited on Gallows Beach.	Nil
j) Any risk to the safety of the environment.	• A safety spotter would be located at each end of the system to reduce the risk of spills or contamination.	Nil
k) Any reduction in the range of beneficial uses of the environment.	• The proposal would not reduce the range of beneficial uses of the environment. • The proposal would introduce a sand transfer system that efficiently removes sand from the navigation channel.	Long term positive (major)
l) Any pollution of the environment.	• A safety spotter would be located at each end of the system to reduce the risk of pollution.	Nil
m) Any environmental problems associated with the disposal of waste	• The proposal will not generate waste.	Nil
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	• The proposal will not increase demand on resources.	Nil.
o) The cumulative environmental effect with other existing or likely future activities.	• The Coffs Harbour boat ramp works Stage 2 are currently underway. These are causing minor intermittent disruptions to traffic flow, parking and pedestrian movements. The additional works for the proposal will increase those impacts for a period of approximately one week. Due to the short duration of the proposed works, the potential impacts are considered to be minor.	Minor short term (negative)
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions.	• The sand removed from the navigation channel will be returned to the same littoral transport pathway from which it is likely to have originated.	Nil
q) Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	• None applicable.	Nil

Factor	Description of impact	Duration and extent
r) Other relevant environmental factors	The potential impacts of the proposal are considered in full in chapter 3 of this REF. No additional impacts beyond those examined in chapter 3 are likely.	In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to Chapter 3 of this assessment.

Matters of National Environmental Significance

Table A2: Matters of national environmental significance

Environmental factor	Impact
a) Any impact on a World Heritage property?	Nil
b) Any impact on a National Heritage place?	Nil
c) Any impact on a wetland of international importance (often called 'Ramsar' wetlands)?	Nil
d) Any impact on nationally threatened species, ecological communities or migratory species? Although nationally threatened species, ecological communities and migratory species have been recorded in the vicinity of the study area, they are not expected to be impacted by the proposal.	Nil
e) Any impact on a Commonwealth marine area?	Nil
f) Does the proposal involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on the environment of Commonwealth land?	Nil

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NSW GOVERNMENT

Appendix B: Aquatic Ecology Assessment

Aquatic Ecology Assessment

Gallows Beach Sand Transfer System

Prepared For: Transport for New South Wales

Report Date: 8 November 2023

H2O Consulting Group Pty Ltd

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Document Details	
Report Title	Aquatic Ecology Assessment
Project Title	Gallows Beach Sand Transfer System
Prepared For	Transport for NSW
Report Date	08/11/2023
Job Number	2332
Project Team	Dr David Cummings, Alex Swanson, Marc Green

Document Control			
Version	Author	Reviewer	Date
Draft	Alex Swanson BMarBiol	Dr David Cummings	26/10/2023
R0	Alex Swanson BMarBiol	Dr David Cummings	8/11/2023

Disclaimer:

The information provided in this document is based on knowledge, understanding and field observations at the time of review of associated materials and/or site survey. The report should be read and considered in its entirety including consideration of the limitations described in the report.

H2O Consulting Group Pty Ltd has completed this assessment in accordance with the relevant federal, state and local legislation. H2O Consulting Group Pty Ltd accepts no liability or responsibility for contents of this report in respect of any use of, or reliance upon, by any third party or for any use other than the purposes for which it was commissioned. Unauthorised use of this document is prohibited.

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Cover Photo: Gallows Beach at Corambirra Point.

Executive Summary

H2O Consulting Group has been engaged by Transport for New South Wales (TfNSW) to prepare an Aquatic Ecology Assessment (AEA) for a proposed modification to the existing Sand Transfer System (the project) at Coffs Harbour boat ramp, at the southern end of Jetty Beach, to redirect sand to the northern end of Gallows Beach, approximately 0.12 km south of the boat ramp.

The maintenance dredging operations and Sand Transfer System proposed as part of this project are an amendment to the existing Coffs Harbour Dredging and Beach Nourishment Program outlined in the 2022 Review of Environmental Factors (TfNSW 2022). The dredging site for the existing and amended 2023 project is located at the Coffs Harbour boat ramp channel, with extracted sand material currently being transferred via pipeline to a dewatering bund and stockpiled at Corambirra Point Quarry. The sand is currently being transferred via truck to Fitzgerald St/Park Beach Carpark and Coffs Harbour Lifesaving Club Carpark with beach nourishment activities occurring along Park Beach.

The amended project proposes the existing discharge pipe that feeds the dewatering bund will be redirected to a new transfer pipe that runs from the Coffs Harbour boat ramp to the northeastern end of Gallows Beach. The pipeline is proposed to pass under Jordan Esplanade through an existing 425 mm concrete carrier pipe, then run above ground across a vegetated area before passing underneath the paved pedestrian pathway at the eastern end of Gallows Beach carpark through either a similar concrete carrier pipe or buried pipe. The pipe outlet is proposed to run across the rocks at the northeastern end of Gallows Beach to a discharge point at the mid-tide zone. The proposed transfer pipe will consist of 280 mm PN10 HDPE 12 m sections with flanged connections (TfNSW 2023).

Works completed as part of this AEA, included a review of existing information and mapping and searches of threatened species databases for State and Commonwealth listed species of aquatic fauna and flora. Site investigations included an inspection of the proposed pipe outlet site to characterise aquatic habitat in the shoreline, intertidal and subtidal areas, including habitat for shorebirds, marine reptiles, marine mammals, sharks and fish. In total 50 marine birds and shorebirds (including waders), 10 marine mammals, 5 marine reptiles, 9 sharks and rays, 4 fish and 1 macroalgae considered threatened and/or migratory species were identified to require further consideration.

Direct impacts from this proposal will include some localised and short-term sedimentation or smothering to intertidal and shallow subtidal areas in the Study Area, potentially resulting in the loss of common sessile invertebrates or slow-moving invertebrates in both intertidal and subtidal rocky habitat. These losses are not expected to detrimentally impact on the wider populations and communities of invertebrates at an ecologically significant level, with species expected to recolonise on adjacent substrata. The smothering of these species in rocky intertidal areas will reduce a small amount of foraging habitat used by shorebirds and marine birds in the locality, however, given the small impact area relative to the vast availability of similar habitat in the Study Area and adjacent locations, this is not considered to detrimentally impact shorebird and marine bird species.

The deposition of sand may result in short-term impacts on water quality in the form of elevated levels of turbidity, with potential sedimentation in the vicinity of the pipe outlet and increased sediment accretion in some rocky reef edge habitat to the northeast during pump operation. It is possible that some threatened marine fauna and flora, particularly the Black Rockcod and Marine Brown Alga (*N. lophocladia*), may occur in areas of rocky reef habitat along Corambirra Headland, the South Breakwater and waters around Muttonbird Island, although habitat in this area is considered very marginal for these species. In instances where large volumes of sand are deposited from the pipe outlet, there is potential that some of these

habitats may be impacted by short-term increases in sediment accretion and decreases in habitat quality. However, given the high swell energy of subtidal areas in close proximity to Corambirra Headland and the South Breakwater and considering the estimated 30,000 m^3 of sediment accretion per annum in these areas from the northward littoral drift along Boambee Beach, short-term impacts from the Sand Transfer System are likely to be consistent with those disturbances that occur as part of natural sand movements in the locality and are unlikely to result in disturbances that are of ecological significance. The monitoring of sand movement and the establishment of trigger values for sand volumes will be essential to identify any potential for the proposal to have wider impacts on adjacent habitats and species, in order to inform the need for the slowing or reduction in volume of pumping operations.

The proposal is considered unlikely to have a significant impact on State and/or Commonwealth listed threatened biodiversity. As such, referral to the Department of the Environment under the EPBC Act is not required. Similarly, the preparation of a Species Impact Statement (SIS) based on the provisions of the BC and FM Act should not be required. Based on the NSW Policy and guidelines for fish habitat conservation and management, a *Section 205 – permit to harm (cut, remove, damage, destroy, shade etc.) marine vegetation (saltmarshes, mangroves, seagrass and seaweeds)* will not likely be required.

To manage the potential risks that this proposal may pose to marine habitat, flora and fauna and the potential for impacts to adjacent habitat from increased sediment accretion and reduced water quality, a series of recommendation have been provided. These recommendations should be adopted into the CEMP for construction and operational works for this proposal.

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1 Background

1.1 Overview

H2O Consulting Group has been engaged by Transport for New South Wales (TfNSW) to prepare an Aquatic Ecology Assessment (AEA) for a proposed modification to the existing Sand Transfer System (the project) at Coffs Harbour boat ramp, at the southern end of Jetty Beach, to redirect sand to the northern end of Gallows Beach, approximately 0.12 km south of the boat ramp.

This report provides supporting information for the Review of Environmental Factors (REF) that is being prepared to assess the potential for environmental impacts from the proposed Sand Transfer System (STS). Under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), TfNSW is required to prepare an REF to identify and consider the likely environmental impacts of the proposal. For the purposes of the proposal, TfNSW is the proponent and the determining authority under Division 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The AEA forms part of the REF being prepared by TfNSW.

1.2 Locality and Site

1.2.1 Gallows Beach

Gallows Beach is located approximately 100 m to the south of Coffs Harbour boat ramp, on the NSW North Coast and falls within the Local Government Area of Coffs Harbour City Council. Gallows Beach is a small (~150 m), open coastal beach with soft sediment and rocky reef habitat, adjoining Corambirra Headland to the northeast and Boambee Beach to the south, which extends ~5.6 km to the south and is a 4-WD access beach. Gallows Beach lies ~1 km directly to the south of the Solitary Islands Marine Park.

Gallows Beach is exposed to the full extent of southeasterly swells along the coastline, with the surf zone possessing a permanent large rip that runs east along Corambirra Headland (BMT WBM 2011). A concrete-lined wastewater outfall also lies ~100 m east of the north-eastern end of Gallows Beach, within the rocky foreshore habitat on Corambirra headland. The shoreline, intertidal and shallow subtidal areas of Gallows Beach will be referred to as the ‘Study Area’ throughout this assessment (Figure 1).

1.3 Description of the Proposal

The maintenance dredging operations and Sand Transfer System proposed as part of this project are an amendment to the existing Coffs Harbour Dredging and Beach Nourishment Program outlined in the 2022 Review of Environmental Factors (TfNSW 2022). The dredging site for the existing and amended 2023 project is located at the Coffs Harbour boat ramp channel, with extracted sand material currently being transferred via pipeline to a dewatering bund and stockpiled at Corambirra Point Quarry, on Corambirra Headland directly to the east of the boat ramp and north of Gallows Beach. The sand is currently being transferred via truck to Fitzgerald St/Park Beach Carpark and Coffs Harbour Lifesaving Club Carpark with beach nourishment works activities occurring along Park Beach.

The amended project proposes the existing discharge pipe that feeds the dewatering bund will be redirected to a new transfer pipe that runs from the Coffs Harbour boat ramp to the northeastern end of Gallows Beach. The pipeline is proposed to pass under Jordan Esplanade through an existing 425 mm concrete carrier pipe, then run above ground across a vegetated area before passing underneath the paved pedestrian pathway at the eastern end of Gallows Beach carpark through either a similar concrete carrier pipe or buried pipe. The pipe outlet is proposed to run across the rocks at the northeastern end of Gallows Beach to a discharge point at the mid-tide zone. The proposed transfer pipe will consist of 280 mm

PN10 HDPE 12 m sections with flanged connections (TfNSW 2023). The area comprising of the proposed pipeline and discharge area will be referred to as the 'Project Area' throughout this assessment (Figure 1).

1.4 Background Information

The small basin containing Coffs Harbour boat ramp was constructed in the mid-1970s. The boat ramp basin has historically experienced water surges during periods of northeasterly swell, resulting in operational difficulties during the launch and retrieval of vessels (Kulmar *et. al.,* 2016). In addition to surges, the basin has also historically experienced accumulation of sediment resulting from long period oscillations (seiching) within Coffs Harbour that exacerbated operational difficulties within the basin. Consequently, the basin has required regular maintenance and sediment removal to maintain operational function of the boat ramp (Kulmar *et. al.,* 2016; MHL 2015).

The basin and boat ramp have undergone numerous upgrades in attempts to reduce surging and sediment accumulation, including the extension of the basin in 2015 (Kulmar *et. al.,* 2016) and extensive upgrade works in 2020 involving an increase in ramp size and a 75 m extension of the basin breakwater. Since the most recent upgrade works, sand has continued to accumulate in the basin. This has resulted in both a build-up of sand on the seaward side of the breakwater as well as sand bypassing of the structure, leading to infilling of the basin entrance channel (TfNSW 2022).

Previous studies of sediment transport pathways along the Coffs Harbour coastline indicate that between 20,000 – 25,000 m^3 of sand enters the main harbour annually (with a range of 5,000 – 130,000 m^3 / year) (MHL 2015), whilst focused studies of the pathways inside Coffs Harbour that pass the basin entrance and southern Jetty Beach have estimated that approximately 4,000 – 6,000 m^3 of sand are transported to these locations annually (MHL 2015). In the proposed area for the new sand pipe outlet, transport pathways include a northward littoral drift of up to 75,000 m^3 annually along Boambee Beach, contributing to an estimated 20,000 m^3 annual accretion at North Boambee Beach, adjacent to Gallows Beach, and an estimated 30,000 m^3 annual offshore accretion to the south of South Coffs Island (MHL 2015).

Prior to the installation of the current system, approximately 15,000 m^3 of sand was removed from the basin between approximately August 2022 – March 2023, using dredging and long reach methods (TfNSW 2023). The current system pumps sand approximately every 4 weeks through 4 separate pumps, typically for a duration of between 1-2 hrs with a 5–10-minute pause between switching operational pumps. The western stockpile at Corambirra Point Quarry currently holds approximately 1400 m^3 of sand, with an average of 179 m^3 pumped every 4 weeks since the system installation in early April 2023. A summary of pumped sand volumes since the system installation is provided below in Table 1 (TfNSW 2023). Sand extracted from Coffs Harbour boat ramp to date has been tested and generally categorised as Excavated Natural Material (ENM).

Table 1: Historical summary of pumped sand volumes from initial Sand Transfer System

Date	Pumped Volume (m^3) Total
3 April 2023	393
5 May 2023	248
5 June 2023	215
3 July 2023	116
31 July 2023	84
2 August 2023	250 (removed by CSD)
28 August 2023	50
4 October 2023	75
Total	**1431**

Sand Transfer Systems and consequent accretion and placement processes have the potential to result in a number of environmental impacts in aquatic environments, including physical (changes to wave refraction and beach impacts), and ecological (e.g., burial of reefs, disturbance of habitats, smothering of species, change to native biota) impacts. Few studies, specific to the NSW coast and its ecology exist, with much of the available literature relating to impacts, consisting of a generic or international nature (Carley and Cox, 2017).

Short-term ecological impacts may include factors such as the direct burial or smothering of biota, lethal or damaging doses of turbidity, and direct damages to habitat and/or species as a result of equipment used during the sand deposition process. Long-term impacts may include changes to the natural state of a beach including profile and gradient, prolonged periods of turbidity affecting light penetration; and altered sediment composition, which may affect the native biota that occur within an area (Carley and Cox, 2017). Sand movement and accretion generally has the largest biological impact on infauna and macroinvertebrates that live amongst the sand grains. Changes in sand particle size has potential to influence critical habitat properties for this group of fauna (Marks 2017) and result in a functionally degraded habitat (Peterson and Bishop 2005).

Hard substrate at the sand and rocky reef interface of the Coffs Harbour coastline provides habitat for the Critically Endangered Marine Brown Alga (*Nereia lophocladia*). The species was first discovered at Port Phillip Heads, Victoria in the late 1880s and has since only been recorded at Coffs Harbour on the NSW Coast. Initial findings of the species at Coffs Harbour in the 1980s included the northern and southern sides of Muttonbird Island, and originally encompassed an area of 10-20 m^2 (NSW Fisheries Scientific Committee 2008). Currently, NSW DPI recognises a known population present on the northern side of Muttonbird Island and along the Coffs Harbour Marina breakwater, with additional known populations at both Sawtell and Woolgoolga Headland (NSW DPI 2018). More recent research has identified the species to occur both within the vicinity of known locations at Little Muttonbird Island, Coffs Harbour, Sawtell and Woolgoolga, and at additional locations in Charlesworth Bay and to the north of the previously recorded extent at Diggers Camp and Minnie Water (Mamo *et. al.,* 2021). In these areas, *N. lophocladia* appear to have a habitat preference for areas of reef, rock pools and subtidal rocky outcrops in dynamic areas along the sand and rock interface (Mamo *et. al.,* 2021). The species is threatened by sand movement, particularly following coastal developments and storms (NSW DPI 2018), however it is also likely that the scouring process driven by sand movement that removes marine growth creates opportunities for this species to establish (Pers. Comm. Nick Yee 2023).

1.5 Relevant Legislation and Policies

The following legislation and policies have been considered in this ecological assessment:

- NSW *Environmental Planning and Assessment Ac*t 1979
- NSW *Fisheries Management Act 1994*
- NSW *Biodiversity Conservation Act 2016*
- NSW *Coastal Management Act 2016*
- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
- NSW *Protection of the Environment Operations Act 1997*

The legislative context for the assessment is outlined in the following sections.

1.5.1 Fisheries Management Act 1994

The objectives of the *Fisheries Management Act 1994* (FM Act) are to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations, and in particular to:

- conserve fish stocks and key fish habitats,
- conserve threatened species, populations and ecological communities of fish and marine vegetation,
- promote ecologically sustainable development, including the conservation of biological diversity, consistently with these objectives,
- promote viable commercial fishing and aquaculture industries,
- promote quality recreational fishing opportunities,
- appropriately share fisheries resources among the users of those resources,
- provide social and economic benefits for the wider community of NSW; and
- recognise the spiritual, social and customary significance of fisheries resources to Aboriginal persons, and to protect and promote the continuation of Aboriginal cultural fishing.

To meet the primary objectives, Part 7 of the FM Act deals with the protection of aquatic habitats, with Part 7A addressing the conservation of threatened species. Part 7 commonly applies to dredging and reclamation works, protection of marine vegetation including mangroves and seagrass, protection of spawning of certain fish, and noxious fish and marine vegetation.

If a public authority (including a local council or state agency) is a determining authority under Part 5 of the EP&A Act, they may still be required to obtain the following approvals or undertake consultation under the following provisions:

- Section 199 – Under s199 of the FM Act, the Minister for Primary Industries is required to be consulted over any dredging or reclamation works carried out, or proposed to be authorised, by a public authority (other than a local government authority) (i.e. any excavation within, or filling or draining of, water land or the removal of woody debris, snags, rocks or freshwater native aquatic vegetation or the removal of any other material from water land that disturbs, moves or harms these in-stream habitats).
- Section 200 – A permit is required for dredging or reclamation work carried out by a local government authority, unless these works are authorised by a relevant public authority (other than NSW DPI) or under the Crown Lands Act 1989.
- Section 205 – A permit to harm (cut, remove, damage, destroy, shade etc) marine vegetation (saltmarshes, mangroves, seagrass and seaweeds).
- Section 219 – A permit to obstruct the free passage of fish.

Listings of threatened species, populations and ecological communities gazetted under the FM Act are relevant to this assessment. Threatened biota impacted by this construction proposal must be assessed under best practise.

Key fish habitat policy

NSW DPI recognises that certain types of activities have varying degrees of impact on key fish habitats and, as such, require different levels of control and regulation. As a general principle, NSW DPI requires that proponents should, as a first priority, aim to avoid impacts upon key fish habitats. Where avoidance is impossible or impractical, proponents should then aim to minimise impacts. For any unavoidable remaining impacts consideration is to be given to establishment of suitable offsets or compensation.

Where key fish habitat is impacted by this construction proposal, suitable offsets or compensation may be required to be negotiated with NSW DPI Fisheries.

1.5.2 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (BC Act) provides for legal protections of biodiversity and threatened species in NSW. Specifically, it provides for the following:

- A process for declaring and protecting areas of outstanding biodiversity value.
- The listing of threatened species, populations and ecological communities, with critically endangered, endangered and vulnerable species under Schedule 1.
- The listing of critically endangered, endangered and vulnerable ecological communities under Schedule 2.
- The listing of extinct species, species extinct in the wild and collapsed ecological communities of animals and plants under Schedule 3.
- Requirements for the preparation of a species impact statement (SIS).
- Determining where the Biodiversity Offset Scheme (BOS) applies to proposals.

The BC Act sets the criteria for determining whether a proposal is likely to have a significant impact on threatened biodiversity listed under the BC Act. If significant impacts are identified, it would necessitate the preparation of a SIS.

To identify areas with outstanding biodiversity value the Biodiversity Values (BV) Map has been prepared under Part 7 of the BC Act to protected land sensitive to impacts from development and clearing. The map forms part of the Biodiversity Offsets Scheme Threshold, which is one of the triggers for determining whether the Biodiversity Offset Scheme (BOS) applies to a clearing or development proposal. Types of land the Environment Agency Head can include on the BV Map include the following:

- Coastal wetlands and littoral rainforest mapped under the State Environmental Planning Policy (Coastal Management) 2018 (Coastal Management SEPP).
- Core koala habitat identified in a plan of management under State Environmental Planning Policy No 44 – Koala Habitat Protection (SEPP 44).
- Declared Ramsar wetlands defined by the Environment Protection and Biodiversity Conservation Act 1999.
- Land containing threatened species or threatened ecological communities identified as having potential for serious and irreversible impacts (SAII) under section 6.5 of the BC Act.
- Protected riparian land.
- High conservation-value grasslands or groundcover.
- Old growth forest identified in mapping developed under the National Forests Policy Statement but excluding areas not meeting the criteria published jointly by the Minister for the Environment and the Minister for Primary Industries.
- Rainforest identified in mapping developed under the National Forests Policy Statement but excluding areas not meeting the criteria published jointly by the Minister for the Environment and the Minister for Primary Industries.
- Declared areas of outstanding biodiversity value.
- Council-nominated areas with connectivity or threatened species habitat that the Minister for the Environment considers will conserve biodiversity at bioregional or state scale.
- Land that, in the opinion of the Environment Agency Head, is of sufficient biodiversity value to be included.

Listed items of threatened biodiversity under the BC Act with potential to be impacted by this proposal will require further consideration. In addition, direct or indirect impacts to any adjacent areas identified as having outstanding biodiversity values may trigger the requirement for determination under the BOS.

1.5.3 Environmental Planning and Assessments Act 1979

Development in NSW falls under the provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and subordinate legislation. Under Section 5.1 of the EP&A Act, there is a duty for determining authority to consider the environmental impacts of proposed activities. The specific aspects of these environmental considerations are detailed in Clause 171 of the Environmental Planning and Assessment Regulations 2021. Under section 5.1of this Act, determining authorities are required to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. These include items of biodiversity listed under the BC and FM Acts.

1.5.4 Coastal Management Act 2016

The objectives of the *Coastal Management Act 2016* (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 wellbeing of the people of the State.

The CM Act defines the coastal zone, comprising four coastal management areas:

- Coastal wetlands and littoral rainforests area,
- Coastal vulnerability area,
- Coastal environment area; and
- Coastal use area.

Part 2 of the CM Act establishes management objectives specific to each of these management areas, reflecting their different values to coastal communities.

The CM Act, along with the State Environmental Planning Policy (Coastal Management) 2018, forms part of the Coastal management framework.

State Environmental Planning Policy (Resilience and Hazards) 2021

The Resilience and Hazards SEPP 2021 replaced the Coastal Management SEPP 2018. The SEPP promotes an integrated and coordinated approach to development assessment, with tailored development controls to ensure development proponents and consent authorities consider and address the most important issues for the coastal management area(s) their proposal falls within. The SEPP is supported by detailed mapping.

Clause 2.7 of the SEPP, which states that development on land in coastal wetlands requires an EIS and council consent, and Clause 2.8 requires proponents in proximity land to assess the potential for a significant impact on the adjacent coastal wetland.

1.5.5 Environmental Protection and Biodiversity Conservation Act 1999

The purpose of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) is to ensure that actions likely to cause a significant impact on matters of national environmental significance undergo an assessment and approval process. Under the EPBC Act, an action includes a project, undertaking, development, or activity. An action that 'has, will have or is likely to have a significant impact on a matter of national environmental significance' is deemed to be a controlled action and may not be undertaken without prior approval from the Commonwealth Minister for the Department of Environment (DoE).

The EPBC Act identifies and categorises matters of national environmental significance (MNES) as the following:

- World heritage properties,

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

Listings of MNES deemed relevant to this construction proposal will require further considered under the guidance provided by the EPBC Act.

1.5.6 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is the key piece of environment protection legislation administered by the NSW Environmental Protection Authority (EPA). The POEO Act relates to noise, air and water pollution and waste management. There is a broad allocation of responsibilities under the Act between the EPA, local councils and other public authorities. The EPA is made the regulatory authority for:

- activities listed in Schedule 1 to the Act and the premises where they are carried out,
- activities carried out by a State or public authority; and
- other activities in relation to which a licence regulating water pollution is issued.

The POEO Act provides for the provision of and conditioning of activities requiring environmental protection licensing. Scheduled activities as listed under Schedule 1 of the Act require an Environmental Protection License (EPL) from the EPA, unless clauses in Schedule 1 specify otherwise.

1.6 Assessment Objectives

The objectives of this assessment are to:

- Identify any potential impacts from the proposed works on threatened biodiversity, MNES, water quality, fish habitat, marine vegetation and fauna, and areas of outstanding biodiversity value; and
- Provide recommendations regarding adoption of environmental controls and mitigation measures into the Construction Environmental Management Plan (CEMP) and identify any additional permitting and approval requirements under the FM Act, including any requirements for an SIS.

Figure 1: Location of the Project Area and Study Area.

2 Methodology and Approach

2.1 Desktop Review

2.1.1 Threatened Species Searches

Relevant databases were searched during October 2023, applying a 10 km radius around the Project Area at Gallows Beach (Locality) to identify threatened biodiversity, migratory species and MNES that may potentially occur at the locality. The following databases and information sources were searched:

- Bionet, Atlas of NSW Wildlife (last 20 years),
- Atlas of Living Australia - Selected species,
- Birdata (Birdlife Australia),
- NSW DPI Fisheries Threatened species lists (NSW DPI 2022b); and
- EPBC Act Protected Matters Report tool.

2.1.2 Existing Mapping and Imagery

Mapping of existing ecological features important to this assessment was reviewed using the following online tools:

- Fisheries NSW Spatial Data Portal – Mapping of Estuarine Macrophytes, Aquaculture, Marine Protected Areas, and Resilience and Hazards SEPP layers,
- Biodiversity Values and Threshold Tool – Biodiversity values,
- High resolution aerial imagery from Nearmap that has been captured since 2018,
- Sea floor bathymetry (topography) mapping provided by the Seabed NSW Program.

A review of the potential environmental constraints identified via these maps was undertaken. This mapping was also used to describe habitats in the wider locality and outside the Study Area.

2.2 Site Investigations

Site investigations of the proposed pipe outlet site, and surrounding aquatic habitats in the vicinity of the site (i.e., the 'Study Area' – see Figure 1), completed as part of this assessment included:

- Inspection and description of general habitat within and adjacent to the proposed pipe outlet,
- Description of intertidal flora and fauna present,
- Description of subtidal flora and fauna present in shallow areas at low tide, surveyed via drone,
- Opportunistic, diurnal records of any marine birds or shorebirds, mammals or reptiles; and
- Verification and mapping of macrophytes (e.g., macroalgae).

Survey effort included diurnal observations within the entire Study Area, with weather conditions cloudy, with 15 kn winds and approximately 2 m visibility. Swell conditions were 1-2m of south to south-easterly swell resulting in high swell energy.

2.3 Mapping

2.3.1 Habitat

Mapping works focused on marine macrophytes and rocky reef habitat within the Study Area. Habitat maps and recent aerial imagery were verified in situ with visual observations aided by drone surveys. Data were imported into GIS-based mapping software, which created shapefiles and polygons based on interpretation of the following data sources:

- Previous reef mapping data (NSW Seabed Program)
- In situ estuarine mapping data
- Aerial imagery

2.4 Threatened Species Assessment

The threatened species assessment was undertaken by desktop review of 'sightings', assessment of the habitat in the Project Area, and determining the likelihood of occurrence of each species using the criteria outlines in Table 2. Once the likelihood of occurrence has been established, the likelihood of impact (none, unlikely, possible or likely), which considered the occurrence and proposed action itself is assigned to each species. Those species with a moderate of higher likelihood of occurrence and possible likelihood or higher of being impacted will trigger further assessment through the 5 / 7 Part Test and/ or Impact Assessment criteria processes.

Table 2: Likelihood of occurrence criteria

Likelihood of occurrence	Criteria
Known	The species was observed within the Study Area. The species is known to inhabit the Study Area.
High	The species has frequently been recorded previously in the Study Area or similar habitats in the locality. The species is known or likely to maintain resident populations surrounding the Study Area. It is likely that the species utilises habitat or resources that are abundant or in good condition within the Study Area. The species is known or likely to visit the Study Area during regular seasonal movements or migrations.
Moderate	The species has infrequently been recorded previously in the Study Area or similar habitats in the locality. The Study Area contains potential marginal and/or modified habitat and resources for the species, which it may occasionally utilise. The species is unlikely to maintain sedentary populations but may seasonally use resources within the Study Area opportunistically or during migrations.
Low	The species has not been recorded previously in the Study Area or similar habitats in the locality. The Study Area is beyond the current distribution range of the species. If present in the Study Area, the species would likely be a transient visitor. The Study Area contains only very marginal habitat for the species, which would not be relied upon for its on-going local existence.
Unlikely	The species is highly restricted to certain geographical areas not including the Study Area. The habitat within the Study Area is unsuitable for the species.

2.5 Limitations

This impact assessment is limited to aquatic flora and fauna (including marine birds and shorebirds). Additional habitat descriptions of terrestrial/shoreline vegetation communities have been provided and general recommendations provided. However, this assessment does not include for detailed impact assessment of terrestrial biodiversity values.

Fauna surveys included an assessment of aquatic habitat values present within the Study Area and was limited to observations of seasonal species present at the time of survey. Habitat assessments are conservative, defaulting to assume presence where there is insufficient knowledge to determine otherwise.

Numerous threatened species of fauna are seasonal in geographical distribution and/or may be transient in nature. For instance, some migratory bird species may be seen only at certain times of the year as they migrate to more significant nearby sites, while other fauna are only present during certain seasons (e.g., migration patterns or seasons).

Mapping is limited to broad-scale GPS mapping and a typical accuracy of +/- 3 m. More detailed spatial and temporal mapping may be required to identify more precise boundaries and seasonal changes in habitat.

Subtidal surveys were limited to visual observation of shallow areas close to shore, with aerial surveys of rocky reef habitat conducted via drone, due to the exposure to swell energy of subtidal areas in the Study Area.

3 Results and Findings

3.1 Desktop Review

3.1.1 Threatened Biodiversity and Protected Matters

Searches of the Bionet database identified sightings data for 28 items listings under the BC Act within a 10 km radius of the Project Area (Appendix 2). These included:

- 20 Threatened marine birds and/or shorebirds,
- 4 Threatened marine mammals; and
- 4 Threatened marine reptiles.

In addition, four shark, three fish species and one marine brown alga listed under the FM Act may also occur within the 10 km of the Project Area.

The EPBC Protected Matters Report Search identified the following MNES relevant to this study (i.e., marine/estuarine species or those that use marine/estuarine habitat) within 10 km radius of the Project Area (Appendix 2):

- 46 Listed Threatened species; and
- 57 Listed Migratory species.

In addition to the above, the EPBC Protected Matters Report Search identified 74 protected marine species that include certain species of fish, along with some marine birds, reptiles and mammals. A total of nine marine mammals were identified as part of protected listings for cetaceans (Appendix 2).

Of the Commonwealth listed threatened and/or migratory species, the following were identified for consideration as part of this assessment:

- 47 marine birds and shorebirds,
- Nine marine mammals,
- Five marine turtles,
- Nine sharks and rays; and
- Four fish.

In total 50 marine birds and shorebirds (including waders), 10 marine mammals, 5 marine reptiles, 9 sharks and rays, 4 fish and 1 macroalgae considered threatened and/or migratory species were identified to require further consideration. A summary of all threatened and migratory species considered as part of this assessment, along with consideration of their likelihood of occurrence within the Project Area and potential to be impacted, is provided in Table 3. Mapped sightings of these species are detailed in Appendix 2.

Table 3: Threatened and migratory species identified from searches. Species in bold type have been considered further in subsequent sections as part of this assessment.

Scientific Name	Common Name	BC/FM Acts	EPBC Acts	Sightings Bionet	Likelihood of Occurrence	Possibility of Impact
Marine Birds and Shorebirds						
Actitis hypoleucos	Common Sandpiper	P	B, CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality.	Unlikely
Anous stolidus	Common Noddy	P	CA, JA, MA, MI	1	Low – Few sightings recorded in the locality. Typically seen in tropical areas and associated with offshore islands.	Unlikely

Scientific Name	Common Name	BC/FM Acts	EPBC Acts	Sightings Bionet	Likelihood of Occurrence	Possibility of Impact
Apus pacificus	Fork-tailed Swift	P	CA, JA, RO, MA, MI	1	Low – Few sightings recorded within the locality. Any occurrence is likely to be rare and exclusively aerial.	Unlikely
Ardenna carneipes	Flesh-footed Shearwater	V, P	JA, RO, MA, MI	0	Low – No sightings recorded within the locality. Occasional records indicate nesting habitat on offshore islands in the adjacent SIMP.	Unlikely
Ardenna grisea	Sooty Shearwater	P	JA, MA, MI	0	Low – No sightings recorded within the locality. Occasional records indicate nesting habitat on offshore islands in the adjacent SIMP.	Unlikely
Ardenna pacifica	Wedge-tailed Shearwater	P	JA, MA, MI	14,232	**High** – Sightings frequently recorded within the locality. Nests on Muttonbird Island and other offshore islands in the adjacent SIMP.	Unlikely
Ardenna tenuirostris	Short-tailed Shearwater	P	CA, JA, RO, MA, MI	59	**High** – Sightings frequently recorded within the locality. Some nesting habitat occurs near Muttonbird Island and other offshore islands in the adjacent SIMP.	Unlikely
Burhinus grallarius	Bush Stone-curlew	E, P		3	Low – Few sightings recorded in the locality. Habitat within the Study Area is only very marginal for this species.	Unlikely
Calidris acuminata	Sharp-tailed Sandpiper	P	B, CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality. Typically, a wading species, with only very marginal habitat in the Study Area.	Unlikely
Calidris canutus	Red Knot	P	E, B, CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality. Typically, a wading species, with only very marginal habitat in the Study Area.	Unlikely
Calidris ferruginea	Curlew Sandpiper	E, P	CE, B, CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality. Habitat within the Study Area is only very marginal for this species.	Unlikely
Calonectris leucomelas	Streaked Shearwater	P	CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality. Any occurrence is likely to be rare and exclusively aerial.	Unlikely
Charadrius leschenaultii	Greater Sand Plover	V, P	V, B, CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality. Known to occur on the Coffs Coast and may occasionally use the Study Area for roosting and foraging habitat.	Unlikely
Diomedea antipodensis	Antipodean Albatross	V, P	V, B, MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Diomedea antipodensis gibsoni	Gibson's Albatross	V, P	V, MA	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Diomedea epomophora	Southern Royal Albatross	P	V, B, MA, MI	0	Low – No sightings in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial as part of transient visits.	Unlikely
Diomedea exulans	Wandering Albatross	E, P	V, B, MA, MI	0	Low – No sightings in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial as part of transient visits.	Unlikely
Ephippiorhynchus asiaticus	Black-necked Stork	E, P		4	Low – Few sightings in the locality. Habitat within the Study Area is only very marginal for this species.	Unlikely
Falco hypoleucos	Grey Falcon	V, P	V	0	Low – No sightings recorded in the locality. Any occurrences are likely to be	Unlikely

Scientific Name	Common Name	BC/FM Acts	EPBC Acts	Sightings Bionet	Likelihood of Occurrence	Possibility of Impact
					exclusively aerial as part of transient visits.	
Fregata ariel	Lesser Frigatebird	P	CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality. Occasional records adjacent to the locality indicate foraging habitat around Muttonbird island and the Study Area.	Unlikely
Fregata minor	Great Frigatebird, Greater Frigatebird	P	CA, JA, MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial as part of transient visits.	Unlikely
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	P	V	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Galliango hardwickii	Latham's Snipe	P	B, JA, RO	3	Low – Few sightings recorded in the locality. Habitat within the Study Area is only very marginal for this species.	Unlikely
Haematopus fuliginosus	Sooty Oystercatcher	V, P		9	**Moderate** – Occasional sightings recorded in the locality. The Study Area provides some limited marginal foraging habitat at low tide.	**Possible**
Haematopus longirostris	Pied Oystercatcher	E, P		8	**Known** – Previously observed foraging on the beach and rocky intertidal in the Study Area during site investigations.	**Possible**
Hirundapus caudacutus	White-throated Needletail	P	V, CA, JA, RO, MA, MI	12	Low – Occasional sightings near the locality. Habitat within the Study Area is only very marginal for this species.	Unlikely
Limosa lapponica baueri	Nunivak Bar-tailed Godwit	P	V	0	Low – No sightings recorded in the locality. Typically, a wading species, with only very marginal habitat in the Study Area.	Unlikely
Macronectes giganteus	Southern Giant Petrel	E, P	E, B, MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Macronectes halli	Northern Giant Petrel	V, P	V, B, MA, MI	1	Low – Few sightings recorded in the locality on Muttonbird Island. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	P	CE, B, CA, JA, RO, MA, MI	1	Low – Few sightings recorded in the locality. Only very marginal habitat in the Study Area.	Unlikely
Numenius minutus	Little Curlew, Little Whimbrel	P	B, CA, JA, RO, MA, MI	0	Low – No sightings recorded in the locality. Typically, a wading species, with only very marginal habitat in the Study Area.	Unlikely
Pachyptila turtur subantarctica	Fairy Prion (southern)	P	V	7	Low – No Sightings recorded in the locality. Typically confined to Islands in southern Australia, any occurrences are likely to be rare and confined to transient visits.	Unlikely
Pandion halieatus cristatus	Eastern Osprey	P	B, MA, MI	28	Moderate – Sightings recorded in the locality. Any occurrences are likely to be exclusively aerial as part of transient visits.	Unlikely
Phoebetria fusca	Sooty Albatross	V, P	V, B, MA, MI	0	Low – No Sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely

Scientific Name	Common Name	BC/FM Acts	EPBC Acts	Sightings Bionet	Likelihood of Occurrence	Possibility of Impact
Pterodroma leucoptera leucoptera	Gould's Petrel	V, P	E	0	Low – No sightings recorded in the locality. Not known to breed on Islands in the SIMP, any occurrences in the Study Area are likely to be transient.	Unlikely
Pterodroma neglecta neglecta	Kermadec Petrel (western)	V, P	V	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Sternula albifrons	Little Tern	E, P	B, CA, JA, RO, MA, MI	6	Low – Sightings recorded within the locality and occasionally on the beach inside Coffs Harbour and the Study Area.	Unlikely
Sterna hirundo	Common Tern	P	CA, JA, RO	1	Low – Few sightings recorded in the locality. Habitat within the Study Area is only marginal for this species.	Unlikely
Sternula nereis nereis	Australian Fairy Tern	P	V	0	Low – No sightings recorded within the locality. Habitat within the Study Area is only very marginal for this species.	Unlikely
Sula dactylatra	Masked Booby	V, P	JA, RO	0	Low – Known to frequent Muttonbird Island. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche bulleri	Buller's Albatross	P	V, B, MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche bulleri platei	Northern Buller's Albatross	P	V, MA	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche carteri	Indian, Yellow-nosed Albatross	P	V, B, MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche cauta	Shy Albatross	E, P	E, B, MA, MI	1	Low – Few sightings recorded adjacent to the locality on Muttonbird Island. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	P	V, B MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche melanophris	Black-browed Albatross	V, P	V, B, MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche salvini	Salvin's Albatross	P	V, B, MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalassarche steadi	White-capped Albatross	P	V, B MA, MI	0	Low – No sightings recorded in the locality. Typically, an oceanic species and any occurrences are likely to be exclusively aerial.	Unlikely
Thalasseus bergii	Crested Tern	P	JA, MI	0	Low – No sightings recorded within the locality. Foraging habitats present within the locality.	Unlikely
Tringa nebularia	Common Greenshank, Greenshank	P	B, CA, JA, RO, MA, MI	0	Low – No sightings recorded within the locality. Typically, a wading species, with marginal habitat in the Study Area.	Unlikely
Marine Mammals						
Arctocephalus forsteri	New Zealand Fur-seal	V, P	MA	3	Low – Sightings recorded within the locality. Some foraging and refuge habitat	Unlikely

Scientific Name	Common Name	BC/FM Acts	EPBC Acts	Sightings Bionet	Likelihood of Occurrence	Possibility of Impact
					occurs at Coffs Harbour, low potential rocky habitat at Gallows Beach.	
Arctocephalus pusillus doriferus	Australian Fur-seal	V, P		2	Low – Sightings recorded within the locality. Some foraging and refuge habitat occurs at Coffs Harbour, low potential rocky habitat at Gallows Beach.	Unlikely
Balaenoptera edeni	Bryde's Whale	P	B, C, MI	2	Low – Few sightings recorded in the locality. Typically remains in deeper water and unlikely to enter the surf zone associated with Gallows Beach	Unlikely
Balaenoptera musculus	Blue Whale	E, P	E, B, C, MA, MI	0	Low – No sightings recorded in the locality. Typically remains in deeper water and unlikely to enter the surf zone associated with Gallows Beach	Unlikely
Dugong dugon	Dugong	E, P	B, MA, MI	0	Low – No sightings recorded in the locality. The lack of any seagrasses inside Coffs Harbour or adjacent to Gallows Beach means there is only very marginal habitat for this species, and it is only likely to be a transient visitor to the Study Area.	Unlikely
Eubalaena australis	Southern Right Whale	E, P	E, B, C, MI	1	Low – Few sightings recorded in the locality. Typically remains in deeper water and unlikely to enter the surf zone associated with Gallows Beach	Unlikely
Megaptera novaeangliae	Humpback Whale	P	C, MI	6	Low – Sightings recorded in the locality. Typically remains in deeper water and unlikely to enter the surf zone associated with Gallows Beach.	Unlikely
Orcinus orca	Killer Whale, Orca	P	B, C, MI	0	Low – No sightings recorded in the locality. Typically remains in deeper water and unlikely to enter the surf zone associated with Gallows Beach.	Unlikely
Physeter macrocephalus	Sperm Whale	V, P	B, C, MI	1	Low – Occasional sightings recorded in the locality. Typically remains in deeper water and unlikely to enter the surf zone associated with Gallows Beach.	Unlikely
Sousa sahulensis	Australian Humpback Dolphin	P	B, C, MI	0	Low – No sightings recorded in the locality. Typically confined to tropical and subtropical waters, only likely to be a transient visitor to the Study Area.	Unlikely
Marine Reptiles						
Caretta caretta	Loggerhead Turtle	E, P	E, B, MA, MI	5	**Moderate** – Occasional sightings in the locality. The species on occasion frequent habitat within the Study Area, however it is unlikely to be of ecological significance to the species.	Unlikely
Chelonia mydas	Green Turtle	V, P	V, B, MA, MI	83	**Moderate** – Frequent sightings within the locality. The species may frequent habitat within the Study Area at times, however it is unlikely to be of ecological significance to the species	Unlikely
Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth	E, P	E, B, MA, MI	0	Low – No sightings recorded in the locality. Typically remains offshore and unlikely to enter Coffs Harbour or Gallows Beach.	Unlikely
Eretmochelys imbricata	Hawksbill Turtle	P	V, B, MA, MI	7	Low – Occasional sightings within the locality. The species may on occasion frequent habitat within the Study Area, however it is unlikely to be of ecological significance to the species.	Unlikely
Natator depressus	Flatback Turtle	P	V, B, MA, MI	5	Low – Occasional sightings recorded in the locality. Typically confined to more	Unlikely

Scientific Name	Common Name	BC/FM Acts	EPBC Acts	Sightings Bionet	Likelihood of Occurrence	Possibility of Impact
					tropical waters, only likely to be a transient visitor to the area.	
Sharks, Rays and Fish						
Carcharhinus longimanus	Oceanic Whitetip Shark	P	B, MA, MI	0	Low – No sightings recorded in the locality. Typically confined to tropical and subtropical waters, only likely to be a transient visitor to the Study Area.	Unlikely
Carcharias taurus (east coast population)	Grey Nurse Shark (east coast population)	P	CE	2*	Low – Known to occur in the locality, however use of habitat in the harbour and Study Area is considered rare.	Unlikely
Carcharodon carcharias	White Shark, Great White Shark	V, P	V, B, MI	21*	Low – No recent sighting records within the locality. The Study Area includes some marginal habitat for foraging.	Unlikely
Epinephelus daemelii	Black Rockcod, Black Cod, Saddled Rockcod	V, P	V	0	**Moderate** – Occasional historical records within the adjacent SIMP. The Study Area includes some marginal habitat for foraging and refuge.	Unlikely
Galeorhinus galeus	School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark	P	CD	0	Low – No sightings recorded in the locality. Typically remains offshore near the continental shelf edge. Juveniles may seasonally use shallower areas as refuge and foraging habitat.	Unlikely
Hippocampus whitei	White's Seahorse, Crowned Seahorse, Sydney Seahorse	E, P	E, MA	0	Low – No sightings recorded in the locality. The lack of any seagrasses inside Coffs Harbour means there is only very marginal habitat for this species and the species is typically confined to habitat within estuaries.	Unlikely
Lamna nasus	Porbeagle, Mackerel Shark		B, MI	0	Low – Rarely recorded in coastal areas. Typically remains offshore near the continental shelf edge and very unlikely to enter Coffs Harbour or Gallows Beach.	Unlikely
Mobula alfredi	Reef Manta Ray, Coastal Manta Ray		B, MI	0	Low – No records within the locality, typically remains offshore and unlikely to enter Coffs Harbour or Gallows Beach.	Unlikely
Mobula birostris	Giant Manta Ray		B, MI	0	Low – No records within the locality, typically remains offshore and unlikely to enter Coffs Harbour or Gallows Beach.	Unlikely
Rhincodon typus	Whale Shark	P	V, B, MI	0	Low – No records within the locality, typically remains offshore and unlikely to enter Coffs Harbour or Gallows Beach.	Unlikely
Seriolella brama	Blue Warehou	P	CD	0	Low – No sightings recorded in the locality. Typically remains offshore near the continental shelf edge. Juveniles may occasionally use shallow areas as refuge.	Unlikely
Sphyrna lewini	Scalloped Hammerhead	E, P	CD	0	Low – Rarely recorded in coastal areas. Typically remains offshore near the continental shelf edge and very unlikely to enter Coffs Harbour or Gallows Beach.	Unlikely
Thunnus maccoyii	Southern Bluefin Tuna	E	CD	0	Low – Rarely recorded in coastal areas. Typically remains offshore near the continental shelf edge and very unlikely to enter Coffs Harbour or Gallows Beach.	Unlikely
Macroalgae						
Nereia lophocladia	Marine Brown Alga	CE		0	**Moderate** – Known habitat on the northern side of Coffs Harbour and at Muttonbird Island, although habitat in the Study Area is very marginal for this species.	**Possible**

CD = Conservation Dependent, P = Protected, V = Vulnerable, E Endangered, CE = Critically Endangered, C = Cetacean, MA = Marine Species, MI = Migratory Species, B = Bonn, CA = CAMBA, JA = JAMBA, RO = ROKAMBA

** Sightings recorded on the Atlas of Living Australia database*

3.1.2 Existing Ecological Mapping

Detailed mapping of Estuarine Macrophytes in and around Coffs Harbour done by NSW DPI (2023a) shows no mapped macrophytes within or in proximity to the Project Area at Gallows Beach (Appendix 3, Item 1). The nearest mapped macrophytes are within the entrance and upstream sections of Coffs Creek 4 km to the north of the Project Area at North Wall Beach, which include significant stands of mangroves and saltmarsh with some fringing beds of the seagrass *Zostera capricorni*.

These areas of mapped macrophytes coincide with a large area of Coastal Wetlands mapped over the same location as part of the Resilience and Hazards SEPP (2021) (Appendix 3, Item 2). Smaller sections of Coastal Wetlands and associated Proximity Areas (200 m radius around the area) are mapped along the vegetated areas behind northern Boambee Beach, to the southwest and outside the Project Area. Detailed mapping under the Resilience and Hazards SEPP (2021) also shows a significant area of Littoral Rainforest mapped along the dune system of Jetty Beach inside Coffs Harbour and over a large section of vegetation to the west of the Coffs Harbour boat ramp and Gallows Beach. The Littoral Rainforest and Proximity Area do not overlap with the Project Area; however, the eastern edge of the Proximity Area is within approximately 185 m of the Project Area (Appendix 3, Item 2).

The entirety of tidal areas inside the Project Area are identified as Key Fish Habitat – Northern Rivers (Appendix 3, Item 3). Key Fish Habitat within and adjacent to the boundaries of the Project Area are classed as Type 2 – Moderately sensitive key fish habitat due to the presence of marine rocky reef habitat and marine macroalgae including *Ecklonia* and *Sargassum* species (Fairfull 2013).

The Solitary Islands Marine Park borders on the north side of Coffs Harbour Marina and Muttonbird Island, which are located within 1 km of the Project Area. Coffs Harbour borders the southern end of the Marine Park, which extends north along approximately 75 km of coastline and covers approximately 710 km^2 in area, providing habitat for a number of threatened species (Appendix 3, Item 4).

Reef Areas

Existing bathymetry mapping conducted by NSW Department of Planning and Environment as part of the Seabed NSW Program indicates the presence of extensive rocky reef habitat landforms in the vicinity of the Project Area.

Mapping along the rocky foreshore of northeast Gallows Beach and the southern edge of Corambirra Headland indicates the presence of reef peaks, scarps and rugose outcrops that extend between 15-45 m from shore. Within the Study Area, these rocky reef formations extend to a maximum depth of approximately -4.5 m, whilst areas further east along the headland reaches depths of approximately -8.0m. Rocky reef habitat continues east past the Corambirra Headland, transitioning to an extensive reef formation around South Coffs Island where bathymetry indicates seabed depth of > -20 m (Appendix 3, Item 5).

3.2 Description of Habitat and Biota

3.2.1 Gallows Beach Sand Transfer Outlet Site

<u>Shoreline Habitat</u>

Shoreline habitat consists of a sandy shoreline and a typical shale rocky headland (Corambirra), with a steep incline, inhabited by native grasses, coastal sedges and succulents. The headland possesses multiple rocky outcrops and ledges, extending from Gallows Beach seaward to the east, with a formal paved path and an informal walking track along the southern edge. The Coffs Harbour South Breakwater extends from the

eastern edge of the headland. Common fringing vegetation was dominated by Wallaby Grass (*Austrodanthonia caespitosa*) and Pigface (*Carpobrotus glaucescens*), with occasional Pandanus trees (*Pandanus tectorius var australianus*) and Coast Banksia (*Banksia integrifolia*).

Shoreline areas provided potential habitat for various marine species. Grassed areas on the headland where human activity is minimal provided potential roosting habitat for shorebirds, such as Sooty Oystercatchers (*Haematopus fuliginosus*) which were observed during site surveys. Rocky areas on lower sections of the headland provided potential haul-out refuge habitat for fur seals, however, given the high swell energy and steep face it would not be expected to be used consistently. Sandy soft sediment along the shoreline at Gallows Beach provides only very limited opportunity for any nesting by Green Turtles (*Chelonia mydas*), which are known to sporadically nest in the wider locality.

A list of shorebirds observed during site surveys is detailed in Table 3.

Intertidal Habitat

Intertidal habitat consisted of shale rocky outcrops of the lower headland at Gallows Beach, with some areas of soft sandy sediment. High intertidal areas were dominated by the common intertidal invertebrates Modest Four-plated Barnacles (*Austrominius modestus*), Variegated Limpets (*Cellana tramoserica*) and Gold-mouthed Conniwinks (*Bembicium auratum*). Mid intertidal areas possessed a significantly higher density of invertebrate species and abundances, dominated by Surf Barnacles (*Catomerus polymerus*), Rose Barnacles (*Tesseropora rosea*), *C. tramoserica* and Little Blue Periwinkle (*Nodilittorina unifasciata*). Common species in this zone also included Sydney Rock Oysters (*Saccostrea glomerata*), False Limpets (*Siphonaria denticulata*) and Mulberry Whelks (*Tenguella marginalba*). Lower intertidal areas possessed the highest diversity and coverage of species, holding a similar community composition as intertidal areas, with the addition of Chitons (*Onithochiton quercinus*) and Tube Worms (*Galeolaria caespitosa*), and large assemblages of Cunjevoi (*Pyura stolonifera*) in the splash zone. Lower intertidal areas also included small rockpools containing common invertebrates and Green Snakelock Anemones (*Aulactinia veratra*).

Intertidal vegetation was restricted to mid to low areas, with rocky habitat largely dominated by Sea Lettuce (*Ulva* sp.) and red algae (*Gelidium* sp.). Other common intertidal species observed included Coralline Alga (*Corallina officinalis*) and small stands of Gulfweed (*Sargassum* sp.).

Subtidal Habitat

Subtidal habitat within the Study Area consists of a high energy surf zone, with turbid waters and high swell energy. Surveys were limited to review of remote sensing data, visual survey from shore and by use of drone.

Subtidal habitat consisted of soft, sandy sediment with areas of rocky reef habitat that likely includes a deeper sand gutter running adjacent to the headland at times. Habitat in shallow areas < -1.0 m depth comprised of clean marine sands, with fringing macroalgae stands along the lower rocky shore immediately adjacent to the sand interface. Macroalgae in this area was dominated by *Sargassum* sp., with *Ulva* sp., *C. officinalis* and turfing algae also common along smaller rocky substrate and boulders amongst large stands of *P. stolonifera*. Intertidal rock formations continued approximately 3 m into subtidal areas close to shore, creating rocky reef habitat that would be likely to support sessile invertebrates such as barnacles and oysters and supported macroalgae stands that are resilient to high swell energy environments.

Potential subtidal habitat for marine animals is minimal due to high swell energy in the Study Area, with no opportunistic sightings of mobile marine fauna observed during site surveys. Fish within the Study Area are expected to be typically pelagic and highly mobile species, with minimal refuge and foraging habitat for more cryptic species. Although rocky reef habitat may provide some crevices and small gutters that would

generally be potential habitat for larger cryptic species such as the Vulnerable Black Rockcod (*Epinephelus daemelii*), the high energy system and shallow depth creates suboptimal conditions for such species. Additionally, high swell energy and the lack of stable macroalgae or seagrass stands does not create suitable habitat for Syngnathidae fishes, including the Endangered White's Seahorse (*Hippocampus whitei*), which is limited to estuarine habitats. Sharks and turtles may on occasion utilise deeper subtidal areas for foraging efforts, however, habitat is not suitable for permanent use and would be expected to be in most part visited as part of transient movements only. The Endangered Cauliflower Soft Coral (*Dendronephthya australis*) was not observed during site surveys, with swell energy considered to be too high for this species to establish.

3.2.2 Biota Present

A wide range of species of flora and fauna was observed within the Study Area during the site surveys undertaken as part of this AEA (Table 4). Details and discussion concerning possible impacts to these species and some other relevant species are presented in Section 4 of this report.

Table 4: List of species observed within the Study Area during the site survey.

Species present within the Project Area [i.e., the dredging or sand placement sites] are indicated by '✓', whilst species not present within the Project Area are indicated by 'X'.

Species	Name	Habitat	Within Project Area
Invertebrates*			
Aulactinia veratra	Green Snakelock Anemone	Rocky intertidal areas in tidal rockpools	✓
Austrominius modestus	Modest Four-plated Barnacle	Rocky intertidal areas	✓
Bembicium auratum	Gold-mouthed Conniwink	Rocky intertidal areas	✓
Catomerus polymerus	Surf Barnacle	Rocky intertidal areas	✓
Cellana tramoserica	Variegated Limpets	Rocky intertidal areas	✓
Chthamalus antennatus	Six-plated Barnacle	Rocky intertidal areas	✓
Galeolaria caespitosa	Tube Worm	Rocky intertidal areas	✓
Nodilittorina unifasciata	Little Blue Periwinkle	Rocky intertidal areas	✓
Onithochiton quercinus	Chiton	Rocky intertidal areas	✓
Pyura stolonifera	Cunjevoi	Rocky intertidal areas, shallow subtidal areas	✓
Saccostrea glomerata	Sydney Rock Oyster	Rocky intertidal areas, shallow subtidal areas	✓
Siphonaria denticulata	False Limpet	Rocky intertidal areas	✓
Tenguella marginalba	Mulberry Whelk	Rocky intertidal areas	✓
Tesseropora rosea	Rose Barnacle	Rocky intertidal areas	✓
Macroalgae			
Corallina officinalis	Coraline Alga	Rocky intertidal areas, shallow subtidal areas	✓
Gelidium sp.	Red Alga	Rocky intertidal areas	✓
Sargassum sp.	Gulfweed	Rocky intertidal areas, shallow subtidal areas	✓
Ulva sp.	Sea Lettuce	Rocky intertidal areas, shallow subtidal areas	✓
Birds			
Haematopus fuliginosus	Sooty Oystercatcher	Rocky and sandy intertidal areas	✓
Haliaeetus leucogaster	Sea Eagle	Aerial observation	✓
Larus novaehollandiae	Silver Gull	Aerial observation	✓
Manorina melanocephala	Native Miner	Aerial observation	✓
Pelecanus conspicillatus	Pelican	Aerial observation	✓

Phalacrocorax carbo	Greater Cormorant	Aerial observation	✓
Phalacrocorax varius	Pied Cormorant	Aerial observation	✓

4 Impact Assessment

Direct and indirect impacts are expected to occur at the pipe outlet site at Gallows Beach. Intertidal and subtidal edge habitats lie at the pipe outlet for sand substrate transferred from Coffs Harbour boat ramp, which will result in excessive sedimentation and smothering of intertidal areas, a reduction in light availability and increased mobilisation and suspension of sediments in subtidal areas. An 'impact area' that has been considered as part of this assessment includes for a 150 m radius of marine habitat around the outlet site (Figure 2).

The Guidelines for Aquatic Ecology in Environmental Impact Assessment identifies that environmental disturbances to aquatic ecology can be categorised in terms of potential physical, chemical and biological effects, which allows for the nature of impacts and their likely magnitude to be assessed (Lincoln Smith 2003). More recently, research on impacts to marine fauna has had increased focus on behavioural impacts as a result of additional sources of disturbance such as underwater noise (Erbe 2012) and light (Tidau 2021). To recognise this, behavioural effects have been added as a fourth category of impacts summarised in Table 5.

Table 5: Identification of potential aquatic impacts from the proposal.

Impact	Likelihood	Description
Physical		
Removal or modification of intertidal habitat	Known	Intertidal habitat within the Study Area consists of sandy and rocky intertidal habitat inhabited by common invertebrates and macroalgae. Intertidal habitat will be smothered by sand substrate deposited by the outlet pipe, resulting in a reduction of habitat quality for those invertebrates and macroalgae inhabiting the direct area along rocky substrate and potential smothering of infauna in sandy areas. This will result also in a reduction of rocky intertidal foraging habitat for shorebirds that may utilise the area, including Pied/Sooty Oystercatchers.
Removal or modification of subtidal habitat	Known	Subtidal habitat within the Study Area consists of clean marine sands and rocky reef habitat inhabited by common invertebrates and macroalgae. Deposition of sand will result in modified habitat quality in subtidal areas as a result of sedimentation. This may result in the smothering of invertebrates and macroalgae inhabiting rocky reef habitat close to shore and may reduce foraging value for species who transiently use subtidal habitat close to shore.
Removal or loss of marine fauna and flora	Known	Some sessile or slow-moving invertebrates on rocky habitat and some infauna that inhabit sandy intertidal and subtidal areas will be smothered and likely lost as part of the Sand Transfer System. Biota impacted will be limited to common intertidal invertebrate species and common macroalgae species tolerant to high energy areas that inhabit areas in proximity to the outlet. Loss of biota is expected to fluctuate and will be affected by the frequency and volume of sand pumping activities.
Physical disturbance or smothering of marine fauna and flora	Known	The Sand Transfer System will result in direct physical disturbance to marine flora and fauna, particularly intertidal sessile invertebrates and subtidal epibenthic organisms such as macroalgae in proximity to the outlet, as a result of smothering. More motile fauna such as fish and decapods may either disperse away from disturbance in subtidal areas as an avoidance response to sudden increases in turbidity, or alternatively be attracted to the turbid plume to opportunistically feed on elutriated infauna or other dispersing prey items. During times of sand pumping, there is potential for temporary physical disturbances to macroalgae stands present in adjacent shallow subtidal areas due to elevated levels of turbidity and sedimentation and a resultant reduction in light availability in the vicinity of the pipe outlet. Additional species likely to be impacted include some species of marine and shorebirds which will experience some disturbances to intertidal foraging habitat.
Sedimentation of adjacent habitat	Known	It is expected that there will be movement of transferred sand substrate at the locality, given the high swell energy and dynamic coastal processes at the site. Nearby rocky reef habitat along Corambirra Headland and the

		South Breakwater may be temporarily impacted by increased levels of sedimentation which may impact on the habitat quality and sessile invertebrate and macroalgae assemblages in the area. However, given the high swell energy of shallow environments close to shore are naturally highly turbid and considering the environment receives an estimated 30,000 m^3 offshore sediment accretion from the northern littoral drift along Boambee Beach (MHL 2015), sedimentation impacts will likely be minimal and short-term. No sensitive habitat types, including seagrasses or extensive reef systems, occur directly within the Study Area, however, sedimentation may have potential to indirectly impact adjacent extensive rocky reef habitat to the north.
Injury caused by ingestion of, or entanglement in, harmful marine debris	Possible	Materials used during construction and operational works that are not contained or disposed of correctly have potential to find their way into the water and be ingested by marine fauna.
Barriers to fish passage	None	The works are not expected to result in any temporary or permanent barriers to fish passage.
Potential for spread of microplastic and marine debris	Possible	Given the extensive distribution of microplastics, their spread is likely unavoidable. Some spread of microplastics may occur if present in basin sands.
Chemical		
Changes in water quality	Known	The Sand Transfer System will result in changes to water quality as a result of increased turbidity and sedimentation. Direct impacts to water quality within the Study Area are likely to be minimal and short-term and are expected to dissipate within normal tidal regimes, with waters within the Study Area are naturally turbid due to the high swell energy. Indirect impacts to water quality may also occur outside of the impact area, however, are likely to be generally short-term.
Mobilisation of contaminants	Unlikely	Sand extracted from Coffs Harbour boat ramp to date has been tested and generally categorised as Excavated Natural Material (ENM), with minimal potential to transport contaminants.
Nutrification	Unlikely	Sand extracted from Coffs Harbour boat ramp to date has been tested and generally categorised as Excavated Natural Material (ENM), with minimal nutrient enrichment risk expected.
Biological		
Introduction or spread of a marine pest species	Possible	Sediments transferred from the basin are a potential vector for introduction or spread of introduced marine species, if present.
Introduction of disease or pathogens	Unlikely	No known diseases or pathogens have been identified as an environmental issue for marine fauna and flora in this locality, while no aquaculture occurs in the vicinity of the Project Area.
Behavioural		
Attraction of fauna to area during nourishment	Possible	It is likely that some behavioural changes to species such as shorebirds or fish will occur during deposition of sediments in the transfer area as individuals may be attracted to potential prey transferred or disturbed by sand plumes. These changes will be short term and limited to the direct time of impact, with no long- term impacts of ecological significance expected to occur for species within the Study Areas.
Generation of construction noise with potential to impact on fauna behaviour	Possible	Some construction noise during installation of sand transfer pipe and as a result of pump use across the rocks will occur in the Study Area. This may result in some short-term disturbances to foraging shorebirds relative to construction periods of the pipe system and operational pumping periods.
Generation of underwater noise with potential to impact on fauna behaviour	Unlikely	Construction activities associated with this Sand Transfer System are land based and are not expected to produce underwater noise capable of injury to marine fauna.

4.1 Estuarine Fauna

4.1.1 Marine Birds, Shorebirds and Waders

Marine birds, shorebirds and waders may regularly use habitat and resources within the Study Area. This may include sandy and rocky intertidal habitat to forage, rest or roost. Such species are known to include gulls, terns, cormorants and oystercatchers, which are common in coastal areas along the NSW coast. Impacts on these species that may occur due to the proposed Sand Transfer System include short-term disturbances to habitat quality including removal or modification of existing shoreline and intertidal foraging

and/or roosting habitats, reduced prey abundances and reduced water quality. These species forage across large areas and would be expected to use a variety of habitats in the vicinity of the Project Area, including Boambee Beach, Muttonbird Island, Little Muttonbird Island, coastal beaches and the Coffs Creek estuary. Considering this and the localised area of intertidal habitat that will be disturbed as a result of sand substrate deposition, these impacts on foraging habitat quality are unlikely to be of ecological significance to shorebirds or waders that may utilise this shoreline or intertidal habitat. However, the Sooty Oystercatcher (*Haematopus fuliginosus*) was observed feeding amongst intertidal rocks at Gallows Beach and some very localised impacts on foraging habitat for this species may occur for individuals that regularly utilise the site for foraging value. Given this, the Sooty Oystercatcher was considered further through a 5-Part Test (Appendix 4).

A majority of shorebirds that frequent the locality do not breed locally nor on the Australian mainland. For those species that do breed locally, including the Pied Oystercatcher (*Haematopus longirostris*), the Study Area only provides very marginal potential breeding habitat and is not considered a breeding/nesting area. However, some of these species, such as some Sand Plovers and Godwits, may at times potentially roost along the higher shoreline of Gallows Beach or within the Study Area, and likely Boambee Beach to the south. While the habitat is marginal for roosting at best and has high human disturbance, the proposed pipeline may physically disturb areas of potential roosting habitat, whilst sand deposition could potentially attract additional birds to feed amongst deposited sands in rocky intertidal areas, which may encourage roosting in areas that are typically not preferred by these species. Given this, the Pied Oystercatcher, which may occasionally use rocky coastlines for nesting (LLS 2021), was considered further through a 5-Part Test (Appendix 4).

Results of the 5-Part Test for these threatened shorebirds concluded that Sooty and Pied Oystercatchers that may at times utilise habitat in the vicinity of Study Area are unlikely to be significantly affected by the proposed activity. Modification to foraging habitat in the Study Area comprises a very small foraging area in the locality, with ample similar habitat available along Gallows Beach, Coffs Harbour and in the adjacent SIMP (Appendix 4).

A wide diversity of other marine birds that forage along the coastline are likely to forage in waters within the Study Area at times. These species may include various albatross, shearwater and petrel species, which spend the majority of their time in coastal areas foraging aerially over very large areas of water along the coastline and at sea (SEWPAC 2012). Marine birds that may use resources in the Study Area include several species of migratory and threatened shearwaters (*A. carneipes, grisea, pacifica, and tenuirostris*), some of which also breed on nearby islands (NPWS 2016). Given this, the waters adjacent to Gallows Beach and at times within the Study Area are likely to contribute to feeding grounds for these species, particularly during the breeding season, which typically occurs in the Solitary Islands and on Muttonbird Island following their arrival in August, with nesting commencing in November and continuing until the adult birds leave in early April and fledgling chicks in late May (NPWS 2009). Other migratory marine birds known to occur in the Study Area include the Crested Tern (*T. bergii*), Lesser Frigatebird (*F. ariel*), Common Tern (*S. hirundo*) and Little Tern (*S. albifrons*). These marine birds typically forage over the water and rely on detecting prey aerially from above (Billerman et al. 2020; DAWE 2020; DPIE 2020). Impacts on the water quality of waters used to forage by these birds has potential to affect the foraging habitat quality for these species. This may be through reduced prey detection success from waters with elevated levels of turbidity (Lunt and Smee 2015). Given that these birds forage over very large areas of the coastline, impacts of water quality on foraging habitat quality as a result of sand deposition, which are likely to be temporary and very localised to shallower areas along the shoreline that are typically highly disturbed due to the exposure to swell energy and existing Wastewater Outfall, are not expected to be of ecological significance for marine birds in proximity to the Study Area.

4.1.2 Marine Mammals

The proposal is limited to shoreline, intertidal and shallow subtidal water. The use of these shallow waters by larger marine mammals, including cetaceans, is likely to be rare and only as part of transient movements through the locality. Smaller marine mammals, such as dolphins and fur-seals, are however, likely to occur on occasions as part of transient movements through the locality for opportunistic foraging. Considering the large areas that these species forage across when compared to the size of the Study Area and Impact Area, any short-term disturbances to habitat quality from the proposal are expected to be minimal and not of ecological significance. The rocky and sandy shoreline in the Study Area and along the southern edge of Corambirra Point is unlikely to be a permanent and/or significant refuge location for Australian or New Zealand Fur-seals, due to the high swell energy and steep rocky shore. Sandy and more protected rocky shores in the vicinity do provide potential refuge habitat for fur-seals, with records of Australian and New Zealand Fur-seals at north Boambee Beach, the tip of Corambirra Point, Muttonbird Island and the Coffs Harbour Marina (ALA 2023). Sedimentation of intertidal areas in the vicinity of the pipe outlet may provide additional sandy habitat for these species to haul-out at Gallows Beach. Considering this and the likely very transient foraging activities along the coast in the Study Area, the proposal is not expected to result in any ecologically significant effects to marine mammals. The works are also not expected to generate any ecologically significant levels of underwater noise with potential for detrimental physiological or behavioural responses by any marine mammals should they be present in the vicinity.

4.1.3 Marine Reptiles

Some marine reptiles may be transient visitors to the Study Area at times. These species include the Green Turtle (*Chelonia mydas*), Loggerhead Turtle (*Caretta caretta*) and Hawksbill Turtle (*Eretmochelys imbricata*), which are regularly sighted along the coast in the SIMP (NSW DPI n.d). Turtle nesting typically occurs in more tropical waters of northern Australia, however, the marine environment around the marine park is an area of tropical and temperate mixing, allowing a variety of tropical and sub-tropical species to live amongst temperate species, including turtles. Numerous records of Green and Loggerhead Turtles nesting along the Coffs Coast have been collected in the past five years by the NSW Turtle Watch program, including at Boambee Beach to the south of the Study Area.

Potential marine turtle habitat associated with the Study Area includes sandy and rocky shoreline, intertidal areas and shallow subtidal areas. Soft sediment shoreline habitat within the footprint of the proposed pipe outlet and along Gallows Beach provides very limited suitable nesting habitat for marine turtles. Habitat above the High-Water Mark consists of a small area of sandy shoreline (<15 m width) bordered by cobble, with large southeasterly swells known to extend the HWM to cover Gallows Beach (BMT WBM 2008) and is in immediate proximity to regular human activity. Suitable nesting habitat is available to the south of the Study Area on Boambee Beach, however, given the relatively minor terrestrial footprint of the Sand Transfer System and expected localised impacts to the immediate shoreline, intertidal and subtidal areas, the proposal is not expected to have an ecologically significant impact on nesting habitat for Green and Loggerhead Turtles. Subtidal habitat in the Study Area consists of clean marine sands and rocky reef, vegetated in shallow areas by stands of common macroalgae. There is potential that localised increases in sedimentation and turbidity or disturbance to macroalgae from the proposal will result in reduced habitat quality for marine turtles foraging in the Study Area during pump operation. However, given the high swell energy and limited macroalgae in the subtidal environment in the Study Area, it is likely that the site would not be used as regular foraging habitat and turtle presence would be part of transient movements. Any short-term subtidal impacts associated with pump operation, including potential for the smothering of shallow rocky areas, are considered of minimal ecological significance to foraging prospects for this group of species. Considering a Green Turtle nesting event has been recorded at Boambee Beach, and occurrences of Loggerhead Turtles have been recorded along the coast, a 5-Part Test and Assessment of Significance was conducted for these species (Appendix 4). These tests concluded that individuals that may potentially utilise habitat in the vicinity of the proposal are unlikely to be significantly affected by the proposed activity. Habitat use in the vicinity of the Study Area is

likely to be very occasional, with limited foraging value and any nesting considered unlikely on adjacent areas of Gallows Beach.

Another major threat to marine turtles is entanglement in or ingestion of marine debris. Sand extracted from Coffs Harbour boat ramp to date has been tested and generally categorised as Excavated Natural Material. Given that sand will be extracted from an area of high human traffic and use, there is some potential that small debris or microplastics may be transported to the outlet and consequent marine habitat with potential consumption by marine turtles.

4.1.4 Fish, Sharks and Rays.

The proposed Sand Transfer System and operational impacts include shallow subtidal waters, localised to the pump outlet at Gallows Beach. Considering this, direct impacts to pelagic and benthic fish, sharks or rays are considered to be unlikely, with a majority of benthic fish that may occupy soft sediment habitat in the Study Area capable of quick movement away from potential disturbances by sedimentation to similar nearby habitat. The deposition of sand may, however, attract fish and smaller shark and ray species that feed on small invertebrates, with sediments facilitating potential opportunistic feeding by some of these species should it contain prey items. Rocky reef species may include highly motile species that move between various reef habitat and resources throughout the much wider locality of the Coffs coastline and adjacent headland, in which rocky reef habitat is extensive. Species within the Study Area and Impact Area are likely to consist predominantly of species that utilise soft sediment, shallow habitat, with more cryptic species that may occupy more complex structures and deeper waters for refuge likely limited to habitat further offshore and away from the high swell energy environment close to the rocky shore of Gallows Beach, such as along the South Breakwater or Muttonbird Island. Cryptic species such as protected Syngnathidae fishes may occur in the Study Area but are most likely associated with macroalgal stands associated with the nearby South Breakwater or Muttonbird Island that would provide permanent habitat. No potential habitat for the Endangered White's Seahorse occurs in the Study Area, as these species are restricted to estuarine environments.

Various other endangered and/or migratory species of larger predatory fish, sharks and rays may transiently occur in the waters of the Study Area and Impact Area. The Critically Endangered Grey Nurse Shark (*Carcharias taurus*) occurs in the locality, with known aggregation sites in the nearby Solitary Islands Marine Park. Two significant aggregation sites for this species are located to the north of Coffs Harbour at North and South Solitary Islands, the closest being South Solitary Island, approximately 16.5 km to the north of the Study Area (NSW DPI 2016). While no known aggregation sites occur in close proximity to the Study Area, it is likely that some individuals may utilise rocky reef in waters around the Study Area for foraging predominantly at night, however, would be unlikely to regularly utilise habitat for refuge purposes in the Study Area or along the southern section of Corambirra Point due to the high energy environment. Given the localised area of impact on subtidal habitats from the proposed pipe outlet and the shallow depth within the Study Area, it is not expected that the proposal will significantly affect *C. taurus* habitat or individuals, which typically occupy deeper waters beyond the surf zone (NSW DPI 2016). The nearby SIMP and adjacent points and islands along the Coffs Harbour coastline also provide notable habitat for the Vulnerable Black Rockcod, which utilises deeper shoreline areas along rocky drop-offs where ledges, overhangs and caves occur (NSW DPI 2012b). Although the Study Area contains rocky reef habitat along the shoreline with likely overhangs and small ledges, the high energy environment and shallow waters are not likely to support permanent or regular habitat use by the species, however, there does remain some potential that individuals may transiently use locations within the Impact Area for foraging efforts. The proposed sand transfer deposition and resulting increases in sedimentation and turbidity have some potential to disturb habitat quality across very localised scales of Black Rockcod that may transiently occur in the Study Area and reduce habitat quality. Impacts must also consider the movement of pumped sand from Gallows Beach along the south of Corambirra Point,

the South Breakwater of Coffs Harbour and potentially Muttonbird Island. Habitat in this area provides deeper and potentially more suitable protected habitat that may be utilised by cryptic species such as Black Rockcod for more permanent habitat. However, given that an estimated 30,000 m^3 annual offshore accretion occurs to the south of Corambirra Headland, it is not likely that additional sedimentation will result in significant impacts (MHL 2015).

Potential to impact on Black Rockcod was considered further through a 7-Part Test and Assessment of Significance. This assessment concluded the viability of the Black Rockcod population that utilise habitat in the vicinity of the proposal is unlikely to be significantly affected by the proposed activity. The habitat inside the Study Area is very marginal for Black Rockcod and is not expected to be significant to the local population. Thus, any disturbances to the species are unlikely, with any potential disturbances limited to very short-term indirect increases in sedimentation or turbidity (Appendix 4).

4.1.5 Marine Invertebrates

Direct disturbances to invertebrate communities inhabiting intertidal and soft sediment habitats will occur as a result of this proposal. This may include infauna and macroinvertebrates that live amongst intertidal rocky and sandy habitat and subtidal soft sediments, likely to consist of various polychaetes, gastropods and bivalves. These small animals, which live amongst the sand grains and on rocky substrata are a key component of marine food webs that provide a food source for fish and birds. Infauna are also a key component of the benthic ecosystem within soft sediment communities and can be good indicators of environmental quality (Marks 2017).

The pipe outlet at Gallows Beach is proposed to deposit sand over the rocky intertidal area, which will result in the sedimentation and smothering of marine invertebrates that inhabit soft sediments and potentially rocky substrata in this location. Invertebrates observed during site surveys were confined to rocky substrata and predominantly sessile, consisting of barnacles, oysters and cunjevoi with mobile invertebrates including chitons and various gastropods. Sedimentation of these communities during operation of the pipe is likely to result in shifts in community composition and abundance, with reduced abundance of some species. Increased sediment loads can have significant effects on foraging capacity of intertidal organisms, particularly those that are filter feeders or grazers. Sedimentation can smother and obstruct feeding mechanisms, such as the cirri of barnacles, restrict movement of grazers and reduce potential food sources by smothering intertidal algae (Minchinton and Fes 2013). It is likely that over time, intertidal macroinvertebrate communities in the Study Area will become dominated by more resilient and mobile species (Minchinton and Fes 2013), with lower intertidal areas likely to have higher abundances or recover more quickly in comparison with higher areas due to swell action washing deposited sand away (Marks 2017). Intertidal infauna inhabiting sandy sediment is likely to experience short-term sedimentation from deposited sand volumes. This may result in the loss of some intertidal invertebrates if covered by large volumes of sand, whilst some more mobile infauna may disperse away from the immediate area. Given the extensive amount of similar habitat adjacent to the Study Area and likely recolonisation between operations, it is not expected that reductions in abundance will be ecologically significant.

In subtidal areas within the Study Area, soft sediment invertebrates such as infauna are likely to be less disturbed by the sedimentation, especially in areas beyond the surf zone. In these areas various polychaetes, gastropods and bivalve species are likely still to be present and abundant in places, with ability to move if disturbed. Invertebrates on rocky substrata in subtidal areas will likely experience some temporary disturbance as sand is washed into shallow subtidal areas, however, given the high energy and naturally turbid state of subtidal habitat in the Study Area this is expected to be of minimal significance.

Other larger soft sediment invertebrates such as larger gastropods and crustaceans and other cnidarians may sporadically occur in the Study Area, and slow moving and solitary species would likely be smothered

by this proposal. The Endangered Cauliflower Soft Coral (*Dendronephthya australis*) typically confined to estuarine environments (NSW DPI 2022) and more stable deeper reefs; thus, it is unlikely to occur in the Study Area, due to constant sand movements and exposure to regular and large swells.

4.1.6 Macroalgae

Macroalgae within the Study Area is typically confined to rocky substrata along the lower intertidal zone and outcrops in shallow subtidal areas at Gallows Beach and along the south of Corambirra Point. Species in these areas comprised of common macroalgae including Gulfweed (*Sargassum* sp.), Sea Lettuce (*Ulva* sp.), Coralline Algae (*Corallina officinalis*) and Red Alga (*Gelidium* sp.). The deposition of sand over intertidal areas is expected to result in some physical disturbance to intertidal macroalgae as a result of smothering and/or scouring. Intertidal macroalgae in proximity to the pipe outlet will likely be impacted by short-term reductions in light and nutrients and some physical removal due to scouring (Littler *et. al.,* 1983), however, it is expected that high swell energy in lower intertidal areas will contribute to the dispersal of deposited and minimise the duration of these impacts. Indirect impacts on larger and more established assemblages in adjacent subtidal areas may occur as a result of sedimentation and reduced water quality. Macroalgae, is typically less sensitive to reduced water quality and sedimentation then other macrophytes, however sedimentation can be a driver of change of these communities, with loss of large canopy forming species and favourable conditions for turfing and opportunistic species (Airoldi 2003), especially wear prolonged disturbances occur that coincide with other events and disturbances, such as removal of large canopy forming macroalgae as a result of ocean swells. Given that subtidal areas at the Study Area are regularly influenced by high swell energy and naturally turbid waters, impacts from short-term disturbances to water quality on nearby macroalgae assemblages are expected to be minimal as a result of this proposal.

The Critically Endangered Marine Brown Alga (*Nereia lophocladia*) is known to inhabit subtidal areas at Coffs Harbour on the northern side of the Coffs Harbour marina and Muttonbird Island. The species inhabits hard substrate on the seabed at the sand/reef interface, typically between 3-12 m depth (NSW DPI 2018). It is particularly threatened by sand movements and sand smothering as a result of storms, large swell and coastal developments, with previous losses in abundance attributed to the construction of the Muttonbird Island breakwater (NSW DPI 2018). Habitat for this species within the Study Area is minimal due to the high swell energy, which would hinder the ability of this species to establish, however, there is potential that stands of the alga may occur in nearby areas along the seabed in rocky reef habitat. Large volumes of sand deposits have potential to smother this species and may result in population decline of any stands that may occur in the area. The natural northward littoral drift at Boambee Beach means that sand will generally move north from the outlet site back into the harbour, however, combinations of large sand volumes with large swell or storm events may have potential to move north along the South Breakwater to Muttonbird Island adjacent to areas of known species presence. Monitoring of presence and abundance of this species in the wider locality where sand transport north beyond Coffs Harbour is expected to significantly change will be essential to manage potential operational impacts to this species.

A 7-Part Test and Assessment of Significance concluded that the proposed sand transfer works are not expected to result in any removal of the mapped *N. lophocladia* population in Coffs Harbour. Any disturbances are expected to be minimal and short-term sedimentation disturbances of habitat, largely limited to occurrences when large volumes of sand are deposited in conjunction with large swell, storm events and environmental conditions resulting in a strong northern littoral drift. The implementation of monitoring, based on sand volume and risks, detailed in Section 5, will minimise the potential for this impact. Given this, any disturbances will likely be confined to areas south of Coffs Harbour, where *N. lophocladia* is considered rare, thus the proposal is unlikely to affect the viability and long-term survival of the Coffs Harbour population of *Nereia lophocladia*.

Figure 2: Habitat map of the Study Area with expected Impact Area.

5 Recommendations and Conclusions

5.1 Recommendations

This section details recommendations for measures to avoid, minimise and mitigate ecological impacts on the marine environment. The recommendations have been provided for pre-construction/pre-operation, construction, operation and ongoing monitoring of the project.

Specific recommendations will be triggered by sand volumes that have potential to impact a wider reach of habitat or with higher potential sedimentation impacts. This trigger value should be developed under advice from coastal engineers with expertise in local coastal processes.

5.1.1 Pre-Construction/Operation

The following actions are recommended to be completed prior to construction and operation works:

- Inspection of the sandy and rocky intertidal habitat at the northern end of Gallows Beach for evidence of nesting marine birds, shorebirds and marine turtles within 4 weeks prior to the construction of the pipe outlet and to the commencement of pump operation by an experienced ecologist. Should nesting fauna be found, further consultation and the preparation an appropriate management plan will need to be negotiated with DPIE and/or NPWS.
- Bathymetric survey of the locality, including the northern end of Gallows Beach and subtidal areas adjacent to Corambirra Headland, to provide a baseline understanding of the seabed profiles before pumping of sand to this locality.
- Development of a visual turbidity monitoring procedure, which can be implemented during sand pumping.

5.1.2 Construction of Pipe Outlet

The following actions are recommended to be completed during construction of the pipe outlet at intertidal habitat at Gallows Beach. It is recommended that these be adopted into the Construction Environmental Management Plan (CEMP) for the works.

- Pipe outlet should be placed and directed in a manner that minimises changes to the natural beach profiles of Gallows Beach. Changes to the immediate intertidal and seabed profile are likely unavoidable.
- Adequately manage and store waste products and material in designated areas on the site.
- All construction work locations are to have designated litter disposal bins to avoid potential for marine debris.
- All machinery should be routinely checked for leaks, with an emergency spill kit to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.
- All fuels and hydrocarbon-based products are to be stored in a bunded area away from the water's edge.
- Should shorebirds be foraging in intertidal areas within 50m of active construction works, reasonable care should be taken to ensure that the birds are not harmed in any way.
- If any marine or shorebirds are found to be nesting, or Fur-seals resting within 100m of the project area during construction works, the works should cease immediately and the local NPWS office notified.
- The contractor should liaise monthly with the local NPWS office to ensure no nesting turtles are using Gallow Beach.

5.1.3 Operation of Pipe Outlet

The following actions are recommended to be conducted during operation works:

- Implementation of a sand monitoring program to determine where the sand moves to and what volumes. This should include modelling to identify volume-based triggers for potential changes in current accretion and scouring along coastal areas north of Coffs Harbour.
- Monitoring of sand volumes pumped per month to inform of volumes exceeding the trigger value. Volumes exceeding the trigger value will initiate protocols detailed in Section 5.1.4.
- Bathymetric Monitoring undertaken at least annually and more regularly as required based on volume-based triggers.
- All machinery should be routinely checked for leaks, with an emergency spill kit to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.
- All fuels and hydrocarbon-based products are to be stored in a bunded area away from the water's edge.

5.1.4 Ecological Monitoring

The major ecological impact from pump operation is expected to be the smothering and burial of common macroalgae and invertebrates in the immediate vicinity of the pipe outlet, addressed in Section 4.

Given that the Critically Endangered Marine Brown Alga occurs to the north of Coffs Harbour, monitoring may be required and will be dependent on further investigations of changes in sand movement and the identification of volume-based triggers with potential for ecological impact.

Bathymetric Monitoring should be undertaken at least annually and more regularly as required based on volume-based triggers.

5.1.5 Offsetting

NSW DPI enforces a 'no net loss' habitat policy as a permit condition or condition of consent. This may require proponents to conduct habitat rehabilitation and/or provide environmental compensation. Common macroalgae stands in intertidal and immediate subtidal areas are expected to minimal, with species likely tolerant to sedimentation and increased turbidity in this location. It is unlikely the current proposal will trigger offsetting requirements under the current NSW DPI Policy (Fairfull 2013).

5.1.6 Permits

The project is not expected to result in harm to common macroalgae in intertidal and immediate subtidal areas, with species likely tolerant to sedimentation and increased turbidity in this location. As such, a Section 205 - permit to harm (cut, remove, damage, destroy, shade etc.) marine vegetation (saltmarshes, mangroves, seagrass and seaweeds) under the FM Act will not likely be required.

5.2 Conclusions

Direct impacts from this proposal will include some localised and short-term sedimentation or smothering to intertidal and shallow subtidal areas in the Study Area, potentially resulting in the loss of common sessile invertebrates or slow-moving invertebrates in both intertidal and subtidal rocky habitat. These losses are not expected to detrimentally impact on the wider populations and communities of invertebrates at an ecologically significant level, with species expected to recolonise on adjacent substrata. The smothering of these species in rocky intertidal areas will reduce a small amount of foraging habitat used by shorebirds and marine birds in the locality, however, given the small impact area relative to the vast availability of

similar habitat in the Study Area and adjacent locations, this is not considered to detrimentally impact shorebird and marine bird species.

The deposition of sand may result in short-term impacts on water quality in the form of elevated levels of turbidity, with potential sedimentation in the vicinity of the pipe outlet and increased sediment accretion in some rocky reef edge habitat to the northeast during pump operation. It is possible that some threatened marine fauna and flora, particularly the Black Rockcod and Marine Brown Alga (*N. lophocladia*), may occur in areas of rocky reef habitat along Corambirra Headland, the South Breakwater and waters around Muttonbird Island, although habitat in this area is considered very marginal for these species. In instances where large volumes of sand are deposited from the pipe outlet, there is potential that some of these habitats may be impacted by short-term increases in sediment accretion and decreases in habitat quality. However, given the high swell energy of subtidal areas in close proximity to Corambirra Headland and the South Breakwater and considering the estimated 30,000 m^3 of sediment accretion per annum in these areas from the northward littoral drift along Boambee Beach, short-term impacts from the Sand Transfer System are likely to be consistent with those disturbances that occur as part of natural sand movements in the locality and are unlikely to result in disturbances that are of ecological significance. The monitoring of sand movement and the establishment of trigger values for sand volumes will be essential to identify any potential for the proposal to have wider impacts on adjacent habitats and species, in order to inform the need for the slowing or reduction in volume of pumping operations.

The proposal is considered unlikely to have a significant impact on State and/or Commonwealth listed threatened biodiversity. As such, referral to the Department of the Environment under the EPBC Act is not required. Similarly, the preparation of a Species Impact Statement (SIS) based on the provisions of the BC and FM Act should not be required. Based on the NSW Policy and guidelines for fish habitat conservation and management, a *Section 205 – permit to harm (cut, remove, damage, destroy, shade etc.) marine vegetation (saltmarshes, mangroves, seagrass and seaweeds)* will not likely be required.

To manage the potential risks that this proposal may pose to marine habitat, flora and fauna and the potential for impacts to adjacent habitat from increased sediment accretion and reduced water quality, a series of recommendation have been provided. These recommendations should be adopted into the CEMP for construction and operational works for this proposal.

6 References

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Plates

Plate 1: Shoreline habitat at the Study Area, showing a) location of proposed pipe outlet at northern Gallows Beach, with Coffs Harbour and the boat ramp basin in the background; and b) shale rocky foreshore with areas of soft, sandy sediment.

Plate 2: Intertidal habitat at the Study Area, showing a) typical intertidal rocky habitat with small sandy areas, b) contrast of low, middle and high intertidal zone species composition, c) high density invertebrate species in mid to low intertidal zones; and d) dense algae and cunjevoi assemblages in low intertidal zones.

Plate 3: Site photos taken with drone, showing a) exposed clean marine sand seabed at low tide immediately adjacent to proposed pipe outlet, b) typical high swell energy during sets at inner Corambirra Headland near Gallows Beach, c) typical high swell and turbidity along the southern edge of Corambirra Headland; and d) typical high swell and turbidity along the eastern edge of Corambirra Headland and the South Breakwater.

Appendix 1: Concept Design Drawings

Figure 1: Proposed initial pipeline layout

Appendix 2: Threatened Species Searches

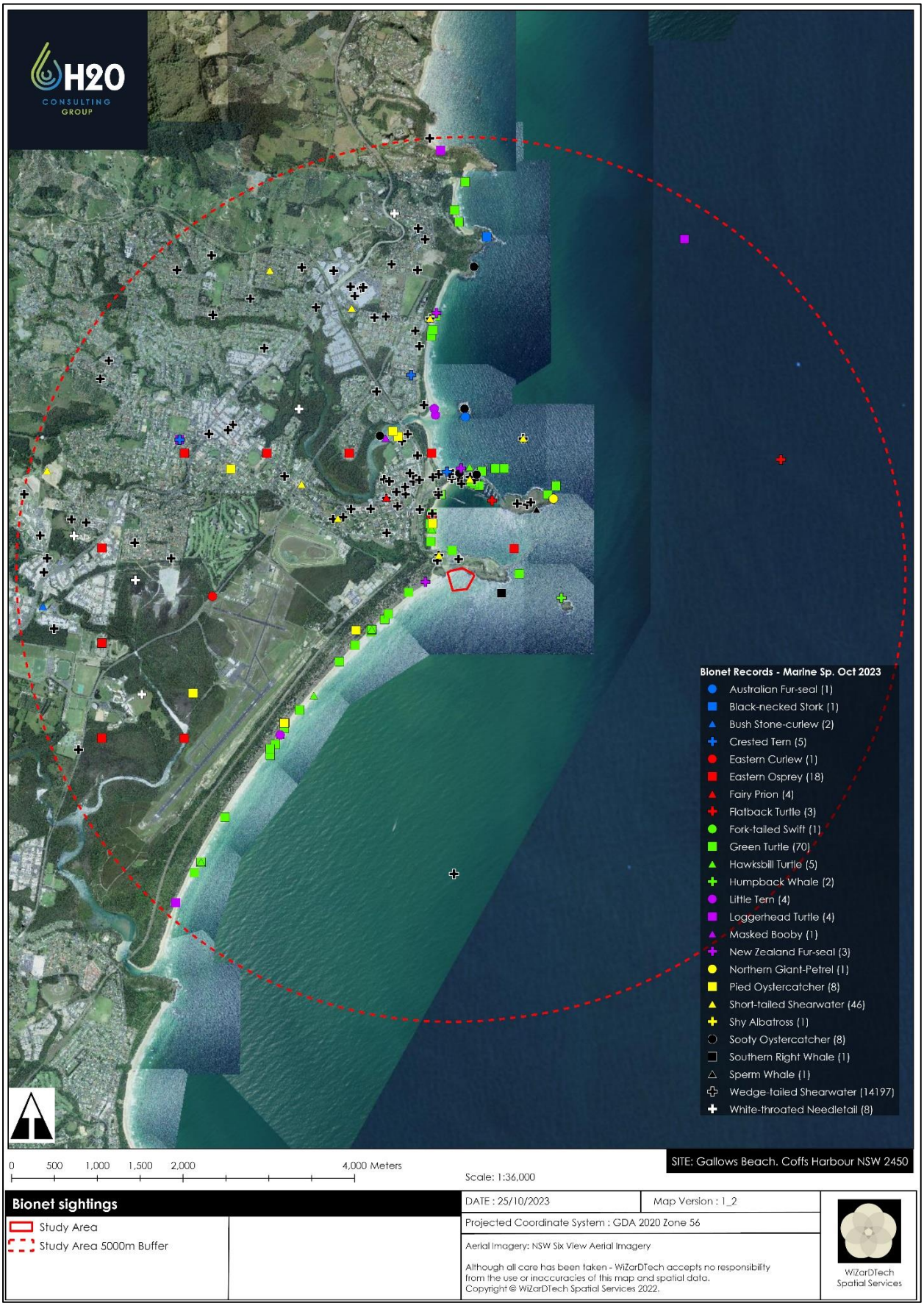

Figure 1: Bionet sightings within 10 km of the Project Area

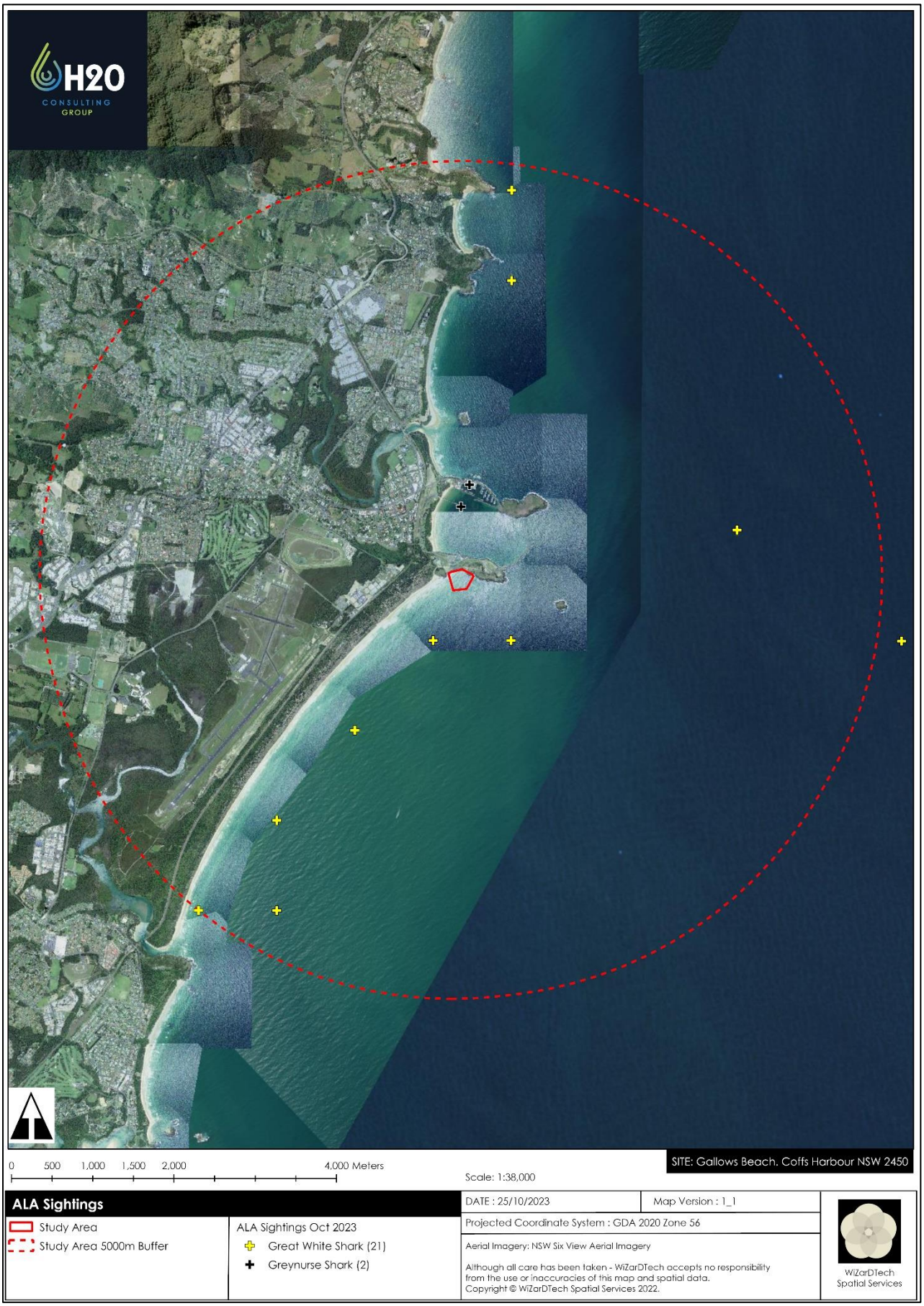

Figure 2: Atlas of Living Australia sightings within 10 km of the Project Area.

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria: Public Report of all Valid Records of Entities in selected area [North: -30.25 West: 153.07 East: 153.21 South: -30.37] recorded since 01 Oct 2003 until 05 Oct 2023 returned a total of 39,432 records of 1,392 species.

Animalia	Aves	Apodidae	0335	*Apus pacificus*	Fork-tailed Swift	P	C, J, K	1
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*	White-throated Needletail	P	V, C, J, K	12
Animalia	Aves	Diomedeidae	0091	*Thalassarche cauta*	Shy Albatross	E1, P	E	1
Animalia	Aves	Procellariidae	0069	*Ardenna pacifica*	Wedge-tailed Shearwater	P	J	14232
Animalia	Aves	Procellariidae	0071	*Ardenna tenuirostris*	Short-tailed Shearwater	P	C, J, K	59
Animalia	Aves	Procellariidae	0937	*Macronectes halli*	Northern Giant-Petrel	V, P	V	1
Animalia	Aves	Procellariidae	0083	*Pachyptila turtur*	Fairy Prion	P		7
Animalia	Aves	Procellariidae	0075	*Pterodroma macroptera*	Great-winged Petrel	P		1
Animalia	Aves	Sulidae	0105	*Sula dactylatra*	Masked Booby	V, P	J, K	1
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1, P		4
Animalia	Aves	Accipitridae	8739	*^^Pandion cristatus*	Eastern Osprey	V, P,3		28
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*	Bush Stone-curlew	E1, P		3
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V, P		9
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1, P		8
Animalia	Aves	Scolopacidae	0168	*Gallinago hardwickii*	Latham's Snipe	P	J, K	3
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*	Eastern Curlew	P	CE, C, J, K	1
Animalia	Aves	Laridae	0122	*Anous stolidus*	Common Noddy	P	C, J	1
Animalia	Aves	Laridae	0953	*Sterna hirundo*	Common Tern	P	C, J, K	1
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1, P	C, J, K	6
Animalia	Aves	Laridae	0115	*Thalasseus bergii*	Crested Tern	P	J	8

EPBC Act Protected Matters Report

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

Report created: 05-Oct-2023

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	104
Listed Migratory Species:	65

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	16
Commonwealth Heritage Places:	None
Listed Marine Species:	99
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	10
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	6
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Dunn's white gum (Eucalyptus dunnii) moist forest in north-east New South Wales and south-east Queensland	Endangered	Community may occur within area	In buffer area only
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Atrichornis rufescens Rufous Scrub-bird [655]	Endangered	Species or species habitat may occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri platei			
Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri			
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta			
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida			
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini			
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Turnix melanogaster			
Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In buffer area only
FISH			
Epinephelus daemelii			
Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hippocampus whitei			
White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
Seriolella brama			
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
Assa darlingtoni Pouched Frog [1965]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat known to occur within area	In feature area
Philoria sphagnicola Sphagnum Frog [59709]	Vulnerable	Species or species habitat may occur within area	In buffer area only
INSECT			
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat known to occur within area	In buffer area only
MAMMAL			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
[Acronychia littoralis](#) Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area	In feature area
[Allocasuarina thalassoscopica](#) [21927]	Endangered	Species or species habitat known to occur within area	In feature area
[Arthraxon hispidus](#) Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Bertya sp. Clouds Creek (M.Fatemi 4)](#) [84675]	Endangered	Species or species habitat may occur within area	In buffer area only
[Boronia umbellata](#) Orara Boronia [56301]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Coleus nitidus listed as Plectranthus nitidus](#) Nightcap Plectranthus, Silver Plectranthus [91380]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Corynocarpus rupestris subsp. rupestris](#) Glenugie Karaka [19303]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Cryptostylis hunteriana](#) Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
[Cynanchum elegans](#) White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
[Endiandra hayesii](#) Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area	In feature area
Owenia cepiodora Onionwood, Bog Onion, Onion Cedar [11344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Parsonsia dorrigoensis Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Samadera sp. Moonee Creek (J.King s.n. Nov. 1949) [86885]	Endangered	Species or species habitat known to occur within area	In feature area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area	In feature area
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat known to occur within area	In feature area
Zieria prostrata Headland Zieria [56782]	Endangered	Species or species habitat known to occur within area	In buffer area only
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
SHARK			
Carcharias taurus (east coast population)			
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In feature area
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]		Breeding known to occur within area	In feature area
Ardenna pacifica			
Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula albifrons Little Tern [82849]		Breeding likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Symposiachrus trivirgatus as Monarcha trivirgatus](#)			
Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#)			
Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
[Calidris acuminata](#)			
Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area	In feature area
[Calidris canutus](#)			
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#)			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Calidris melanotos](#)			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Charadrius leschenaultii](#)			
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#)			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
[Gallinago megala](#)			
Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Gallinago stenura](#)			
Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Limosa lapponica](#)			
Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11377]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11384]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11354]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11374]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Corporation [11373]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11385]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11381]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11380]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Telstra Corporation Limited [11378]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11379]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11382]	NSW	In buffer area only
Defence		
Defence - Training Depot [10075]	NSW	In buffer area only
Defence - Training Depot [10074]	NSW	In buffer area only
Unknown		
Commonwealth Land - [11376]	NSW	In buffer area only
Commonwealth Land - [11375]	NSW	In buffer area only
Commonwealth Land - [11383]	NSW	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]		Breeding known to occur within area	In feature area
Ardenna pacifica as Puffinus pacificus			
Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Pterodroma nigripennis Black-winged Petrel [1038]		Breeding known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding likely to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat may occur within area overfly marine area	In feature area
Fish			
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In feature area
[Campichthys tryoni](#) Tryon's Pipefish [66193]		Species or species habitat may occur within area	In feature area
[Corythoichthys amplexus](#) Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In feature area
[Corythoichthys ocellatus](#) Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In feature area
[Festucalex cinctus](#) Girdled Pipefish [66214]		Species or species habitat may occur within area	In feature area
[Filicampus tigris](#) Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
[Halicampus grayi](#) Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In feature area
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
[Hippichthys cyanospilos](#) Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In feature area
[Hippichthys heptagonus](#) Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In feature area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In feature area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In feature area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In feature area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In feature area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In feature area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In feature area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In feature area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In feature area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In feature area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Mammal			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dugong dugon			
Dugong [28]		Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Eretmochelys imbricata			
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hydrophis elegans			
Elegant Seasnake [1104]		Species or species habitat may occur within area	In feature area
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area	In feature area
Pelamis platurus			
Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In feature area

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata			
Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni			
Bryde's Whale [35]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
[Feresa attenuata](#) Pygmy Killer Whale [61]		Species or species habitat may occur within area	In buffer area only
[Globicephala macrorhynchus](#) Short-finned Pilot Whale [62]		Species or species habitat may occur within area	In buffer area only
[Globicephala melas](#) Long-finned Pilot Whale [59282]		Species or species habitat may occur within area	In buffer area only
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
[Kogia breviceps](#) Pygmy Sperm Whale [57]		Species or species habitat may occur within area	In buffer area only
[Kogia sima](#) Dwarf Sperm Whale [85043]		Species or species habitat may occur within area	In buffer area only
[Lissodelphis peronii](#) Southern Right Whale Dolphin [44]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area	In buffer area only
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area	In buffer area only
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area	In buffer area only
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area	In buffer area only
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area	In buffer area only
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area	In buffer area only

Australian Marine Parks [Resource Information]

Park Name	Zone & IUCN Categories	Buffer Status
Solitary Islands	Special Purpose Zone (Trawl) (IUCN VI)	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Bongil Bongil	National Park	NSW	In buffer area only
Bruxner Park	Flora Reserve	NSW	In buffer area only
Coffs Coast	Regional Park	NSW	In buffer area only
Kororo	Nature Reserve	NSW	In buffer area only
Moonee Beach	Nature Reserve	NSW	In buffer area only
Muttonbird Island	Nature Reserve	NSW	In feature area
Solitary Islands	Marine Park	NSW	In feature area
Split Solitary Island	Nature Reserve	NSW	In buffer area only
Ulidarra	National Park	NSW	In buffer area only
Yuraarla	Flora Reserve	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

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

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Clarence Valley and Coffs Harbour Regional Water Supply Project	2005/2191	Controlled Action	Post-Approval	In feature area
Pacific Highway Upgrade - Coffs Harbour Bypass, NSW	2017/8005	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
25km upgrade of the Pacific Highway	2007/3910	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Land clearing for horticulture (blueberries), South Moonee, NSW	2013/7023	Not Controlled Action	Completed	In buffer area only
Rehabilitation and Re-sculpting of Coffs Creek Flying Fox Camp and Adjacent Rese	2007/3771	Not Controlled Action	Completed	In buffer area only
Safe management of vegetation within Obstacle Limitation Surfaces, Coffs Harbour Regional Aerodrome,	2016/7794	Not Controlled Action	Completed	In buffer area only
Sawtell Catholic Care of the Aged, NSW	2020/8738	Not Controlled Action	Completed	In buffer area only
Undertake vegetation removal as per CASA safety requirements	2011/6007	Not Controlled Action	Completed	In buffer area only
Vegetation removal over sewer infrastructure easement	2013/6725	Not Controlled Action	Completed	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In feature area
World Rally Championship 'Super Special Stage'	2013/6731	Referral Decision	Completed	In feature area

Biologically Important Areas			
Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus			
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In feature area
Seabirds			
Ardenna carneipes			
Flesh-footed Shearwater [82404]	Foraging	Known to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status
Procellaria parkinsoni Black Petrel [1048]	Foraging	Likely to occur	In buffer area only
Sharks			
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In feature area
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur	In buffer area only
Whales			
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact us page.

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Appendix 3: Existing Mapping

NSW Estuarine Macrophytes

NSW Coastal Management SEPP

NSW KFH Map

NSW Marine Protected Areas

NSW Seabed Bathymetry

Department of Primary Industries

Legend

GIS101Delivery.DBO.
FLORA_NATIVE_Macrophytes

- Halophila
- Mangrove
- Mangrove/Saltmarsh
- Posidonia
- Posidonia - Sparse
- Posidonia/Zostera
- Ruppia
- Saltmarsh
- Zostera
- Zostera - Sparse
- Zostera/Ruppia

Notes

0.9 0 0.46 0.9 Kilometers

WGS_1984_Web_Mercator_Auxiliary_Sphere

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05-Oct-2023

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Department of Primary Industries

Legend

Coastal Wetlands

- Coastal Wetlands
- Proximity Area for Coastal Wetland

Littoral Rainforest

- Littoral Rainforest
- Proximity Area for Littoral Rainfores

Notes

0.9 0 0.46 0.9 Kilometers

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Department of Primary Industries

1: 18,056

Legend

Key Fish Habitat - Northern Riv

Notes

0.9 0 0.46 0.9 Kilometers

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Department of Primary Industries

Legend

NSW Marine Protected Areas

- Aquatic Reserve (IUCN IV)
- Aquatic Reserve (Sanctuary) (IUCN
- General Use Zone (IUCN VI)
- Habitat Protection Zone (IUCN IV)
- Habitat Protection Zone (Restrictior
- Sanctuary Zone (IUCN II)
- Special Purpose Zone (IUCN VI)

Notes

0.9 0 0.46 0.9 Kilometers

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SEED | Sharing and Enabling Environmental Data

SEED Map

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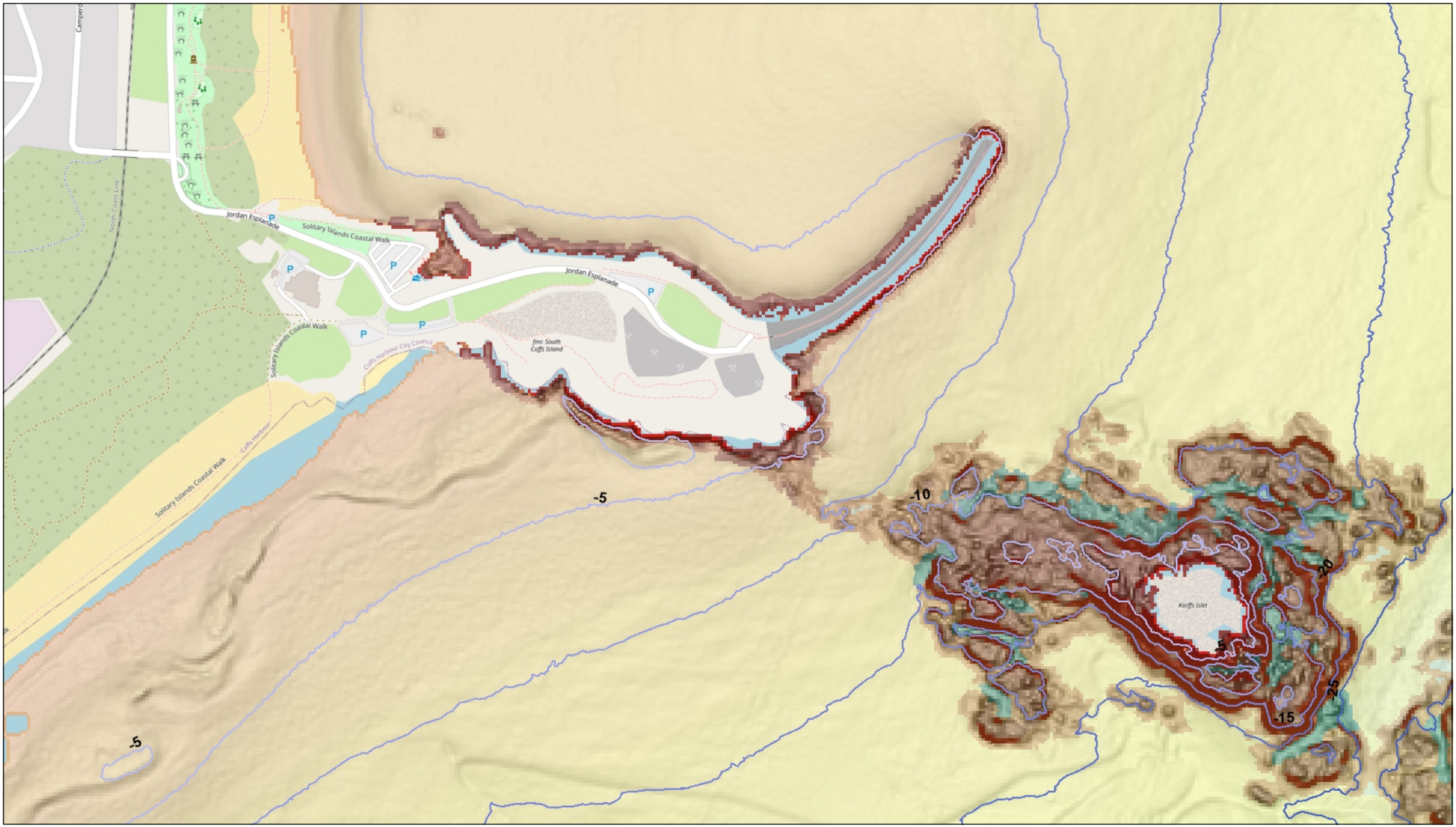

0.5 0 0.25 0.5 Kilometers

Scale 1: 10,096.54

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Appendix 4: Threatened Species Assessments

Threatened Shorebirds

Species Review

Name /Species		Status FM Act	Status EPBC Act
Pied Oystercatcher (*Haematopus longirostris*)		Endangered	
Sooty Oystercatcher (*Haematopus fuliginosus*)		Vulnerable	
Species	**Distribution**	**Habitat and Prey**	**Breeding**
H. longirostris	Distributed around the entire Australian coastline, although it is most common in coastal Tasmania and parts of Victoria. In NSW the species is thinly scattered along the entire coast.	Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide for molluscs, worms, crabs and small fish.	Nests between August and January, mostly on coastal or estuarine beaches, although occasionally they use saltmarsh or grassy areas.
H. fuliginosus	Found around the entire Australian coast, including offshore islands, being most common in Bass Strait. Small numbers of the species are evenly distributed along the NSW coast.	Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries, where they forage on intertidal invertebrates such as limpets and mussels.	Breeds in spring and summer amongst pebbles and shells on rocky shore or cliffs located exclusively on offshore islands, but occasionally on isolated promontories.

Sources: DPIE (2020)

5-Part Test – Threatened Shorebirds (BC Act)

Threatened Shorebirds (BC Act)
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
The Pied Oystercatcher typically uses sandy and rocky habitats, which may include those associated with Gallows Beach and the associated rocky foreshore. Nesting is unlikely to occur in the Study Area given the close proximity to human activity and would likely be restricted to more isolated coastal areas and the adjacent Solitary Islands Marine Park (SIMP). Construction works involving the installation of the transfer pipe will likely result in short-term disturbance to a very small amount of habitat the species uses due to increased construction noise, that may temporarily decrease quality of habitat. Operation of the sand transfer pipe may result in some additional smothering of rocky intertidal areas which will result in decrease habitat quality for foraging amongst a small area of the rocky foreshore that is used by *H. fuliginosus*. Contrastingly, there is also potential that deposited sand may attract the species to forage for small invertebrates that have been transported, especially *H. longirostris* that typically forages amongst soft sediments. These disturbances are unlikely to have any adverse effects on the lifecycle of any individuals that may use this location at times. It is likely that individuals will still forage at low tide when the pump is both in and not in operation, while if disturbed will utilise adjacent habitats which are plentiful. The habitat in and adjacent to the Study Area provides good foraging value for these species, however, comprises only a small area of available habitat and is not considered to be of importance to the life cycle of the local population of either species.
(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
Not Applicable
(c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

i)	The rocky intertidal habitat that will be modified as a result of this proposal is limited to a small amount of rocky foreshore adjacent to the pump outlet at Gallows Beach. Deposition of sand may result in the smothering of a small area of intertidal and soft sediment foraging habitat; however, similar habitat is available along the entire rocky foreshore at Gallows Beach. These modifications will not result in any net habitat loss.
ii)	No habitat is expected to become fragmented or isolated as a result of the proposal.
iii)	Modifications to the existing rocky intertidal habitat will result in minimal change, with short-term impacts on a small area of foraging value at Gallows Beach. Any changes or modifications that do occur will also likely be temporary and short-term. Habitat within the Study Area provides a very small amount of the potential foraging habitat in the locality at Gallows Beach, Coffs Harbour and the adjacent SIMP that may be utilised by Pied and Sooty Oystercatchers. Deposition of sand in the Study Area may also attract individuals for altered foraging efforts. Given this, the habitat to be modified is not considered to be of significance to the long-term survival of either species in the locality.
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	
No, no declared areas of outstanding biodiversity value occur at the locality.	
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	
NSW KTPs with potential to be exacerbated by the proposed development do not have potential to impact on Pied or Sooty Oystercatchers.	
Conclusion	The Pied and Sooty Oystercatchers that may potentially at times utilise habitat in the vicinity of Study Area are unlikely to be significantly affected by the proposed activity. Modification of foraging habitat in the Study Area comprises a very small area in the locality, with ample similar habitat available along Gallows Beach, Coffs Harbour and in the adjacent SIMP.

Marine Turtles

Species Review

Name /Species	Status FM Act	Status EPBC Act
Green Turtle (*Chelonia mydas*)	Vulnerable	Vulnerable, Migratory
Loggerhead Turtle (*Caretta caretta*)	Endangered	Endangered, Migratory

Species	Distribution	Habitat and Prey	Breeding
C. mydas	Widely distributed throughout tropical and sub-tropical waters and will occur at times in temperate waters. In coastal waters of NSW, it is generally seen on the north and central coasts. Can migrate more than 2600 km between feeding and nesting grounds.	Hatchlings spend their pelagic phase drifting in ocean current until reaching 30-40cm size, when they will settle in shallow benthic foraging habitats such as tropical tidal and sub-tidal coral and rocky reef habitat or inshore seagrass beds. Adults eat mainly seagrass and algae, although they will occasionally eat other items including mangroves, fish-egg cases, and sponges. Young turtles tend to be more carnivorous than adults. During their pelagic stage they feed on plankton.	Breeding and nesting can occur all year round in some areas of the tropics. Typically nest on isolated beaches or offshore coral cays in tropical regions. Some nesting occurs on beaches in northern NSW between November and May.
C. caretta	In Australia, it occurs in areas of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia, including temperate waters of NSW where it is seen as far south as Jervis Bay.	Small Loggerhead Turtles live at or near the surface of the ocean and move with the ocean currents. As they grow, they remain typically ocean-dwellers, foraging in deeper water for fish, jellyfish and bottom-dwelling animals, before recruiting to their chosen inshore or neritic feeding area at approximately 70cm or more in size. In their juvenile stage they feed on algae, pelagic crustaceans, molluscs, flotsam and anthropogenic debris. As they grow they become more carnivorous, feeding primarily on benthic invertebrates and smaller amounts of jellyfish, starfish, corals, crabs and fish.	Nests on open, sandy beaches in tropical areas. Low density and sporadic nesting also occur southwards into northern NSW. Breeds from November to March with nesting possible through to May.

Sources: DPIE (2020)

5-Part Test – Marine Turtles (BC Act)

Threatened Marine Turtles (BC Act)
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
Marine turtles may forage in subtidal habitats within and adjacent to the Study Area, however, foraging habitat within the Study Area is very limited due to high swell energy and limited subtidal reef that may provide refuge or foraging habitat. Areas of reef associated with the southern Corambirra Headland, and the offshore reef are likely to provide better potential foraging habitat for marine turtles. The foraging grounds that marine turtles utilise in the locality are likely to widely spread along the coastline and throughout the adjacent SIMP. A Green Turtle nesting event was recorded at Boambee Beach, just south of the Study Area, however the sporadic nesting events that occur in these areas are typically confined to more isolated beaches. Gallows Beach provides very minimal nesting habitat value, given its proximity to human activity and a carpark and minimal sandy shoreline area above the high-water mark, with potential for the sandy shoreline to be completely covered at times of large southeasterly swell. No equipment or construction will occur on the sandy shore of Gallows Beach. Deposition of sand on the rocky foreshore and sandy intertidal areas may contribute to additional potential habitat for these species, however, given no nesting has occurred at this site previously and the naturally minimal nesting value, it is unlikely to be utilised. Given this, the proposal has minimal potential to affect the life cycle of any marine turtles in the locality, such that either species would be likely to be placed at risk of extinction.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
Not Applicable
(c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality
iv) The subtidal habitat that will be disturbed as a result of this proposal is limited to a small amount of the shallow rocky reef in a high swell energy area. Areas of rocky reef habitat along the southern edge of Corambirra Headland may experience some periods of increased sediment accretion following sand deposition, however, this is expected to be short-term with sand expected to be transported along the coast as part of the northward littoral drift at Coffs Harbour. These modifications will not result in any net habitat loss for this species. Modifications to existing nesting habitat at Boambee Beach will not be affected by the proposal, with the minimal value nesting habitat at Gallows Beach potentially nourished by increased sand loads. v) No habitat is expected to become fragmented or isolated as a result of the proposal. vi) Shallow rocky reef habitats within the Study Area are considered only marginal for foraging by marine turtles, with limited macroalgal stands. Modifications to the existing rocky subtidal habitat will result in minimal change, with short-term disturbances to water quality in the locality. Other indirect modifications to reef habitat along Corambirra Headland from sediment accretion are expected to be minimal. Potential nesting habitat along Gallows Beach provides only marginal nesting value due to the high presence of human activity and limited suitable space, with successful nesting unlikely to naturally occur. Given this, habitat within and adjacent to the Study Area is considered to be of minimal importance to the long-term survival of marine turtles that may utilise resources in the locality.
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).
No, no declared areas of outstanding biodiversity value occur at the locality.
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process
NSW KTPs with potential to be exacerbated by the proposed development do not have potential to impact on marine turtles.
Conclusion — Marine turtles that may potentially utilise habitat in the vicinity of the proposal are unlikely to be significantly affected by the proposed activity. Habitat use in the vicinity of the Study Area is likely to be very occasional for opportunistic foraging, with any nesting considered unlikely on adjacent areas of Gallows Beach.

Significant Impact Assessment: Threatened and Migratory Marine Turtles (EPBC Act)

Significant Impact Criteria: Threatened and Migratory Marine Turtles (EPBC Act)	Likelihood of Impact
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
1. Lead to a long-term decrease in the size of an important population of a species	
The action is not expected to lead to any long-term decrease in the size of a population of marine turtles as: • The foraging grounds that marine turtles utilise in the locality are likely to be widely spread along the coastline and throughout the adjacent SIMP. The Study Area only provides very marginal potential foraging grounds, which are not of a size of ecologically relevance to the areas that marine turtles forage across in northern NSW waters. • Nesting by marine turtles in northern NSW is sporadic and of low density, while Gallows Beach is unlikely to be suitable due to the high levels of potential human disturbance and limited suitable space.	Unlikely
2. reduce the extent of the species	

The proposal will be limited to some short-term disturbances that may reduce habitat quality in the Study Area and potentially some adjacent areas at times (e.g., water quality and sediment accretion). Disturbances with potential to impact occupancy will likely be very short-term and limited to periods when sand transfer pump is in operation, resulting in localised sedimentation that may impact on habitat quality. These short-term disturbances are not expected to impact the area of occupancy of marine turtles at any ecologically significant scales.	Unlikely
3. fragment an existing important population into two or more populations	
The proposal is not expected to result in any habitat that marine turtles may use to become fragmented or isolated from other areas of habitat.	Unlikely
4. adversely affect habitat critical to the survival of a species	
The habitat is not considered to be critical to the survival of marine turtles.	Unlikely
5. Disrupt the breeding cycle of an important population	
The habitat is not considered to be critical to the life cycles (including breeding and nesting) of marine turtles.	Unlikely
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	
Rocky reef habitat within the Study Area is very limited with high swell energy and subsequently provides minimal potential refuge and foraging habitat for marine turtles. Modifications to the existing rocky subtidal habitat in the Study Area and adjacent habitat along Corambirra Headland from sediment accretion are expected to be minimal and short-term, with sediment expected to travel as part of the northern littoral drift along Coffs Harbour. However, given the low density of marine turtles and likely minimal/transient use of habitats within the Study Area, these impacts on habitat quality have minimal potential to result in any species decline for marine turtles.	Unlikely
7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable, endangered or critically endangered habitat or habitat for migratory species	
No known invasive species harmful to marine turtles are likely to be released or have their populations enhanced as a result of this proposal.	Possible
8. introduce disease that may cause the species to decline	
The proposed action is unlikely to result in the introduction of disease that may cause a decline in the local marine turtle population.	Unlikely
9. interfere substantially with the recovery of the species	
The proposed action is unlikely to substantially interfere with the recovery of marine turtles.	Unlikely
Conclusion	
The proposal is unlikely to result in a significant impact on marine turtles. Impacts will be confined to short disturbances that may reduce habitat quality during operational periods for the very marginal habitat, which is typically confined to the Surf Zone of Gallows Beach, while nesting opportunity on Gallows Beach is also considered minimal, due to the lack of habitat for nesting above the MHWM and high human activity.,. The habitat with potential to be disturbed as a result of this proposal is very minimal in ecological significance to marine turtles and represents only a very small area the species may use within the locality and is not critical to their lifecycle, while nesting is unlikely to occur on nearby Gallows Beach.	

Epinephelus daemelii – Black Rockcod

Species Review

Name /Species		Status FM Act	Status EPBC Act
Black Rockcod (*Epinephelus daemelii)*		Vulnerable	Vulnerable
Species	**Distribution**	**Habitat and Prey**	**Breeding**
E. daemelii	Black Rockcod is now mostly found from southern Queensland to eastern Victoria, with the NSW coastline forming its main range. Adults are territorial and often occupy a particular cave for life.	Adult Black Rockcod are usually found in caves, gutters and beneath bommies on rocky reefs, from nearshore environments to depths of at least 50m. Small juveniles are often found in coastal rock pools, and larger juveniles around rocky shores in estuaries. Black Rockcod are opportunistic carnivores, eating mainly other fish and crustaceans.	The Black Rockcod is a protogynous hermaphrodite, first developing as a sexually mature female and then changing into a male later in life at a length of approximately 100–110cm.

Source: NSW DPI 2018.

7 Part Test – FM Act

***Epinephelus daemelii* – Critically Endangered (FM Act)**
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
The Black Rockcod is known to be common on coastal reefs along the northern NSW coast and adjacent Solitary Island Marine Park (SIMP). Juveniles are also known to occur amongst rocks and cracks along the edges of break walls inside estuaries and harbours. Adults will typical frequent caves and overhangs on coastal reefs. Offshore rocky reef along the outer edge of Corambirra Headland and the South Breakwater and adjacent reef on nearby islands provides potential Black Rockcod habitat, with juveniles likely to utilise cracks and crevices associated with the breakwater. Within the Study Area, potential habitat for this species was very limited with shallow and turbulent waters and a lack of substantial subtidal reef that may include large crevices, overhangs or boulders. Any use of this habitat in the Study Area is unlikely to be permanent in nature and only as part of opportunistic movements, likely for prey items. While any effects on this very marginal habitat would be confined to short-term disturbances to water quality and sedimentation of some shallow subtidal reef areas amongst the wave zone. Given this, the proposal is unlikely to have an adverse effect on the life cycle of the Black Rockcod such that a viable local population of the species is likely to be placed at risk of extinction.
(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.
Not Applicable
(c) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
Not Applicable
(d) in relation to the habitat of a threatened species, population or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality
i) The rocky subtidal habitat that will be directly disturbed as a result of this proposal is limited to a small amount of shallow rocky reef in areas of high swell energy close to shore. The deposition of sand during operation will result in some short-term disturbances to habitat, reducing water quality as a result of localised sedimentation. Areas of rocky reef habitat along the southern edge of Corambirra Headland which provides more suitable habitat for the species may experience some periods of increased sediment accretion following sand deposition, however, this is expected to be short-term and minimal in comparison to natural coastal processes at this location, with sand expected to be transported along the coast as part of the northern littoral drift at Coffs Harbour. These modifications will not result in any net habitat loss for this species.

(e) Whether the proposed development or activity is likely to have an adverse effect on any critical habitat (either directly or indirectly)
This question is not applicable, as no critical habitat has been listed for Black Rockcod.
(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.
A Black Rockcod Recovery Plan has been prepared by the NSW DPI Fisheries (DPI, 2012). The objectives or actions of the recovery plan are: • Determine the distribution and abundance of Black Rockcod in NSW. • Initiate and support research into the biology and ecology of Black Rockcod. • Initiate and support research into the impacts of high and moderate risks to Black Rockcod. • Identify important areas of Black Rockcod habitat and implement appropriate actions to recover Black Rockcod. • Improve the collection of data on interactions between Black Rockcod and fishers. • Increase community awareness and support for Black Rockcod issues and recovery actions. • Ensure that management authorities carry out appropriate planning and impact assessment and make management decisions which minimise impacts on Black Rockcod habitats. • Mitigate the impacts of water pollution on Black Rockcod. The proposed action is consistent with some objectives of the recovery plan. While the SIMP is an important area for these species with known distributions of Black Rockcod, works in the Study Area are restricted to locations that are not considered important for the species. The Study Area provides much more marginal habitat that would not be expected to support any permanent residency from Black Rockcod compared to adjacent areas with ample good habitat. Thus, proposed actions are expected to have minimal impacts on Black Rockcod habitats. Impacts on water quality will be minimal given the high swell energy environment resulting in high natural levels of mobilized sands and the adjacent wastewater outfall at the Study Area.
(g) Whether the proposed development constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.
KTPs with potential to be exacerbated by the proposed development do not have potential to impact on Black Rockcod.

Conclusion	The viability of the Black Rockcod population that utilise habitat in the vicinity of the proposal is unlikely to be significantly affected by the proposed activity. The habitat inside the Study Area is very marginal for Black Rockcod and is not expected to be significant to the local population. Thus, any disturbances to the species are unlikely, with any potential disturbances limited to very short-term indirect increases in sedimentation or turbidity.

Significant Impact Assessment: Black Rockcod (EPBC Act)

Significant Impact Criteria: Black Rockcod (EPBC Act)	Likelihood of Impact
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
1. lead to a long-term decrease in the size of an important population of a species	
The species has a high level of site fidelity with habitat known to occur in the adjacent SIMP. However, the proposed action is limited to disturbances of very marginal habitat associated with shallow rocky reef in a high swell energy area that would only be used sporadically for foraging if at all by Black Rockcod. The species is unlikely to occupy this area given the minimal potential refuge habitat, with individuals more likely to inhabit rocky reef in deeper waters off Corambirra Headland, the South Breakwater or islands to the north. Disturbances may include some modification of very marginal shallow rocky reef habitat within the Study Area and along the southern edge of Corambirra Headland as increased sediment loads are moved along the coast as part of the northern littoral drift of the sand. Use of these areas by Black Rockcod is expected to be minimal and confined to deeper areas beyond the Study Area and surf zone, while it is not considered a significant site for the species in the locality and SIMP. Given this, the proposal is unlikely to lead to a long-term decrease in the size of an important population of Black Rockcod in the locality.	Unlikely
2. reduce the extent of the species	
The proposal is not expected to reduce any area of occupancy important to the Black Rockcod population in the locality. Review of sighting data and assessment of the site indicated there is very minimal potential for Black Rockcod in the Study Area.	Unlikely
3. fragment an existing important population into two or more populations	
The proposal is not expected to result in any habitat important to Black Rockcod to become fragmented or isolated from other areas of habitat.	Unlikely
4. adversely affect habitat critical to the survival of a species	

The Study Area includes only a very small amount of very marginal habitat that may is only likely to provide opportunistic foraging habitat for Black Rockcod. This habitat is unlikely to be critical to the survival of the species in the locality, while any disturbances will be minimal and short-term.	Unlikely
5. Disrupt the breeding cycle of an important population	
The types of habitats in the Study Area and adjacent areas are not identified to be of importance for spawning by the population.	Unlikely
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	
Modification of potential habitat will be minimal, limited to short-term increases in sediment accretion and reduced water quality, and not be expected to impact to an ecologically significant degree that would have potential to result in a likely decline of Black Rockcod.	Unlikely
7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable, endangered or critically endangered habitat or habitat for migratory species	
No known invasive species harmful to Black Rockcod are likely to be released or have their populations enhanced as a result of this proposal.	Possible
8. introduce disease that may cause the species to decline	
The proposed action is unlikely to result in the introduction of disease that may cause a decline in the local Black Rockcod population.	Unlikely
9. interfere substantially with the recovery of the species	
The proposed action is unlikely to substantially interfere with the recovery of Black Rockcod.	Unlikely
Conclusion	
Habitat in the Study Area is not expected to be suitable for permanent occupation by this species, which typically exhibits high levels of site fidelity, while any use of the habitat will likely be confined to transient movements or opportunistic pursuits of prey. Thus, habitat in the Study Area is not considered significant habitat for Black Rockcod or likely to be permanently used by part of the local population.	

Nereia lophocladia alga

Species Review

Name /Species		Status FM Act	Status EPBC Act
Marine Brown Alga (*Nereia lophocladia)*		Critically Endangered	
Species	**Distribution**	**Habitat**	**Life History**
N. lophocladia	*Nereia lophocladia* is endemic to the north coast of New South Wales between Sawtell and Woolgoolga, with a known population at Muttonbird Island off Coffs Harbour since the 1980s.	The species grows on hard substrate on the seabed and the interface of sand and reef, typically at depths between 3-12 m.	The species has a heteromorphic alternation of generations, where stages of life history are influenced by seasonal environmental factors. Sporophytes release spores that germinate into free living microscopic, branched creeping filaments, gametophytes. Gametophytes undergo a microscopic and macroscopic stage, with macroscopic stage only typically visible from July to December.

Source: NSW DPI 2018.

7 Part Test – FM Act

***Nereia lophocladia* – Critically Endangered (FM Act)**
(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No. No *N. lophocladia* is expected to be directly removed as a result of these works, with no known populations in the Study Area or in the immediate proximity. The closest known population is on the northern side of Muttonbird Island along the northern Coffs Harbour marine breakwater, approximately 1.9 km from the Study Area. The Coffs Harbour coastline typically demonstrates a northerly littoral drift, predominantly occurring in the mid to outer surf zone. Previous studies have estimated a regional longshore sediment transport rate of 75,000 m^3 per year, with sand movements along Boambee Beach and infilling Coffs Harbour. Littoral drifts typically lose transport power as water deepens and around control features such as headlands, reefs or breakwaters that may interrupt sediment transport. Drift is also heavily influenced by winds, tides and the prevailing wave direction. Deposition of sand has some potential for minor disturbances to the species at times when deposition of large volumes of sand coincides with large swells or storm events and a strong northerly littoral drift, where smothering, sedimentation or reduced water quality of the species may occur. Abundance monitoring, the implementation of trigger values for volume limits and timing of pumping around large weather events will minimise the potential for this impact. Given this, it is unlikely this action has potential to place at risk of extinction the local population of *N. lophocladia* in Coffs Harbour.
(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.
Not Applicable
(c) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
Not Applicable
(d) in relation to the habitat of a threatened species, population or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality

i)	The proposed transfer of sand will not result in any direct removal of mapped or known *N. lophocladia*, any impacts will be limited to edge sedimentation disturbances to habitat where *N. lophocladia* occurs nearby if large volumes of sand are deposited in conjunction with large swell and storm events, which would be considered unlikely.
ii)	The proposed transfer of sand will not result in any additional fragmentation of potential *N. lophocladia* habitat at Coffs Harbour, or at known habitat at Muttonbird Island and north of Coffs Harbour marina.
iii)	No known or mapped *N. lophocladia* habitat exists within the Study Area or in close proximity to the Study Area. Known habitat 1.9 km to the north of the Study Area is important for the survival of the species in the locality and is one of three significant locations where the species grows on the New South Wales north coast. However, any potential impacts to this location are expected to be minimal, short-term sedimentation impacts that would not be expected to remove or significantly modify this habitat.
(e) Whether the proposed development or activity is likely to have an adverse effect on any critical habitat (either directly or indirectly)	
This question is not applicable, as no critical habitat has been listed for Nereia.	
(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.	
Not Applicable	
(g) Whether the proposed development constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	
KTPs with potential to be exacerbated by the proposed development do not have potential to impact on Nereia.	
Conclusion	The proposed sand transfer works are not expected to result in any removal of the mapped *N. lophocladia* population in Coffs Harbour. Any disturbances are expected to be minimal and short-term sedimentation disturbances of habitat, largely limited to occurrences when large volumes of sand are deposited in conjunction with large swell, storm events and environmental conditions resulting in a strong northern littoral drift. The implementation of abundance monitoring, the implementation of trigger values for volume limits and timing of pumping around large weather events will minimise the potential for this impact. Given this, any disturbances are unlikely to affect the viability and long-term survival of the Coffs Harbour population of *Nereia lophocladia*.

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Appendix C: Consultee Responses

Your ref: e-mail dated 21/09/2023
Our ref: DOC23/843801-2

NSW Maritime
33 James Craig Road
ROZELLE NSW 2039

Attention: Ms Jennifer van Bruinessen

Dear Ms van Bruinessen

Re: Request for Biodiversity and Conservation Division's Review of Environmental Factors Environmental Assessment Requirements – Coffs Harbour Boat Ramp to Gallows Beach Sand Transfer System

Thank you for your e-mail dated 21 September 2023 about the proposed sand pump system between the Coffs Harbour Boat Ramp and Gallows Beach, seeking Environmental Assessment Requirements (EARs) from the Biodiversity and Conservation Division (BCD) of the Department of Planning and Environment. I appreciate the opportunity to provide input.

We note the project will be assessed in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Review of Environmental Factors (REF) EARs provided by the BCD are limited to biodiversity, NPWS estate, acid sulfate soils, flooding, and coastal processes and associated hazards.

We anticipate the REF will be sufficiently comprehensive to enable unambiguous assessment of all direct and indirect impacts of the proposed activity.

Given the environmental sensitivity of the location of the proposal, we recommend the following matters be adequately addressed in the REF:

1. Potential direct or indirect impacts on areas of Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions Endangered Ecological Community, which has been recorded close to the proposed pipeline route.

2. Potential direct or indirect impacts on threatened flora species, silverbush (*Sophora tomentosa*) and coast headland pea (*Pultenaea maritima*), which are known to occur close to the proposed pipeline route.

3. Potential impacts on ecosystems at the extraction and receival sites, and surrounding areas if a plume of sediment is expected to occur, which may include upper beach, intertidal and subtidal species and ecosystems.

4. Potential impacts on the foraging and/or nesting habitat of threatened shorebirds such as the pied oystercatcher and sooty oystercatcher.

5. Potential impacts on marine turtle nesting habitat.

6. Compatibility of the sand from the extraction site with sand at the receiving site, particularly in terms of colour, odour, and particle size.

7. Appropriate distribution and placement of the sand/water mix discharged from the pipe on to Gallows Beach. When determining the system design and operation, the proponent should consider

successful sand placement systems used at locations such as Noosa Heads and Surfers Paradise for sand re-circulation. We recommend the proponent also consult with the beaches team at the City of Gold Coast and Noosa Council for their experience/advice on this practice.

8. Consistency and appropriate alignment of the adopted solution with the Coffs Harbour Open Coast Coastal Management Program (CMP), whose Scoping Study is currently in progress. We also recommend TfNSW undertake to work with the City of Coffs Harbour on the development of the CMP for Open Coast and review and amend the adopted approach as necessary to reflect the recommendations of the CMP once finalised.

9. Potential impacts of climate extremes to infrastructure and operations, which may include impacts of storm tide inundation, beach inundation due to waves, beach erosion and estuarine flooding caused by rainfall.

10. Potential impact on surf amenity and other water-based activities.

11. A monitoring program to assess the effectiveness of the sand bypass system in maintaining boat ramp access and channel navigability and track the evolution of the shoreline and sand profile at the disposal site at Gallows Beach

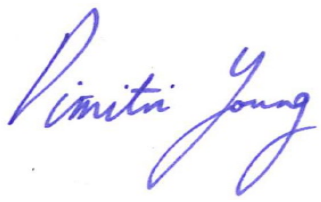
12. Evidence of consultation with the City of Coffs Harbour and other relevant stakeholders to ensure the proposal is consistent with the Coastal Management Programs, which are in preparation and due to be finalised in December 2024

We consider this information is necessary for a comprehensive REF for the proposed activity.

The full list of our requirements that may need to be addressed in the REF is provided in **Attachment 1**. In preparing the REF, the proponent should refer to the relevant guidance material listed in **Attachment 2.**

If you have any further questions about this advice, please do not hesitate to contact Mr Don Owner, Senior Conservation Planning Officer, at don.owner@environment.nsw.gov.au or on 6659 8239.

Yours sincerely



DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Biodiversity and Conservation

13/10/2023

Enclosures:
Attachment 1 - BCD Recommended Environmental Assessment Requirements for REF – Coffs Harbour Boat Ramp to Gallows Beach Sand Transfer System
Attachment 2 - REF Guidance Material

Attachment 1

Biodiversity and Conservation Division's Recommended Environmental Assessment Requirements (EARs)

Review of Environmental Factors

Coffs Harbour Boat Ramp to Gallows Beach Sand Transfer System

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A. The Proposed Activity

The Review of Environmental Factors (REF) should fully and clearly describe the proposed activity, including any environmental impact mitigation measures, and identify all the processes and activities intended for the site during the life of the proposed activity.

The description of the proposed activity in the REF should, where relevant, include:

1. the location of the proposed activity and details of the surrounding environment;
2. appropriate land use zoning;
3. the size and type of the proposed activity and its operation;
4. the proposed layout of the site;
5. the staging and timing of the proposed activity;
6. the proposed activity's relationship to any other proposal.
7. all equipment proposed for use at the site;
8. chemicals, including fuel, used on the site and proposed methods for the transportation, storage, use and emergency management;
9. waste generation, storage and disposal;
10. the anticipated environment impacts of the proposed activity, both direct and indirect,
11. a plan showing the distribution of any threatened flora or fauna species and the vegetation communities on or adjacent to the subject site, and the extent of vegetation proposed to be cleared;
12. ownership details of any residence and/or land likely to be affected by the proposed activity;
13. maps/diagrams showing the location of residences and properties likely to be affected and other industrial developments, conservation areas, wetlands, etc. in the locality that may be affected by the proposed activity;
14. methods to mitigate any expected environmental impacts of the proposed activity; and
15. the anticipated level of performance in meeting required environmental standards.

B. Environmental Impacts of the Proposed Activity

Impacts related to Biodiversity, NPWS Estate, Acid Sulfate Soils, Flooding, Coastal Processes and Associated Hazards, and Cumulative Impacts, should be assessed, quantified, and reported on in the EIS, as required.

The EIS should address the specific requirements outlined under each heading below, where necessary, and assess impacts in accordance with the relevant guidelines mentioned. A full list of guidelines is at **Attachment 2**.

C. Biodiversity

1. The REF must assess the impacts of the proposed activity on biodiversity values to determine if the proposed activity is "likely to significantly affect threatened species" for the purposes of Section 7.8 of the *Biodiversity Conservation Act 2016* (BC Act) as follows:

   A. The REF must demonstrate whether the proposed activity is to be carried out in a declared area of outstanding biodiversity value.

   B. If the proposed activity is not carried out in a declared area of outstanding biodiversity value, then the REF must document *the test for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities* as outlined in Section 7.3 of the BC Act, by preparing an ecological assessment that should include:

      I. A field survey of the site of the proposed activity conducted and documented in accordance with relevant guidelines, including:

         a. *Field survey methods for environmental consultants and surveyors when assessing proposed developments or other activities on sites containing threatened species* (OEH undated) https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/field-survey-method-guidelines.pdf

         b. *NSW Survey Guide for Threatened Frogs (DPIE 2020)* https://www.environment.nsw.gov.au/research-and-publications/publications-search/nsw-survey-guide-for-threatened-frogs

         c. *Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method* (DPIE 2020) https://www.environment.nsw.gov.au/research-and-publications/publications-search/surveying-threatened-plants-and-their-habitats-survey-guide-for-the-biodiversity-assessment-method

         d. *"Species credit' threatened bats and their habitats* https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/species-credit-threatened-bats-survey-guide-180466.pdf

         e. *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft* (DEC, 2004), https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/draft-threatened-biodiversity-survey-guide.pdf.

      If a proposed field survey methodology is likely to vary significantly from the methods in the guidelines above, then the proponent should discuss the proposed methodology with the Biodiversity and Conservation Division prior to undertaking surveys for the REF, to determine whether the Biodiversity and Conservation Division considers the proposed methodology appropriate.

The results of recent (less than five years old) field surveys may be used. However, the results of previous field surveys should not be used if they have:

- been undertaken in seasons, weather conditions or following extensive disturbance events when the subject species are unlikely to be detected or present, or
- utilised methodologies, survey sampling intensities, timeframes or baits that are not the most appropriate for detecting the target subject species,

unless these differences can be clearly demonstrated to have had an insignificant impact upon the outcomes of the field surveys.

If the results of previous field surveys are used, then field surveys for any additional threatened entities listed under the BC Act since the previous field surveys took place, must be undertaken and documented.

The list of potential threatened species, populations, ecological communities, or their habitats for the site should be determined in accordance with:

- the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft* (DEC, 2004) https://www.environment.nsw.gov.au/research-and-publications/publications-search/threatened-biodiversity-survey-and-assessment, and
- the Department's Threatened Species website http://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species ,and
- the *Bionet Atlas of NSW* http://www.environment.nsw.gov.au/wildlifeatlas/about.htm , and
- the Vegetation Information System (BioNet Vegetation Classification) http://www.environment.nsw.gov.au/research/Visclassification.htm , and
- other data sources (e.g. SEED, PlantNET, Online Zoological Collections of Australian Museums (http://www.ozcam.org/), previous or nearby surveys etc.) may also be used to compile the list.

II. The following information as a minimum:

a. A description, spatial data files, and geo-referenced mapping of the study area, (overlays on topographic maps, satellite images and /or aerial photos, including details of map datum, projection and zone), showing all field survey locations, vegetation communities classified in accordance with the BioNet Vegetation Classification (http://www.environment.nsw.gov.au/research/Visclassification.htm), key habitat features and reported locations of threatened species and ecological communities present in the subject site and study area.

b. A description of survey methodologies used, including timing, location and weather conditions.

c. Details, including qualifications and experience, of all staff undertaking the surveys, mapping and assessment of impacts as part of the EIS.

d. Identification of national and state listed threatened biota known or likely to occur in the study area and their conservation status.

e. A description of the likely impacts of the proposed activity on biodiversity values, including direct and indirect impacts and construction and operation impacts, with impacts quantified, wherever possible, such as the amount of each vegetation community or species habitat to be cleared or impacted, and/or the degree of fragmentation of a habitat connectivity.

f. Identification of the avoidance, mitigation and management measures that will be put in place as part of the proposed activity to avoid or minimise biodiversity impacts, including details about alternative options considered and how long-term management arrangements will be guaranteed.

g. A description of the residual impacts of the proposed activity.

III. The '*test for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats'* as outlined in Section 7.3 of the BC Act undertaken in accordance with the gazetted *Threatened Species Test of Significance Guidelines* (OEH 2018) available at: https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/threatened-species-test-significance-guidelines-170634.pdf.

2. If the REF determines under 1 above that the proposed activity is likely to significantly affect threatened species, then in accordance with Section 7.8 of the BC Act, an Environmental Impact Statement must be prepared that is accompanied by a Species Impact Statement prepared in accordance with Part 7, Division 5 of the BC Act, or, if the proponent so elects, a Biodiversity Development Assessment Report prepared in accordance with Part 6, Division 3 of the BC Act.

3. If the REF determines under 1 above that the proposed activity is unlikely to significantly affect threatened species, then the proposed activity should:

   a. be designed to avoid and minimise impacts on biodiversity values to the fullest extent possible, and

   b. include a biodiversity offset package to offset remaining direct and indirect impacts on biodiversity values, prepared in accordance with the Department's 13 offsetting principles available at http://www.environment.nsw.gov.au/biodivoffsets/oehoffsetprincip.htm:

Note:

For the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999,* the REF should identify any relevant Matters of National Environmental Significance and whether the proposal has been referred to the Commonwealth or already determined to be a controlled action.

D. NPWS Estate

The REF should address the following with respect to land reserved under the *National Parks and Wildlife Act 1974*.

1. Where appropriate, likely impacts (both direct and indirect) of the proposed development on any adjoining and/or nearby NPWS estate reserved under the *National Parks and Wildlife Act 1974 s*hould be considered, with reference to the

Developments adjacent to National Parks and Wildlife Service lands Guidelines for consent and planning authorities (DPIE, 2020) available at:

https://www.environment.nsw.gov.au/research-and-publications/publications-search/developments-adjacent-to-national-parks-and-wildlife-service-lands

2. The NPWS has clear guidelines for assessing the environmental impact of developments and activities proposed within NPWS managed lands. These include guidelines for the preparation of a REF for activities proposed on land reserved under the *National Parks and Wildlife Act 1974,* including national parks and nature reserves. The *Guidelines for preparing a Review of Environmental Factors* provides information on how to determine whether certain activities are permissible, as well as specific information on matters for consideration during the preparation of an REF. The guidelines can be found at

   http://www.environment.nsw.gov.au/research-and-publications/publications-search/guidelines-for-preparing-a-review-of-environmental-factors

3. For those proposals within NPWS managed areas that seek a lease or licence under Section 151 of the *National Parks and Wildlife Act 1974*, in addition to an REF, applications must also be accompanied by a sustainability assessment. The assessment must address the criteria adopted by the Chief Executive of the former Office of Environment and Heritage. Templates for completing a Sustainability Assessment can be found at:

   http://www.environment.nsw.gov.au/protectedareas/sustainabilityassessments.htm

Note: Proposals which may impact marine protected areas should be referred to the Regions, Industry, Agriculture and Resources Group in the Department of Planning, Industry and Environment to determine the assessment and approval requirements.

E. Acid Sulfate Soils

The REF should address the following:

1. The potential impacts of the proposed development on acid sulfate soils must be assessed in accordance with the relevant guidelines including the following:

   - Assessment Guidelines in the Acid Sulfate Soils Manual (Stone et al. 1998),
   - National Acid Sulfate Soils Identification and Laboratory Methods Manual (Sullivan et al. 2018a),
   - National Acid Sulfate Soils Sampling and Identification Methods Manual (Sullivan et al. 2018b), and where relevant,
   - Overview and Management of Monosulfidic Black Ooze (MBO) Accumulations in Waterways and Wetlands (Sullivan et al. 2018c),
   - Guidelines for the Dredging of Acid Sulfate Soil Sediments and Associated Dredge Spoil Management (Simpson et al. 2018), and
   - Guidance for the Dewatering of Acid Sulfate Soils in Shallow Groundwater Environments (Shand et al. 2018).

   Samples must be tested according to procedures in National Acid Sulfate Soils Identification and Laboratory Methods Manual (Sullivan et al. 2018a).

2. A sound conceptual model must be developed for the site, including an understanding of local hydrogeological conditions, of the stratigraphic and lateral

distribution of sulfide minerals, and of the presence of sensitive environmental receptors.
This must include:

a. Identifying whether sufficient pyrite is present in sediments to cause significant acidification on oxidation,

b. Determining whether mining activities are likely to cause oxidation of pyrite and leach acidity and soluble metals into groundwater or surface waterways,

c. Determining the likely extent and severity of groundwater or surface water contamination that may be caused by acidic leachate from oxidising sediments, and

d. Identifying whether there are ecosystems or groundwater users in the vicinity of the mine site that are likely to be exposed to contamination from acidic leachate.

3. Describe mitigation and management measures that will be used to prevent, control, abate or minimise potential impacts from the disturbance of acid sulfate soils associated with the proposal and to reduce risks to human health and prevent the degradation of the environment. This must include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.

4. Describe the contingency plan, incorporating a commitment to appropriate monitoring.

F. Flooding, Coastal Process and Associated Hazards

The REF should include an assessment of the following referring to the relevant guidelines in Attachment 2:

1. The potential effect of coastal processes and coastal hazards including potential impacts of sea level rise:

   a. on the proposed activity; and

   b. arising from the proposed activity.

2. Whether the proposed activity is consistent with any coastal management programs or plans.

3. Whether the proposed activity is consistent with any floodplain risk management plans.

4. Whether the proposed activity is compatible with the flood hazard of the land.

5. Whether the proposed activity will significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other proposals or properties.

6. Whether the proposed activity will significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

7. Whether the proposed activity incorporates appropriate measures to manage risk to life from flood.

8. Whether the proposed activity is likely to result in unsustainable social and economic costs to the community as a consequence of flooding.
9. The implications of flooding over the full range of potential flooding, including the probable maximum flood, should be considered as set out in the NSW Government Floodplain Development Manual. This should include the provision of:
    a. Full details of the flood assessment and modelling undertaken in determining any design flood levels (if applicable), including the 1 in 100 year flood levels.
    b. A sensitivity assessment of the potential impacts of an increase in rainfall intensity and runoff (10%, 20% and 30%) and sea level rise on the flood behaviour for the 1 in 100 year design flood if applicable.
10. All site drainage, stormwater quality devices and erosion / sedimentation control measures should be identified and the onsite treatment of stormwater and effluent runoff and predicted stormwater discharge quality from the proposed activity should be detailed.

G. Cumulative Impacts

The REF should include an assessment of the following:

1. The cumulative impacts, including both construction and operational impacts, from all clearing activities and operations, associated edge effects and other indirect impacts on cultural heritage, biodiversity and NPWS Estate in accordance with the *Environmental Planning and Assessment Act 1979*.
2. The cumulative impacts, including both construction and operational impacts, of the proponent's existing proposals and other proposals and associated infrastructure (such as access tracks etc.), as well as the cumulative impact of the proposed activity in the context of other proposals located in the vicinity.

Attachment 2 – REF Guidance material

Title	Web address
Relevant Legislation	
Biodiversity Conservation *Act 2016*	https://www.legislation.nsw.gov.au/#/view/act/2016/63/full
Coastal Management Act 2016	https://www.legislation.nsw.gov.au/#/view/act/2016/20/full
Commonwealth Environment Protection and Biodiversity Conservation Act 1999	http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
Fisheries Management Act 1994	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+38+1994+cd+0+N
Marine Parks Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+64+1997+cd+0+N
National Parks and Wildlife Act 1974	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+80+1974+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+2000+cd+0+N
Wilderness Act 1987	http://www.legislation.nsw.gov.au/viewtop/inforce/act+196+1987+FIRST+0+N
Biodiversity	
Biodiversity Assessment Method (DPIE, 2020)	https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020
Biodiversity Development Assessment Report	https://www.legislation.nsw.gov.au/#/view/act/2016/63/part6/div3/sec6.12
Guidance and Criteria to assist a decision maker to determine a serious and irreversible impact (OEH, 2017)	http://www.environment.nsw.gov.au/resources/bcact/guidance-decision-makers-determine-serious-irreversible-impact-170204.pdf

Title	Web address
Accreditation Scheme for Application of the Biodiversity Assessment Method Order 2017	https://www.legislation.nsw.gov.au/regulations/2017-471.pdf
Biodiversity conservation actions	www.environment.nsw.gov.au/resources/bcact/ancillary-rules-biodiversity-actions-170496.pdf
Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules	www.environment.nsw.gov.au/resources/bcact/ancillary-rules-reasonable-steps-170498.pdf
Threatened Species Website	www.environment.nsw.gov.au/threatenedspecies/
NSW BioNet (Atlas of NSW Wildlife)	www.bionet.nsw.gov.au/
Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method (DPIE 2020)	https://www.environment.nsw.gov.au/research-and-publications/publications-search/surveying-threatened-plants-and-their-habitats-survey-guide-for-the-biodiversity-assessment-method
Threatened biodiversity survey and assessment - Guidelines for developments and activities (2004 working draft)	https://www.environment.nsw.gov.au/research-and-publications/publications-search/threatened-biodiversity-survey-and-assessment
Field survey methods for environmental consultants and surveyors when assessing proposed developments or other activities on sites containing threatened species (OEH undated)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/field-survey-method-guidelines.pdf
NSW Survey Guide for Threatened Frogs (DPIE 2020)	https://www.environment.nsw.gov.au/research-and-publications/publications-search/nsw-survey-guide-for-threatened-frogs
Koala (*Phascolarctos cinereus*) Biodiversity Assessment Method Survey Guide (DPE 2022)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/koala-phascolarctos-cinereus-biodiversity-assessment-method-survey-guide-220249.pdf
'Species credit' threatened bats and their habitats (OEH 2018)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/species-credit-threatened-bats-survey-guide-180466.pdf

Title	Web address
Threatened reptiles Biodiversity Assessment Method survey guide (DPE 2022)	https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/threatened-reptiles-biodiversity-assessment-method-survey-guide-20220563.pdf
BioNet Vegetation Classification - NSW Plant Community Type (PCT) database	www.environment.nsw.gov.au/research/Vegetationinformationsystem.htm
SEED Data Portal (access to online spatial data)	http://data.environment.nsw.gov.au/
Department of Primary Industry Policy and guidelines for fish habitat conservation and management (update 2013)	https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/fish-habitat-conservation
List of national parks	http://www.environment.nsw.gov.au/NationalParks/parksearchatoz.aspx
Revocation, recategorisation and road adjustment policy (OEH, 2012)	http://www.environment.nsw.gov.au/policies/RevocationOfLandPolicy.htm
Developments adjacent to NPWS lands Guidelines for consent and planning authorities (DPIE 2020)	https://www.environment.nsw.gov.au/research-and-publications/publications-search/developments-adjacent-to-national-parks-and-wildlife-service-lands
Acid Sulfate Soils	
Acid Sulfate Soils Planning Maps	http://data.nsw.gov.au/data/
Acid Sulfate Soils Manual (Stone et al. 1998)	http://www.environment.nsw.gov.au/resources/epa/Acid-Sulfate-Manual-1998.pdf
National Acid Sulfate Soils Guidance: National acid sulfate soils identification and laboratory methods manual, Department of Agriculture and Water Resources, Canberra, ACT. (Sullivan, L, Ward, N, Toppler, N and Lancaster, G. 2018a)	https://www.waterquality.gov.au/sites/default/files/documents/dewatering-acid-sulfate-soils.pdf
National Acid Sulfate Soils guidance: National acid sulfate soils sampling and identification methods manual,	https://www.waterquality.gov.au/issues/acid-sulfate-soils/sampling-and-identification-methods-manual.pdf

Title	Web address
Department of Agriculture and Water Resources, Canberra ACT.(Sullivan, L, Ward, N, Toppler, N and Lancaster, G. 2018b)	
National Acid Sulfate soils Guidance: Overview and management of monosulfidic black ooze (MBO) accumulations in waterways and wetlands, Department of Agriculture and Water Resources, Canberra ACT. (Sullivan, LA, Ward, NJ, Bush, RT, Toppler, NR, Choppala, G. 2018c)	https://www.waterquality.gov.au/issues/acid-sulfate-soils/monosulfidic-black-ooze-accumulation.pdf
National Acid sulfate soils guidance: Guidelines for the dredging of acid sulfate soil sediments and associated dredge spoil management, Department of Agriculture and Water Resources, Canberra, ACT (Simpson, SL, Mosley, L, Batley, GE and Shand P. 2018)	https://www.waterquality.gov.au/sites/default/files/documents/dredging-sediments-spoil.pdf
National Acid Sulfate Soils Guidance: Guidance for the dewatering of acid sulfate soils in shallow groundwater environments, Department of Agriculture and Water Resources, Canberra, ACT. (Shand, P, Appleyard, S, Simpson, SL, Degens, B, Mosley, LM 2018)	https://www.waterquality.gov.au/issues/acid-sulfate-soils/dewatering-groundwater-environments.pdf
Flooding, Coastal Processes and Associated Hazards	
Reforms to coastal erosion management	http://www.environment.nsw.gov.au/coasts/coastalerosionmgmt.htm
Floodplain development manual	http://www.environment.nsw.gov.au/floodplains/manual.htm
Guidelines for Preparing Coastal Zone Management Plans	http://www.environment.nsw.gov.au/resources/coasts/130224CZMPGuide.pdf
NSW Climate Impact Profile	http://climatechange.environment.nsw.gov.au/

Title	Web address
Climate Change Impacts and Risk Management	Climate Change Impacts and Risk Management: A Guide for Business and Government, AGIC Guidelines for Climate Change Adaptation

COFFS HARBOUR CITY COUNCIL

5 April 2023

Mr Darren Wood
Director MIDO
Transport for New South Wales
231 Elizabeth Street
SYDNEY NSW 2000

Via email: Darren.Wood2@transport.nsw.gov.au

Dear Mr Wood

I refer to your letter to the Mayor Paul Amos dated 4 April 2023, regarding Maritime Infrastructure Delivery Office (MIDO) TfNSW's proposed strategy to address the sand removal from the harbour, and in particular, the sand build-up in the vicinity of the boat ramp. Following receipt of a letter from the local State Government member, Council considered this matter at its meeting on 13 October 2022 and resolved:

> *That Council advises the NSW State Government through the local member that it:*
>
> 1. *Supports Transport for NSW's investigation of a long term sand removal solution for the harbour.*
> 2. *Supports in principle sand removal solutions consistent with the adopted and gazetted Coffs Harbour Coastal Zone Management Plan 2019, such as the deposition of sand on Park Beach in the intertidal zone.*
> 3. *Does not support the deposition of sand south of the harbour on Boambee and/or Gallows Beaches as this is inconsistent with the Coffs Harbour Coastal Zone Management Plan 2019.*

As requested, and in accordance with Council's above resolution, the City does not support the deposition of sand south of the harbour on Boambee and/or Gallows Beaches, as this is inconsistent with the Coffs Harbour Coastal Zone Management Plan 2019.

Our discussions with TfNSW on 29th March 2023 were not reflective of the proposed strategy, as recorded in your letter and specifically these two sections:
ii. Medium term – (6-24 months) Installation of a pipeline and pump sand south to Gallows beach and,
iii. Long term – (24- months – indefinite) investigate and scope a major dredge campaign of the basin.

Locked Bag 155, Coffs Harbour 2450 (Customer Service Centre: 2 Castle Street, Coffs Harbour)
Tel: (02) 6648 4000 Email: coffs.council@chcc.nsw.gov.au
Website: www.coffsharbour.nsw.gov.au
ABN 79 126 214 487

It was requested at our meeting that the “medium” term in section (ii) above be updated to a short term of 9-12 months but this does not seem to have been reflected in your proposal. Pumping sand at Gallows Beach is not a realistic or acceptable medium term proposal.

Section (iii) is unsatisfactory as it does not provide TfNSW’s express commitment to implement a harbour dredging campaign but instead it leaves the proposed “medium” term as an indefinite solution by way of keeping the “long term” an indefinite investigation. This is not reflective of the discussion that was had at the meeting and of the adopted Coffs Harbour Zone Management Plan 2019 and cannot be supported.

As clearly communicated at the meeting, the City has an urgent need for beach replenishment north of the harbour. There is no need to increase the rate of growth of Boambee Beach. And this proposal is in direct contradiction to the scientific body of work that has determined that sand travels north and therefore any back passing of sand is not a realistic or proactive solution for a key regional City such as Coffs Harbour.

Yours sincerely

Natalia Cowley
General Manager

06 October 2023

Kim Bowra
Acting Director
Marine Infrastructure Delivery Office (MIDO)
Kim.Bowra@transport.nsw.gov.au

CC:
Daniel Cini
Daniel.Cini@transport.nsw.gov.au
coffsharboursandmanagement@transport.nsw.gov.au

Dear Mr Bowra

Re. Invitation to comment – proposed sand transfer system from Coffs Harbour Boat Ramp to Gallows Beach

Thank you for the invitation to comment on the proposed sand transfer system from Coffs Harbour Boat Ramp to Gallows Beach.

We understand that a review of environmental factors (REF) is currently being prepared to assess the likely impacts of the proposal and that the City of Coffs Harbour (the City) has been invited to comment and advise of any interests, concerns or statutory requirements relating to the proposal so they can be considered in the REF.

The City would firstly like to reiterate that Council resolved at the meeting of 13 October 2022:

That Council advises the NSW State Government through the local member that it:
1. *Supports Transport for NSW's investigation of a long term sand removal solution for the harbour.*
2. *Supports in principle sand removal solutions consistent with the adopted and gazetted Coffs Harbour Coastal Zone Management Plan 2019, such as the deposition of sand on Park Beach in the intertidal zone.*
3. *Does not support the deposition of sand south of the harbour on Boambee and/or Gallows Beaches as this is inconsistent with the Coffs Harbour Coastal Zone Management Plan 2019.*

The City understands that sand from the Coffs Harbour Boat Ramp, that was being stockpiled for return to the coastal system, has been classified as waste under the POEO Act and has been used for developments in nearby suburbs. Removal of sand from the coastal system is inconsistent with the gazetted Coffs Harbour Coastal Zone Management Plan 2019 (CZMP) and results in depletion of much needed sand supply to the beaches to the north of the Harbour.

The following comments are made in relation to the proposed sand transfer system from Coffs Harbour Boat Ramp to Gallows Beach and the REF:

1. The proposal is contradictory to the CZMP, will supply sand to Gallows Beach which is accreting and further lead to a coastal erosion crisis by stealing the sand from nourishing the beaches north of the Harbour.

2. The City has not provided permission for the pipeline to pass through / over a section of City managed land. Please provide a copy of the permission giving you the right to proceed over this section of land.

3. Please provide your plan to successfully manage the following environmental considerations such as:
    - Potential impacts on marine life and ecosystems.
    - Investigation and potential management of contaminated sediments (if present) and quality control of material being discharged onto Gallows Beach.
    - Avoiding damage to existing native terrestrial vegetation.
    - Appropriate erosion and sediment control measures during construction.
    - Potential impact on sand budgets, sand transport and local sand storage.

4. Please clarify the duration of the proposed sand transfer and identify when you are intending to provide a solution that does not contravene the CZMP.

5. Please provide a copy of the community engagement undertaken to support the proposed option.

The City is disappointed by TfNSW's proposal and intent to deliver an unsustainable solution that is in contravention to the CZMP, is suboptimal and is compromising the community's and coastal environment needs. The transportation of sand from the Coffs Harbour Boat Ramp to Gallows Beach is not supported and the City strongly affirms its request in previous correspondence sent to TfNSW dated 5 April 2023 to not proceed with this option.

The City requests to see a plan that takes into consideration the above, doesn't permanently remove sand from the system and therefore lead to permanent damage to coastal properties north of the Harbour.

The City also advise that it has commenced Stage 1 of a new Coastal Management Program (CMP) for the open coastline of the Coffs Harbour Local Government Area, this will look at the issue of sand management in more detail, however this CMP will not be finalised for some years.

In the meantime, the City requests proactive conversations regarding the use of the sand removed from the Coffs Harbour Boat Ramp, and the need to discuss both short and longer term solutions for the sand management consistent with the CZMP to maintain sand supply in the northern littoral drift.

For further information, please contact Sally Whitelaw Team Leader Biodiversity, Coastal & Flooding on 02 6648 4673.

Yours faithfully

Ian Fitzgibbon
Acting Director City Planning and Communities

DOC23/848757-1

3 October 2023

Mr Daniel Cini
Project Manager
Transport for NSW
Via email to: Daniel.Cini@transport.nsw.gov.au

Dear Daniel

Re: Proposed Sand Transfer System from Coffs Harbour Boat Ramp to Gallows Beach

I refer to your request for input into the preparation of a Review of Environmental Factors (REF) for the above project. From the information provided, it appears that the EPA will be the Appropriate Regulatory Authority for the proposal for matters regulated under the *Protection of the Environment Operations Act 1997* (POEO). The EPA's key issues are summarised below.

Water quality
The nearby Solitary Islands Marine Park is of high conservation value and supports environmental values important to the protection of water quality including aquatic ecosystem health, primary and secondary contact recreation, and recreational fishing.

It is therefore essential that water quality is protect and that the REF assess how water quality impacts will be prevented in all construction and operational stages of the project. For example, the REF must clearly detail how the following issues will be managed to prevent water pollution:

- Mobilised sediments from land and marine excavation works;
- Dewatering of marine sediments;
- Stormwater generated on and around project construction sites;
- Fuels, hydraulic oils, chemicals etc involved with the construction and operational works;

The REF should also provide detail on the management practices that will be implemented to ensure water quality issues are detected and promptly acted upon to prevent impacts.

Air Quality
The potential risks to human health from exposure to airborne particulates (from uncontrolled dust emissions) must be assessed. This is of particular importance given the proximity of the extraction and project construction sites to high public use areas. Dust control measures must be detailed, with the aim to prevent any movement of dust off-site.

Noise Impacts
The REF must assess potential impacts from noise generated from all potential construction and operational noise sources and also detail any potential noise attenuation works that are needed to address these impacts. The REF should also consider the following recommended standard hours of operation:

- Monday to Friday – 7:00am to 6:00pm
- Saturday – 8:00am to 1pm; and
- No work on Sundays or Public Holidays

Waste Management
The REF should estimate volumes of waste generated on the site and identify waste streams and disposal options for all waste including liquid waste and wastes classified as hazardous. Waste management should consider the prevention of pollution, minimising resource use, improving the recovery of materials from the waste stream and ensuring the appropriate disposal of waste.

If you have any questions please contact me on 02 6640 2522 or 0447 142 916.

Yours sincerely

Scott Ensbey
A/Unit Head – Regional Operations, Coffs Harbour
Environment Protection Authority

Department of Primary Industries (Fisheries)
Department of Regional NSW

OUR REF: C23/610

9 October 2023

Daniel Cini
Transport for NSW
Via email: Daniel.Cini@transport.nsw.gov.au

Dear Mr Cini,

Re: DPI Fisheries comments on the preparation of a review of environmental factors for proposed sand bypass system from Coffs Harbour boat ramp to Gallows Beach, Lot 3 DP 1285051, Coffs Harbour, Coffs Harbour LGA.

I refer to your letter dated 21 September 2023 seeking comment on the preparation of a review of environmental factors (REF) for the subject proposal.

DPI Fisheries is responsible for ensuring that fish stocks are conserved and that there is "no net loss" of key fish habitats upon which they depend. To achieve this, the Coastal Systems Unit assesses activities under Parts 4 and 5 of the *Environmental Planning and Assessment Act 1979* in accordance with the objectives of the *Fisheries Management Act 1994* (FM Act), the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the FM Act, and the *Policy and Guidelines for Fish Habitat Conservation and Management (2013 Update)* (DPI Fisheries P&G). In addition, DPI Fisheries is responsible for ensuring the sustainable management ofcommercial fishing and aquaculture, quality recreational fishing and the continuation of Aboriginal cultural fishing within NSW.

DPI Fisheries also has operational responsibility for NSW marine parks, this includes attaining the primary purpose of marine parks to conserve the biological diversity and maintain ecosystem integrity and function of bioregions in the marine estate. DPI Fisheries aims to ensure that activities comply with or are consistent with the requirements of the *Marine Estate Management Act 2014* (MEM Act), Marine Estate Management Regulation 2017 and Marine Estate Management (Management Rules) Regulation 1999. Any works proposed in the locality of the Solitary Islands Marine Park have the potential to affect the environmental, cultural and social values of the marine park and must be considered under section 56 of the MEM Act.

It is understood that the proposal aims to construct a sand transfer system to remove sand from the navigation channel of the Coffs Harbour boat ramp and pump it via a pipeline to the north of Gallows Beach around the mid-tide zone.

Part 7 *Fisheries Management Act 1994* Approvals

The table below outlines actions that trigger sections of the FM Act.

Sections	Description of action	Legislative trigger
198-202	Dredge (digging) and/or reclamation (filling) of land permanently or periodically inundated by water (including wetlands).	Digging and/or filling below the Highest Astronomical Tide (~1m AHD) in estuaries. Digging and/or filling within the high bed of 3rd order and higher watercourses (based on 1:25,000 scale maps) and/or draining water from land for its reclamation. Digging and/or filling within Coastal Wetlands. Activities described in cl 226 *Fisheries Management (General) Regulation* 2019
205	Harming marine vegetation (seagrass, mangroves, and kelp)	Gather, cut, pull up, destroy, poison, dig up, remove, injure, or otherwise harm marine vegetation or any part of it. Activities described in cls 228-229 *Fisheries Management (General) Regulation* 2019
218-220	Obstructing free passage of fish, in waterways	Construction or alteration of a dam, floodgate, causeways, or weir or otherwise creation of an obstruction

The proposed works meet the definition of dredging and reclamation works under the FM Act and will trigger the associated provisions listed in the table above. A permit under section 200/201 or consultation under section 199 (for a public authority other than a local authority) of the FM Act will need to be obtained prior to the commencement of the proposed works. For any works likely to cause harm to marine vegetation a permit under section 205 of the FM Act will need to be obtained prior to the commencement of works.

Avoiding impacts on fisheries resources

Key fish habitats are defined within the DPI Fisheries P&G and are graded by 'type' on the basis of their sensitivity, or their importance to the survival of fish (refer to section 3.2 of DPI Fisheries P&G for further information). The DPI Fisheries impact mitigation hierarchy is to first avoid impacts to key fish habitats. Where impacts to key fish habitats cannot be avoided, the preference is to impact less sensitive key fish habitats over more highly sensitive key fish habitats. All unavoidable impacts should be appropriately mitigated and offset.

Other information requirements

DPI Fisheries' standard minimum information requirements for environmental assessment are clearly detailed in section 3.3 of the DPI Fisheries P&G. Please ensure that these requirements are addressed in the environmental studies. This will facilitate an effective assessment of the proposal and reduce delays.

In addition to the minimum information requirements of section 3.3 of the DPI Fisheries P&G, the REF for this proposal should:

- Highlight how the proposal will seek to avoid impacts to "undisturbed areas" and seek to preferentially impact pre-existing impacted areas;
- Identify measures to minimise impacts to mature native vegetation, the footprint of structures located within or over water, and the use of hard protection measures in structures such as rock;
- Provide detailed plans of the dredge and disposal footprint and its layout proximate to sensitive receptors (e.g. rocky reef, seagrass, threatened species habitat etc., oyster aquaculture and popular fishing locations);
- Detail the sediment characteristics and volumes of material that is to be dredged and transferred, including turbidity plumes associated with the discharge;
- Provide justification as to why the specific dredging and disposal methods were chosen and detail alternative options that were discounted;
- Details of mitigation measures that will be implemented to avoid and minimise impacts to fish and fish habitats, including seagrass and other sensitive receptors, during both the dredging and disposal components of the work, and a discussion on likely impacts to water quality from the proposed activity;
- Identify all unavoidable impacts to marine vegetation including the extent, vegetation types and whether these are located within SEPP Coastal Wetland areas;
- Identify any potential impacts to nearby critically endangered Marine Brown Alga (*Nereia lophocladia*);
- Propose viable rehabilitation and compensation measures for all unavoidable impacts to marine vegetation in accordance with section 3.3.3 of the DPI Fisheries P&G;
- Identify the potential impacts of the proposed sand transfer on the long-shore drift and coastal transportation of sand within that sediment compartment, including information on the likely sand migration pathways and volumes from the disposal site;
- Describe the potential contribution of the proposal to cumulative impacts on fish and fish habitat in the vicinity of the proposal; and,
- Detailed monitoring programs, including methods to detect the success of techniques used to ameliorate impacts on fish and fish habitat in the vicinity of the proposal.

It should be noted that DPI Fisheries would not support proposals, or components of a proposal, where structures are located within key fish habitat that do not have an overriding functional requirement to be located within tidal waters.

If you have any queries, please contact me on 0499 689 583 or fletcher.mingramm@dpi.nsw.gov.au.

Yours sincerely

Fletcher Mingramm
Fisheries Manager, Coastal Systems (North Coast)
Marine Estate Management, Primary Industries NSW

USEFUL DEFINITIONS

The definitions given below are relevant to these requirements:

Dredging work means:

(a) any work that involves excavating water land, or

(b) any work that involves the removal of material from water land that is prescribed by the regulations as being dredging work to which this Division applies.

Farm Dam means the backed up waters of any dam, or impoundment, located on land that is not public water land.

Fish means any part of marine, estuarine, or freshwater fish or other aquatic animal life at any stage of their life history (whether alive or dead). Fish include oysters and other aquatic molluscs, crustaceans, echinoderms and beach worms and other aquatic polychaetes.

Marine vegetation means any species of plant that at any time in its life must inhabit water (other than fresh water).

Reclamation Work means any work that involves:

(a) using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber, or rocks) to fill in or reclaim water land, or

(b) depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or

(c) draining water from water land for the purpose of its reclamation.

Stream Order (Strahler) When two first order streams come together, they form a second-order stream. When two second order streams come together, they form a third order stream. Streams of lower order joining a higher order stream do not change the order of the higher stream. Thus, if a first order stream joins a third order stream it remains a third order stream. It is not until a third order stream combines with another third order stream that it becomes a fourth order stream. DPI Fisheries, using maps at a scale of 1:25,000, consider 3rd order and above (i.e. 4th, 5th, 6th etc) waterways as Key Fish Habitats and works in these waterways in almost all instances trigger permit requirements under the *Fisheries Management Act* 1994.

Water Land means land submerged by water:

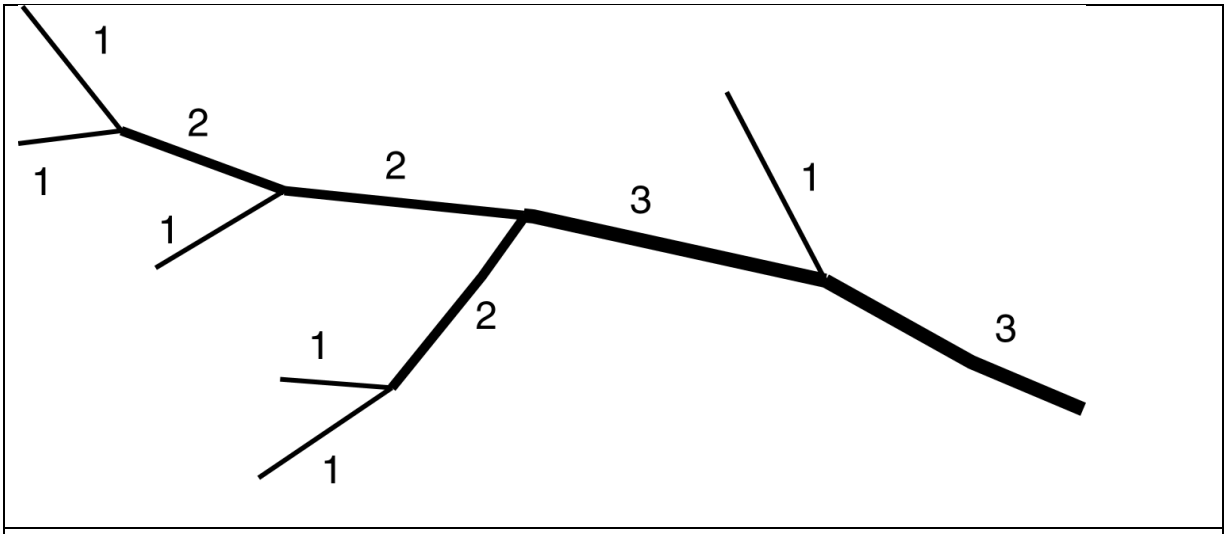
a) whether permanently or intermittently, or

b) whether forming an artificial or natural body of water,

and includes wetlands and any other land prescribed by the regulations as water land to which this Division applies.

Waters refers to all waters including tidal waters to the Astronomical High Tide Level (AHTL) as well as flowing streams, irregularly flowing streams, gullies, rivers, lakes, coastal lagoons, wetlands, and other forms of natural or man-made water bodies on both private and public land.

Wetlands include marshes, mangroves, swamps, or other areas that form a shallow body of water when inundated intermittently or permanently with fresh, brackish, or salt water, and where the inundation determines the type and productivity of the soils and the plant and animal communities



Diagrammatic representation of Strahler Stream Order

Further Information

DPI Fisheries' Policy and Guidelines series contains more detailed information on techniques and practices that satisfy DPI Fisheries' requirements to minimise impacts of developments on fish and fish habitat. The Guidelines are available at:

http://www.dpi.nsw.gov.au/fisheries/habitat/protecting-habitats/toolkit

Considering the information in these documents prior to developing and submitting your proposal is strongly recommended.

Another document "*Guidelines for the Assessment of Aquatic Ecology in EIA"* (Draft 1998) produced by the Department for Urban Affairs and Planning (now the Department of Planning and Environment) may prove useful in outlining appropriate procedures and methodologies for conducting aquatic surveys required for the preparation of an environmental assessment.

Appendix D: PACHCI Assessment

6 October 2023

Project Manager Julian Burgess
Organisational Unit Project Manager
Department Maritime Services
Agency Transport For NSW

Dear Julian,

Preliminary assessment results for Coffs Harbour Boat Ramp and Sand Bypass – Gallows Sand disposal **based on Stage 1 of the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (the procedure)*.***

The project, as described in the Stage 1 assessment, was assessed as being unlikely to have an impact on Aboriginal cultural heritage.

The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did indicate moderate to high concentrations of Aboriginal objects or places in the study area.
- The study area does contain landscape features that indicate the presence of Aboriginal objects, based on the Heritage NSW's ***Due diligence Code of Practice for the Protection of Aboriginal objects in NSW*** and the Transport for NSW's procedure.
- The cultural heritage potential of the study area appears to be reduced due to past disturbance.
- There is an absence of sandstone rock outcrops likely to contain Aboriginal art.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes, you must contact me and your regional environmental staff to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Transport for NSW's ***Unexpected Archaeological Finds Procedure*.**

For further assistance in this matter do not hesitate to contact me.

Yours sincerely,

Crystal Donovan
Aboriginal Community & Heritage Partner – Region North

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