



# **Review of environmental factors: Demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b, Lot 4 DP837195, Goat Island, Sydney Harbour**



**Final – January 2025**

## Contents

1.	Introduction	1
1.1	Brief description of the proposal	1
1.2	Estimated development cost of proposal	2
1.3	Estimated duration of proposal	2
2.	Proponent's details	2
3.	Permissibility and assessment pathway	7
3.1	Permissibility under NSW legislation	7
3.2	Environmental Planning and Assessment Act 1979	14
3.3	Other relevant NSW legislation	15
3.4	Commonwealth legislation	18
3.5	Consistency with national parks policy	19
3.6	Summary of licences and approvals	20
4.	Consultation – general	21
4.1	Statutory consultation	21
4.2	Targeted consultation	22
5.	Consultation – Aboriginal communities	23
5.1	Native title notification requirements	23
5.2	Parks under joint management arrangements other than an indigenous land use agreement	24
5.3	Other parks	24
6.	Proposed activity (or activities)	25
6.1	Location of activity	25
6.2	Description of the proposed activity	25
7.	Reasons for the activity and consideration of alternatives	30
7.1	Objectives and reasons for the proposal	30
7.2	Consideration of alternatives	30
7.3	Justification for preferred option	31
7.4	Site suitability	31
8.	Description of the existing environment	31
8.1	Overview of the project area	31
8.2	Natural values	34
8.3	Cultural values	55
8.4	Social values	66
8.5	Matters of national environmental significance	68
9.	Impact assessment during all stages of the activity	69
9.1	Physical and chemical impacts	69
9.2	Biodiversity impacts	75
9.3	Community impacts	80
9.4	Natural resource impacts	82
9.5	Aboriginal cultural heritage impacts	83

9.6 Other cultural heritage impacts	86
9.7 Impacts on matters of national environmental significance	87
9.8 Cumulative impacts	89
10. Proposals needing more information	89
10.1 Activities within regulated catchments	89
11. Summary of impacts and conclusions	94
12. Supporting documentation	96
13. Declarations	98
14. Bibliography	99
Appendix A: Demolition Specification	102
Appendix B: Ecologically Sustainable Development	103
Appendix C: Statement of Heritage Impact	104
Appendix D: DPIRD – Fisheries correspondence	105
Appendix E: Photographic record	107
Appendix F: Aquatic Ecology Assessments	115
Appendix G: Recorded species	116
Appendix H: Likelihood of Occurrence table (BioNet Atlas)	118
Appendix I: Protected Matters Search Tool results	125

## List of figures

Figure 1. Location of Goat Island and land tenure	3
Figure 2. Broadside Wharf 4a and 4b subject site	4
Figure 3. Northern Broadside Wharf 55b subject site	5
Figure 4. Location overlay	6
Figure 5. Underground Coal Mining (Non-EPI)	15
Figure 6. CMP description of Broadside Wharf 4a	32
Figure 7. CMP description of Broadside Wharf 4b	32
Figure 8. CMP analysis of Broadside Wharf	33
Figure 9. CMP description of Northern Broadside Wharf 55b	33
Figure 10. CMP analysis of Northern Broadside Wharf 55b	33
Figure 11. Soil Landscape mapping	35
Figure 12. Key Fish Habitat and Coastal Management mapping	37
Figure 13. Vegetation mapping	42
Figure 14. Threatened species previously recorded in 10 km, in the vicinity of Goat Island	44
Figure 15. Approximate distribution of Spiny Kelp patches and benthic substrates around Broadside Wharf 4a + 4b	46
Figure 16. Approximate distribution of Spiny Kelp patches and benthic substrates around Northern Broadside Wharf 55b	48
Figure 17. Previously recorded White's Seahorse and <i>Zostera Capricornia</i>	49


Figure 18. Estuarine habitat	50
Figure 19. Mapped <i>Zostera</i>	52
Figure 20. Mapped <i>Posidonia australis</i> Endangered population	53
Figure 21. AHIMS basic search results	55
Figure 22. State Heritage Register – Goat Island (#00989)	60
Figure 23. HHIMS sites within and proximate to Broadside Wharf 4a + 4b	61
Figure 24. HHIMS sites within and proximate to Northern Broadside Wharf 55b	62
Figure 25. Archaeological Zoning Plan	64
Figure 26. Features of high significance	65
Figure 27. Views of significance	67
Figure 28. Sydney Harbour Catchment map	90
Figure 29. Foreshores and Waterways Area map	90

## List of tables

Table 1. Sydney Harbour National Park Plan of Management – Goat Island Outcomes, Aims and Actions	11
Table 2. Triggers for publication of the review of environmental factors	20
Table 3. Consultation triggers under the Transport and Infrastructure State Environmental Planning Policy	21
Table 4. Summary of activity location	25
Table 5. Lesryk aquatic investigations – conditions experienced	39
Table 6. Considered threatened and protected aquatic species	45
Table 7. Type 1 and 2 Key Fish Habitat within the study area	51
Table 8. Key threatening processes	54
Table 9. Generic Due Diligence process	57
Table 10. Non-Aboriginal (European) cultural heritage listings	58
Table 11. Matters for all regulated catchments	91
Table 12. Additional factors in Sydney Harbour’s Foreshores and Waterways Area	93
Table 13. Consideration of significance of impacts for each environmental factor	94
Table 14. Documents that accompany the review of environmental factors	96

Report cover photographs: (Left) Collapsed section of Broadside Wharf 4b; (Right) Character of Northern Broadside Wharf 55b.

## Document control

Version	Date	Author/ Modified by	Approved by
Draft V1	01/11/24	Deryk Engel (Lesryk Director; Senior Ecologist) Kirsty Bloomfield (Team Leader)	Deryk Engel
Final	28/11/24	Deryk Engel and Kirsty Bloomfield	Deryk Engel
Final updated	04/12/24	Kirsty Bloomfield	Deryk Engel
Final updated with DPIRD Fisheries response	08/01/25	Kirsty Bloomfield	

## Glossary

Term	Definition
<b>Direct impact</b>	Are those that directly affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat (State of NSW and OEH 2018).
<b>Habitat</b>	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component.
<b>Indirect impact</b>	Impacts that occur when project-related activities affect species or ecological communities in a manner other than direct loss within the subject site. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development. When applying each factor, both long-term and short-term impacts are to be considered (State of NSW and OEH 2018).
<b>Mitigation</b>	Action to reduce the severity of an impact.
<b>Population</b>	A group of organisms, all of the same species, occupying a particular area.
<b>Ramsar wetlands</b>	The Convention on Wetlands of International Importance
<b>Study Area</b>	Means the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account (State of NSW and OEH 2018).
<b>Study region</b>	Is specified as a 10 km polygon around the outer edge of the defined subject site.
<b>Subject site</b>	Means the area directly affected by the proposal. The subject site includes the footprint of the development and any ancillary works, facilities, accesses or hazard reduction zones that support the construction or operation of the development or activity (State of NSW and OEH 2018).

## Acronyms & Abbreviations

Abbreviation	Definition
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AIS	Assets of Intergenerational Significance
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
CEMP	Construction Environmental Management Plan
CMP	Goat Island Conservation Management Plan
Cth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPIRD	NSW Department of Primary Industries and Regional Development
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESCP	Erosion and Sediment Control Plan
FM Act	NSW <i>Fisheries Management Act 1994</i>
KFH	Key Fish Habitat
KTP	Key Threatening Process
MNES	Matters of National Environmental Significance
MOP	Materials offload platform
MPR	Marine Pollution Research Pty Ltd
NPW Act	NSW <i>National Parks and Wildlife Act 1974</i>
NPWS	NSW National Parks and Wildlife Service
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
NSW EPA	NSW Environmental Protection Authority
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
PMST	Protected Matters Search Tool
PoM	Sydney Harbour National Park Plan of Management
REF	Review of Environmental Factors
RHSEPP	State Environmental Planning Policy (Resilience and Hazards) 2021
SEED	The Central Resource for Sharing and Enabling Environmental Data in NSW
SEPP	State Environmental Planning Policy
SHNP	Sydney Harbour National Park
SIS	Species Impact Statement
TEC	Threatened Ecological Community
TISEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021

# 1. Introduction

## 1.1 Brief description of the proposal

<b>Proposal</b>	Demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b.  Section 6 of this REF provides further details on the proposal.
<b>Location</b>	Maritime Waters around Goat Island
<b>NPWS park or reserve</b>	Sydney Harbour National Park (SHNP)
<b>NPWS Area</b>	Sydney South Area
<b>Council</b>	Unincorporated
<b>NSW State electorate</b>	Sydney

This Review of Environmental Factors (REF) has been prepared by Lesryk Environmental Pty Ltd (Lesryk) at the request of the NSW Department of Climate Change, Energy, the Environment and Water (NSW National Parks and Wildlife Service) — hereafter referred to as NPWS, as NPWS are proposing the demolition and removal of the existing Broadside Wharf 4b and (sections of) 4a and the Northern Broadside Wharf 55b, inclusive of sections that have already collapsed.

The site at which work would occur is within the Shipyard and North Depot Precincts on the western and northern sides of Goat Island (Figures 1 - 3).

In accordance with the Demolition Specification prepared for the proposal (Consult Marine 2024 [Appendix A]), the proposed scope of work will involve the demolition and disposal of an 80 m length of Broadside Wharf (4b and part of 4a) and a 27 m length of Northern Broadside Wharf (55b), inclusive of:

- all components of the timber substructure, decking and connections
- all ancillaries that exist on the wharf except the mooring bollards and signage which are to be removed and provided to the Principal
- timber piles and pile stumps (fully withdrawn) from the seabed (except identified piles which will be cut off at seabed level)
- all debris and materials located on the seabed under the wharf and within a 4.5 m zone around the wharf

Collection of debris from the wharf structures, and within the 4.5 m zone, will occur prior to any demolition/removal work, with debris to be checked for marine life.

An estimated worst-case estimate of about 0.16 ha of seafloor could be disturbed to permit the works.

A qualified structural Engineer is to be engaged to carry out an engineering investigation of the subject wharves. The Contractor engaged for the project will assess the method for demolition.

The proposed demolition and removal work will contribute to the preparation of the culturally significant Goat Island for its handover to Aboriginal ownership and management.

It is acknowledged Lesryk has prepared previous ecological reports in the vicinity of the wharves on Goat Island (Lesryk 2024a, 2024b, 2023a, 2023b). As part of these previous works, aquatic surveys (Lesryk 2023c, 2024c) and an Aquatic Ecology Assessment (MPR 2022) have also been prepared. Where applicable, results from previous reports will be drawn on and incorporated within this REF.

Unless a specific aspect of the proposal is referred to, the work would hereafter be referred to as 'the proposed work.'

This REF is required to assess any environmental and heritage impact associated with the proposal; with the proposed work to be assessed under, and this REF prepared to ensure compliance with Part 5 of the EP&A Act and section 171 of the Environmental Planning and Assessment Regulation 2021.

## **1.2 Estimated development cost of proposal**

\$2,100,000

## **1.3 Estimated duration of proposal**

The duration of the proposed work is estimated to take 12 weeks; commencing on 03/02/2025, with work completed 25/04/2025.

## **2. Proponent's details**

Contact name	Mark Daniels
Position	Senior Project Officer
Street address	580 Ku-ring-gai Chase Road, Mount Colah, NSW 2079
Postal address (if different to above)	PO Box 3031, Asquith, NSW 2077
Contact phone number	
Email	mark.daniels@environment.nsw.gov.au
Manager	Rob Newton





Figure 1. Location of Goat Island and land tenure



Figure 2. Broadside Wharf 4a and 4b subject site





Figure 3. Northern Broadside Wharf 55b subject site

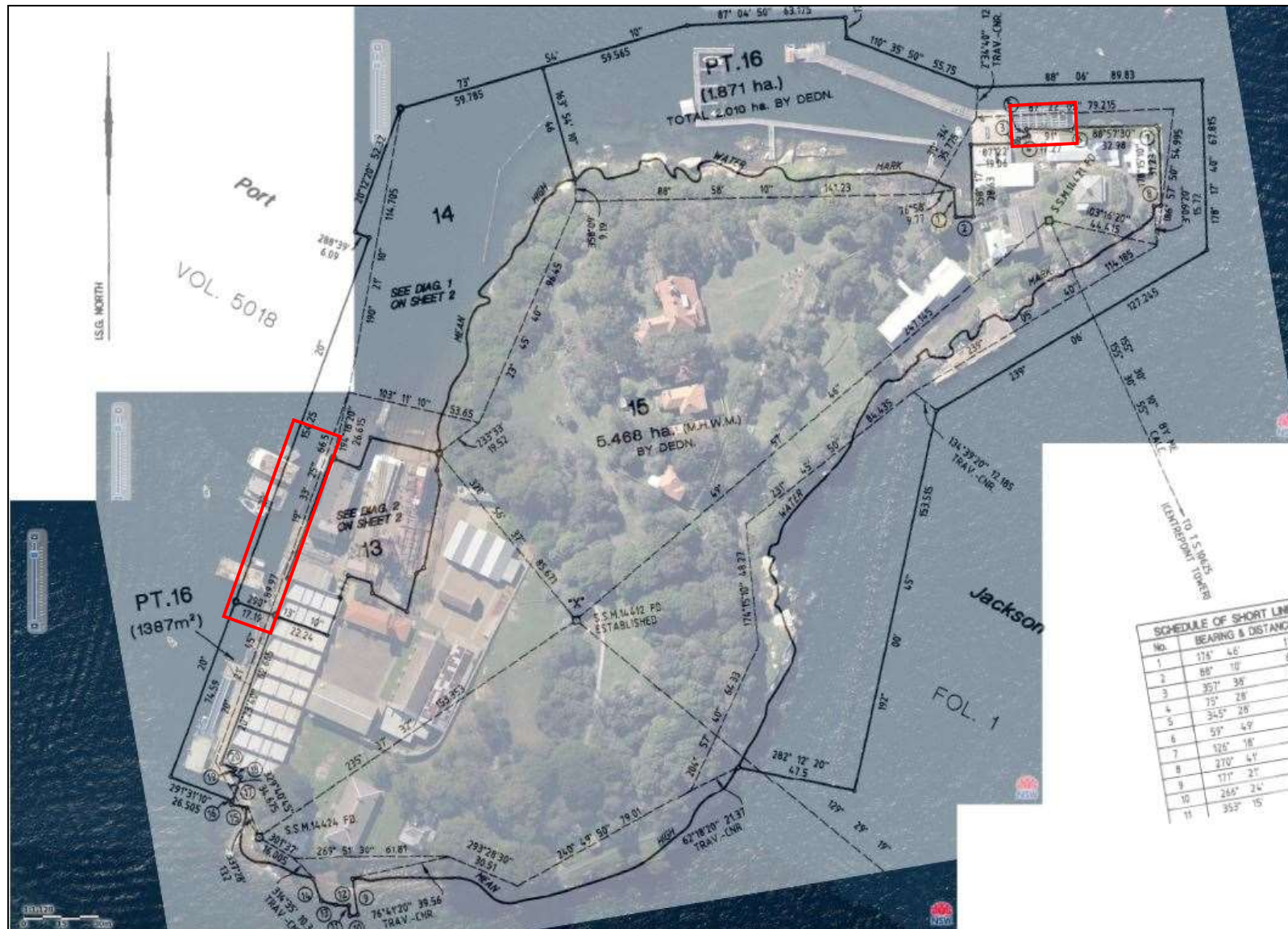


Figure 4. Location overlay

## 3. Permissibility and assessment pathway

### 3.1 Permissibility under NSW legislation

The following sections outline how the activity is permissible under applicable NSW legislation.

#### 3.1.1 National Parks and Wildlife Act 1974

##### On land reserved or acquired under the National Parks and Wildlife Act 1974

The objects of s.2A of this Act are as follows—

- (a) *the conservation of nature, including, but not limited to, the conservation of—*
  - (i) *habitat, ecosystems and ecosystem processes, and*
  - (ii) *biological diversity at the community, species and genetic levels, and*
  - (iii) *landforms of significance, including geological features and processes, and*
  - (iv) *landscapes and natural features of significance including wilderness and wild rivers,*
- (b) *the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including, but not limited to—*
  - (i) *places, objects and features of significance to Aboriginal people, and*
  - (ii) *places of social value to the people of New South Wales, and*
  - (iii) *places of historic, architectural or scientific significance,*
- (c) *fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation,*
- (d) *providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation.*

Land reserved under the NPW Act on Goat Island is above the mean high-water mark. Broadside Wharf and Northern Broadside Wharf are outside the boundary of the SHNP; however, this is adjoining land (the seabed) leased to NPWS by Transport for NSW. The proposal remains consistent with the objects of the Act.

The proposed works would require a disturbance footprint (based on a precautionary worst-case estimate) that totals about 0.16 ha, restricted to previously disturbed/modified areas in an aquatic environment. In accordance with s.2A(a)-(b), as assessed within this REF, the proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is designed to minimise any potential impacts on the conservation of the natural environment and cultural values.

Section 8.3.1 of this REF details that an Aboriginal Heritage Information Management System (AHIMS) search returned two previously recorded Aboriginal sites on Goat Island. The nearest is identified about 74 m south-east of the Northern Broadside Wharf subject site; therefore, none are indicated within, or near to, the study area. The study area is highly disturbed and maintains a large proportion of reclaimed land. Whilst it is possible that Aboriginal archaeological deposits could exist within the seabed surrounding the island, it may be unlikely that these would still remain given the history of the area, or be encountered during the proposed works. Overall the study area is deemed to have low Aboriginal archaeological potential. It is expected that the proposed activity can proceed with due



caution without the need to obtain an Aboriginal Heritage Impact Permit (AHIP) in accordance with s.90 of the NPW Act. Refer to Section 8.3.1 of this REF for further details.

In accordance with s.2A(c)-(d), the proposal would ultimately have a positive impact on the study area as it will remove dilapidated and unsafe infrastructure to better support management of Goat Island, providing continued appreciation and enjoyment of the surrounding natural, cultural heritage and recreational values. Furthermore, the proposal will contribute to the preparation of the culturally significant Goat Island for its handover to Aboriginal ownership and management.

In accordance with s.2A(2) of the NPW Act, *the objects of this Act are to be achieved by applying the principles of ecologically sustainable development* as described in section 6(2) of the *Protection of the Environment Administration Act 1991*. The principles of Ecologically Sustainable Development are addressed in Appendix B.

In accordance with s.2A(3)(b) of the NPW Act, the work is considered to be in *the public interest in the protection of the values for which land is reserved under this Act and the appropriate management of those lands*.

Provided the recommended mitigation measures in Section 9 of this REF are implemented, the proposal is considered consistent with, and would not contravene, the objects of the NPW Act.

### **Reserve Management Principles**

Pursuant to Part 4, Division 2, s.30E(1) of the NPW Act, *The purpose of reserving land as a national park is to identify, protect and conserve areas containing outstanding or representative ecosystems, natural or cultural features or landscapes or phenomena that provide opportunities for public appreciation and inspiration and sustainable visitor or tourist use and enjoyment so as to enable those areas to be managed in accordance with subsection (2).*

In accordance with s.30E(2), and those principles relevant to the proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b:

- 2) *A national park is to be managed in accordance with the following principles—*
  - (a) *the conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena and the maintenance of natural landscapes,*
  - (b) *the conservation of places, objects, features and landscapes of cultural value,*
  - (c) *the protection of the ecological integrity of one or more ecosystems for present and future generations,*
  - (d) *the promotion of public appreciation and understanding of the national park's natural and cultural values,*
  - (e) *provision for sustainable visitor or tourist use and enjoyment that is compatible with the conservation of the national park's natural and cultural values,*
  - (f) *provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the national park's natural and cultural values.*

Giving consideration to the above, the carrying out of the proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will remove dilapidated and unsafe infrastructure within Goat Island; providing continued conservation, protection, promotion and sustainable use and enjoyment of Goat Island's natural, heritage and recreation values.

### **Sydney Harbour National Park Plan of Management**

Section 81 of the NPW Act requires operations in a National Park to be in accordance with a plan of management. The adopted *Sydney Harbour National Park Plan of Management* (PoM) (OEH 2012) identifies Goat Island within Precinct 11: Goat Island, and identifies eight desired outcomes to contribute to the successful management, protection and visitor enjoyment of the park (Table 1 – page 11 below). The proposal complies with, or does not contravene, these.

### **Assets of intergenerational significance**

Three declared AIS sites (AIS-ES-101, AIS-ES-102, AIS-ES-103) of Nielsen Park She-oak (*Allocasuarina portuensi*), Endangered under the EPBC and BC Acts, occur within SHNP.

Relevant to the proposal, pursuant to s.153G(4) of the NPW Act and s.78B of the National Park and Wildlife Regulation 2019, the following actions may be taken for the management of declared land—

- (a) the management of known or foreseeable risks to the land, including the protection of the land from bush fire risks*
- (d) the carrying out of conservation activities under the approved conservation action plan for the land.*

As a 'sensitive' species, the exact location of these AIS sites with the SHNP is not publicly available; however, NPWS can advise that there are no AIS sites on Goat Island.

### **Leasing, licensing and easement provisions**

Not applicable (N/A)

### **Internal NPWS projects**

The proposed demolition work would remove dilapidated and unsafe infrastructure; maintain a conservation area; preserve the natural, cultural heritage and recreational values of Goat Island; avoid damage to Aboriginal objects, and improve public safety. As such, the proposal complies with the following NPWS management powers and responsibilities of the NPW Act:

- *s.8(3) The Secretary shall in the case of every national park, historic site, state conservation area, regional park, nature reserve, karst conservation reserve and Aboriginal area—*
  - (b) arrange for the carrying out of such works as the Secretary considers necessary for or in connection with the management and maintenance thereof,*
- *s.12: The Service is to carry out such works and activities as the Minister may direct, either generally or in a particular case, in relation to the following:*
  - (a) the conservation and protection of land reserved under this Act or acquired for reservation under this Act and of land for which the National Parks and Wildlife Reserve Trust is the Crown land manager,*
  - (b) the conservation and protection of wildlife (including threatened species, populations and ecological communities, and their habitats),*
  - (c) the conservation and protection of wilderness areas and wild rivers,*
  - (d) the identification, conservation and protection of, and prevention of damage to, Aboriginal objects and Aboriginal places,*
  - (e) conservation agreements and conservation areas,*

- (f) *the provision of facilities and opportunities for sustainable visitor or tourist use and enjoyment on land reserved under this Act,*
- (g) *the identification and protection of buildings, places and objects of non-Aboriginal cultural values on land reserved under this Act.*

### **3.1.2 Wilderness Act 1987 (for activities in wilderness areas)**

N/A

### **3.1.3 Biodiversity Conservation Act 2016**

The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of Ecologically Sustainable Development.

The BC Act provides a listing of threatened species, populations and ecological communities, areas of outstanding biodiversity value, and key threatening processes.

Part 7 of the BC Act requires that the significance of the impact of a proposed development or activity on threatened species, ecological communities, or their habitats, listed under the BC Act are assessed using a five-part test in accordance with s.7.3 of the Act. Where a significant impact is likely to occur, a Species Impact Statement (SIS) or Biodiversity Development Assessment Report must be prepared.

An assessment of the potential impact of the proposal on biodiversity is provided in Section 8.2.5 of this REF.



**Table 1. Sydney Harbour National Park Plan of Management – Goat Island Outcomes, Aims and Actions**

Outcome and Aim	Actions	Response
<p>1. Conserve the natural values of the park.</p> <ul style="list-style-type: none"> <li>❖ Developing a sustainable and balanced ecology that enhances the natural values of the island landscape.</li> </ul>	<p>Establish a more natural form of shoreline in those sections of the foreshore not required for operational wharves or structural support.</p>	<p>The demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b within existing disturbed and modified footprints does not adversely affect the natural values of the park.</p>
<p>2. Celebrate and nurture contemporary and traditional Aboriginal culture.</p> <ul style="list-style-type: none"> <li>❖ The significance of Goat Island to Aboriginal people will remain a key component in the interpretation of the island's shared history.</li> </ul>	<p>Continue to liaise with the Aboriginal people of Sydney on matters relating to the protection, management and interpretation of the Aboriginal cultural heritage of the island.</p>	<p>The demolition removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will contribute to the preparation of the culturally significant Goat Island for its handover to Aboriginal ownership and management. The proposed work does not affect Aboriginal cultural heritage or associations.</p>
<p>3. Celebrate the historic heritage values of the park.</p> <ul style="list-style-type: none"> <li>❖ Goat Island's historic buildings, structures, sites and collections will be conserved and interpreted.</li> </ul>	<p>Conserve, adapt and manage buildings and structures on Goat Island in accordance with the Goat Island Conservation Management Plan 2011 and any conditions identified by the NSW Heritage Council.</p>	<p>Section 8.3.2 of this REF details that Goat Island is listed on the State Heritage Register; however, as the subject site (Broadside Wharf 4b and [sections of] 4a and Northern Broadside Wharf 55b) is outside the heritage curtilage, an application for approval under s.60 of the Heritage Act is not required.</p> <p>Though Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b have Moderate to High heritage significance, the proposed demolition works are considered to be consistent with the Goat Island Conservation Management Plan.</p>
<p>4. Provide enriching and memorable experiences in the park.</p> <ul style="list-style-type: none"> <li>❖ To provide special recreational and educational experiences for visitors that draw upon and emphasis the cultural and natural heritage qualities of Goat Island.</li> </ul>	<p>New wharves may be constructed where required for safe and sustainable access to and from the island.</p>	<p>The demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will remove dilapidated, unsightly (collapsed) and unsafe infrastructure.</p> <p>The future re-construction of any/all of Wharf 4b is dependent on variable factors (e.g. budgeting/financial costs, handover to Aboriginal ownership and management).</p> <p>Wharf 55b will not be replaced.</p>

Outcome and Aim	Actions	Response
<p>5. Improved access to the park for all.</p> <ul style="list-style-type: none"> <li>❖ New experiences and facilities will seek to accommodate Sydney's increasingly diverse cultural community while endeavouring to remove barriers to access.</li> </ul>	<p>No specific aim or action is relevant to the proposal.</p>	<p>The existing sections of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b subject to the proposal are dilapidated and unsafe (including collapsed sections), and currently inaccessible to the public. Therefore, the removal of these would not have an adverse impact on existing access to the Goat Island. It is acknowledged other points of access to Goat Island remain unaffected by the proposal.</p>
<p>6. Strengthen and create partnerships.</p> <ul style="list-style-type: none"> <li>❖ Continue to support and build on strong volunteer, commercial and local government partnerships established to support the vision for Goat Island.</li> </ul>	<p>Work in partnership with Sydney Harbour stakeholders and land managers towards a shared vision and lasting legacy for the people of Sydney and Australia by enhancing the amenity, conserving values and providing public access to Goat Island.</p>	<p>Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are on land (the seabed) owned by Transport and leased to NPWS. NPWS have sought Transport's concurrence to demolish Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b.</p>
<p>7. Robust Management of the park is sustained.</p> <ul style="list-style-type: none"> <li>❖ The precinct will provide an excellent example of best-practice management in relation to conservation, training and adaptive reuse design and including environmental sustainability.</li> </ul>	<p>Consider the probable effects of climate change, high winds and tides on the lowest parts of the island when considering the retention / removal of buildings and structures on those parts of the island, along with consideration of their significance and condition.</p>	<p>As part of the park wide inter-tidal asset maintenance and heritage protection, NPWS will monitor impacts and implement best-practice maintenance and adaptation for sites directly impacted by rising sea levels. Relevant to the proposal, such sites include inter-tidal ecosystems, sea walls and wharves.</p> <p>Currently, the wharves are not at risk from rising sea levels.</p> <p>The demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will remove dilapidated and unsafe infrastructure; thereby supporting management of Goat Island.</p> <p>Ultimately, the demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will contribute to the preparation of the culturally significant Goat Island for its handover to Aboriginal ownership and management.</p>
<p>8. Contribute to the goal of easy and safe transport to and within the park.</p> <ul style="list-style-type: none"> <li>❖ Provide safe and more-flexible visitor access to Goat Island to service proposed visitation opportunities.</li> </ul>	<p>No specific aim or action is relevant to the proposal.</p>	<p>The existing sections of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b subject to the proposal are dilapidated and unsafe (including collapsed sections), and currently inaccessible to the public. Therefore, the removal of these would not have an adverse impact on existing access to the Goat Island. It is acknowledged other points of access to Goat Island remain unaffected by the proposal.</p>

### 3.1.4 NSW Reconstruction Authority Act 2022

The primary object of this Act is to promote community resilience to the impact of disasters in New South Wales through—

- (a) *disaster prevention, preparedness and adaptation, and*
- (b) *recovery and reconstruction following disasters.*

With reference to Section 38(1) of the Act:

- 1) *A relevant entity must have regard to the State disaster mitigation plan and any relevant disaster adaptation plan in exercising any of the relevant entity's functions that are prescribed by the regulations for the purposes of this section.*

The NSW Reconstruction Authority has developed Australia's first *State Disaster Mitigation Plan 2024-2026* (SDMP) (NSW RA 2024). This supports the NSW Government's commitment to making our communities safer, more resilient and better prepared to face the challenges of disasters caused by natural hazards such as floods, bush fires, storms and cyclones and coastal erosion and inundation.

Chapter 4 of the SDMP outlines 'Tools to reduce hazard exposure' and 'Tools to reduce hazard vulnerability', represented by Actions and Desired Outcomes, however, none are specific to the proposal, as these relate to issues such as: evacuation infrastructure, relocation (movement of people and existing homes and infrastructure), mitigation infrastructure (e.g. sea walls, flood levees, water storage, slope stabilisation), strategic planning controls, warning systems, building codes and standards, community infrastructure. Nonetheless, the proposed work is not inconsistent with these actions and outcomes.

While the proposed demolition work is located within the coastal environment, it is not related to a natural hazard disaster. The proposed work will remove the dilapidated and unsafe infrastructure of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b, supporting management of Goat Island and providing for improved safety, continued conservation, appreciation and enjoyment of the surrounding natural, cultural heritage and recreational values.

### 3.1.5 Rural Fires Act 1997

The objectives of the RF Act are to provide for:

- the prevention, mitigation and suppression of fires
- coordination of bushfire fighting and prevention
- protection of people from injury and death, protection of property from damage, protection of infrastructure and environmental, economic, cultural, and community assets from damage, arising from fires
- protection of the environment.

Reference to the online SEED Map (Central Resource for Sharing and Enabling Environmental Data in NSW) (NSW Government 2024a)—utilising the NSW Bush Fire Prone Lands mapping—does not encompass Goat Island; however, reference to the *Fire Management Plan: Sydney Harbour and Botany Bay (La Perouse Precinct) National Parks* (NSW NPWS 2004) identifies Goat Island as a Heritage Area Management Zone; the objective being: *to protect and maintain the cultural assets and buildings of the Island.*

The potential for the proposal to be a bushfire risk is considered in Section 9.3(5) of this REF.

The proposal, located within existing disturbed and modified footprints, will remove dilapidated and unsafe infrastructure, supporting management of Goat Island and providing for improved safety. It is not considered to impede firefighter access or public evacuation operations. The proposal would not contravene the RF Act, nor would it have an adverse impact on bushfire or bushfire management.

## 3.2 Environmental Planning and Assessment Act 1979

### 3.2.1 Assessment pathway

It is confirmed that a REF is the applicable assessment pathway because each of the following apply:

- The activity is not declared to be state significant infrastructure under s.2.13 of the Planning Systems SEPP.
- The activity may be undertaken in accordance with s.2.80(4) of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) — *Development for the purpose of wharf or boating facilities may be carried out by or on behalf of a public authority without consent on any land.*

Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are located on land (adjoining NPWS estate) leased to NPWS from Transport for NSW, that own the seabed below the mean high-water mark. Transport for NSW, DPIRD Fisheries & NPWS are joint determining authority for the activity and would assess environmental impact of the proposal.

Under s.5.5(1) of the EP&A Act, NPWS (as determining authority & proponent), TfNSW & DPIRD Fisheries (as Determining Authority) 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.*'

This REF complies with the requirement for public authorities to assess the impact of an activity under Part 5 of the EP&A Act.

- The activity is **not** identified as requiring development consent under another environmental planning instrument that prevails over the TISEPP. In particular:
  - The activity is not in a coastal wetland or littoral rainforest, or it does not otherwise meet the criteria for development requiring consent outlined in s.2.7(2) of the State Environmental Planning Policy (Resilience and Hazards) 2021 (RHSEPP).
  - The activity is not coastal protection works or, if coastal protection works, the activity is one of the types of coastal protection works that may be carried out by or on behalf of a public authority without development consent.
  - The activity is not a type of development requiring development consent under s.2.9 of the Resources and Energy SEPP.
- The activity is not declared to be exempt development under an environmental planning instrument or fails to fully meet the requirements for exempt development.

### 3.2.2 Strategic plans

Goat Island is located within an unincorporated area; therefore, there is no Strategic Plan made under Division 3.1 of the EP&A Act relevant to the study area.

### 3.3 Other relevant NSW legislation

#### 3.3.1 Coal Mine Subsidence Compensation Act 2017

Reference to the NSW Planning Portal ePlanning Spatial Viewer (NSW Government 2024b) identifies the Broadside Wharf 4a and 4b component of the subject site is in an area mapped as being subject to previous underground coal mining (Figure 5). The spatial layer includes properties that are located above or in close proximity to underground coal mine workings (NB. some took place in NSW over 100 years ago).

The proposal does not occur in an area mapped as a Mine Subsidence District and so approval from the Chief Executive of Subsidence Advisory NSW (formerly known as the Mine Subsidence Board) is not required.



Figure 5. Underground Coal Mining (Non-EPI)

#### 3.3.2 Fisheries Management Act 1994

In accordance with s.3(1) of the FM Act, *The objects of this Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations.*

2) *In particular, the objects of this Act include—*

- (a) *to conserve fish stocks and key fish habitats*
- (b) *to conserve threatened species, populations and ecological communities of fish and marine vegetation*
- (c) *to promote ecologically sustainable development, including the conservation of biological diversity.*

and, consistently with those objects—

- (d) *to promote viable commercial fishing and aquaculture industries, and*
- (e) *to promote quality recreational fishing opportunities, and*
- (f) *to appropriately share fisheries resources between the users of those resources, and*
- (g) *to provide social and economic benefits for the wider community of New South Wales, and*

- (h) *to recognise the spiritual, social and customary significance to Aboriginal persons of fisheries resources and to protect, and promote the continuation of, Aboriginal cultural fishing.*

NSW Department of Primary Industries (DPIRD) administers the FM Act and associated Regulations. The department has jurisdiction over all fish and marine vegetation in state waters (these powers also extend to Commonwealth waters for some species and fishing methods). This includes permanent and intermittent freshwater areas and 'water land' below the highest astronomical tide in tidal areas, extending to three nautical miles offshore (or beyond where other legislative powers of the state apply). 'Water land' is defined under the FM Act as land submerged by water: *whether permanently or intermittently, or, whether forming an artificial or natural body of water*, and includes wetlands and any other land prescribed by the FM Regulations as water land.

Part 7 of the FM Act provides for the protection of aquatic habitats and whether the proposal will require notification to or approval from NSW DPIRD – Fisheries prior to works commencing if it affects fish, fish habitat, fish passage or harm to marine vegetation (i.e. sections 199, 200, 205 or 219 of the FM Act), including threatened species. 'Fish' - under the FM Act means *marine, estuarine or freshwater fish or other aquatic animal life at any stage of their life history (whether alive or dead)* (including crustaceans, molluscs, worms, insects and other invertebrates that spend all or part of their life cycle in aquatic, but excludes whales, mammals and birds).

Part 7A of the FM Act deals with threatened species conservation and requires that the significance of the impact of a proposed development or activity on threatened species, populations or ecological communities listed under the FM Act are assessed using a seven-part test in accordance with s.221ZV of the Act. Where a significant impact is likely to occur, a SIS must be prepared.

An assessment of the potential impact of the proposal on aquatic habitats and threatened species is provided in Sections 8.2.3 and 8.2.5 of this REF.

The proposed work involves the demolition and removal of an 80 m length of Broadside Wharf (4b and 4a) and 27 m length of Northern Broadside Wharf (55b), inclusive of all piles, and debris/materials on the seabed beneath the wharves and within a 4.5 m zone.

Given that the proposed work is development without consent in accordance with Division 13 Port, wharf or boating facilities – s.2.80(4) of the TISEPP, pursuant to s.2.80(9) of the TISEPP, *In this section, a reference to development for the purpose of navigation and emergency response facilities, wharf or boating facilities or associated public transport facilities for a public ferry wharf also includes a reference to dredging, or bed profile levelling, of existing navigation channels, if that dredging or levelling is—*

- (a) *carried out for safety reasons, or*
- (b) *carried out in connection with any such facilities that, at the time of the dredging or levelling, exist*

Under Part 7, Division 3, of the FM Act, *Dredging and reclamation* is defined as:

**dredging work** means—

- (a) *any work that involves excavating water land, or*
- (b) *any work that involves moving material on water land or removing material from water land that is prescribed by the regulations as being dredging work to which this Division applies.*

**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.*

**water land** means land submerged by water—

- (a) whether permanently or intermittently, or*
- (b) whether forming an artificial or natural body of water.*

Therefore, as the proposed work involves dredging, in accordance with s.199 of the FM Act, NPWS must, before it carries out or authorises the carrying out of dredging work—

- (a) give the Minister written notice of the proposed work, and*
- (b) consider any matters concerning the proposed work that are raised by the Minister within 21 days after the giving of the notice (or such other period as is agreed between the Minister and the public authority).*

Refer to Section 4.1.2 of this REF for DPIRD Fisheries consultation.

Based on a worst-case scenario, under the FM Act, a s.37 permit (in accordance with s.220ZW *Licence to harm threatened species, population or ecological community or damage habitat*) for the emergency rescue of threatened species (i.e. potential occurrence of White's Seahorse), and a Part 7, s.205 permit to harm marine vegetation, will be required.

Per Section 142 of Part 6 of the FM Act, Aquaculture means *(a)cultivating fish or marine vegetation for the purposes of harvesting the fish or marine vegetation or their progeny with a view to sale, or (b)keeping fish or marine vegetation in a confined area for a commercial purpose (such as a fish-out pond)*. No aquaculture is present within the study area and, as the proposal does not involve obstruction of fish passage (no in-stream devices [e.g. cofferdam]), no permits in accordance with s.144 or 219 of the FM Act are necessary.

### **3.3.3 Heritage Act 1977**

The Heritage Act provides protection for items of State heritage significance that are listed on the State Heritage Register (SHR).

In accordance with s.57 *Effect of interim heritage orders and listing on State Heritage Register* of the Heritage Act, subsection 57(1) states: *When an interim heritage order or listing on the State Heritage Register applies to a place, building, work, relic, moveable object, precinct, or land, a person must not do any of the following things except in pursuance of an approval granted by the approval body under Subdivision 1 of Division 3—*

- (a) demolish the building or work,*
- (b) damage or despoil the place, precinct or land, or any part of the place, precinct or land,*
- (c) move, damage or destroy the relic or moveable object,*
- (d) excavate any land for the purpose of exposing or moving the relic,*
- (e) carry out any development in relation to the land on which the building, work or relic is situated, the land that comprises the place, or land within the precinct,*
- (f) alter the building, work, relic or moveable object,*
- (g) display any notice or advertisement on the place, building, work, relic, moveable object or land, or in the precinct,*
- (h) damage or destroy any tree or other vegetation on or remove any tree or other vegetation from the place, precinct or land.*

A Statement of Heritage Impact has been prepared for the proposal (Draft) (Newton et al. (2024); Appendix C).

Goat Island is listed as an item on the SHR (listing no: 00989), the boundary of which aligns approximately with the mean high-water mark. Outside of this, which includes all the wharves, is not included in the listing.

Three items listed on the NPWS Historic Heritage Information Management System (HHIMS) are directly associated with the study area.

Section 8.3.2 of this REF determines that the proposed work does not require approval under s.60 of the Heritage Act as the proposed demolition works are not located within the curtilage of the SHR listing. Refer to Section 8.3.2 of this REF for further details.

### **3.3.4 Marine Estate Management Act 2014**

N/A. The proposed work does not adjoin, and will not affect, a marine park or aquatic reserve.

### **3.3.5 Protection of the Environment Operations Act 1997**

In accordance with Part 3.2 'Licences required for scheduled development work and scheduled activities,' the proposed work is not an activity identified under Schedule 1 of the Act. Therefore, an environmental protection licence issued by the NSW EPA in accordance with s.47-49 of this Act is not required.

Part 5.3, s.120 of the Act, stipulates a person who pollutes any waters is guilty of an offence. Provided the mitigation measures recommended within this REF are implemented, the proposed work is not anticipated to result in the pollution of nearby waters, nor is an approval or permit required under s.122 of this Act.

## **3.4 Commonwealth legislation**

### **3.4.1 Environment Protection and Biodiversity Conservation Act 1999**

This Act regulates the assessment and approval of activities that will have, or are likely to have, a significant impact on Matters of National Environmental Significance (MNES), activities by Commonwealth government agencies and activities by any person on Commonwealth land. MNES currently include World Heritage properties, Ramsar wetlands, a nationally threatened species and ecological communities, migratory species (as listed by the Commonwealth Government), nuclear actions, Commonwealth marine areas and other matters prescribed by the Regulations.

Under the EPBC Act an action will require approval from the minister if the action has, will have, or is likely to have, a significant impact on a MNES. The *Matters of National Environmental Significance – Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DE 2013) provide overarching guidance on determining whether an action is likely to have a significant impact on a matter protected under the EPBC Act. For proposed actions that have the potential to significantly impact on MNES or the environment of Commonwealth land, a referral is required to the Australian Government.

The EPBC Act applies as the activity is on land that contains the following, or the activity may affect:

- nationally listed threatened species and ecological communities or listed migratory species.



An assessment of the potential impact of the proposal on MNES is summarised in Section 8.5 of this REF (refer also to Section 9.7).

The activity will not affect any of the following:

- heritage values of a place on the World Heritage List or National Heritage List
- the ecology of a Ramsar wetland
- nationally listed ecological communities or listed migratory species.

### 3.4.2 Native Title Act 1993

The NT Act recognises and protects native title. The Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions affecting native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register.

With reference to Section 5 of this REF, the existing Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b, subject to the proposal, is considered to conform to the definition of a “public work” — considered to have extinguished native title in relation to the land or waters on which the public work is situated. Therefore, the proposed work (the later “future act”) is validated in accordance with subdivision 24JA of the NT Act.

A search of the National Native Title Tribunal (NNTT 2024a) (referencing the website’s Native Title Vision [NNTT 2024b]) was conducted, with no Native Title holders/claimants identified.

## 3.5 Consistency with national parks policy

Policy name	How proposal is consistent
Neighbour Relations Policy (NSW Government – Environment and Heritage 2021)	<p>This policy applies to all lands acquired or reserved under the NPW Act (except for lands reserved under Part 4A of the Act – unless the Board of Management for those lands has adopted the policy).</p> <p>The policy aims to build and maintain good relationships with the people and groups who live on or manage land next door to national parks, including public or private landholders (including leaseholders) who have a common boundary with NPWS-managed lands or whose properties are accessed through a park, and government agencies that manage land or public service utilities in parks, whose activities may be affected by NPWS activities or may affect NPWS park management.</p> <p>Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are on land owned by Transport. NPWS have sought Transport’s concurrence to demolish Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b.</p>
Visitor safety (NSW Government – Environment and Heritage 2022)	<p>This policy outlines NPWS’ legal duty of care towards people in parks where the risk is foreseeable to NPWS, the risk is not insignificant, and a reasonable person (if aware of the risk) would have taken precautions to limit or remove the risk; and provides guidance about how to address safety issues and reduce risk to park visitors while maintaining park values.</p> <p>The proposed work will remove the dilapidated and unsafe infrastructure of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b, supporting management of Goat Island and providing for improved safety in compliance with current Australian Standards, procedures and guidelines/manuals (see Section 6.2 of this REF).</p>

## 3.6 Summary of licences and approvals

### 3.6.1 Approval required from National Parks and Wildlife Service

Internal NPWS approval or authorisation, including expenditure.

### 3.6.2 Other approvals

While no seahorses were observed during the previous aquatic surveys conducted by Lesryk, there is potential for the vagile species to inhabit the area within the timeframe between these previous surveys and commencement of the proposed work. Therefore, it is recommended that a suitably qualified and licensed aquatic ecologist (or similar person) conduct an aquatic investigation of the proposed subject site immediately prior to the work; whereby a s.37 FM Act permit (in accordance with s.220ZW *Licence to harm threatened species, population or ecological community or damage habitat*) may be required for the emergency rescue of threatened species.

Dependent on the findings of the aquatic investigation immediately prior to the work, a Part 7, s.205 permit to harm marine vegetation (under the FM Act) would also be required.

### 3.6.3 Publication triggers

In accordance with s.171(4) of the EP&A Act Regulation 2021, the REF will need to be published following determination because it is subject to a permit as outlined in Table 2 (a trigger under s.171(4)(b)).

It may also be suitable for publication given the level of public interest in Goat Island.

**Table 2. Triggers for publication of the review of environmental factors**

Permit or approval	Applicable?
Fisheries Management Act, sections 144, 200, 205 or 219	Of these, a permit in accordance with Part 7, s.205 Marine vegetation – regulation of harm will be applicable.
Heritage Act, section 57(1) (commonly known as a section 60 and <b>not</b> an Exemption under section 57(2))	No
National Parks and Wildlife Act, section 90 (AHIP)	No
<i>Protection of the Environment Operations Act 1997</i> , sections 47–49 or 122	No

## 4. Consultation – general

### 4.1 Statutory consultation

#### 4.1.1 Transport and Infrastructure SEPP

The TISEPP requires consultation with relevant authorities as identified in Table 3.

**Table 3. Consultation triggers under the Transport and Infrastructure State Environmental Planning Policy**

Authority (TISEPP section)	Trigger	Applicable to proposal?
Consultation with local council (s 2.10)	Development with impacts on council infrastructure or services (such as stormwater, sewer, water, roads and footpaths)	No
Consultation with local council (s 2.11)	Development with impacts on heritage items listed under the local environmental plan (LEP)	No
Consultation with local council (s 2.12)	Development that will change flood patterns on flood-labile land	No
Consultation with State Emergency Service (s 2.13)	Development on flood-labile land	No
Consultation with local council (s 2.14)	Development that is inconsistent with a certified coastal management program affecting land within the mapped coastal vulnerability area.	No
Consultation with NPWS (s 2.15(2)(a))	Development adjacent to land reserved or acquired under the NPW Act	Yes
Consultation with NPWS (s 2.15(2)(b))	Development on land in Zone C1 that is yet to be reserved under the NPW Act	No
Consultation with Transport for NSW (s 2.15(2)(c))	Development comprising a fixed or floating structure in or over navigable waters	Yes
Consultation with the Director of the Siding Spring Observatory (s 2.15(2)(d))	Development that may increase the amount of artificial light in the night sky and that is on land within the mapped dark sky region	No
Consultation with the Cth Department of Defence (s 2.15(2)(e))	Development located within the buffer around the defence communications facility near Morundah as mapped under the Lockhart, Narrandera or Urana LEPs	No
Consultation with the Subsidence Advisory NSW (s 2.15(2)(f))	Development on land in a mine subsidence district.	No
Consultation with the Willandra Lakes Region World Heritage Advisory Committee and Heritage NSW (s 2.15(2)(g))	Development on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region World Heritage Property	No

Authority (TISEPP section)	Trigger	Applicable to proposal?
Consultation with the Western Parkland City Authority (s 2.15(2)(h))	Development within a Western City operational area (Western Parkland City Authority Act 2018, Schedule 2) with a capital investment value of \$30 million or more	No
Consultation with Transport for NSW (s 2.221)	Traffic-generating development listed in Schedule 3	No

#### 4.1.2 Other statutory consultation

In accordance with s.199 of the FM Act, Lesryk (on behalf of NPWS) notified DPIRD Fisheries of the proposal on 2 December 2024.

DPIRD – Fisheries responded via emailed letter on 19 December 2025. DPIRD Fisheries have advised they have no objections to the proposal, provided the environmental mitigation measures outlined in the notification letter are implemented on site and that they occur as described in this REF for these works. Correspondence with DPIRD – Fisheries is provided in Appendix D.

Additionally, per the FM Act, a s.37 permit (in accordance with s.220ZW *Licence to harm threatened species, population or ecological community or damage habitat*) for the emergency rescue of threatened species, and a Part 7 s.205 permit to harm marine vegetation, will be required.

DPIRD Fisheries are joint determining authority for the proposal.

## 4.2 Targeted consultation

### 4.2.1 Adjacent landowners

Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are located within unincorporated waters on land (Lot 4 DP837195) leased to NPWS by the seabed owner: Transport for NSW.

Transport for NSW are the joint determining authority for the proposal.

In regard to whether piles immediately adjacent and parallel to the seawalls can remain in the seabed, Transport has given its consent for this process provided these are cut at seabed level, to which the proposed work accords.

### 4.2.2 Wider community consultation and/or notification of works

Wider community consultation is not required. The proposed work is a minor, localised activity which addresses the demolition of infrastructure associated with Goat Island.

Members of the public may visit Goat Island during the course of the proposed work; therefore, through the NPWS website, NPWS will provide notification to the local community and visitors about the aim and the progress of the proposal. Recommended mitigation measures are provided in Section 9 of this REF.

### 4.2.3 Interest groups and/or notification

NPWS is leading a project to transfer Goat Island to Aboriginal ownership and management. NPWS will conduct essential works to expedite the transfer process and address immediate maintenance and safety issues. The proposed demolition and removal of Broadside Wharf

4b and (sections of) 4a and Northern Broadside Wharf is a part of the program to address the island's maintenance and safety issues.

There are no past or current Aboriginal social or cultural associations with the wharves, and they do not demonstrate Aboriginal cultural significance. The Me Mel Transfer Committee is aware of the proposal and has raised no objections.

It is expected NPWS would provide notification of the proposed work to commercial boat licence holders that are associated with tourism on the island.

## 5. Consultation – Aboriginal communities

### 5.1 Native title notification requirements

1. Is the land subject to an Indigenous land use agreement (ILUA)? No

Reference to the National Native Title Tribunal website, and the site's Native Title Vision mapping, indicates that the study area is not subject to an ILUA.

2. Has native title been **extinguished**? Yes

Relevant to the proposal, a "public work" is defined in the NT Act (s.253) as—

*(a) any of the following that is constructed or established by or on behalf of the Crown or a local government body or other statutory authority of the Crown, in any of its capacities:*

- (i) a building or other structures (including a memorial) that is a fixture;*
- (ii) a road, railway or bridge;*
- (iii) a well, or bore for obtaining water;*
- (iv) any major earthworks;*

*["major earthworks" means earthworks (other than in the course of mining) whose construction causes major disturbance to the land, or to the bed or subsoil under waters.]*

*(b) a building that is constructed with the authority of the Crown, other than on a lease*

The existing Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b, subject to the proposal, conforms to the definition of a "public work," which is considered to have extinguished native title in relation to the land or waters on which the public work is situated. The northern Broadside Wharf was built in 1942, with Broadside Wharf built between 1946-1949, and the SHNP being reserved in 1975.

The proposed work (the later "future act") is validated in accordance with subdivision 24JA of the NT Act—

- 1) *This Subdivision applies to a future act (the later act) if:*

*(a) an act (the earlier act) took place before the later act and on or before 23 December 1996; and*

*(b) the earlier act was valid (including because of Division 2 or 2A); and*

*(c) the earlier act:*

- (i) was done by the Crown in right of the Commonwealth, a State or Territory; and*

*(d) the earlier act contained, made or conferred a reservation, proclamation, dedication, condition, permission or authority (the reservation ) under which the whole or part of any land or waters was to be used for a particular purpose; and*

*(e) the later act is done in good faith:*

- (i) under or in accordance with the reservation; or*
- (ii) in the area covered by the reservation, so long as the act's impact on native title is no greater than the impact that any act that could have been done under or in accordance with the reservation would have had.*

The proposed works are limited to within the original area of disturbance of the public work.

3. Has there been a determination of native title applicable to the land or is there a native title claim pending? No

A search of the Register of Native Title Claims did not identify the study area within the boundary of any Native Title Claim.

## **5.2 Parks under joint management arrangements other than an indigenous land use agreement**

Is the park's management subject to another joint management arrangement such as a memorandum of understanding? No

## **5.3 Other parks**

NPWS is leading a project to transfer Goat Island to Aboriginal ownership and management. NPWS will conduct essential works to expedite the transfer process and address immediate maintenance and safety issues. The proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf is a part of the program to address the island's maintenance and safety issues.

There are no past or current Aboriginal social or cultural associations with the wharves, and they do not demonstrate Aboriginal cultural significance.

The Me Mel Transfer Committee is aware of the proposal and has raised no objections.

## 6. Proposed activity (or activities)

### 6.1 Location of activity

**Table 4. Summary of activity location**

<b>Description of location</b>	Broadside Wharf 4b and (section of) 4a and Northern Broadside Wharf within the western and northern extent of Goat Island.		
<b>Site commonly known as</b>	The wharves are also known as the Western Wharf (Broadside Wharf) and Skeleton Wharf (Northern Broadside Wharf).		
<b>Park name</b>	Sydney Harbour National Park		
<b>Lot/DP</b>	Lot 4 DP837195		
<b>Site reference</b>	<b>Easting:</b>	<b>Northing:</b>	<b>MGA zone:</b>
<b>Broadside Wharf</b>	333029	6252747	56
<b>Northern Broadside Wharf</b>	333318	6252906	56

### 6.2 Description of the proposed activity

The proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b within the existing structural footprints, inclusive of sections that have already collapsed, will remove dilapidated and unsafe infrastructure, supporting management of Goat Island and providing for improved safety in compliance with current Australian Standards, procedures and guidelines/manuals.

A qualified structural Engineer is to be engaged to carry out an engineering investigation of the subject wharves. The Contractor engaged for the project will assess the method for demolition.

Broadly, the proposed scope of work will involve the demolition and disposal of an 80 m length of Broadside Wharf (4b and 4a) and a 27 m length of Northern Broadside Wharf (55b), inclusive of:

- all components of the timber substructure, decking and connections
- all ancillaries that exist on the wharf except the mooring bollards and signage which are to be removed and provided to the Principal
- timber piles and pile stumps (fully withdrawn) from the seabed (except identified piles which will be cut off at seabed level)
- all debris and materials located on the seabed under the wharf and within a 4.5 m zone around the wharf.

Based on a worst-case estimate, the proposal would require a total disturbance footprint (i.e. footprint in which construction impact [i.e. demolition] and disturbances would occur) totalling about 0.16 ha, inclusive of:

- 971.75 m<sup>2</sup> (80 m length of Broadside Wharf 4b and section of 4a, by 7 m width; and 4.5 m buffer)
- 582.75 m<sup>2</sup> (approximate 27 length of Northern Broadside Wharf 55b, by 14 m width [at its widest point]; and 4.5 m buffer)



All demolition and removal works will be completed in accordance with, but may not be limited to, the following Australian Standards, procedures and guidelines/manuals.

Standards, procedures, guidelines/manuals	How proposal is consistent
Australian Standards	The proposal is in compliance with Australian Standard 2601-2001 <i>The demolition of structures</i> , and any standards specified in the final design plans.
NPWS Guidelines	The proposed work will meet the performance requirements contained within the NPWS <i>Park Facilities Manual</i> (internal document, OEH 2016).
NPWS Construction Assessment Procedures	<p>The requirements within the <i>Construction Assessment Procedures</i> (OEH 2011c) apply to all building and infrastructure works, including demolition, on lands reserved or acquired under the NPW Act.</p> <p>As previously stated, the NPW Act is not applicable to the proposal; nonetheless, as the proposed works is carried out by NPWS, it is expected (where applicable) that works will remain consistent with this document.</p>
NSW Standards and manuals	<p>Demolition works must be in accordance with <i>Work Health and Safety Regulation 2017</i> and relevant WorkCover Authority codes of practice and standards.</p> <p>SafeWork Australia <i>Demolition Work Code of Practice</i>.</p> <p>All erosion and sedimentation control devices to be in accordance with <i>Managing Urban Stormwater: Soils and Construction</i> (the Blue Book) (Landcom 2004).</p>

### 6.2.1 The proposed activity: pre-construction, construction, operation and remediation

The following proposed staging of works is provided, pending a final demolition plan.

#### Pre-construction

1. Contractor to prepare Construction Environmental Management Plan (CEMP) and Erosion and Sediment Control Plan (ESCP).
2. Identify all existing (and disused) utilities and service lines at the subject site, including undertaking a Dial Before You Dig. Protect and preserve those to be retained. Liaise with, notify and seek approval from each existing utility owner as necessary.
3. The contractor appointed for the work is to make contact with the Waterways Operations Sydney Harbour division of Transport for NSW to discuss the on-water works and the Waterway Management Plan required prior to commencement of the works.
4. Harbour Master's approval from NSW Port Authority will be sought for no wash and low wash zones around the proposed work area.

#### Site establishment

5. Contractor site inductions. As part of this, all personnel are to be briefed on site sensitivities (i.e. Type 1 and 2 Key Fish Habitat (KFH), threatened species habitat, heritage values — these are discussed individually in subsequent sections of this REF).
6. Establish maritime navigation exclusion zones.



7. Install temporary sediment controls identified within the ESCP; to be monitored and maintained for the duration of the work period (particularly after periods of heavy rainfall).
8. Establish temporary compound/stockpile site on the crane barge.
9. Qualified, licensed personnel are to disconnect, cap or otherwise control all identified utilities and service lines not required for the demolition work within the structure to be demolished or to be retained.
10. Install on-site temporary signage, including to delineate work areas as required for the duration of the work period. Required signs would include necessary safety and explanatory signs (e.g. location identification vessel limits, no mooring).
11. Temporary mooring of crane barge alongside subject site and delivery of equipment.

### **Construction**

12. Prior to demolition works, all debris and materials will be cleared from the seabed under the wharves and within a 4.5 m zone, and checked for marine life by a licensed ecologist.
  - Identified protocols (i.e. *Seahorse Relocation Protocol*) will be followed where marine life is detected.
13. All demolition material will be temporarily stored on the crane barge.
14. Using the crane barge:
  - Demolition and removal of existing structure of Broadside Wharf 4b and section of 4a, and section of Wharf 55b, including:
    - all components of the timber substructure, decking and connections,
    - all ancillaries that exist on the wharf (except mooring bollards and signage which are to be removed and provided to the Principal)
    - all timber piles and pile stumps will be fully withdrawn from the seabed, except identified piles which will be cut off at seabed level.

### **Post-construction**

15. Waste to be transported off-site for disposal at a licensed waste management facility. Waste would be disposed of in accordance with the NSW Waste Classification Guidelines (NSW EPA 2014).
16. Recycle or dispose of material in accordance with EPA statutory requirements.
17. Demobilisation. Subject site to be cleared of barge, temporary signage and maritime navigation exclusion/buffer zones, and made good (i.e. removal of waste).
18. Carry out a final survey of the subject site and surrounding area upon completion of the demolition, certifying conformity to the specification.
19. Provide a seabed clearance survey upon completion of the works to certify that all piles and debris have been removed and no underwater obstacles remain. The seabed clearance survey is also to confirm that any piles permitted to be cut off at seabed (near seawalls) are not protruding out of the seabed.

## **6.2.2 The activity footprint (size of the area of impact)**

The proposed work would occur within the existing disturbed and modified structural footprint of the wharves. Based on a worst-case estimate, the total demolition disturbance impact footprint would be restricted to an area about 0.16 ha in size.

The extent of disturbance would be restricted to the proposed work and accommodating the associated short-term impacts that permit ancillary areas and the movement of personnel.

### 6.2.3 Proposed construction methods, materials and equipment

The demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will be conducted in accordance with Australian Standard 2601-2001 *The demolition of structures*. The demolition sequence will be developed by the approved works contractor, considering all environmental and safety matters.

In accordance with *Construction Assessment Procedures* (OEH 2011c), all demolition work must be undertaken safely and will minimise risks to the health and welfare of people (including park visitors) in accordance with work health and safety requirements.

Specifics of the proposed scope of work is to be in accordance with instructions provided in the finalised design plans.

It is acknowledged timber piles and pile stumps will be fully withdrawn from the seabed, except identified piles which will be cut off at seabed level. The pile is not to be pulled completely out of the seabed using a large load; the load is to be incrementally increased for final extraction. The proposed method of pile extraction is as follows:

- Position and anchor barge as close as possible to pile locations.
- Pulling chains to be positioned below any “necking” in the tidal zone.
- 15 tonne load to be put onto pile. Hold for 5 minutes.
- 20 tonne load to be put onto pile. Hold for 5 minutes.
- 25 tonne load to be put onto pile. Hold for 10 minutes.
- 30 tonne load to be put onto pile. Hold for 10 minutes.
- 35 tonne load to be put onto pile. Hold for 10 minutes.
- 40 tonne load to be put onto pile. Hold for 10 minutes.
- 45 tonne load to be put onto pile. Hold for 10 minutes.
- 50 tonne load to be put onto pile. Hold for 10 minutes.

If the piles to be removed cannot be extracted, the Contractor shall use water or air jetting to reduce suction to improve the ability for the pile removal.

Demolition of existing infrastructure assets requires a New Works Certificate and Completed Works Certificate if the works are over \$200,000 in value. Certificates must be approved by the NPWS Regional Manager, Greater Sydney Branch, in accordance with the *Construction Assessment Procedures*.

The proposed work will be consistent with NPWS policies and best practice procedures per the standards, procedures, guidelines/methods as described under Section 6.2.

A crane barge will be used to transport personnel, equipment and demolition materials to and from the work site.

The proposed work is to be carried out by contractors engaged by NPWS.

### 6.2.4 Receival, storage and on-site management for materials used in construction

A crane barge will be used to transport personnel, equipment and demolition materials to and from the subject site.

All demolition material will be stored on the crane barge within the temporary compound/stockpile site. No land-based stockpile site is proposed; however, if required, this may be permitted within existing hardstand areas within Lot 4 in accordance with temporary sediment controls identified within the ESCP.

All work amenities will be provided on the barge.

It is expected the crane barge will need to be manoeuvred into position using towing and/or pushing vessels and may need to be kept in-situ over multiple tide cycles. Holding a barge in place for construction works is generally done using barge-mounted winches and wires connected to pre-placed mooring blocks (weighing about one tonne).

### **6.2.5 Earthworks or site clearing including extent of vegetation to be removed**

The proposed works involve minor and localised seabed excavation, as timber piles and pile stumps will be fully withdrawn from the seabed.

However, to prevent adverse impact on the structural integrity of the seawall adjacent to the wharves, identified wharf piles directly next to the wall will be cut off at seabed level to avoid destabilisation.

No dry land-based excavation is required to permit the proposed demolition works.

To minimise further site disturbance, the sea bed floor will be permitted to naturally stabilise and return to pre-disturbance topography condition through wave and tidal action.

Protected species of marine vegetation, including TYPE 1 and 2 KFH, and marine macroalgae, are identified in association with the wharves and, based on a worst-case scenario, will require a permit in accordance with Part 7 s.205 Marine vegetation – regulation of harm of the FM Act (refer to Section 8.2.5, page 52 of this REF for further details).

### **6.2.6 Environmental safeguards and mitigation measures**

A CEMP is anticipated to be prepared by the contractor as required under the construction contract conditions. The CEMP would set out the methods to manage the demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b, and will include environmental safeguards and mitigation measures in accordance with all relevant construction, environmental and safety legislation and guidelines, and conditions of determination of this REF.

### **6.2.7 Sustainability measures – including choice of materials and water/energy efficiency**

Beyond the measures provided below, as the proposal is for the demolition and removal of the deteriorating and damaged Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b, sustainability measures are impractical.

- Enacting recycling methods (where applicable) of demolition material in accordance with EPA statutory requirements.
- Transport movements would be coordinated to minimise fuel consumption. All transport, machinery and equipment used would be serviced and maintained to ensure efficient operation and energy use.

### **6.2.8 Construction timetable and staging and hours of operation**

Generally, the work would take place within standard working hours in accordance with the *Interim Construction Noise Guideline* (NSW EPA 2009):

- 7:00 am – 6:00 pm Monday to Friday
- 8:00 am – 1:00 pm Saturday.

No work would be carried out on Sundays or public holidays unless authorised by written approval from NPWS.

For safety reasons, demolition works may need to take place at night when the water is calm and wind speed is generally 0.5 m/s, and when the harbour is not busy and there is low impact from vessel wash.

It is expected works would take place intermittently, between which quiet periods would occur before the next stage progresses.

## 7. Reasons for the activity and consideration of alternatives

### 7.1 Objectives and reasons for the proposal

1. Demolish and remove dilapidated and unsafe infrastructure of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b.
2. Removal of Broadside Wharf 4b is necessary to permit assessment of the condition and repair methodology for the seawall.
3. Collapsed sections of the wharf structures are a threat to visitors and shipping.

The proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will contribute to NPWS' island-wide remediation program to address immediate maintenance and safety issues, in preparation of Goat Island's handover to Aboriginal ownership and management.

### 7.2 Consideration of alternatives

#### Do-nothing

This option would mean retaining Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b in their current condition, with no demolition works carried out.

This option is considered untenable given the partially collapsed, dilapidated and unsafe standard of the wharves in light of their [typical] use as an entry point for public access to Goat Island — which is currently unfeasible; and, with regard to Broadside Wharf 4a +4b, as a land/sea interface for commercial ship repair services and its light duty Materials offload platform (MOP); and, ultimately, the objective to address immediate maintenance and safety issues in preparing Goat Island for its transfer to Aboriginal ownership and management.

Fundamentally, the do-nothing option would not meet the objectives of the proposal, nor comply with the objectives of the NPW Act, the PoM and identified NPWS' policies.

#### Repair of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b

An alternative to repair the partially collapsed section of Broadside Wharf 4b is not viable. As identified within the *Goat Island Conservation Management Plan* (CMP; OEH 2011a), *the wharf is currently disused and it is proposed to remove the wharf as it is not recoverable.*

Similarly, the CMP identifies that [of the Northern Broadside Wharf 55b] *the western end, providing access to the ferry wharf has been repaired, the remainder of the wharf has been demolished.* It is noted that the skeletal structure of a section of Wharf 55b remains, which is subject to the proposed demolition and removal works assessed within this REF.

## 7.3 Justification for preferred option

The preferred option is the proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b.

This option is considered to be a prudent, balanced and financially justifiable method that would:

- Address the partially collapsed, dilapidated and unsafe condition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b
- Remove hazards and improve safety
- Permit assessment of the condition and repair methodology for the seawall near Wharf 4b
- Conserve heritage values
- Conserve the natural values of the study area
- Meet the objectives, and management principles in accordance with s.30E, of the NPW Act
- Meet the identified outcomes of the PoM
- Comply with identified NPWS policies
- Meet NSW and Commonwealth legislation
- Meet relevant Australian standards.

## 7.4 Site suitability

NPWS is the proponent for the project and it is not seeking a lease or license. As such, completion of a site suitability assessment is not required.

# 8. Description of the existing environment

## 8.1 Overview of the project area

Goat Island is one of the 12 precincts encompassed within the SHNP ('Goat Island' is identified as Precinct 11).

The Goat Island CMP (OEH 2011a) details that Broadside Wharf 4a + 4b is located within the western extent of Goat Island, known as the Shipyard Precinct, with the Northern Broadside Wharf 55b located within the North Depot Precinct. A description and analysis of the wharves is provided in Figures 6-10 (below).

The Northern Broadside Wharf consists of two components; a timber wharf repaired in 2008 with a then new concrete deck (wharf 55b) and a section of condemned wharf with no concrete deck, the deck having been removed in 2008 while safe to do so (Newton et al. 2024).

In reference to a 2023 Condition Assessment Report of the Goat Island seawalls prepared by Consult Marine, there are two types of seawall behind Broadside Wharf 4b (Monier Trestle & Plate and Sandstone block wall) and one behind 4a (Concrete sheet pile), with three types behind/proximate to Northern Broadside Wharf (Sandstone block walls, Mass concrete wall). The seawalls would not be affected by the proposed demolition and removal works.




4, 4a,*	1946	Broadside Wharf	Reasonably intact	Good
		<p>The Broadside Wharf is a single wharf, however for convenience described in two sections: 4a being the part of the wharf fronting the Ship Repair Workshop, 4b being the part of the wharf north of Ship Repair Workshop.</p> <p>4a is a timber framed wharf on hardwood piles (350x350) with timber headstocks (350x350) and girders (350x250), a concrete deck (120-150 thick) and painted timber handrail to the southern end, set in front of and attached to a stone sea wall and providing access to the sea side of the shipwright's shop. The wharf extends and connects to wharf 4b and also extends around the southern end of the Ship Repair Workshop (1) as a narrow walkway linking to the shore. A set of access stairs is located at the south-west corner to provide small boat and ferry passenger access. The wharf is partially concrete decked but was originally timber decked. The core construction that remains dates from the mid 1940s reconstruction of the area when adjacent buildings were also constructed on an area of reclaimed land. The construction is standard, uses a regular pile grid and is similar to the other 1940s (and later) period wharf construction, all of which had a common designer and construction period. A number of fenders are located along its length these are 200 - 300mm squared timber with a splayed top. The wharf has undergone extensive repairs during 2007, using new hardwood piles and headstocks, and concrete decking. It is used in conjunction with the commercial use of the shipyard in contrast to general mooring as seen on the north side of the island.</p> <p>The wharf is used to provide access between vessels to the shore buildings containing stores and workshops. Use of the wharf is currently shared between the shipyard lease (northern part) as the main access point to the island for staff and public (southern end).</p>		

Figure 6. CMP description of Broadside Wharf 4a


4, 4b*	1946	Broadside Wharf	Partial collapse	Very Poor
		<p>Wharf 4b is a long timber framed wharf extending from the Ship Repair Workshop (1) alongside the slipways as a freestanding wharf set on hardwood piles (350 x 350mm) with raking piles at every second grid. It connects to the coal loader wharf at its northern edge. The wharf is partially covered in a concrete topping.</p> <p>The construction is standard with timber decking (under the concrete in places), a concrete deck of approximately 120-150mm thick, headstocks (350 x 350mm), girders (300 x 300mm) and evenly spaced cast iron bollards. The wharf featured a small hand operated crane and several light standards. It has several timber ladders extending into the tidal zone and several fenders.</p> <p>The wharf was used for berthing of vessels under repair or construction with rail access to the workshops.</p> <p>The wharf is in very poor condition with most piles missing or failed. In 2010 a section of the wharf collapsed including the hand-operated crane that is now under debris on the harbour floor. Due to its condition, the wharf is currently disused and it is proposed to remove the wharf as it is not recoverable.</p>		

Figure 7. CMP description of Broadside Wharf 4b

Wharf Name	Rarity	Representativeness	Comment
Broadside Wharf 4a + 4b (partially collapsed)	Rare	Representative	This wharf is rare due to the relationship to the shore building that appears to be the only such example remaining in the Harbour. The section fronting the shore buildings is the most important section of the wharf as it relates to the shipyard buildings. Sections of the wharf have collapsed and will be removed.

Figure 8. CMP analysis of Broadside Wharf


55b	1942	Northern Broadside Wharf	Demolished eastern end - west end reconstructed 2008,	Good
		A standard hardwood pile wharf (350mm diameter), two bays wide with timber superstructure of headstocks (350 x 350mm) and girders (300 x 300) attached to a stone seawall. The wharf extended for the full length of the reclaimed foreshore on the eastern face of the precinct and projected past this point to connect via a ramp to the eastern wharf. This was the last section of wharf to be built around this end of the island. The western end, providing access to the ferry wharf has been repaired, the remainder of the wharf has been demolished.		

Figure 9. CMP description of Northern Broadside Wharf 55b

Northern Wharf 55a + 55b (largely demolished)	Not rare	Representative	This was a typical and standard broadside or shore wharf similar to others in the harbour and around Australia.
---	----------	----------------	---

Figure 10. CMP analysis of Northern Broadside Wharf 55b

The subject site of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b is devoid of any terrestrial vegetation; however, a maintained lawn occurs adjacent to Wharf 55b on the landward (southern) side of the wharf, featuring two Eucalypt trees.

Appendix E provides a photographic record of the study area assessed in this REF.

As part of the Goat Island CMP, a detailed heritage inventory of Broadside Wharf is included in *Volume 3 Site Database* (OEH 2011b).

The southwestern end of the Broadside Wharf and Ship Repair Workshop appears to have been partially constructed over a stone jetty and the sites of these small structures shown in an 1891 survey, and an 1890s photo of the magazine complex (OEH 2011b). Further development occurred in 1925, while in 1946-1949 the wharf was rebuilt in its present form (OEH 2011b). In 1969 the wharf was re-decked in concrete; and in 2007 NPWS undertook replacement of concrete decking where it had failed along with the substructure below and replacement of deteriorated hardwood piles and headstocks (OEH 2011b).

The condition assessment within the heritage inventory details that Wharf 4a is in overall good condition. Wharf 4b, particularly the northern section, is in very poor condition with many piles missing or failed and the majority of timber elements failed. Most of this section of the wharf is no longer safe for use or access and it is now closed (OEH 2011b).

It is acknowledged the Northern Broadside Wharf 55b is not assessed within the CMP's Volume 3 heritage inventory.

### **Surrounding land use:**

Broadside Wharf 4a currently serves as mixed use:

- An access point for visitors to Goat Island
- Light duty MOP
- Land/sea interface for commercial ship repair services.

As previously stated, Broadside Wharf 4b is closed — unsafe or inaccessible for its typical Shipyard use. Similarly, sections of Northern Broadside Wharf 55b are closed.

Both wharves front several existing buildings, including the Slipway Workshop and repair workshops (Broadside Wharf 4a + 4b); and the Gear Shed and Corrugated Iron Shed (Northern Broadside Wharf 55b).

The Magazine Precinct is a core area of the island that contains the majority of the colonial period buildings centred around the extensive quarried cut bench for the construction of the powder magazines and their enclosing fortified stone wall. The area was significantly altered by the overlaid maritime shipyard use which reclaimed the foreshore, placed buildings and wharves into the forecourt of the magazine and saw some significant changes to the colonial period buildings (OEH 2011a).

The shipyard precinct is the area fronting the waterfront excised from the Magazine precinct when the major shipyard construction, including filling to extend the foreshore and further quarrying for slipways, took place. The precinct comprises three related components: slipways, wharves and ship repair workshop buildings. This is an industrial precinct, virtually devoid of natural or introduced landscaping (OEH 2011a). The western edge of Goat Island (featuring the Shipyard Precinct) is the most modified part of the island.

The North Depot area is defined by the area below the escarpment and quarried face along the northern edge of the island extending around the eastern tip. It comprises the remaining wharves, a section of the sea wall and areas of reclamation that now contain a series of maritime buildings built during the Maritime Period: MSB phase of occupation (OEH 2011a).

### **Meteorological data:**

According to monthly rainfall figures from Sydney (Observatory Hill), the mean annual rainfall experienced by the study region is about 1211.1 mm, with the greatest falls of 133.1 mm being encountered during the month of June (BoM 2024a). January has a mean maximum summer temperature of 26°C, while July is the coldest month with a mean minimum of 8.1°C.

## **8.2 Natural values**

### **8.2.1 Geology, geomorphology and topography**

A *Sampling and Analysis Quality Plan* has previously been prepared for Goat Island (Greencap 2022). Reference to the report identifies that the Sydney 1:100,000 Geological Sheet describes the area in which [Goat Island] lies as being underlain by Hawkesbury Sandstone.

The *Soil Landscapes of the Sydney 1:100,000 Sheet*, utilising the SEED Dataset mapping (State Government of NSW and NSW DCCEEW 2009), identifies that the subject site is located within mapped Disturbed Terrain (Figure 11).

Disturbed terrain geology is artificial fill; dredged estuarine sand and mud, demolition rubble, industrial and household waste, and also includes rocks and local soil materials. The landscape is characterised by level plain to hummocky terrain, extensively disturbed by



human activity, including complete disturbance, removal or burial of soil (Chapman and Murphy 1989).

Goat Island is a small island formed from eroding sandstone bedrock (Newton et al. 2024).

Natural elevations within the area investigated are between -2 and 2 m Above Sea Level.

There are no identified land stability issues. A rockfall hazard has not been identified in regard to the proposal.

The proposed work will be restricted to the existing disturbed and modified structural footprints of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b; with only minimal disturbance of adjacent areas anticipated. Provided recommended mitigation measures identified within Section 9 of this REF are implemented, the proposed work would not have any adverse impact on geodiversity or result in any significant adverse alteration or change to landform features within the surrounding landscape.



**Figure 11. Soil Landscape mapping**

## **8.2.2 Soil types and properties (including contamination)**

Disturbed Terrain soils are turfed fill areas commonly capped with up to 40 cm of sandy loam or up to 60 cm of compacted clay over fill or waste material. Limitations are dependent on nature of fill material and can include mass movement hazard, unconsolidated low wet strength materials, impermeable soil, poor drainage, localised very low fertility and toxic materials (Chapman and Murphy 1989).

No seabed geotechnical or contamination investigation has been prepared for Goat Island. Nonetheless, Lesryk's previous aquatic investigations of the subject site identified the aquatic substrate to be made up of 1-2 m deep ballast that extended for a distance of up to 3

m (at Broadside Wharf 4a + 4b) and 20 m (at Wharf 55b). Beyond the wharves, the sea floor transitioned to an unconsolidated sediment of mostly silt, with sparse rubble and remnant urban refuse to an observed depth of between 6 m – 8 m.

It is likely that the seabed under the wharves is similar to elsewhere in the eastern Sydney Harbour, which consists of very soft estuarine sediment overlying soft to very stiff residual soil and Hawkesbury Sandstone. Estuarine sediments within the Sydney Harbour tend to be soft-loose, grey to black coloured soils rich in organic matter and shell fragments (Coffey Services Australia 2020a). As elsewhere in Sydney Harbour, there may be a background of heavy metals and chlorinated hydrocarbons in local seabed sediments, but not at elevated levels that would impact most construction activities (Coffey Services Australia 2020b). The background of contaminants in the Sydney Harbour seabed is considered to derive from a range of sources (e.g. urban stormwater discharges, runoff from roads surfaces, soil erosion, sewer overflows, industrial activities, atmospheric deposition).

Section 6.2.5 of this REF details that, to avoid seabed excavation, wharf piers will be cut at seabed level. Similarly, removal of the piles by this method will ensure there is no increased turbidity. No dry land-based excavation is required to permit the proposed demolition works. To prevent any potential erosion risk and off-site movement of sediment/material, an ESCP would be prepared for the proposal and would be in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom 2004).

### **Contaminated and Acid Sulfate Soils**

The Contaminated Land Record (NSW EPA 2024) does not identify the study area as supporting any land that is contaminated.

Should asbestos or asbestos-containing material be present within the wharf structures, SafeWork NSW would be notified in writing at least five working days prior to the commencement of asbestos removal by an organisation licensed at the appropriate class (whether Class A or Class B) (Consult Marine 2024). Any removal of asbestos would be managed in accordance with SafeWork Australia's *How to Safely Remove Asbestos Code of Practice*.

Reference to the NSW Planning portal (NSW Government 2024b), utilising the Acid Sulfate Soils layer, does not identify the study area as mapped acid sulfate soils.

## **8.2.3 Watercourses, waterbodies and their catchments**

Goat Island is surrounded by Sydney Harbour, which the DPIRD Fisheries NSW Spatial Data Portal maps as KFH (DPIRD 2024a) (Figure 12). Reference to the Strahler Stream Order and waterway classification system (DPI n.d.) identifies the Sydney Harbour as Class 1 *Major Key Fish Habitat*, by virtue of it being an estuarine waterway.

Sydney Harbour is a regulated water catchment, with Goat Island also within the mapped Sydney Harbour Foreshores and Waterways Area (see Section 10 of this REF for further details).

Broadly, the proposal involves demolition and removal work of wharf infrastructure within waters of Sydney Harbour. Section 6.2.5 of this REF details that timber piles and pile stumps will be fully withdrawn from the seabed. However, to prevent adverse impact on the structural integrity of the seawall adjacent to the wharves, identified wharf piles directly next to the wall will be cut off at seabed level to avoid destabilisation. Where piles to be removed also occur adjacent to marine vegetation, these, too, are to be cut off at seabed level.

Therefore, pursuant to Part 7, Division 3 of the FM Act, as the proposed work conforms to *Dredging and reclamation*, Lesryk (on behalf of NPWS) notified DPIRD – Fisheries of the proposal in accordance with s.199 of the FM Act to DPIRD. DPIRD Fisheries have advised they have no objections to the proposal, provided the environmental mitigation measures are

implemented on site and that they occur as described in this REF for these works. A number of additional recommendations from DPIRD Fisheries have been incorporated within Section 9 of this REF, including a recommendation that adequate water depth must be maintained underneath all barges and propellers to ensure that marine vegetation is not impacted at any time. At least 600 mm clearance must be maintained between the hull and the river bed, and also between the propeller and the river bed. Where adequate clearances beneath barges cannot be maintained at low tide, works should be restricted to high tide conditions. Correspondence with DPIRD – Fisheries is provided in Appendix D.



**Figure 12. Key Fish Habitat and Coastal Management mapping**

Access to the subject site will be by water. A crane barge is required to be moored offshore, lifting equipment and materials to and from the site.

Although considered a low risk, potential impact on the waters of Sydney Harbour as a result of the proposed work may include: water pollution, fallen debris entering the water, and spills/leaks (e.g. oil) from work machinery/equipment.

To prevent the suspension of fine sediment particles in the water column and ensure the subject site (including deployed environmental controls, e.g. silt screen) is not disturbed by wave action, it is recommended the demolition work is carried out in calm weather conditions.

The proposed work will be conducted within an aquatic environment, and mitigation measures in compliance with *Policy and guidelines for fish habitat conservation and management* (update 2013) (DPI 2013) have been recommended. Provided recommended mitigation measures identified within Section 9 of this REF are implemented (including key measures identified below), the proposed work is not considered to have an adverse impact

on the waters and aquatic environment of Sydney Harbour, the regulated catchment or the Sydney Harbour Foreshores and Waterways Area.

- Avoid unnecessary seabed (substrate) disturbance.
- Appropriate sediment control measures would be temporarily established as required around/within the subject site prior to commencement of work, and kept in place for the duration. These are to be maintained and should not be removed until the work is complete or the area is stabilised.
  - Environmental safeguards (silt screen, booms, etc) would be deployed before, during and as long as necessary after demolition works (e.g. to prevent the escape of suspended sediments, ensure there is no escape of turbid water into the aquatic environment).
  - Where applicable, scheduled inspections of these should be made to ensure compliance.
- For the duration of the project, work should be scheduled for periods of dry weather (<5 mm rainfall).
- Spill kits commensurate to the type and quantity of any hazardous material used must be available on-site at all times.
- The proposed work should be scheduled during calm weather conditions (e.g. undisturbed by wave action).

No wild or scenic rivers are present within the study area.

Refer to Section 8.2.5 of this REF for consideration of aquatic species and their habitat.

Reference to the NSW Government's SEED map viewer (NSW Government 2024a), utilising the EPI Protection Layer, did not identify the study area on land mapped as containing salinity.

## 8.2.4 Coasts and estuaries

Sydney Harbour is a tide-dominated drowned-valley estuary with an open entrance (NSW Government 2024c). Sydney harbour is not an aquatic reserve or marine park.

With reference to the RHSEPP 2021, utilising the Repealed – SEPP (Coastal Management) 2018 SEED Dataset mapping (State Government of NSW and NSW DPHI 2024), the proposed demolition works are not located on land mapped as Coastal Wetlands (s.2.7), Littoral Rainforests (s.2.8) or their proximity areas.

A review of the Protected Matters Search Tool (PMST) (Cth DCCEEW 2024a), based on a 10 km buffer on Goat Island, returned a result for one Wetland of International Importance (Ramsar wetland). The *Towra point nature reserve* is located about 16 km south of Goat Island; as such, the proposal would not affect the ecology of a Ramsar wetland.

With reference to the RHSEPP 2021, utilising the Repealed – SEPP (Coastal Management) 2018 SEED Dataset mapping, the proposed demolition works are located within land mapped as Coastal Environment Area (s.2.10) and Coastal Use Area (s.2.11) (see Figure 12). With the exception of Coastal Wetlands, Littoral Rainforest and Coastal Protection Works (s.2.16) of the RHSEPP, the proposed work — development without consent under s.2.80(4) of the TISEPP — prevails over the conditions of the RHSEPP, and development consent under the RHSEPP is not required. Nonetheless, the proposal has been designed and would be managed to avoid, minimise or mitigate adverse impact to mapped coastal environment areas.

The proposal is not Coastal Protection Works (i.e. beach nourishment activities or works, or 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).

No coastal lakes identified in Schedule 1 of the RHSEPP are located near the study area.



## 8.2.5 Biodiversity

### Aquatic survey methodology

Due to previous on-site surveys conducted as part of investigations relating to Broadside Wharf and Northern Broadside Wharf — the most recent conducted on 4 June 2024, a current, underwater inspection of the subject site was not required.

As part of the desktop assessment, previous studies conducted in the surrounding region and known databases were reviewed to identify the diversity of ecological communities, terrestrial flora and fauna, and aquatic species known for, or potentially occurring in, the study region as listed under the Schedules of the EPBC, BC and/or FM Acts.

The databases and reports referred to include, but are not limited to, the:

- Protected Matters Search Tool (Cth DCCEE 2024a)
- BioNet Atlas database [Atlas of NSW Wildlife] (NSW DCCEE 2024a)
- NSW State Vegetation Type Map (release C2.0M2.0) (State Government of NSW and NSW DCCEE 2023).
- *Review of Environmental Factors: Me Mel Goat Island Remediation: Me Mel Goat Island Remediation: Broadside Wharf 4a and 2008 pontoon repairs within Lot 4 Part 16 DP 837196* (Lesryk 2023a)
- *Aquatic survey Broadside Wharf 4a and 2008 Pontoon repairs Me Mel Goat Island, NSW* (Lesryk 2023b)
- *Review of Environmental Factors: Me Mel Goat Island Remediation: Wharf 54a demolition and Wharf 54b repairs* (Lesryk 2023c)
- *Aquatic survey Northern Broadside Wharf 55b and Broadside Wharf 4a and 4b, Goat Island, NSW* (Lesryk 2024a)
- *Goat Island Wharf 54a&b Pile Repairs and Demolition Works Review of Environmental Factors – Aquatic Ecology Assessment* (MPR 2022; Appendix F).

Scuba assisted aquatic investigations of the subject site have been previously conducted by:

- Lesryk personnel: Harry Engel<sup>1</sup> B.Mar.Sc., Jessica Davis<sup>2</sup> B.Env.Sc (Hons), Oliver Wallace<sup>3</sup> Undergrad.B.Env.Bio, Anthony Jackson<sup>4</sup> B.Art.Eco.Fin, and Tori Engel<sup>5</sup> B.Edu (N.B. not all personnel were involved in both inspections).
- Marine Pollution Research Pty Ltd in June 2021 and September 2022 (MPR 2022).

Table 5 provides the investigation dates and water/weather conditions experienced during the recent Lesryk surveys.

**Table 5. Lesryk aquatic investigations – conditions experienced**

Date	Element inspected	Start time	End time	Water and weather conditions
6 April 2023	Broadside Wharf	10.00 am	10.45 am	Water conditions experienced at the time of the investigation were mild temperatures (mean 20 °C),

<sup>1</sup> Diving qualification: Padi Advanced Open Water Certificate # 22020B5900

<sup>2</sup> Diving qualification: Padi Divemaster Certificate # 377957

<sup>3</sup> Diving qualification: SSI Open Water Certificate # 73101334604201741952/AU

<sup>4</sup> Diving qualification: RAID Explorer 30 Certificate # 43476

<sup>5</sup> Diving qualification: Padi Advanced Open Water Certificate # 1812AH2284

Date	Element inspected	Start time	End time	Water and weather conditions
				<p>smooth surface conditions with moderate boat wake, strong currents and about 6 m visibility.</p> <p>The investigation was conducted during a high tide of 1.53 m. The maximum dive depth reached during the course of the survey was 6.5 m.</p> <p>The above surface weather conditions experienced during this investigation were mild temperatures (18.5 °C), overcast skies (70% cloud cover), slight breeze and scattered showers.</p>
4 June 2024	Broadside Wharf and Northern Broadside Wharf	9.30 am	11.00 am	<p>Water conditions experienced at the time of the investigation were mild temperatures (mean 16 °C), smooth surface conditions with moderate boat wake, strong currents and about 4-6 m visibility.</p> <p>The investigation was conducted during an out-going tide, with a high of 1.53 m at 6.07 am and a low of 0.48 m at 12.03 pm. The maximum dive depth reached during the course of the survey was 8 m.</p> <p>The above surface weather conditions experienced during this investigation were mild temperatures (13 °C), overcast skies (60% cloud cover) and light breeze.</p>

It should be recognised that the data gathered is indicative of the environmental conditions of the site at the time field work was conducted. As documented in the extract provided below from the Marine Pollution Research Pty Ltd report, climatic conditions have an influence on the aquatic microhabitats present in the study area:

*As a result of prolonged and heavy rainfall in and over the catchment of Parramatta River estuary in late 2021 through much of 2022, additional aquatic ecology surveys by MPR surveys for syngnathids ..... indicated that kelp forests had been decimated by the prolonged turbidity and low salinity and no syngnathids were found (MPR 2022 page 16).*

The purpose of the aquatic inspections conducted of the wharves, along with a review of databases, reports, aerial imagery and photographs, was to identify those aquatic plants, habitats and species (primarily vertebrate) present within, and in close proximity, to the subject site; particularly any that are of State and/or national conservation significance as listed under the Schedules to the EPBC, BC and FM Acts.

To determine those species and aquatic habitats present, 2-4 marine ecologists conducted scuba assisted dives under, and around, the wharf structures (particularly the piles proposed to be removed). When conducting the sub-surface dives, parallel linear transects across the entire predicted 'disturbance area' and targeted inspections of any habitat features (e.g. rock rubble, Spiny Kelp [*Ecklonia radiata*]), were carried out.

Each pile associated with the wharves, and the surrounding seabeds, was surveyed for stemming features that could be utilised by Syngnathiformes (seahorses, sea-dragons, pipefish, pipe-horses and sea-moths) for habitat. Where any stands of kelp or other stemming features were located, these were analysed with a torch to identify if any Syngnathiformes were occupying these features.

## Limitations

Considering the objectives of the assessment, no significant limitations to the success of the aquatic surveys, such as limited access and reduced water clarity, were encountered. Use of scuba equipment permitted researchers to survey the proposed disturbance footprint, thereby ensuring that all aquatic habitats were sampled.

During the April 2023 and June 2024 dives, visibility ranged from a minimum of 4 m to a maximum of 6 m. This visibility may have limited the overall number of species recorded, as aquatic fauna is active and any individuals that did not come within these distances of a surveyor would not have been observed. Whilst site visibility reduced the detection of species such as schooling fish, it did not hamper the investigation of the aquatic habitats present, particularly in regards to the detection of any White's Seahorse (*Hippocampus whitei*) individuals or sea grass meadows. Strong tidal currents and water movement from the nearby boat wash zone to the south of the Goat Island were also experienced during the April 2023 dive, these flowing in a southerly direction.

Not all animals can be fully accounted for within any given study area. The presence of threatened species is not static; it changes over time, often in response to longer term natural forces that can, at any time, be dramatically influenced by climatic factors or human-made disturbances. Where required, a precautionary approach was adopted in regards to the presence of certain species, this drawing on both the findings of database searches and the determination of those fauna habitats present.

## Overview of terrestrial and aquatic biodiversity

Two habitat types: aquatic and disturbed/modified environments, present within and adjacent to the subject site are available to aquatic and terrestrial species.

### Terrestrial biodiversity

The subject site of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b is devoid of any terrestrial vegetation; and only the maintained lawn adjacent to Northern Broadside Wharf 55b supports minimal terrestrial flora species, limited to Buffalo Grass (*Bouteloua dactyloides*), Kikuyu Grass (*Cenchrus clandestinus*), Couch Grass (*Elymus repens*), Pig Face (*Carpobrotus aequilaterus*) and two mature native Gum trees (*Eucalyptus* spp.).

The proposal will not affect any terrestrial biodiversity.

No riparian vegetation is present; therefore, the Key Threatening Process: *Degradation of native riparian vegetation along New South Wales water courses*, listed under the FM Act did not require consideration.

Under the NSW Biosecurity Act 2015 'all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.' No weed species listed under Schedule 3 of the NSW Biosecurity Regulation 2017, as a Priority Weed for the Greater Sydney region (DPIRD 2024b) or a Weed of National Significance (DPIRD 2024c) were identified.

Native terrestrial fauna species recorded during previous Lesryk investigations on Goat Island are common to abundant native bird species (protected under the BC Act) located throughout, and well conserved within, the surrounding region; including in association with a range of coastal habitats, as well as urban environments (e.g. Pied Cormorant (*Phalacrocorax varius*), Silver Gull (*Chroicocephalus novaehollandiae*), Australian Magpie (*Cracticus tibicen*). These species would not be reliant upon the study area such that further disturbance would threaten the occurrence of these animals. The species are all expected to be present within the surrounding locality post-work.



### **Aquatic biodiversity**

During the previous aquatic investigations of (and surrounding) the subject site, a number of fish, molluscs and aquatic plants were observed (Appendix G).

In regard to the species recorded, all were either positively identified during the field investigation or identified post survey from photos/samples taken. The species recorded are typical of the aquatic communities present within Sydney Harbour, none being unique to Goat Island.

Generally, various listed cetaceans (whales and dolphins), marine mammals (seals and sea lions), marine reptiles (turtles and sea-snakes) and sea-birds (ocean birds and waders) are known from Sydney Harbour and are known to penetrate the harbour to and beyond the study area (albeit rarely). However, the site does not provide any significant habitat features for these species. Of the species that may occur in the vicinity of Goat Island, few, if any, would be utilising the resources of the inshore intertidal rock reef habitats or the adjacent waters to any great extent and would generally be in the locality as transients or opportunistic feeders.

The potential for threatened species to occur is addressed in the 'Threatened species and populations' sections below.

### **Plant Community Types and Threatened ecological communities**

Reference to the State Vegetation Type Map (State Government of NSW and NSW DCCEE 2023) identifies the study area is mapped as Plant Community Type (PCT) ID 0 – not classified (Figure 13); while PCT 3594 is not within, or near to, either wharf project area.



**Figure 13. Vegetation mapping**

Vegetation mapping identifies the study area as PCT ID 0 – not classified; therefore, no terrestrial or aquatic TECs are present within, or near to, the study area.

During their respective investigations, MPR and Lesryk considered the presence of, but did not record, the EPBC Act listed (and FM Act protected) *Posidonia australis* seagrass meadows of the Manning-Hawkesbury ecoregion (Hawkesbury Shelf bioregion, Port Jackson-Sydney Harbour) EEC in Sydney Harbour. As noted by MPR, 'No seagrass species are reported from Goat Island, specific surveys to date had not found any seagrass around Goat Island' (MPR 2022 page 6).

With reference to the Fisheries NSW Spatial Data Portal (utilising the "Estuarine Macrophytes" layer), no *Posidonia australis* has been mapped around Goat Island.

### **Areas of outstanding biodiversity value or critical habitat**

The Commonwealth's Register of Critical Habitat (Cth DCCEEW 2024b), DPIRD's Register of critical habitat (DPIRD 2024d) and the Areas of Outstanding Biodiversity Value register (NSW DCCEEW 2024b) (in conjunction with Part 3 of the Biodiversity Conservation Regulation 2017) per listings provided under the EPBC, BC and FM Acts did not identify any gazetted areas of critical habitat or Areas of Outstanding Biodiversity Value for any flora or fauna species, populations or communities occurring within or near to the scope of work proposed.

In pursuance of s.220T of the FM Act, 10 areas are identified as critical habitat of the Critically Endangered Grey Nurse Shark (*Carcharias taurus*) (DPI 2002); however, none of these are located within, or near to, Goat Island.

Additionally, a number of areas around Manly are identified as critical habitat for the Little Penguin (*Eudyptula minor*) Endangered Population at Manly; however, these are located over 8 km north-west of the study area and will not be affected by the proposal.

### **Environmental assets of intergenerational significance (AIS)**

Refer to Section 3.1.1 of this REF.

### **Threatened terrestrial species and populations**

The Likelihood of Occurrence table provided in Appendix H gives consideration to a total of 47 threatened flora and fauna species listed under the Schedules of the EPBC and BC Acts, that have been previously recorded (per the BioNet Atlas database) within the last 10 years, and within a 10 km radius of Goat Island. Within the vicinity of Goat Island, the threatened species previously recorded per BioNet Atlas are presented in Figure 14 (note: some species locations may overlap with one 'record' accounting for several animals).

The BioNet did not return any previous records for threatened flora species on Goat Island.

A review of the PMST (Appendix I) returned results for species that have known occurrences or habitat within 10 km.

Given the highly modified terrestrial environment associated with Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b, the extant environment does not meet the lifecycle requirements for the previously recorded threatened fauna species. Therefore, the terrestrial species identified in Appendix H were assessed as having a 'low' or 'moderate' likelihood of occurrence.

While previously recorded within and/or having known habitat within 10 km of the study area, the terrestrial threatened fauna species listed in Appendix H would not occur within, or be reliant upon, the environments present within the area investigated. A number of the threatened animals listed may fly over Goat Island on occasion; however, the proposed work is not considered to have an adverse impact on any of these species. No areas of habitat relied upon by these animals for any part of their lifecycle requirements are to be removed or significantly disturbed, and no barriers to their movement patterns would be erected.



**Figure 14. Threatened species previously recorded in 10 km, in the vicinity of Goat Island**

No large stick nests characteristic of those occupied by raptors (e.g. White-bellied Sea-eagle *Haliaeetus leucogaster*) are present within the study area; therefore, this group of birds is not considered to be roosting within the study area.

There are no hollow-bearing trees present; and the study area does not offer suitable roosting habitat for the previously recorded threatened cave-associated microbats.

As no threatened terrestrial species, populations or ecological communities listed under the EPBC or BC Acts will be impacted, reference to assessment criteria under the EPBC Act's Significance Impact Guidelines or criteria under s.7.3 of the BC Act is not required. No recovery actions or activities (e.g. the NSW Government's Saving our Species strategy) are relevant to the study area.

### Threatened aquatic species, populations and habitat

With reference to previous ecological reports conducted in the vicinity of the wharves (Lesryk 2023a, 2023c, MPR 2022), the potential presence of the fish and seagrass species presented in Table 6, listed and protected under the EPBC and/or FM Acts, have been considered in the preparation of this REF.

**Table 6. Considered threatened and protected aquatic species**

Species	EPBC Act	FM Act
Grey Nurse Shark ( <i>Carcharias taurus</i> )	Critically Endangered	Critically Endangered
Great White Shark ( <i>Carcharodon carcharias</i> )	Vulnerable, Migratory	Vulnerable
Black Rockcod ( <i>Epinephelus daemeli</i> )	Vulnerable	Vulnerable
White's Seahorse ( <i>Hippocampus whitei</i> )	Endangered, Marine	Endangered
Bigbelly Seahorse ( <i>Hippocampus abdominalis</i> )	Marine	Protected
Widebody Pipefish ( <i>Stigmatopora nigra</i> )	Marine	Protected
Stick Pipefish ( <i>Trachyrhamphus bicoarctatus</i> )	Marine	Protected
Hairy Pipefish ( <i>Urocampus carinirostris</i> )	Marine	Protected
<i>Posidonia australis</i>	—	Endangered Population in Port Hacking, Botany Bay, Sydney Harbour, Pittwater, Brisbane Waters and Lake Macquarie LGAs
<i>Zostera capricorni</i>	—	Protected
<i>Halophila ovalis</i>	—	Protected

### Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b aquatic surveys

Lesryk's aquatic investigations of the subject site confirmed that the environment present on the sea floor, below the wharves, is made up of 1-2 m deep ballast (presumably deposited as part of the development and expansion of Goat Island) that extended for a distance of up to 3 m from the existing sandstone sea wall of Broadside Wharf 4a + 4b, and up to 20 m from the existing sandstone wall of Northern Broadside Wharf 55b. Beyond the wharves, the sea floor transitioned to an unconsolidated sediment of mostly silt, with sparse rubble and remnant urban refuse to an observed depth of 6 m – 8 m.



All supporting piles of the wharves were found absent of suitable habitat for White's Seahorse. Vegetation growing from the substrates was considered to be mostly low density and lacking characteristic features that typically support the lifecycle of *Hippocampus* spp. (e.g. dense vegetation to allow attachment, or providing protection from currents and camouflage opportunities). While some piles supported the sparse growth of kelp, no Syngnathiformes were found occupying these features.

Isolated, low-density patches of kelp were observed throughout the Wharf 4a + 4b subject site, predominately growing from the sea floor (Figure 15).



**Figure 15. Approximate distribution of Spiny Kelp patches and benthic substrates around Broadside Wharf 4a + 4b**

Two high-density patches of Spiny kelp (and four low-density patches) were observed beneath Wharf 55b, while a further nine high- and-low-density patches were recorded beyond the subject site, growing amongst deposited ballast or on large boulders within the aquatic survey area (Figure 16).

No Syngnathiformes were found occupying these habitat features, presumably due to the sparsity of vegetation.

It is acknowledged a dense bed of aquatic vegetation dominated by Spiny Kelp (initially recorded in 2023, growing amongst deposited ballast) was re-identified during the 2024 aquatic investigation; however, this is observed about 11 m south of Broadside Wharf 4a (just west of the existing boatshed) and well beyond the subject site.

### **Threatened aquatic species and habitat results**

Four White's Seahorse individuals have been previously recorded among rock rubble kelp habitat underneath Wharf 54b on the northern side of Goat Island in 2021 (MPR 2022) (Figure 17); however, no seahorses were identified during MPR's 2022 investigation (the lack of White's Seahorses during the 2022 was attributed to an influx of fresh water into the Port Jackson drainage system) (MPR 2022).

None of the aquatic fauna species recorded during Lesryk's previous aquatic investigations are listed as threatened under the EPBC or FM Acts.

Though the infrastructure of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b have been deemed unsuitable for White's Seahorse, given the structure of the recorded high-density patches of Spiny Kelp within the study area, these are considered to offer suitable habitat for Syngnathiformes, including the potentially occurring threatened White's Seahorse. As such, per the *Policy and guidelines for fish habitat conservation and management* (DPI 2013), this habitat is classed as TYPE 1 - Highly sensitive KFH.

While no seahorses were observed during the recent aquatic surveys conducted by Lesryk, there is potential for the vagile species to inhabit the area within the timeframe between these previous surveys and commencement of the proposed work.

Therefore, given the presence of suitable habitat for White's Seahorse within, and near to, the subject site, it is considered necessary to conduct a precautionary assessment on this species' potential presence. Assessments referencing the EPBC Act's Significant Impact Guidelines and Part 7A, Division 12, Subdivision 221ZV of the FM Act concluded the proposal would not have a significant impact on White's Seahorse (see aquatic report). The preparation of a SIS is not triggered.

In accordance with the previous aquatic surveys conducted (Lesryk 2023b, 2024a), recommendations were made for a suitably qualified and licensed aquatic ecologist or similar person to conduct aquatic investigations of the proposed subject site immediately prior to work. Due to the instability of the wharves, a pre-work inspection of the wharf structures and debris may not be feasible; therefore, based on a worst-case scenario, a s.37 FM Act permit (in accordance with s.220ZW *Licence to harm threatened species, population or ecological community or damage habitat*) for the emergency rescue of threatened species (i.e. potential occurrence of White's Seahorse) will be required.

In reference to the Marine listing of several species in Table 6, the proposed work is not located within the Commonwealth marine area—being from 3 to 200 nautical miles from the coast—therefore, no assessment referencing the EPBC Significant Impact Guidelines that is relevant to the Commonwealth marine environment, is considered necessary.



Figure 16. Approximate distribution of Spiny Kelp patches and benthic substrates around Northern Broadside Wharf 55b





Figure 17. Previously recorded White's Seahorse and *Zostera Capricornia*

Although Black Rockcod (Vulnerable) is known from the outer harbour and could potentially occur, habitat for this species (rock crevice, caves, rock rubble habitat), is not expected to be directly or indirectly affected by the proposed work.

The DPIRD's Estuarine Habitat Dashboard (DPIRD 2024e) maps *Foreshore – Artificial* proximate to the subject site (Figure 18; indicative study area denoted by yellow circle).

The Grey Nurse Shark (Critically Endangered) and Great White Shark (Vulnerable and Migratory) are known from coastal waters at the mouth of Sydney Harbour; however, these shark species would only be expected in the harbour in pursuit of prey, and would not be expected to penetrate up the harbour as far as Goat Island. No further legislative consideration of these two species within this REF is required.



**Figure 18. Estuarine habitat**

### Marine vegetation

The sub-surface observations made within the proposed disturbance area are consistent with the description provided on page 3 of the MPR 2022 study, which states '*Fish habitat mapping of marine vegetation in the Sydney Harbour estuary by NSW DPI Fisheries in 2018 indicate extensive rock reef habitats and no seagrass beds around Goat Island.*'

None of the aquatic flora species recorded during the previous aquatic investigations are listed as threatened under the EPBC or FM Acts; however, several are protected under the FM Act.

The FM act sets out provisions to protect marine vegetation (mangroves, seagrass and seaweeds whether alive or dead) from 'harm.' 'Harm' under the FM Act means *gather, cut, pull up, destroy, poison, dig up, remove, injure, prevent light from reaching or otherwise harm the marine vegetation, or any part of it.*

Part 7, Section 205(1) Marine vegetation—regulation of harm of the FM Act, applies to—

- (a) mangroves, or
- (b) seagrasses, or
- (c) any other marine vegetation declared by the regulations to be marine vegetation to which this section applies, but does not apply to protected marine vegetation under section 204A

Clarification of “(c) any other marine vegetation,” in reference to the Fisheries Management (General) Regulation 2019 s.228(1), states, *The following are declared to be marine vegetation to which section 205 of the Act applies—*

- (a) attached marine and estuarine macroalgae<sup>6</sup>,
- (b) saltmarsh in a protected area.

Per the regulation definitions, protected species of marine vegetation belonging to the plant classification divisions of *Rhodophyta* and *Phaeophyta*, and marine macroalgae, are identified in association with the wharves.

The 2022 MPR aquatic survey located a  $\geq 5 \text{ m}^2$  patch of *Zostera capricorni* seagrass inshore from [the now demolished] Wharf 54a, about 27 m south-west of the Northern Broadside Wharf 55b subject site (see Figure 17); however, this will not be affected by the current proposed works. Though not listed as threatened, the considered *Zostera capricorni* and *Halophila ovalis* are protected under the FM Act. The DPIRD Fisheries NSW Spatial Data Portal maps the nearest area of *Zostera* off McMahon’s Point about 548 m north-east of the study area (DPIRD 2024a; Figure 19). No *Zostera* is recorded within the subject site.

No intertidal mangroves or saltmarsh is present within the study area; however, the subject site features TYPE 1 - Highly sensitive KFH and TYPE 2 – Moderately sensitive KFH, per classifications in the *Policy and guidelines for fish habitat conservation and management* (DPI 2013) (Table 7). As previously identified, a pre-work inspection of the wharf structures and debris may not be feasible due to the instability of the wharves; therefore, based on a worst-case scenario, a Part 7 s.205 permit to harm marine vegetation under the FM Act will be required where protected marine vegetation is present and harm cannot be avoided.

**Table 7. Type 1 and 2 Key Fish Habitat within the study area**

TYPE	Result
1	High-density patches of Spiny Kelp, considered to offer threatened species habitat (i.e. potentially occurring White’s Seahorse)
2	Marine macroalgae such as <i>Ecklonia</i> and <i>Sargassum</i> species

As detailed in the Threatened Ecological Community section (p43 of this REF) the EPBC Act listed *Posidonia australis* EEC is not present around Goat Island. Furthermore, the *Posidonia australis* Endangered population in Sydney Harbour is mapped within the eastern extent of the harbour; with none indicated around Goat Island (DPIRD 2024f, Figure 20).

<sup>6</sup> s.288(3) of the Fisheries Management (General) Regulation 2019 identifies marine and estuarine macroalgae to mean *those species of non-microscopic plants commonly known as seaweeds that belong to the plant classification divisions of Rhodophyta, Phaeophyta and Chlorophyta that are endemic to New South Wales marine and estuarine waters.*



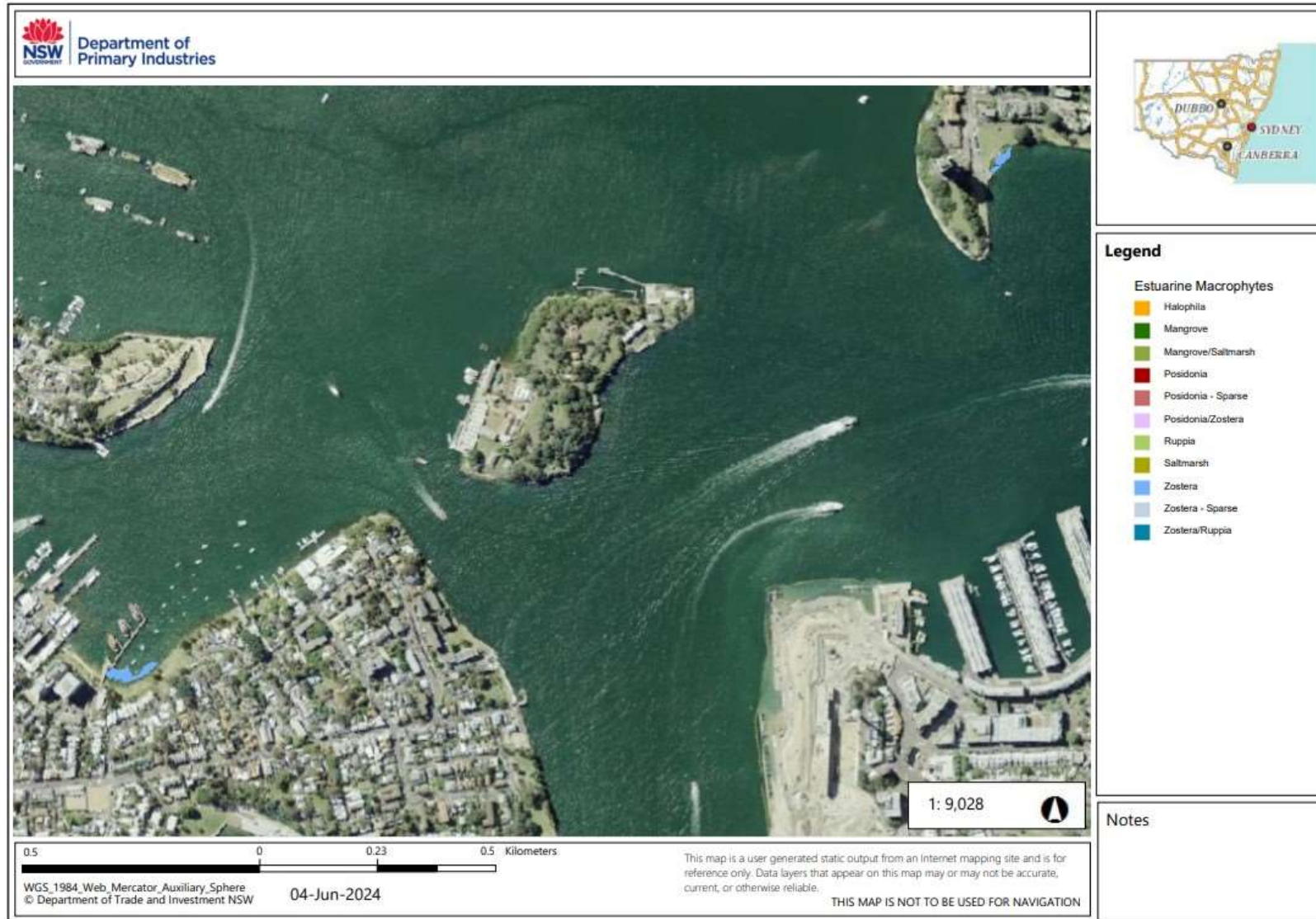
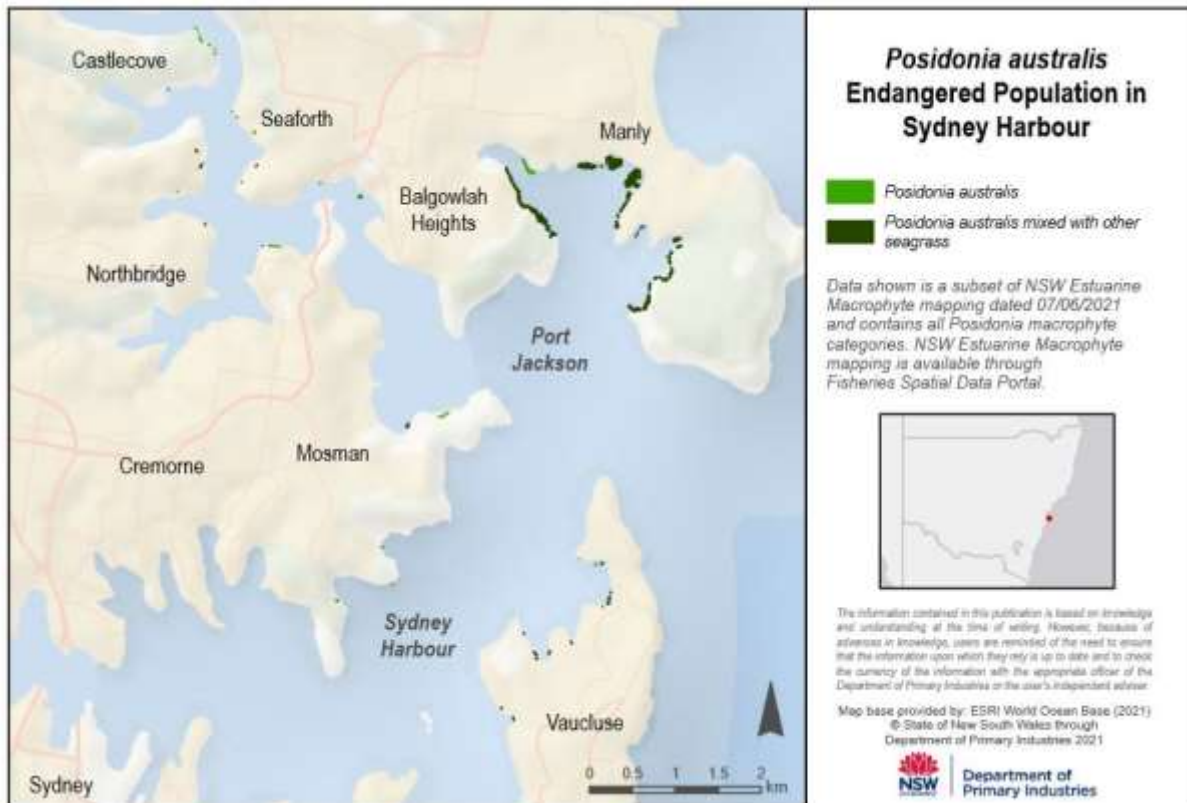


Figure 19. Mapped *Zostera*



**Figure 20. Mapped *Posidonia australis* Endangered population**

Consistent with the habitat losses detailed in the MPR *Aquatic Ecology Assessment* (Appendix F), the removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b infrastructure will result in the loss of artificial hard wetted surface habitat, and attached biota including marine algae and encrusting fauna.

The future re-construction of any/all of Wharf 4b is dependent on variable factors (e.g. budgeting/financial costs, handover to Aboriginal ownership and management), and it is acknowledged Wharf 55b will not be replaced.

Though there will be a loss of artificial hard wetted surface habitat, suitable habitat remains and is predicted to be further colonised (over time) by marine algae and encrusting fauna, providing habitat for those fish observed or expected.

It is noted that habitat for aquatic species has been identified around Goat Island, including close to Wharf 55b, this available for any existing, or displaced, species (Marine Pollution Research Pty Ltd 2022, Consult Marine 2023).

In addition, it has been recommended that at least four (4) 'seahorse hotels' be installed west of Broadside Wharf 55b to offset the potential removal of patches of Spiny Kelp within the proposed disturbance footprint.

In reference to Section 6.2.3 of this REF, it is acknowledged timber piles and pile stumps will be fully withdrawn from the seabed, except identified piles which will be cut off at seabed level. The pile is not to be pulled completely out of the seabed using a large load — the load is to be incrementally increased for final extraction. If the piles to be removed cannot be extracted, it is proposed the Contractor shall use water or air jetting to reduce suction to improve the ability for the pile removal. It is recommended that, where piles occur proximate to recorded patches of Spiny Kelp as identified in Figure 16, these piles are also to be cut off at seabed level to ensure no loss of natural estuarine habitat and that seabed habitat will not be adversely affected.



Post-removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b, pending any potential future re-construction, the subject site in the interim period would benefit through decreased shading of the natural estuarine habitat. In this respect, the amount of time the crane barge is in place is to be managed to reduce the effects of shading on the aquatic environment.

Manoeuvring work vessels and barges, and holding these in place using barge mounted winches and wires connected to pre-placed mooring blocks, has the potential to damage aquatic habitats via vessel or propeller strike/wash. Damage can also occur via mooring or anchoring points deployed in, on or over habitats. As detailed in the *Policy and guidelines for fish habitat conservation and management* (DPI 2013), moorings can harm invertebrates and aquatic vegetation, in particular marine vegetation, through the direct crushing or removal of vegetation during installation of the mooring blocks, and also by the longer-term effects of vegetation removal from swing chains, scalping from wires laid across the seabed, and shading.

Provided the mitigation measures identified within Section 9 of this REF are implemented (including key measures identified below), the proposed work is not considered to have an adverse impact on aquatic species (threatened or otherwise).

- There will be no stockpiling of demolition or construction materials on the seabed.
- Where winches and mooring blocks are used, the blocks will be placed, and buoyancy devices used, to avoid direct damage/impact to habitat such as scalping by sagging cables.

No aquaculture is present within the study area and, as the proposal does not involve obstruction of fish passage, no permits in accordance with s.144 or 219 of the FM Act are necessary

### Key Threatening Processes

Currently, 39 Key Threatening Processes (KTPs) for NSW are listed under Schedule 4 of the BC Act, with additional KTP listed on the EPBC Act (including several equivalents) and FM Acts. Of these, given the aquatic nature of the proposed work, one KTP is applicable to the proposal (Table 8).

Anthropogenic debris is defined as pollution by human-generated objects. The proposed work can avoid this KTP by the contractor ensuring no human-generated objects (e.g. plastic debris) enter the water.

**Table 8. Key threatening processes**

Key threatening process	BC Act	EPBC Act	FM Act
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments (as described in the final determination of the Scientific Committee to list the key threatening process)	✓	✓	×

### State Environmental Planning Policy (Biodiversity and Conservation 2021)

Chapter 4 'Koala habitat protection 2021' of the BCSEPP only applies to development applications assessed under Part 4 of the EP&A Act, not those considered under Part 5 (to which this proposal accords). Furthermore, s.4.4(3)(a) of Chapter 4 'Koala Habitat Protection 2021' of the BCSEPP states that this chapter does not apply to land dedicated or reserved under the NPW Act, or acquired under Part 11 of that Act; the subject site being within SHNP.

### 8.3 Cultural values

#### 8.3.1 Aboriginal cultural heritage

An AHIMS database search of Goat Island was recently conducted by Lesryk on 7 May 2024 (NSW Government 2024e) (Figure 21).

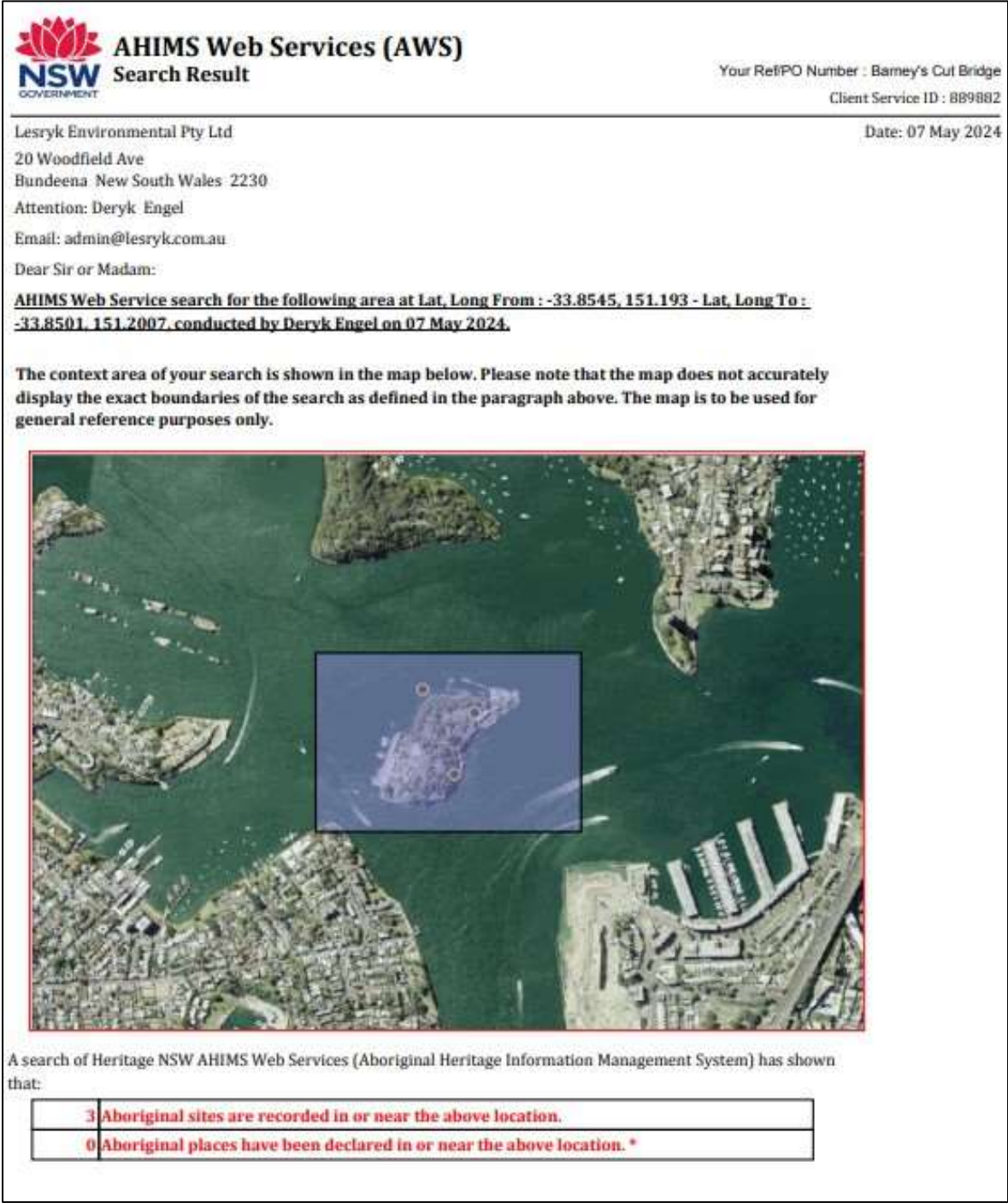


Figure 21. AHIMS basic search results

Section 5 of the SoHI presents an Aboriginal Due Diligence Assessment (summarised in Table 9 below).

Section 5(2) of the SoHI acknowledges two of the previously recorded AHIMS sites on Goat Island are identified as rockshelters/middens. The third is a registration of the whole island for its associations with Bennelong and the history of Aboriginal prisoners on the island in the mid-nineteenth century. The nearest to the subject site is about 74 m south-west of Northern Broadside Wharf 55b, well beyond the impact footprint of the proposal.

Section 5(3) of the SoHI details previous Aboriginal archaeological investigations that have been conducted on (and around) Goat Island. It was concluded that, despite evidence of extensive landform and land use disturbance throughout the assessment area, some portions of the original landform which have been subject to limited ground surface modification have the potential to contain remnant natural soils. It was hypothesised that any remnant natural soils (buried or exposed) have the potential to retain any associated subsurface Aboriginal archaeological deposit. The area encompassing the approximate extent of the original peninsula landform within the assessment area (prior to reclamation works) was identified as an area of archaeological sensitivity. This report is of relevance as it contributes to the predictive model for the region (Newton et al. 2024).

In consideration of the analysis of previously recorded Aboriginal sites, the environmental context, relevant assessments and known historical disturbances, the SoHI desktop assessment presented the following predictive model has been developed for the study area:

- The study area is highly disturbed and maintains a large proportion of reclaimed land. The entire island has been impacted to some degree by tree clearance, and more starkly by quarrying.
- The wharves within the study area are situated on the outskirts of the island's reclaimed land and underwater.
- The sandstone cliff faces in combination with the shallow soils that are highly susceptible to erosion, means that natural soil profiles capable of retaining a significant Aboriginal archaeological deposit in a subsurface capacity are unlikely to be present.
- Goat Island has undergone significant historical disturbance across the site, particularly along the original shoreline (including substantial land reclamation and modification, and mining of the sandstone outcrops).
- Whilst it is possible that Aboriginal archaeological deposits could exist within the seabed surrounding the island, it may be unlikely that these would still remain given the history of the area, or be encountered during the proposed works.
- Overall the study area is deemed to have low Aboriginal archaeological potential, however, any surviving traces of past Aboriginal use on the island would be considered significant.

As a prudent measure, the SoHI outlines precautionary actions to be taken before and during the proposed works. These are provided in Section 9.5(2) of this REF.

NPWS is leading a project to transfer Goat Island to Aboriginal ownership and management. NPWS will conduct works to expedite the transfer process and address immediate maintenance and safety issues, including the demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b. Based on the assessment of Aboriginal cultural heritage, given the land-use history of the study area, shoreline and the conducting of the proposed work on the seabed, adjacent to reclaimed land that has undergone previous development/site disturbance, it is considered that there is very low potential of unexpected Aboriginal objects occurring within the study area; therefore, it is expected the proposal may proceed with due caution, and an AHIP under s.90 of the NPW Act is not required.

There are no nearby declarations under s.153G of the NPW Act of cultural AIS for Aboriginal cultural value. The study area has not been declared an Aboriginal Place under s.84 of the NPW Act.

**Table 9. Generic Due Diligence process**

Step	Comment
1. Will the activity disturb the ground surface or any culturally modified trees?	<p>No. The proposal—restricted to the existing disturbed and modified structural footprint of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf—does not involve any dry land-based excavation.</p> <p>Whilst it is possible that Aboriginal archaeological deposits could exist within the seabed surrounding the island, it may be unlikely that these would still remain given the history of the area, or be encountered during the proposed works.</p> <p>Grinding grooves, engraving sites and culturally modified trees are unlikely to occur within the assessment area as reflected in their overall rarity in the local region (Kelleher Nightingale Consulting Pty Ltd 2020 cited in Newton et al. 2024).</p>
2. Are there any:	
a. relevant confirmed site records or other associated landscape feature information on AHIMS?	Reference to the AHIMS database did not identify any previously recorded sites within the study area.
b. any other sources of information of which a person is already aware?	The study area occurs within an existing disturbed and modified footprint within 200 m of waters. It is unlikely the island would have been a place of permanent occupation given the potential lack of freshwater available.
c. landscape features that are likely to indicate presence of Aboriginal objects?	The study area has now been classified as the Disturbed Terrain soil landscape.
- within 200 m of waters	Previous Aboriginal archaeological investigations recorded the identified AHIMS sites (the midden site found to be overgrown), with no further Aboriginal sites located.
- located within a sand dune system	
- located on a ridge top, ridge line or headland	
- located within 200 m below or above a cliff face	
- within 20 m of or in a cave, rock shelter, or a cave mouth	
- and is on land that is not disturbed land.	
3. Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	<p>Yes. Harm can be avoided as the proposed works would be restricted to existing disturbed and modified areas that have undergone previous development.</p> <p>No previously recorded AHIMS sites were recorded for the study area.</p>
4. Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?	As detailed above, no Aboriginal objects are present or considered likely.

### 8.3.2 Historic heritage values

The NSW *Heritage Act 1977* defines a relic as *any deposit, artefact, object or material evidence that—*

- (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
- (b) is of State or local heritage significance.*

To determine the presence of previously recorded non-Aboriginal [European] cultural heritage within the vicinity of the proposed remediation work, Lesryk conducted a desktop search of relevant heritage databases; the results presented in Table 10.

A Statement of Heritage Impact has also been prepared for the proposal (Appendix C).

**Table 10. Non-Aboriginal (European) cultural heritage listings**

Database	Comment
Australian Heritage Database (Cth DCCEEW 2024d)	<ul style="list-style-type: none"> <li>Water Police Station (former), Goat Island, NSW, Australia – listed as an Indicative Place on the RNE.</li> <li>The SoHI also identified the RNE lists the colonial sandstone structures (buildings and fortified wall) on Goat Island, both separately and as a precinct.</li> </ul> <p>Indicative Place on the RNE means: <i>Data provided to or obtained by the Australian Heritage Council or the former Australian Heritage Commission was entered into the RNE database however a decision on whether the place should be entered in the RNE itself was not made before the RNE was closed in 2007.</i></p> <p>The RNE was closed in 2007 and is no longer a statutory list. The RNE is maintained on a non-statutory basis as a publicly available archive and educational resource. All references to the RNE were removed from the EPBC Act in 2012; as such, no assessment on this listing is required.</p>
Heritage NSW – State Heritage Inventory and Register (NSW Government 2024f)	<p>Goat Island (Listing No: 00989) is identified on the SHR, the boundary of which aligns approximately with the mean high-water mark. Outside of this, which includes all the wharves, is not included in the listing.</p> <p>Whilst the study area locations are technically outside the boundary of the State Heritage Listing, they are directly tied to the item.</p>
Historic Heritage Information Management System (HHIMS) Heritage Act - s.170 NSW State agency heritage register (State Government of NSW and DCCEEW 2019)	<p>Goat Island and its component parts are heritage items within the DECC Section 170 Register numbered from item 3444 to item 3529 (65 separate items).</p> <p>Three of these items are directly associated with the study area.</p>
Maritime Heritage Database (NSW DCCEEW 2024c)	<p>No maritime heritage sites are recorded in association with Goat Island.</p>



Goat Island is identified as a Landscape item on the SHR, with the entire Goat Island included in the State heritage curtilage (within the mean high tide line) (Figure 22); however, as the subject site (Broadside Wharf 4b and [sections of] 4a and Northern Broadside Wharf 55b) is outside the heritage curtilage, an application for approval under s.60 of the Heritage Act is not required.

Numerous HHIMS sites also occur within and surrounding the study area, and within the greater Goat Island (Figures 23 and 24). Those directly associated with the study area are:

- Broadside Wharf; GI4a and 4b
- Wharf archaeological site – Water Police; GI98
- Northern Wharf ruins; GI52a and b

A detailed Historical Development of Goat Island and history of the two sites subject to the proposal are provided in Section 3-5 of the SoHI.

Section 6(4) of the SoHI provides an assessment of archaeological potential. The study area has potential to possess a moderate level of archaeological research significance, providing material evidence for the use and development of several successive historical phases within the study area from the mid-19<sup>th</sup> century to the late 20<sup>th</sup> century (Newton et al. 2024).

The study area may contain archaeological resources, materials of aesthetic or technical significance, and archaeological resources or materials of that reflect the changing use of the study area from the mid-19<sup>th</sup> century through to the 21<sup>st</sup> century (Newton et al. 2024).

The potential archaeological resources within the study area are assessed to meet criterion at a local or State level, dependant on the resource and its ability to provide information about colonial wharf use on Goat Island (Newton et al. 2024). Should examples of previous wharf structures or relics associated with the use of the site (throughout various phases) be uncovered, these may be assessed to meet local or State significance (Newton et al. 2024).

The major physical impact of this proposal will be the removal of timber piles from the seabed, which may have the potential to impact or churn up previous relics, debris or other unrecorded features (Newton et al. 2024).



Figure 22. State Heritage Register – Goat Island (#00989)

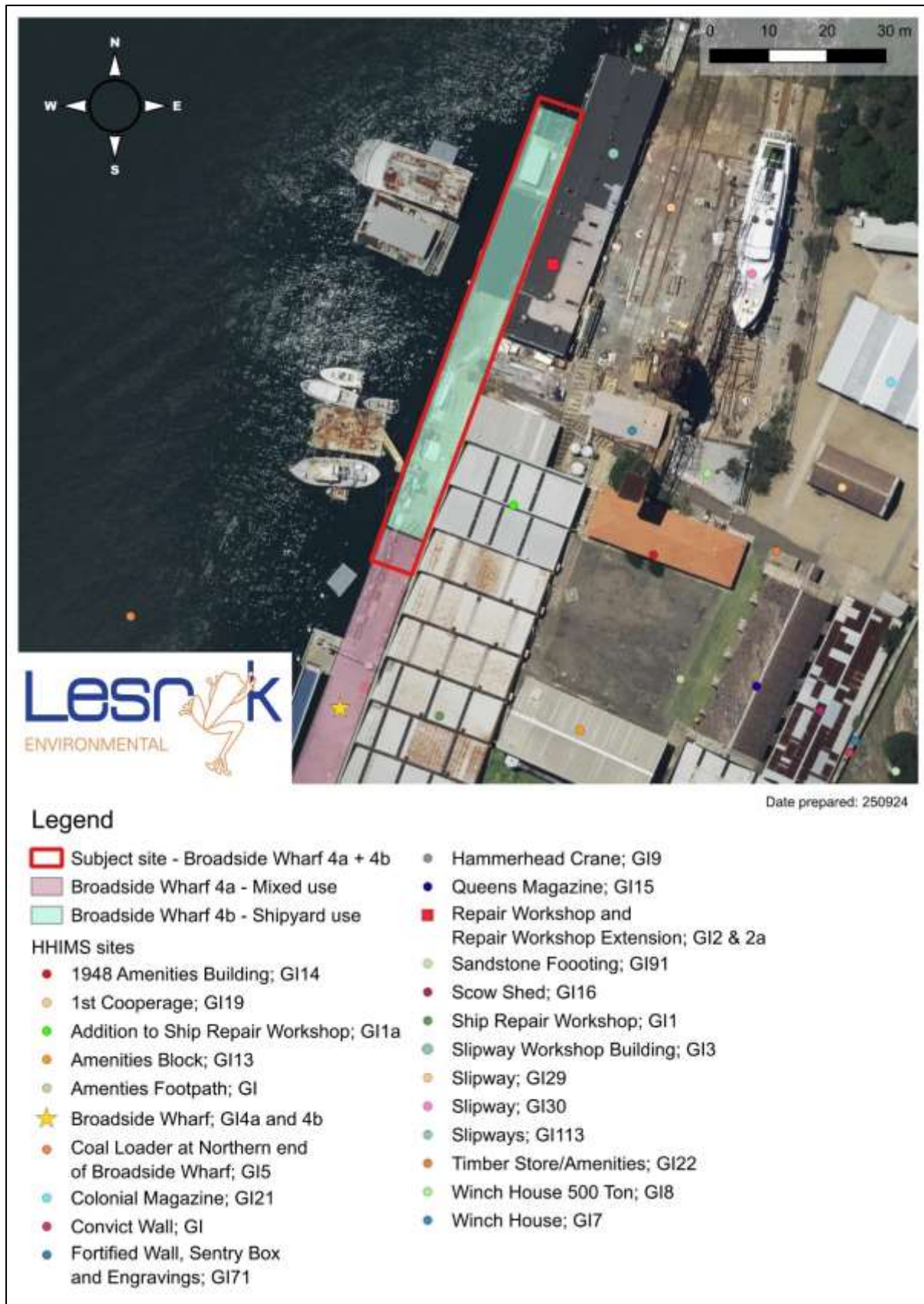


Figure 23. HHIMS sites within and proximate to Broadside Wharf 4a + 4b





Figure 24. HHIMS sites within and proximate to Northern Broadside Wharf 55b

### Goat Island Conservation Management Plan

In accordance with Section 5.4 [Summary Statement of Significance] of the CMP, relevant to the proposed work, *Goat Island has local significance for the collection of wharves and related buildings on Goat Island are representative of timber wharf design and construction within Sydney Harbour, where working wharves from this period have almost disappeared.*

A detailed heritage inventory of Broadside Wharf is included in *Volume 3 Site Database* of the CMP. In contrast, the Northern Broadside Wharf 55b is not assessed within the CMP's Volume 3 heritage inventory.

The CMP provides an archaeological zoning plan for high potential and known locations across the island to contain archaeological resources (Figure 25). The northern stone jetty embedded within the seawall is highlighted yellow on this map. It is unclear whether this map considered the potential for archaeological resources to be present within the land reclamation associated with the wharves or if there is the potential for elements of the wharves and past history to be present within the seabed (Newton et al. 2024).

Table 11 of the SoHI provides a Significance Assessment for Wharf 4b as per the CMP. The wharf is of high significance for similar reasons to wharf 4a except that for nearly all of its length it does not front a shore building. It is also a rare example of a broadside wharf related to shipyard use within the harbour. It defines the edge of the slips. It contributes to the visual value of wharf 4a and the shipyard precinct. It is assessed at both State and local significance as its principal value is now the continuity it provides with wharf 4a, this continuity can be achieved with a section of the wharf being linked to wharf 4a. The CMP also notes in Section 7.7 that whilst Wharf 4b is considered to have moderate-high significance, it obstructs the remnants of the original stone wharf and receiving dock (Newton et al. 2024).

Table 12 of the SoHI provides a Significance Assessment for Wharf 55b (and seawall) as per the CMP. Wharf 55b is considered to be of moderate significance, being the last section of wharf to be built at the northern side of the island. Later concrete decking was removed and recently the structure has dismantled due to its very poor condition. The CMP also notes in Section 7.7 that whilst Wharf 55b is considered to have moderate significance, the remaining section obscures but also protects the original seawall associated with the Water Police Station (Newton et al. 2024).

Reference to Figure 26 (extracted from the CMP [OEI 2011a, p211]) identifies the features of High Significance across the island. An anomaly is acknowledged with regard to Wharf 55b in that, while it is graded a Moderate level of significance within the CMP, Figure 26 indicates that a section of Northern Broadside Wharf 55b subject to the demolition works is identified as a feature of High Significance — being part of the Northern Wharf Stone Sea Wall (identified in the SoHI as #98).

In accordance with Section 7(3) *Assessment of Heritage Impact* of the SoHI, the proposal will have no impact on moveable heritage or natural heritage, and is not part of a conservation area.

The proposed development will have no substantial physical impact on significant heritage fabric within the listed boundary of the Goat Island heritage item itself. However, Wharf 4b has been classified as having high significance for its associations with maritime use of the island, and the demolition of this wharf will impact of its heritage significance. The proposed demolition of Wharf 4b will result in the loss of the highly significant wharf. However, the identified significance of Wharf 4b can be further enhanced through future repair and reconstruction (Newton et al. 2024). The proposed demolition and eventual construction of wharves 4b and 55b will enable the dilapidated and unusable wharves to be functional and safe, which will provide a positive contribution to the island. It will have a positive heritage impact as it will provide upgraded amenities and facilities for use on the island (Newton et al. 2024).



The demolition of Wharf 4b will visually impact the study area, as it is considered to be of high visual importance within its context of the wider Shipyard Precinct. Removal of Wharf 55b will enable the stone seawall and remnant highly significant archaeological stone jetty (98) to be seen and repaired (Newton et al. 2024). Whilst Wharf 4b, which has high visual importance, will be removed as a part of this proposal, it will eventually be reconstructed. For the time being, the loss of the visual values of this wharf is unavoidable due to the deteriorate condition of the structure. Whilst Wharf 55b only contains moderate significance, the same principle applies in terms of temporary loss of visual values (Newton et al. 2024).

The CMP states there are several cultural plantings east of Broadside Wharf 4a + 4b. These are situated to the rear of existing buildings, well beyond the subject site and will not be affected by works. There are no cultural plantings within the study area of the North Depot Precinct.

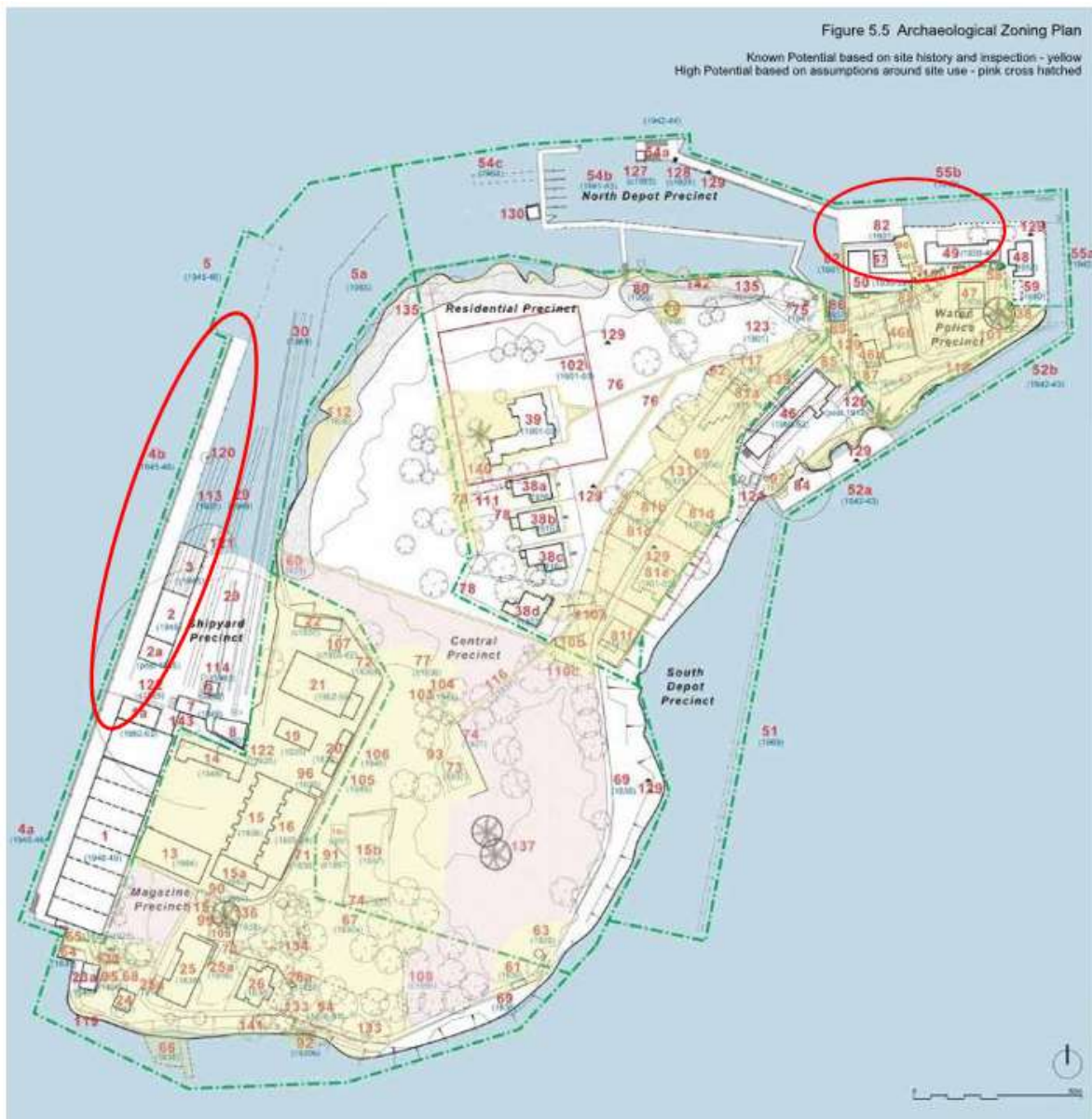


Figure 25. Archaeological Zoning Plan

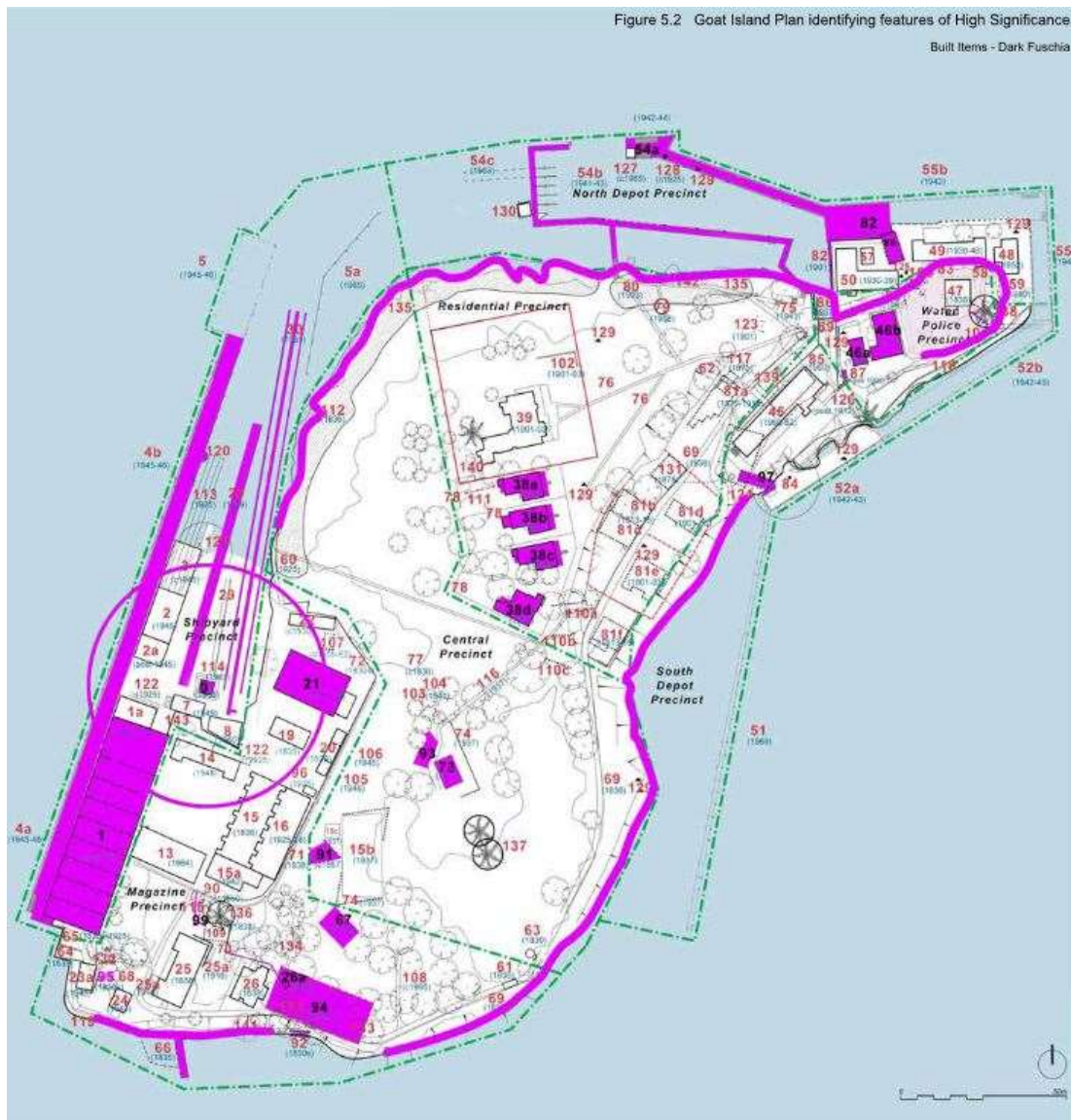


Figure 26. Features of high significance

## Conservation and Policy

Volume 3 of CMP details that *options for the northern section of [Broadside Wharf 4b], from reconstruction to partial removal, are acceptable within the constraints of the Goat Island Wharves Conservation Management Strategy (2007 cited in OEH 2011b).*

Section 7 of the CMP outlines the conservation policies for the site. Section 7.2 of the CMP states, *Goat Island requires substantial conservation works, adaptation works to some buildings to provide for new uses, ongoing maintenance to all elements, repair, reconstruction **and in some cases removal of wharves** and structures, works to make parts of the island safe for access and works to provide for equitable access. For Goat Island to have a future as part of the Sydney Harbour National Park with expectations of public access and use commensurate with other harbour national park areas, not every element of the place can be retained.*

Table 13 of the SoHI presents an assessment against the policy relevant to the study area and proposal. Though Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b have Moderate to High heritage significance, the proposed demolition works comply with (or do not contravene) the CMP policies. Broadly, the demolition (and eventual reconstruction) of

the currently unusable and unsafe wharves will enable improved access, continual use of the island, and enhance the overall history of the site, with mitigation measures provided to avoid direct and indirect impact to known archaeological sites (e.g. stone jetty 98 beneath Wharf 55b).

Recommended mitigation measures are provided in Section 9.6(1) of this REF.

## **8.4 Social values**

### **8.4.1 Recreation values**

Goat Island is in a prime location to offer a wide range of recreational activities, ranging from passive enjoyment of the spectacular views and landscape to participation in major events and functions or educational activities and opportunities (OEH 2012). Since Goat Island became part of the national park, recreation has been limited to guided tours, private and public functions and events, such as the Goat Island Film Festival and Biennale, and prebooked New Year's Eve fireworks viewing (OEH 2012).

Though identified among a number of historic items on Goat Island, Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are not recreational assets in and of themselves; however, the demolition of these will remove dilapidated, unsightly (collapsed), hazardous and unsafe infrastructure, to better service and support management of Goat Island and facilitate their mixed use (i.e. access to the park, land/sea interface for commercial ship repair services).

Disruptions to any recreation values resulting from the proposed work would be temporary and short-term. In addition to notifications of the aim and progress of the proposal on the NPWS website, to facilitate on-site public awareness and mitigate safety risks with regard to the work in progress, management structures (i.e. fencing and/or signage) would be temporarily installed at publicly accessible entrance points to Goat Island and the study area to alert members of the public, delineate the work site, manage access where necessary, and ensure safety.

### **8.4.2 Scenic and visually significant areas**

Located west of the Sydney Harbour Bridge, Goat Island has a commanding position in the harbour. Goat Island is the largest of the SHNP's five islands, and one of the eight remaining islands of Sydney Harbour. The six and a half-hectare island contains the richest and most diverse array of Aboriginal, historic and natural heritage values of all the park islands. Of particular note are the more than 30 buildings and other structures dating from the 1830s to the 1960s (OEH 2012).

As presented in Figure 27 (extracted from the CMP), view lines of Exceptional Significance towards Northern Broadside Wharf 55b are available from north-east of the study area (green arrows); notably View 1 looking towards the Water Police Station (and Wharf 55b in sight) from the harbour and North Shore. View lines of High Significance to and from Broadside Wharf 4a + 4b are available to the west, north-west and south-west, and from the west (red arrows); notably View 5 which encompasses views from the Magazine Complex from the south and south-west (including Wharf 4b in view line). A blue arrow represents a view line of moderate significance.

Aesthetically, Broadside Wharf 4a + 4b is an important visual element in the appearance of the western end of the island with its long linear form set against the shipyard buildings that front it (OEH 2011b).



The proposed demolition of the wharves will impact on the significant Views 1 and 5 of Goat Island. However, this is a minor impact in consideration of the wider precinct areas that the views encompass (Newton et al. 2024).

The proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will remove dilapidated, unsightly (collapsed), hazardous and unsafe infrastructure within existing disturbed and modified structural footprints. Though Broadside Wharf 4a is of visual high value (and wharf 4b contributes to this), the proposed demolition works are considered to be consistent with the CMP. Northern Broadside Wharf 55b has been partially removed and is, otherwise, in poor condition.

Any visual or noise impact associated with the proposed work (e.g. presence of personnel, occupation of the subject site) will be temporary, and only for the short-term duration of the work.

Recommended mitigation measures have been provided in Section 9 of this REF.

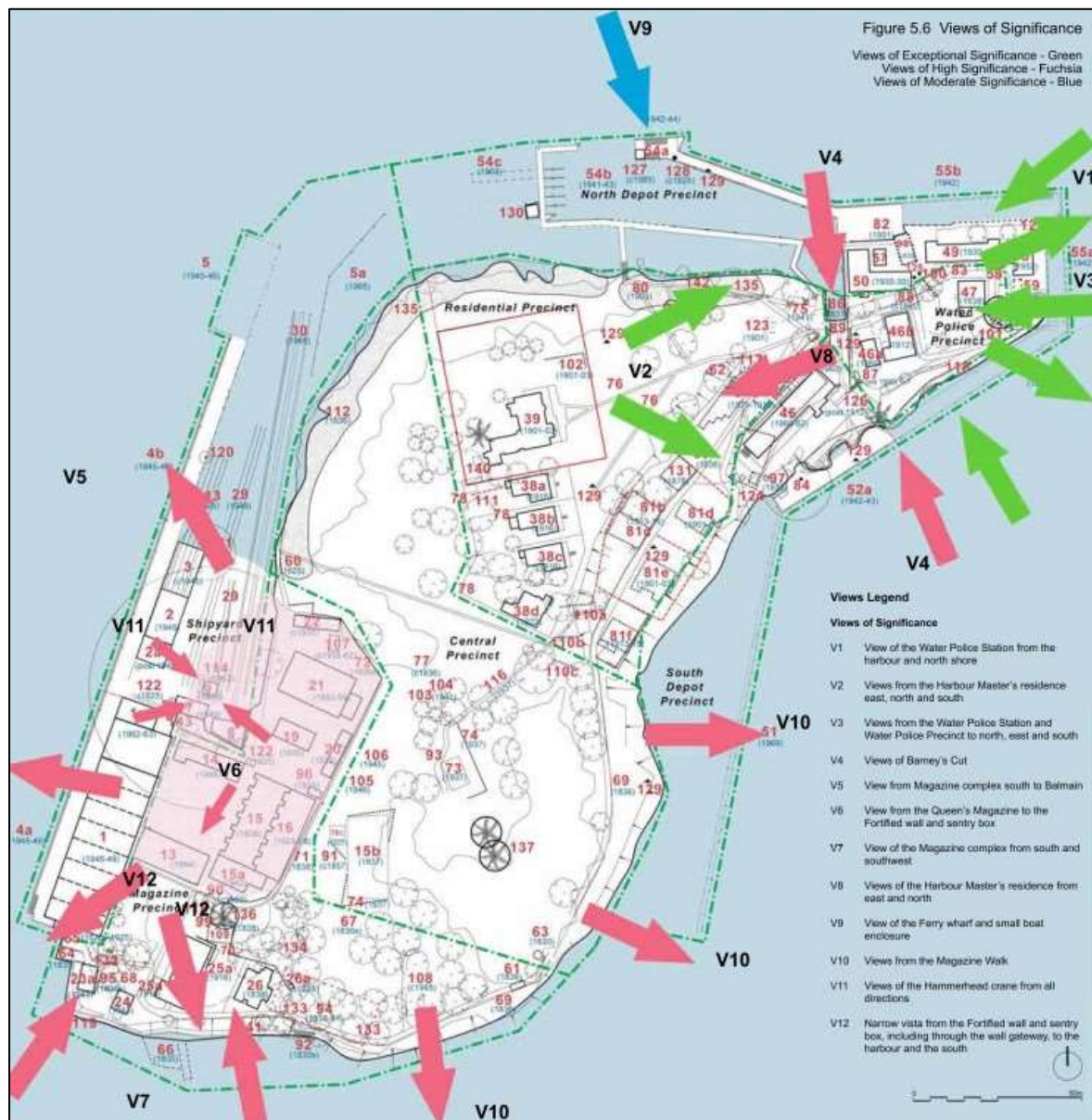


Figure 27. Views of significance

### 8.4.3 Education and scientific values

The diversity of natural and cultural values, combined with the easy accessibility of Sydney Harbour National Park, provide many opportunities to enrich visitor experience through interpretation and educational programs. Key themes include Aboriginal heritage, contemporary Aboriginal perspectives on the harbour and culture, the colonial and historic development of the harbour, the challenges of protecting urban bushland and wildlife populations, and other sustainable use and management options (OEH 2012).

As Broadside Wharf 4a has [historically] been repaired several times, the focus of interpretation and education is considered to lie with it being “a rare example of a broadside wharf with a directly related shore building, the two elements are linked operationally and historically” (OEH 2011a). “The wharf is capable of and important to interpretation of the shipyard and the island” (OEH 2011b).

Educational and scientific values would not be adversely affected by the proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b.

### 8.4.4 Interests of external stakeholders

The following external stakeholders have/or may be involved in consultation:

- Roads and waterways – Transport for NSW
- Tourism industry and operators
- Aboriginal elders and Groups

NPWS will consult and communicate with these organisations on an as need basis. NPWS will also provide project updates and notifications via its website.

Temporary disruptions to park visitors are detailed in Section 8.4.1 above, with mitigation measures provided in Section 9 of this REF.

## 8.5 Matters of national environmental significance

As detailed in Section 8.2.4 of this REF, the proposal would not affect the ecology of a Ramsar wetland as no such site occurs within, or near to, Goat Island.

As assessed within Section 8.2.5 of this REF, based on the desktop assessment—including a review of the BioNet and PMST—though recorded within and/or having known habitat within 10 km of the study area, and based on a consideration of their habitat needs, the majority of species identified in Appendix H would not occur within, or be reliant upon, the environments present within the subject site. No areas of habitat relied upon by these animals for any part of their lifecycle requirements are to be removed or significantly disturbed, and no barriers to their movement patterns would be erected.

No threatened species listed under the EPBC Act were recorded during Lesryk’s previous investigations of the subject site; however, as potential habitat for White’s Seahorse (Endangered, Marine) was recorded within and just beyond the subject site, and the species has been previously recorded underneath Wharf 54b on the northern side of Goat Island in 2021 by MPR, it was considered necessary to conduct a precautionary assessment referencing the EPBC Act’s Significant Impact Guidelines on this species’ potential presence. To consider the impact of the proposal on White’s Seahorse, the assessment provided in the aquatic report concluded that the proposal would not have a significant impact on this MNES. Therefore, referral of the proposal as a controlled action to the Australian Government is not required.

Section 8.3.2 identifies that the study area is not located on Commonwealth land.



## 9. Impact assessment during all stages of the activity

### 9.1 Physical and chemical impacts

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
5. impact on soil quality or land stability?	Yes	Low adverse	<p>Demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b (within their highly disturbed and modified footprints) will be within Sydney Harbour and will involve minor and localised impacts to the seabed.</p> <p>An estimated worst-case estimate of about 0.16 ha of seafloor could be disturbed to permit the works.</p> <p>Section 6.2.5 of this REF details that timber piles and pile stumps will be fully withdrawn from the seabed, except identified piles which will be cut off at seabed level.</p> <p>No dry land-based excavation is required to permit the proposed demolition works.</p> <p>There are no identified land stability issues.</p> <p>A rockfall hazard has not been identified in regard to the proposal.</p>	<ul style="list-style-type: none"> <li>The contractor is expected to prepared a CEMP for the proposal. The CEMP is to document the systems to manage and control environmental impacts during pre-demolition, demolition, and decommissioning phases. The CEMP also provides the overall framework for systems and procedures to ensure environmental impact is minimised and legislative requirements are fulfilled.</li> <li>All construction personnel will complete a compulsory site induction that outlines the requirements of the CEMP and legislative requirements, tool box talks on specific environmental issues (e.g. conservation, threats, risk), and daily pre-start meetings. <ul style="list-style-type: none"> <li>As part of the 'site induction' all personnel are to be briefed of site sensitivities prior to entering the work area (these are discussed individually in subsequent sections).</li> </ul> </li> <li>The limits of the subject site (demolition/disturbance footprint), exclusion/buffer zones, biodiversity values and site sensitivities are to be identified both on site maps/plans and on-site (where applicable, e.g. displayed on the construction barge).</li> <li>Building and infrastructure works, including demolition, on lands reserved or acquired under the NPW Act must comply with the requirements within the <i>Construction Assessment Procedures</i> (OEH 2011c).</li> <li>An ESCP will be prepared for the proposal and is to be in line with the publication <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom 2004).</li> <li>For the duration of the project, work will be scheduled for periods of dry weather (&lt;5 mm rainfall).</li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
6. affect a waterbody, watercourse, wetland or natural drainage system – either physically or chemically (e.g. due to runoff or pollution)?	Yes	Low adverse	<p>The proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b occurs within Sydney Harbour; mapped as KFH.</p> <p>Section 3.3.2 of this REF identifies that the proposal does not conform to <i>Dredging and reclamation</i> under Part 7, Division 3 of the FM Act.</p> <p>Although considered a low risk, potential impacts on the aquatic environment as a result of the proposed work may include: water pollution, fallen debris entering the water, and spills/leaks (e.g. oil) from work machinery/equipment.</p> <p>Section 8.2.4 of this REF details that the proposal is not located within, or near to, Coastal Wetland or a nationally important or Ramsar wetland.</p> <p>Provided mitigation measures are implemented, it is expected that the work would not have any adverse direct or indirect impact on the waters and aquatic environment of Sydney Harbour.</p>	<ul style="list-style-type: none"> <li>• Timber piles are not to be pulled completely out of the seabed using a large load — the load is to be incrementally increased for final extraction, as per methodology provided in Section 6.2.3 of this REF.</li> <li>• To prevent adverse impact on the structural integrity of the seawall adjacent to the wharves, identified wharf piles directly next to the wall will be cut off at seabed level to avoid destabilisation.</li> <li>• Avoid unnecessary seabed (substrate) disturbance.</li> <li>• A Waterway Management Plan (also known as a Marine Traffic Management Plan or Marine Activity Plan) is to be provided by the contractor engaged to undertake the work.</li> <li>• The contractor appointed for the work is to make contact with the Waterways Operations Sydney Harbour division of Transport for NSW to discuss the on-water works and the Waterway Management Plan required prior to commencement of the works.</li> <li>• Harbour Master's approval from NSW Port Authority will be sought for no wash and low wash zones around the proposed work area.</li> <li>• Establish a maritime navigation exclusion around the subject site.</li> <li>• Erosion and sediment mitigation devices (temporary) are to be erected in a manner consistent with current Best Management Practice (i.e. <i>Managing Urban Stormwater: Soils and Construction</i> [Landcom 2004]) to prevent entry of sediment into the waterway prior to commencement of work, and kept in place for the duration.</li> <li>• As required, a silt screen (e.g. to prevent the escape of suspended sediments, ensure there is no escape of turbid water into the aquatic environment) will be deployed before, during and as long as necessary after demolition works. Silt screens should be placed to isolate the works area and be attached (i.e. to the same bank) upstream and downstream of the work site.</li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
				<ul style="list-style-type: none"> <li>• Screens or other guards should be carefully removed after the work is completed.</li> <li>• Silt screens should generally only be used in still water conditions.</li> <li>• These are to be maintained in good working order and will not be removed until the risk of sedimentation is negligible and the site has been stabilised following completion of work.</li> <li>• Where applicable, scheduled inspections of these will be made to ensure continued compliance.</li> <li>• Work will be scheduled during calm weather conditions (e.g. undisturbed by wave action).</li> <li>• Material removed from a waterway, that is to be temporarily deposited or stockpiled on land, is to be located well away from the waterway and be contained by appropriate erosion and sediment control devices.</li> <li>• A Spill Prevention and Response Plan will be prepared by the contractor as required under the construction contract conditions. The plan will provide a systematic framework to prevent environmental impacts from potential spills or inappropriate disposal of contaminants.</li> <li>• If a spill occurs, the NPWS client-side Project Manager and NPWS Principal Authorised Person will be notified as soon as practicable.</li> <li>• Spill kits commensurate to the type and quantity of any hazardous material used must be available on-site at all times during the proposed works.</li> <li>• If a potential environmental incident is beyond the scope of the emergency spill kit, the Project Manager will contact Sydney Ports Corporation Spill Response.</li> <li>• Spills that cause material harm to the environment are to be reported in accordance with legislative and licensing requirements (NSW EPA).</li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
				<ul style="list-style-type: none"> <li>• Prior to use at the site and/or entry into the waterway, machinery is to be appropriately cleaned, degreased and serviced.</li> <li>• Spot checks on machinery utilised will be conducted daily before works commence to reduce the risk of water contamination (i.e. associated with fuel or oil spills).</li> <li>• Adequate water depth must be maintained underneath all barges and propellers to ensure that marine vegetation is not impacted at any time. At least 600 mm clearance must be maintained between the hull and the river bed, and also between the propeller and the river bed. Where adequate clearances beneath barges cannot be maintained at low tide, works should be restricted to high tide conditions.</li> </ul>
7. change flood or tidal regimes, or be affected by flooding?	No	N/A	N/A	
8. affect or be affected by coastal processes and coastal hazards, including those under climate change projections (e.g. sea level rise)?	No	N/A	<p>In reference to Section 7.14 of the CMP, it is noted that Climate Change impact by 2050 — relative to the projected 38 cm sea level rise (flat sea level without consideration of waves) — will submerge the Northern Broadside Wharf at least annually; while Climate Change impact by 2100 — relative to the projected 89 cm sea level rise — will submerge all wharves and jetties (except for the western Broadside Wharf) and the land seaward of the Port Emergency Services Building 50 times per year, and submerge all foreshore structures every 10 years (Average Recurrence Interval).</p> <p>Currently, the wharves are not at risk from rising sea levels. The proposal will not affect, nor is it considered to be affected by coastal processes or hazards.</p>	No further safeguards or mitigation measures than those provided.

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			While the future concerns of climate change do not affect the current proposed remediation works, it is noted that Wharf 55b should not be remediated if future sea levels rise and submerge it (Newton et al. 2024)	
9. involve the use, storage or transport of hazardous substances, or use or generate chemicals which may build up residues in the environment?	Yes	Low adverse	<p>It is anticipated that, of the machinery/equipment employed during the proposed work, there would be no requirement to refuel, or store substances, on-site. However, there remains the potential for accidental spills to occur (i.e. failure of hydraulic lines etc).</p> <p>As part of the engaged Contractor's investigation, an inspection is to be made prior to commencement of work of the potential for asbestos or asbestos-containing material within the wharf structures, hazardous chemicals and materials.</p>	<ul style="list-style-type: none"> <li>• All WH&amp;S procedures and regulations for the storage and transport and use of hazardous substances will be followed.</li> <li>• The barge will be refuelled off-site.</li> <li>• No vehicle or vessel wash down will occur on-site.</li> <li>• If stored on the barge, materials (e.g. oils, chemicals) will be stored in an appropriate cabinet or container with impervious flooring and sufficient capacity to contain 110% of the largest container protected in a bunded area to prevent leaks or spills entering the water. These containers will only be removed for a specific activity and then returned.</li> <li>• Implement appropriate control measures if hazardous chemicals or materials are present.</li> <li>• Materials Safety Data Sheets will be made available for reference by all site personnel for any hazardous chemicals on-site.</li> <li>• If present, the removal of asbestos would be managed in accordance with SafeWork Australia's <i>How to Safely Remove Asbestos Code of Practice</i>.</li> <li>• SafeWork NSW would be notified in writing at least five working days prior to the commencement of asbestos removal by an organisation licensed at the appropriate class (whether Class A or Class B) (Consult Marine 2024).</li> <li>• If coal tar asphalt is identified and removed, it would be disposed of to landfill in accordance with Transport for NSW's Environmental Direction No.21 – Coal Tar Asphalt Handling and Disposal.</li> <li>• If present, lead paint materials would be managed in accordance with the Australian Standard AS4361.1 'Guide to Lead Paint Management – Part 1 Industrial Applications 1995.'</li> </ul>



Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
10. involve the generation or disposal of gaseous, liquid or solid wastes or emissions?	Yes	Low adverse	<p>Minor exhaust emissions would result from the use of machinery (i.e. small plant, tools) and transport (i.e. watercraft vessels) during the course of the work. These emissions would be minimal and only for the duration of the project (i.e. short term).</p> <p>Waste associated with the proposal is expected to be limited to decommissioned material that would be disposed of at a licensed waste management facility.</p>	<ul style="list-style-type: none"> <li>• Transport (i.e. watercraft vessels) would be serviced and operate within standard Transport for NSW guidelines.</li> <li>• Employed machinery/equipment would be serviced, regularly maintained and operated within relevant guidelines.</li> <li>• Waste will be classified before being disposed to an appropriately licensed facility in accordance with <i>Waste Classification Guidelines: Part 1 Classifying Waste</i> (NSW EPA 2014).</li> <li>• All waste products are to be taken off-site (via barge) to the mainland and on to authorised waste facilities.</li> <li>• Personal rubbish is to be collected and deposited into a receptacle.</li> <li>• Visual inspections of the subject site are to be made at the completion of the work to ensure no urban refuse/debris remains.</li> <li>• Wastewater from vessels would be discharged at an approved vessel wastewater disposal facility. No vessel wastewater would be discharged (i.e. pumped out) directly into the water or onto any land adjacent.</li> </ul>
11. involve the emission of dust, odours, noise, vibration or radiation?	Yes	Low adverse	<p>The proposed work may result in localised, minor, short term/temporary dust, noise and/or vibration impact during the course of the proposed work, associated with transport movements and operation of machinery/equipment, the presence of personnel and the occupation of the site.</p> <p>For safety reasons, demolition works may need to take place at night when the water is calm and wind speed is generally 0.5 m/s, when the harbour is not busy and there is low impact from vessel wash. It is expected works would take place intermittently, between which quiet periods would occur before the next stage progresses.</p>	<ul style="list-style-type: none"> <li>• Dust, odour and/or noise would be restricted to the demolition period.</li> <li>• Activities will generally be limited to the period: <ul style="list-style-type: none"> <li>○ 7.00 am to 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm on Saturday.</li> <li>○ No work would be carried out on Sundays or during public holidays (unless authorised by NPWS).</li> </ul> </li> <li>• Compliance of all vehicles and machinery with industry noise guidelines.</li> <li>• Where feasible, limit amount of plant equipment operating at any one time.</li> <li>• Contractor will act on any noise, vibration or other complaints.</li> </ul>

## 9.2 Biodiversity impacts

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. affect a declared area of outstanding biodiversity value, critical habitat or environmental asset of intergenerational significance?	No	N/A	N/A	
2. result in the clearing or modification of vegetation, including ecological communities and plant community types of conservation significance?	Yes	Low adverse	<p>Loss of non-threatened aquatic vegetation will be limited to those attached biota on the wharf infrastructure to be removed.</p> <p>Manoeuvring work vessels and barges, and holding these in place using barge mounted winches and wires connected to pre-placed mooring blocks, has the potential to damage aquatic habitats via vessel or propeller strike/wash. Damage can also occur via mooring or anchoring points deployed in, on or over habitats via direct crushing or scalping from wires laid across the seabed.</p> <p>Air jetting may be required to assist extraction of piles; therefore, some temporary pulse turbidity may occur through the proposed work, however, this is not considered a significant risk for marine habitats and biota at the site.</p> <p>No TECs were recorded within, or near to, the study area.</p>	<ul style="list-style-type: none"> <li>It is recommended that, where piles occur proximate to marine vegetation (e.g. recorded patches of Spiny Kelp, macroalgae), these piles are to be cut off at seabed level (as opposed to complete removal of the piles/jetting) to limit disturbance to microalgae, ensure no loss of natural estuarine habitat and that seabed habitat will not be adversely affected.</li> <li>Disturbance to the recorded dense aquatic vegetation located beyond the disturbance footprint highlighted will be avoided. These areas need to be identified and appropriately delineated as "No Go" areas.</li> <li>In accordance with recommendations presented in the <i>Aquatic Ecological Assessment</i> (MPR 2022): <ul style="list-style-type: none"> <li>If required, jetting work will be performed using an enclosing silt curtain to minimise smothering of potential adjacent vegetated habitats.</li> <li>There will be no stockpiling of demolition or construction materials on the seabed.</li> <li>Any dropped construction offcuts are to be retrieved immediately.</li> <li>By virtue of the shallow depths over the marine vegetation habitats, no vessel is to be taken over the indicated marine vegetation unless there is sufficient depth to prevent vessel strike, propeller strike or scouring damage from propeller wash.</li> </ul> </li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
				<ul style="list-style-type: none"> <li>○ No vessel is to be moored with anchor or other bottom tackle located in the indicated marine vegetation habitats.</li> <li>○ To prevent seabed disturbance, all barge mobilisation and movement will be done during favourable tide, wind and low wave/wash conditions, with the pushing vessel operated to minimise sediment disturbance and prevent strike or disturbance to seabed aquatic habitats.</li> <li>○ Where winches and mooring blocks are used, the blocks will be placed, and buoyancy devices used, to avoid direct damage/impact to habitat such as scalping by sagging cables.</li> <li>• Work positioning barges would occur during calm conditions (generally wind speed of about 0.5 m/s and less) to minimise sediment disturbance.</li> <li>• If the mooring block is lifted it should be replaced in the exact same location and the chain shortened to limit damage to marine vegetation. This will generally require the guidance of a diver during the replacement of the mooring block. <ul style="list-style-type: none"> <li>○ A record of the location (e.g. diver survey, GPS (global positioning system)) should be taken prior to moving the block to ensure that the mooring is placed in the same position at a later date.</li> </ul> </li> <li>• The amount of time the crane barge is in place is to be managed to reduce the effects of shading on the aquatic environment.</li> </ul>
3. endanger, displace or disturb terrestrial or aquatic fauna, including fauna of conservation significance, or create a barrier to their movement?	Yes	Low adverse	As White's Seahorse have been previously recorded in association with Wharf 54b, about 70 m west of Northern Broadside Wharf 55b, and suitable TYPE 1 habitat for the species has been recorded within/proximate to the subject site, precautionary assessments referencing the EPBC Act Significant Impact Guidelines and Subdivision 221ZV of the FM Act have been conducted to consider the impact of the proposal on the potential presence of the threatened White's Seahorse; the	<ul style="list-style-type: none"> <li>• Biodiversity site sensitivities presented in Figures 15, 16 and 17 of this REF will be identified on site maps/plans and (where feasible) on-site, to avoid direct and indirect impact to these: <ul style="list-style-type: none"> <li>○ Recorded suitable habitat for White's Seahorse</li> <li>○ Type 1 – Highly sensitive KFH</li> <li>○ Type 2 – Moderately sensitive KFH</li> </ul> </li> <li>• All personnel are to be briefed of these site sensitivities.</li> <li>• Where possible, avoid direct/indirect impact to these sites of biodiversity value.</li> <li>• Due to the instability of the wharves, a pre-work inspection of the wharf structures and debris may not be feasible. To overcome</li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			<p>assessments concluding the proposal would not have a significant impact on this species (see aquatic report).</p> <p>The species identified in the Likelihood of Occurrence table and the PMST (Appendices I and J) are not considered to be reliant on habitat identified within the study area such that the proposed scope of work would have a significant adverse effect on these.</p> <p>While the proposed work may temporarily disturb terrestrial and aquatic fauna species during demolition works (e.g. due to associated noise, movement), the proposal is not considered to significantly endanger, displace or disturb native fauna, or create barriers to the movement patterns of these species, or other terrestrial or aquatic fauna.</p> <p>Aquatic fauna present would be adapted to high levels of background sound from operating vessels.</p>	<p>this limitation, an underwater drone should be employed. The objective of any inspections is to ensure that no Syngnathiformes are present on the built environments or within the likely disturbance zones.</p> <ul style="list-style-type: none"> <li>• In lieu of any possible inspection of the subject site immediately prior to the commencement of work by a suitably qualified and licensed aquatic ecologist (or similar person) — to determine the presence of the threatened White's Seahorse, a s.37 permit under the FM Act will be required (in accordance with s.220ZW <i>Licence to harm threatened species, population or ecological community or damage habitat</i>), to permit the aquatic ecologist to collect and relocate locally any potential species in accordance with the <i>Seahorse Relocation Protocol</i> (attached to the Aquatic Ecology Assessment (Appendix F).</li> <li>• Prior to works commencing the Seahorse Relocation Protocol (MPR 2022) is to be sent to DPIRD Fisheries for review.</li> <li>• Prior to works, at least four (4) 'seahorse hotels' are to be installed west of Broadside Wharf 55b to offset the potential removal of patches of Spiny Kelp within the proposed disturbance footprint.</li> <li>• If White's Seahorse are present, to maximise the success of a relocation, it is recommended that this be scheduled for each of the first (mobilisation) days for the staged project commencement. This will minimise the possibility of other seahorses recolonising piles to be removed.</li> <li>• If Syngnathiformes are recorded, the Seahorse Relocation Protocol prepared by MPR (2022) should be implemented. <ul style="list-style-type: none"> <li>◦ If threatened species are recorded (i.e. White's Seahorse) implementation of this plan will require a permit under the FM Act for the emergency rescue of threatened fauna.</li> </ul> </li> <li>• It is recommended that, when removing the piles, this be undertaken over the course of one day to reduce long periods of increased turbidity.</li> <li>• Clearing of aquatic vegetation is to be limited to the minimum required to successfully achieve the objectives of the proposal.</li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
				<ul style="list-style-type: none"> <li>• Consideration should be given to salvaging any 'large' marine invertebrates (e.g. molluscs, star fish) that are present on the portions of the piles to be removed. These should be relocated locally by a qualified marine ecologist.</li> <li>• Spot checks on machinery utilised should be conducted daily before works commence to reduce the risk of water contamination associated with things such as fuel or oil spills.</li> <li>• Where possible, disturbance to the dense aquatic vegetation located beyond the disturbance footprint highlighted within this report should be avoided.</li> <li>• If unexpected threatened terrestrial or aquatic fauna species [not assessed within this REF] are identified:               <ol style="list-style-type: none"> <li>1. Potentially harmful work is to cease in the vicinity of the fauna species.</li> <li>2. In line with aforementioned procedures, fauna should be allowed to disperse from an area without intervention, and handling of the species is to be avoided where possible.</li> <li>3. Notify the project's Environment Manager (who will arrange for an Ecologist to investigate and conduct an assessment of significance of likely impact).</li> <li>4. If impact is likely, determine if this is consistent with approval conditions, or implement new advised protocols (as provided by the Ecologist). If no impact is expected, recommence work.</li> <li>5. In the event of newly identified records of threatened species, the location will be uploaded to BioNet or DPIRD.</li> </ol> </li> <li>• In the event of an injured aquatic species, the NPWS Project Officer will be immediately notified.</li> <li>• DPIRD Fisheries (1800 043 536) and the EPA (131 555) are to be notified immediately if any fish kills occur in the vicinity of the works. In this situation, all works other than emergency response procedures are to cease until the issue is rectified and approval is given by DPIRD Fisheries and/or the EPA for the works to proceed.</li> </ul>



Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
4. result in the removal of protected flora or plants or fungi of conservation significance?	No	N/A	<p>The subject site features:</p> <ul style="list-style-type: none"> <li>• TYPE 1 - Highly sensitive KFH (High-density patches of Spiny Kelp offering threatened species habitat for the potentially occurring White's Seahorse)</li> <li>• TYPE 2 – Moderately sensitive KFH (Marine macroalgae such as <i>Ecklonia</i> and <i>Sargassum</i> species)</li> </ul> <p>A <math>\geq 5 \text{ m}^2</math> patch of <i>Zostera capricorni</i> seagrass was recorded inshore from [the now demolished] Wharf 54a, about 27 m south-west of the Northern Broadside Wharf 55b subject site (MPR 2022); however, this will not be affected by the proposed work.</p> <p>Protected species of marine vegetation belonging to the plant classification divisions of Rhodophyta and Phaeophyta are recorded, though no threatened flora or plants were recorded.</p>	<p>Further to the recommended safeguards/mitigation measures in Section 92(3) [above]:</p> <ul style="list-style-type: none"> <li>• A Part 7, s.205 permit to harm marine vegetation under the FM Act will be required.</li> </ul>
5. contribute to a key threatening process to biodiversity or ecological integrity?	No	Negligible	<p>One KTP is applicable to the aquatic environment of the proposal, being:</p> <ul style="list-style-type: none"> <li>• Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments</li> <li>• Anthropogenic debris is defined as pollution by human-generated objects.</li> </ul> <p>Marine debris is known to entangle and be ingested by marine, estuarine and pelagic vertebrate species. Entanglement and ingestion may occur either accidentally while feeding or scavenging, or deliberately if marine debris is mistaken for prey items (NSW TSSC 2004).</p>	<ul style="list-style-type: none"> <li>• The proposed work can avoid the <i>Entanglement in or ingestion of anthropogenic debris in marine and estuarine</i> environments KTP by the contractor ensuring no human-generated objects (e.g. plastic debris) enter the water.</li> <li>• Additional waste mitigation measures are provided in Section 9.1(6) above.</li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			<p>Detrimental effects of entanglement with marine debris include strangulation, increased drag, lacerations, infection and loss of limbs. Ingestion of marine debris may lead to the blockage and/or perforation of an individual's digestive system, or potentially, poisoning by polychlorinated biphenyls (PCBs) (NSW TSSC 2004).</p> <p>No further KTP listed under the EPBC, BC or FM Acts are relevant to the proposal.</p>	
6. introduce weeds, pathogens, pest animals or genetically modified organisms into an area?	No	Negligible	<p>The Aquatic Ecological Assessment (MPR 2022) identifies the listed pest algae species <i>Caulerpa taxifolia</i> is known from Sydney Harbour.</p> <p>The proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b will not introduce weeds, pathogens, pest animals or genetically modified organisms into an area.</p>	<ul style="list-style-type: none"> <li>The CEMP will set out methods to prevent spreading pests including: <ul style="list-style-type: none"> <li>Removing weeds or sediment from equipment and their disposal in an appropriate waste receptacle or facility.</li> </ul> </li> </ul>

### 9.3 Community impacts

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. affect community services or infrastructure?	No	N/A	N/A	
2. affect sites important to the local or broader community for their recreational or other values	Yes	Positive	<p>Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are not recreational assets in and of themselves; however, the demolition works will remove dilapidated, unsightly (collapsed), hazardous and unsafe infrastructure to better service and support management of Goat Island.</p>	<ul style="list-style-type: none"> <li>NPWS will provide public notification on their website in advance of the commencement of work, clearly advising the local community of the aim and progress of the proposal.</li> <li>To facilitate public awareness and mitigate safety risks with regard to the work in progress, management structures (i.e. fencing and/or signage) will be temporarily installed at</li> </ul>

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
or access to these sites?			<p>These existing wharf sections are currently inaccessible to the public. Therefore, the removal of these would not have an adverse impact on existing access to Goat Island. It is acknowledged other points of access to Goat Island remain unaffected by the proposal.</p> <p>Disruption to sites important to the community, as a result of the proposed work (e.g. minor increase in noise and visual impact due to the presence of personnel and machinery) would be temporary and short-term.</p>	<p>publicly accessible entrance points to alert members of the public, delineate the work site, manage access where necessary, and ensure safety.</p> <ul style="list-style-type: none"> <li>Schedule work to avoid peak visitation periods (including weekends), public and school holidays where possible.</li> </ul>
3. affect economic factors, including employment, industry and property value?	Yes	Long-term positive	The poor, unsafe condition and inaccessibility of Broadside Wharf 4b is having an adverse impact on the commercial use of the shipyard.	No further safeguards or mitigation measures than those provided.
4. have an impact on the safety of the community?	Yes	Positive	The demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf will remove dilapidated and collapsed infrastructure currently inaccessible or presenting a safety risk to the public.	No further safeguards or mitigation measures than those provided.
5. cause a bushfire risk?	No	Negligible	<p>There is unlikely to be a need for hot works as part of the proposed work; therefore, the risk of associated fire ignition is minimal.</p> <p>The proposal is not considered to adversely impact the protection of people, the environment, or infrastructure and assets. The proposal will not impede firefighter access or public evacuation operations.</p>	<ul style="list-style-type: none"> <li>No hot works to be carried out when bushfire danger is greater than High (e.g. during declared Total Fire Bans or Park Fire Bans).</li> <li>Basic fire suppression equipment (extinguisher etc.) and fire trained staff will be available on-site at all times.</li> </ul>
6. affect the visual or scenic landscape?	Yes	Positive Short-term low adverse	Though Broadside Wharf 4a is of visual high value (and wharf 4b contributes to this), the proposed demolition works are considered to be consistent with the CMP. Northern Broadside Wharf 55b has	No further safeguards or mitigation measures than those provided.

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			<p>been partially removed and is, otherwise, in poor condition.</p> <p>The demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf will remove dilapidated, collapsed and unsightly infrastructure.</p> <p>Short term, temporary visual impact (i.e. site occupation) will occur during the course of the work; however, no significant or permanent adverse alteration to the existing scenic landscape or the identified views of Exceptional and High Significance to and from the site (see Section 8.4.2 of this REF) is anticipated.</p> <p>No permanent loss of privacy, glare or overshadowing would occur as a result of the proposal.</p> <p>Temporary signage may be required to facilitate public awareness and safety with regard to the work; however, permanent signage is not a component of the proposed scope of work.</p>	

## 9.4 Natural resource impacts

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. result in the degradation of the park or any other conservation area?	No	Negligible	Provided the mitigation measures are implemented, the proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf, within existing disturbed/modified structural footprints, would not result in the degradation of the park.	No further safeguards or mitigation measures than those provided.
2. affect the use of, or the community's	No	N/A	The demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is not	No further safeguards or mitigation measures than those provided.

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
ability to use, natural resources?			considered to affect the use of, or the community's ability to use, natural resources. It is acknowledged other points of access to Goat Island remain unaffected by the proposal, these permitting the community continued use of existing resources.	
3. involve the use, wastage, destruction or depletion of natural resources including water, fuels, timber or extractive materials?	Yes	Low adverse	Minor use of fuels for operation of transport, machinery and equipment will be required, but will not involve the wastage, destruction or depletion of natural resources. Where applicable, removed redundant infrastructure will be recycled.	<ul style="list-style-type: none"> <li>• Use of resources would be limited to amounts necessary to complete the works.</li> <li>• Resource management hierarchy principles are to be followed where possible: <ul style="list-style-type: none"> <li>○ Avoid unnecessary resource consumption as a priority</li> <li>○ Avoidance is followed by resource recovery, i.e. construction and demolition wastes should be recycled (at a licensed recycling centre) or reused.</li> </ul> </li> </ul>
4. provide for the sustainable and efficient use of water and energy?	Yes	Positive	Activities involved with the proposed work would not involve significant use of water or energy. Where applicable, high energy efficiency tools would be used.	<ul style="list-style-type: none"> <li>• For more efficient energy use, no machinery would be permitted to idle.</li> </ul>

## 9.5 Aboriginal cultural heritage impacts

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. disturb the ground surface or any vegetation likely to contain culturally modified trees?	No	Negligible	The demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b does not involve any dry land-based excavation. Whilst it is possible that Aboriginal archaeological deposits could exist within the seabed surrounding the island, it may be unlikely that these would still remain given the history of the area, or be encountered during the proposed works.	No further safeguards or mitigation measures than those provided.



Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			Grinding grooves, engraving sites and culturally modified trees are unlikely to occur within the assessment area as reflected in their overall rarity in the local region (Kelleher Nightingale Consulting Pty Ltd (2020) cited in Newton et al. (2024)).	
2. affect or occur near known Aboriginal objects, Aboriginal places or an Aboriginal cultural asset of intergenerational significance? If so, can impacts be avoided? How?	No	Negligible	<p>Section 8.3.1 of this REF details two previously recorded Aboriginal sites on Goat Island. The nearest is about 74 m south-west of Northern Broadside Wharf 55b, well beyond the impact footprint of the proposal. The study area is highly disturbed and maintains a large proportion of reclaimed land.</p> <p>Whilst it is possible that Aboriginal archaeological deposits could exist within the seabed surrounding the island, it may be unlikely that these would still remain given the history of the area, or be encountered during the proposed works.</p> <p>Overall the study area is deemed to have low Aboriginal archaeological potential, however, any surviving traces of past Aboriginal use on the island would be considered significant.</p> <p>No Aboriginal cultural AIS is identified on the NPWS AIS Interactive Map.</p>	<ul style="list-style-type: none"> <li>The proposed works must be contained to the area assessed within this REF.</li> <li>An Unexpected Finds Procedure should be followed in the event that Aboriginal archaeological resources are uncovered during the demolition process: <ol style="list-style-type: none"> <li>Cease works in the immediate vicinity of the find.</li> <li>Contact the Project archaeologist to verify the nature of the find.</li> <li>If Unexpected Find is confirmed as Aboriginal archaeology, Project archaeologist will notify the Local Aboriginal Land Council and Heritage NSW of the find. If Unexpected Find is confirmed as not Aboriginal in origin, Project archaeologist will provide advice for works to recommence.</li> <li>Project Archaeologist will undertake a preliminary assessment and recording of the findings.</li> <li>Formulate archaeological or heritage management plan specific to nature of the find.</li> <li>Implement archaeological/heritage management plan.</li> <li>Works may commence once archaeological/heritage management plan has been successfully implemented and Project archaeologist provides sign off to contractor for works to resume in vicinity of find.</li> </ol> </li> </ul>
3. affect areas: a. within 200 m of waters	Yes	Negligible	The study area occurs within an existing disturbed and modified footprint within 200 m of waters. It is unlikely the island would have been a place of permanent	No further safeguards or mitigation measures than those provided.

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
b. within a sand dune system c. on a ridge top, ridge line or headland d. within 200 m below or above a cliff face e. in or within 20 m of a cave, rock shelter or a cave mouth? If so, can impacts be avoided? How?			occupation given the potential lack of freshwater available.  As no previously recorded AHIMS sites occur within the study area, and given the disturbed and modified footprint of the subject site, it is considered that the proposal may proceed with caution and an AHIP under s.90 of the NPW Act is not required for the proposed work.	
4. affect wild resources which are used or valued by the Aboriginal community or affect access to these resources?	No	N/A	N/A	
5. affect access to culturally important locations?	No	N/A	N/A	

## 9.6 Other cultural heritage impacts

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. affect or occur near places, buildings or landscapes of heritage significance?	Yes	Short-term negative Long-term positive	<p>Goat Island (Listing No: 00989) is identified on the SHR, the boundary of which aligns approximately with the mean high-water mark. Outside of this, which includes all the wharves, is not included in the listing.</p> <p>Whilst the study area locations are technically outside the boundary of the State Heritage Listing, they are directly tied to the item.</p> <p>Goat Island and its component parts are heritage items within the DECC Section 170 Register numbered from item 3444 to item 3529 (65 separate items).</p> <p>Three of these items are directly associated with the study area.</p> <p>Though identified among a number of historic assets on Goat Island, Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are outside the SHR curtilage; therefore, an application for approval under s.60 of the Heritage Act is not required.</p> <p>As detailed in Section 8.3.2 of this REF, though Broadside Wharf 4a+ 4b and Northern Broadside Wharf 55b have Moderate to High heritage significance, the proposed demolition works are considered to be consistent with the CMP.</p> <p>The archaeological remains of earlier buildings/stone jetties proximate to Broadside Wharf 4a, and the stone seawall proximate to Northern Broadside Wharf 55b, are not part of the proposal and recommendations have been made to avoid direct and indirect impact to these features.</p> <p>No historic cultural AIS are identified on the NPWS AIS Interactive Map.</p>	<ul style="list-style-type: none"> <li>Cultural heritage site sensitivities will be identified on site maps/plans and (if applicable) on-site, to avoid direct and indirect impact to these: <ul style="list-style-type: none"> <li>Goat Island SHR listing</li> <li>Archaeological remains of earlier buildings/stone jetties proximate to Broadside Wharf 4a</li> <li>Stone seawall proximate to Northern Broadside Wharf 55b.</li> </ul> </li> <li>All personnel are to be briefed of cultural heritage site sensitivities.</li> <li>Avoid direct/indirect impact to these sites of cultural heritage value.</li> </ul> <p><u>Historical archaeology</u> (per the SoHI)</p> <ul style="list-style-type: none"> <li>A Maritime Archaeological Survey should be conducted once it is safe to do so after the demolition of the wharves. Any findings and recommendations of this survey should become an addendum to the SoHI.</li> <li>An Unexpected Finds Procedure (see methodology above) should be followed in the event that any historical relics are encountered.</li> </ul> <p><u>Built heritage</u> (as per the SoHI)</p> <ul style="list-style-type: none"> <li>It is recommended that a brief photographic archival recording is prepared for the existing wharves prior to their demolition, should this be approved.</li> <li>Some miscellaneous wharf elements could be retained for re-use if possible.</li> </ul>
2. impact on relics or moveable heritage items, or	Yes	Short-term negative	<p>As above.</p> <p>The proposal will have no impact on moveable heritage.</p>	No further safeguards or mitigation measures than those provided.

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
an area with a high likelihood of containing relics?				
3. impact on vegetation of cultural landscape value (e.g. gardens and settings, introduced exotic species, or evidence of broader remnant land uses)?	No	N/A	The CMP states there are several cultural plantings east of Broadside Wharf 4a + 4b. These are situated to the rear of existing buildings, well beyond the subject site and will not be affected by works. There are no cultural plantings within the study area of the North Depot Precinct.	

## 9.7 Impacts on matters of national environmental significance

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
1. listed threatened species or ecological communities)?	Yes	Negligible	<p>White's Seahorse have been previously recorded in association with Wharf 54b, about 70 m west of Northern Broadside Wharf 55b, and suitable habitat for the species has been recorded within/proximate to the study area.</p> <p>Precautionary assessments on the potential presence of White's Seahorse concluded the proposal would not have a significant impact on this species (see aquatic report).</p> <p>The species identified in the Likelihood of Occurrence table and the PMST (Appendices I and J) are not considered to be reliant on habitat identified within the study area such that the proposed scope of work or the proposal in operation would have a significant adverse effect on these.</p>	No further safeguards or mitigation measures than those provided.

Review of Environmental Factors: Wharf demolition and removal, Goat Island

Is the proposed activity likely to...	Applies?	Impact level	Reasons	Safeguards/mitigation measures
			No TECs were recorded within, or near to, the study area.	
2. listed migratory species?	No	Negligible	Migratory species identified in the Likelihood of Occurrence table or the PMST (Appendices I and J) are not considered to be reliant on habitat identified within the study area such that the proposed scope of work or the proposal in operation would have a significant adverse effect on these.	No further safeguards or mitigation measures than those provided.
3. the ecology of Ramsar wetlands?	No	N/A	N/A	
4. world heritage values of World Heritage properties?	No	N/A	N/A	
5. the national heritage values of national heritage places?	No	N/A	N/A	



## **9.8 Cumulative impacts**

In consideration of whether the impact of the proposed work adds to cumulative impacts arising from other works, the proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is part of a major works program to repair and remediate Goat Island, which is a positive cumulative impact.

The carrying out of the demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is not anticipated to have any adverse cumulative impact with surrounding work.

The impacts of the proposed work considered in Section 9 of this REF, given its location within disturbed/modified structural footprints, and provided recommended mitigation measures are implemented, is not considered to have any adverse cumulative environmental impact on accesses, drainage patterns, flood behaviour or biodiversity (including connectivity of habitat and wildlife movement) at the demolition and decommissioning phases of the proposal. Delivery of works or community impacts are not an expected long-term impact. It is expected the proposal can be effectively scheduled to minimise associated outcomes (i.e. cost, delays etc).

## **10. Proposals needing more information**

### **10.1 Activities within regulated catchments**

The study area is located within the regulated Sydney Harbour Catchment (Figure 28; study area location denoted by red circle) and the sub-catchment Sydney Harbour Foreshores and Waterways Area (Figure 29; study area location denoted by red circle), and the proposal is subject to the consideration of matters provided in Tables 11 and 12, pursuant to Part 6.2 Division 2 and Part 6.3 Division 3, respectively, of Chapter 6 of the BCSEPP.

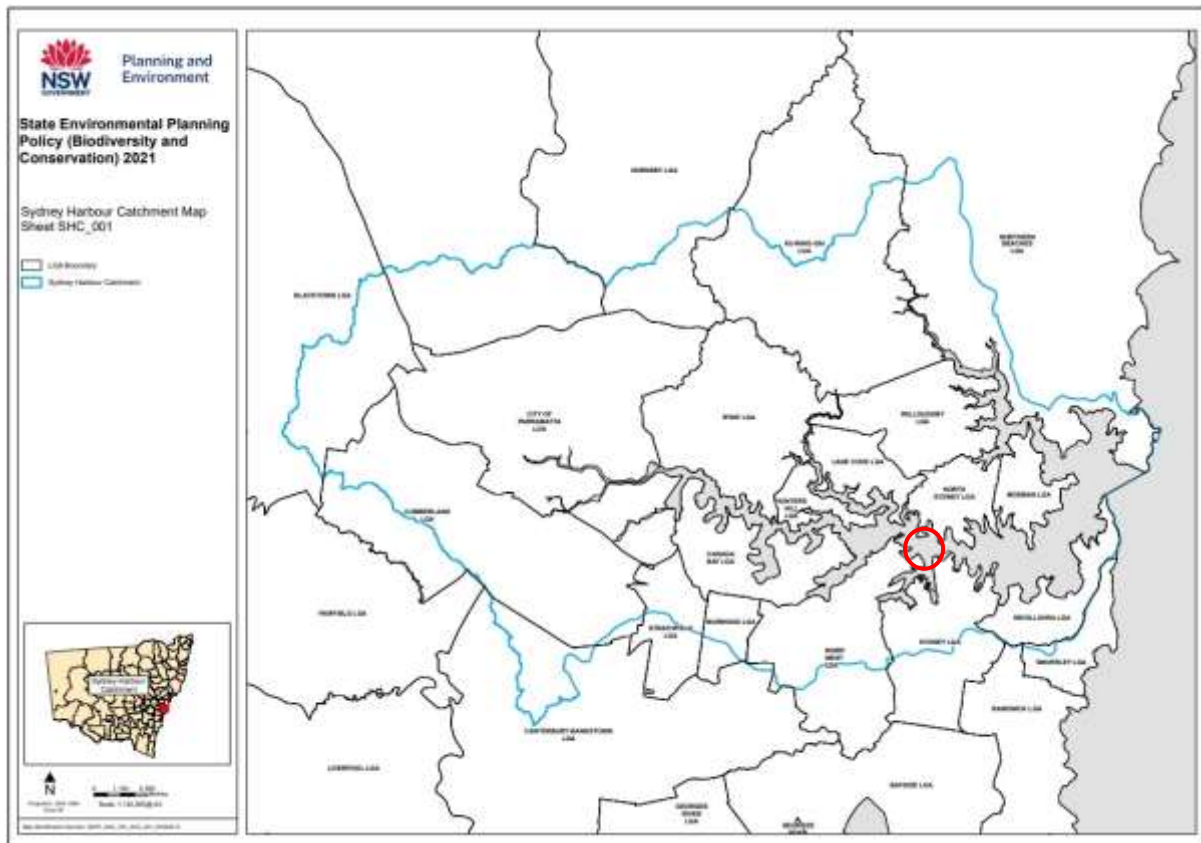


Figure 28. Sydney Harbour Catchment map

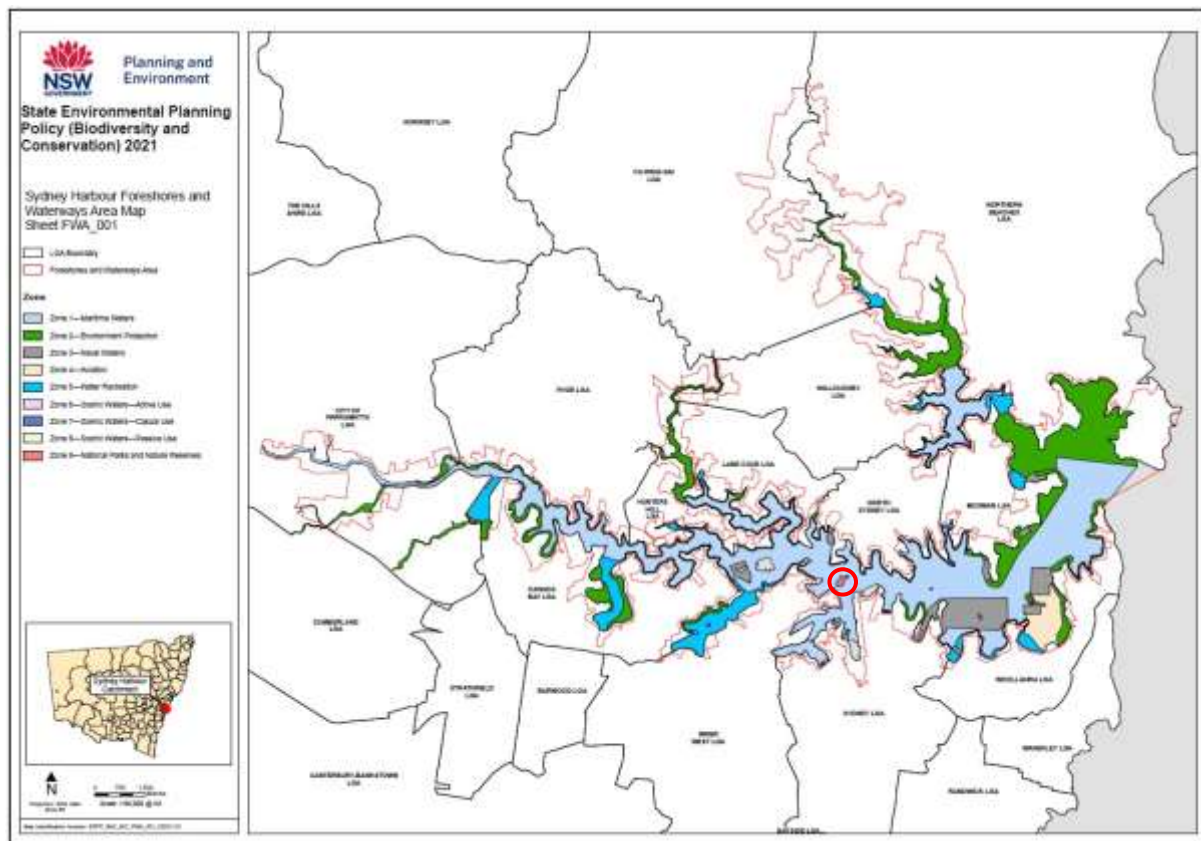


Figure 29. Foreshores and Waterways Area map

**Table 11. Matters for all regulated catchments**

Factors	Response
<b>1. Water quality and quantity</b>	
a. will the proposal have a neutral or beneficial effect on the quality of water entering a waterway?	Provided recommended mitigation measures are implemented, the proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is expected to have a neutral effect on the quality of water entering a waterway.
b. will the proposal have an adverse impact on water flow in a natural waterbody?	Given the expanse of Sydney Harbour, the proposed demolition works positioned on the western and northern foreshore of Goat Island, and limited to existing disturbed and modified footprints, would not have an adverse impact on water flow in a natural waterbody.
c. will the proposal increase the amount of stormwater runoff from a site?	The proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is limited to existing disturbed and modified structural footprints within Sydney Harbour; therefore, there will be no increase in the amount of stormwater runoff from the site.
d. will the proposal incorporate on-site stormwater retention, infiltration or reuse?	The proposal does not involve on-site stormwater retention, infiltration or reuse.
e. what is the impact of the proposal on the level and quality of the water table?	The proposal does not have any direct or indirect influence or impact on the level and quality of the water table.
f. what will be the cumulative environmental impact of the proposal on the regulated catchment?	Provided recommended mitigation measures are implemented, the proposed demolition of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is not considered to have any adverse cumulative environmental impact on the regulated catchment.
g. does the proposal make adequate provision to protect the quality and quantity of ground water?	Reference to the Australian Groundwater Explorer (BoM 2024b) does not identify the study area as featuring ground water.
<b>2. Aquatic ecology</b>	
a. will the proposal have a direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation? How?	Located within the existing disturbed and modified structural footprints of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b, and provided recommended mitigation measures are implemented, the proposal has been assessed within this REF to have no direct or indirect cumulative adverse impact on any terrestrial, aquatic or migratory fauna, or vegetation.
b. does the proposal involve the clearing of riparian vegetation?	The proposal is not located within a riparian zone; therefore, it does not involve the clearing of riparian vegetation.

Factors	Response
c. will the proposal minimise or avoid the erosion of land abutting a natural waterbody and/or the sedimentation of a natural waterbody?	To avoid potential risk of sedimentation of a natural waterbody, and avoid the erosion of land abutting a natural waterbody, in addition to further mitigation measures provided in Section 9 of this REF, an ESCP would be prepared for the proposal and would be in line with the publication <i>Managing Urban Stormwater: Soils and Construction</i> . Sediment control measures (i.e. silt screen) would be temporarily established as required prior to commencement of work, and kept in place for the duration.
d. will the proposal have an adverse impact on wetlands (not including those in mapped coastal wetlands and littoral rainforests areas)?	Section 8.2.4 of this REF identifies that no wetlands are present within, or near to, the study area.
e. does the proposal include adequate safeguards and rehabilitation measures to protect aquatic ecology?	Mitigation measures to protect aquatic ecology are provided in Section 9. It is not considered that the proposed work requires any rehabilitation measures.
f. if the development site adjoins a natural waterbody, are additional measures required to ensure a neutral or beneficial effect on the water quality of the waterbody?	No additional measures beyond those detailed above are required.
<b>3. Flooding</b>	
What is the likely impact of the proposal on periodic flooding that benefits wetlands and other riverine ecosystems?	The proposal does not have any direct or indirect influence or impact on periodic flooding.
<b>4. Recreation and public access</b>	
a. what is the likely impact of the proposal on recreational land uses?	Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b are not recreational assets in and of themselves.  These existing wharf sections are currently inaccessible to the public. It is acknowledged other points of access to Goat Island remain unaffected by the proposal.
b. will the proposal maintain or improve public access to and around foreshores without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation?	The existing sections of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b subject to the proposal are dilapidated and unsafe (including collapsed sections), and are currently inaccessible to the public. Therefore, the removal of these would not impact existing public access to Goat Island (or on natural waterbodies, watercourse, wetlands or riparian vegetation), with other points of access to Goat Island remaining unaffected by the proposal.

**Table 12. Additional factors in Sydney Harbour's Foreshores and Waterways Area**

Factors requiring consideration	Response
1. Is the activity consistent with the following principles— a. Sydney Harbour is a public resource, owned by the public, to be protected for the public good b. the public good has precedence over the private good c. the protection of the natural assets of Sydney Harbour has precedence over all other interests?	Provided recommended mitigation measures are implemented, the proposal is considered to consistent with these principles.
2. Will the activity promote the equitable use of the Foreshores and Waterways Area, including use by passive recreation craft?	The existing sections of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b subject to the proposal are dilapidated and unsafe (including collapsed sections), and currently inaccessible for equitable use, including by passive recreation craft.
3. Will the activity have an adverse impact on the Foreshores and Waterways Area, including on commercial and recreational uses?	The existing sections of Broadside Wharf 4a + 4b and Northern Broadside Wharf 55b subject to the proposal are dilapidated and unsafe (including collapsed sections), and are currently inaccessible for commercial or recreational uses.
4. Does the activity promote water-dependent land uses over other land uses?	The proposal does not promote water-dependent land uses over other land uses.
5. Will the activity minimise risk from rising sea levels or changing flood patterns as a result of climate change?	Currently, the wharves are not at risk from rising sea levels or changing flood patterns.
6. Will the activity protect or reinstate natural intertidal foreshore areas, natural landforms and native vegetation?	Activities to reinstate natural intertidal foreshore areas, natural landforms or native vegetation are beyond the scope of the proposal; however, provided recommended mitigation measures are implemented, these areas (where present) would be protected.
7. Does the development protect or enhance terrestrial and aquatic species, populations and ecological communities, including by avoiding physical damage to or shading of aquatic vegetation?	Provided recommended mitigation measures are implemented, the carrying out of the proposed demolition and removal of Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b is considered to protect aquatic species by avoiding physical damage to or shading of aquatic vegetation.  No populations or ecological communities were recorded.  The proposal does not impact terrestrial species.
8. Will the activity protect, maintain or rehabilitate watercourses, wetlands, riparian lands, remnant vegetation and ecological connectivity?	Provided recommended mitigation measures are implemented, the proposal is considered to protect the waters of Sydney Harbour, and remnant aquatic vegetation present.  No wetlands or riparian lands are present.



## 11. Summary of impacts and conclusions

**Table 13. Consideration of significance of impacts for each environmental factor**

Environmental factor	Consideration	Significance of impact*
1. the environmental impact on the community	Social, economic and cultural impacts as described in sections 9.3, 9.5 and 9.6	Not significant
2. the transformation of the locality	Human and non-human environment as described in sections 9.1, 9.2 and 9.4	Not significant
3. the environmental impact on the ecosystems of the locality	Amount of clearing, loss of ecological integrity, habitat connectivity/fragmentation and changes to hydrology (both surface and groundwater) as described in sections 9.1, 9.2 and 9.4 and, for nationally listed threatened ecological communities, in section 9.7.	Not significant
4. reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	Visual, recreational, scientific and other impacts as described in section 9.3.	Not significant
5. the effects on any locality, place or building that has— a. aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance, or b. other special value for present or future generations	Impacts to Aboriginal and historic heritage associated with a locality (including intangible cultural significance), architectural heritage, social/community values and identity, scenic values and others, as described in sections 9.3, 9.5 and 9.6 and (for MNES heritage places) section 9.7.	Not significant
6. the impact on the habitat of protected animals, within the meaning of the Biodiversity Conservation Act	Impacts to all native terrestrial species, including but not limited to threatened species, and their habitat requirements, as described in section 9.2.	Not significant
7. the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air	Impacts to all listed terrestrial and aquatic species, and whether the proposal increases the impact of key threatening processes, as described in section 9.2	Not significant
8. long-term effects on the environment	Long-term residual impacts to ecological, social and economic values as described in all parts of section 9.	Not significant
9. degradation of the quality of the environment	Ongoing residual impacts to ecological, social and economic as described in section 9.4.	Not significant
10. risk to the safety of the environment	Impacts to public and work health and safety, from contamination, bushfires, sea level rise, flood, storm surge, wind speeds, extreme heat, rockfall and landslip, and	Not significant

Environmental factor	Consideration	Significance of impact*
	other risks likely to increase due to climate change as described in sections 9.1, 9.3 and 9.4.	
11. reduction in the range of beneficial uses of the environment	Impacts to natural resources, community resources and existing uses as described in sections 9.3 and 9.4.	Not significant
12. pollution of the environment	Impacts due to air pollution (including odours and greenhouse gases); water pollution (water quality health); soil contamination; noise and vibration (including consideration of sensitive receptors); or light pollution, as described in sections 9.1 and 9.3.	Not significant
13. environmental problems associated with the disposal of waste	Transportation, disposal and contamination impacts as described in section 9.3.	Not significant
14. increased demands on natural or other resources that are, or are likely to become, in short supply	Impacts to land, soil, water, gravel, minerals and energy supply as described in section 9.4.	Not significant
15. the cumulative environmental effect with other existing or likely future activities	The negative synergisms with existing development or future activities as considered in section 9.8.	Not significant
16. the impact on coastal processes and coastal hazards, including those under projected climate change conditions	Impacts arising from the proposed activity on coastal processes, and impacts on the proposed activity from those coastal processes and hazards, both current and future, as considered in section 9.1.	Not significant
17. applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	Inconsistency with the objectives, policies and actions identified in local, district and regional plans, as considered in section 3.2.2.	Not significant
18. other relevant environmental factors.	Any other factors relevant in assessing impacts on the environment to the fullest extent, such as native title.	Not significant

### In conclusion:

- There **is not** likely to be a significant effect on the environment and an environmental impact statement **is not** required

Reason(s): The demolition and removal of the existing Broadside Wharf 4b and (sections of) 4a and Northern Broadside Wharf 55b would not have a significant effect on the environment such that an Environmental Impact Statement is required. The total disturbance/demolition footprint is about 0.16 ha, located within the existing disturbed/modified structural footprint of the wharf infrastructure within an aquatic environment. Ultimately, the proposed work would have a positive impact on the study area as it would address the dilapidated and unsafe infrastructure of the wharves, and as part of readying Goat Island for its transfer to Aboriginal ownership and management; providing an approved service level of infrastructure, continued

efficiency and safe access, while conserving the natural, heritage and recreational values of Goat Island for future enjoyment and appreciation.

- There **is not** likely to be a significant effect on threatened species, populations, ecological communities or their habitats and a species impact statement **is not** required

Reason(s): No threatened species, populations or ecological communities have been recorded within, or close to, the study area; however, as White's Seahorse have been previously recorded in association with Wharf 54b (about 70 m west of Northern Broadside Wharf 55b), and suitable habitat recorded within/proximate to the study area, a precautionary assessment on the potential presence of this species was conducted. The proposal is located within the existing disturbed/modified structural footprint of the wharf infrastructure within an aquatic environment, and will be designed and managed to avoid, minimise or mitigate any potential adverse impacts; therefore, the proposed work is not considered to have a significant effect on any threatened species, populations, ecological communities or their habitats. A SIS was not triggered.

- The activity **is not** likely to have a significant impact on matters of national environmental significance listed under the Commonwealth Environment Protection and Biodiversity Conservation Act and so **will not** require referral to the Australian Government.

Reason(s): No MNES have been previously recorded within, or close to, the study area; however, as White's Seahorse have been previously recorded in association with Wharf 54b (about 70 m west of Northern Broadside Wharf 55b), and suitable habitat recorded within/proximate to the study area, a precautionary assessment on the potential presence of this species was conducted. The proposal is located within the existing disturbed/modified structural footprint of the wharf infrastructure within an aquatic environment, and will be designed and managed to avoid, minimise or mitigate any potential adverse impacts; therefore, the proposed work is not considered to have a significant effect on any MNES listed under the EPBC Act. Referral of the matter as a controlled action to the Australian Government is not required.

- The activity **will not** require certification to the Building Code of Australia, Disability (Access to Premises – Buildings) Standards 2010 or Australian Standards in accordance with the NPWS Construction Assessment Procedures.

## 12. Supporting documentation

**Table 14. Documents that accompany the review of environmental factors**

Document title	Author	Date
Demolition Specification	Consult Marine	October 2024
Statement of Heritage Impact (Draft)	Robert Newton, Principal Project Officer, NSW NPWS; Mark Daniels, Senior Project Officer, NSW NPWS; Rebecca Agius, Senior Archaeologist and Heritage Specialist, Curio Projects, for Department of Climate Change, Energy, the Environment and Water (NSW NPWS)	November 2024
DPIRD Fisheries correspondence	Lesryk Environmental Pty Ltd DPIRD Fisheries	December 2024 – January 2025
Heritage Inventory extract	The Office of Environment and Heritage NSW	June 2011
Aquatic Ecology Assessment	Lesryk Environmental Pty Ltd	2024
	Marine Pollution Research Pty Ltd	October 2022



## 13. Declarations

As the person responsible for the **preparation** of the REF, I certify that, to the best of my knowledge, this REF is in accordance with the EP&A Act, the EP&A Regs and the Guidelines approved under section 170 of the EP&A Regs, and the information it contains is neither false nor misleading.

Signature	
Name (printed)	Deryk Engel
Position	Director and Senior Ecologist, Lesryk Environmental Pty Ltd
Date	08 January 2025

**By endorsing the REF, the proponent confirms that the information in the REF is accurate and adequate to ensure that all potential impacts of the activity can be identified.**

Signature	
Name (printed)	
Position	
Date	

Seal (if signing under seal):



## 14. Bibliography

Bureau of Meteorology 2024a, Monthly climate statistics, (Sydney Observatory Hill; Site number 066062), viewed September 2024.

- 2024b, Australian Groundwater Explorer, viewed September 2024.

Chapman G.A. and Murphy C.L., 1989, *Soil Landscapes of the Sydney 1:100,000 Sheet report*, Soil Conservation Service of NSW, Sydney.

Churchill, S 2008, *Australian bats* - 2nd Edition, Allen and Unwin, Crows Nest, NSW.

Coffey Services Australia 2020a, *Fort Denison Ferry Berth Upgrade Geotechnical Investigation Report*. Prepared 19 November 2020.

- 2020b, *Fort Denison Ferry Berth Upgrade Preliminary Contamination Assessment*. Prepared 8 December 2020.

Cogger, HG 2014, *Reptiles and Amphibians of Australia*, 7<sup>th</sup> Edition, CSIRO Publishing, Collingwood, VIC.

Consult Marine 2023, *Me Mel (Goat Island) Seawalls: Condition Assessment Report – Issue 5*. Report prepared for NPWS by Consult Marine, Leichhardt, NSW.

Commonwealth Department of Climate Change, Energy, the Environment and Water 2024a, Protected Matters Search Tool, data downloaded September 2024.

- 2024b, Register of Critical Habitat, viewed September 2024.

- 2024c, Species profile and threats database, viewed September 2024.

- 2024d, Australian Heritage Database (search: Goat Island), viewed September 2024.

Consult Marine 2023, *Me Mel (Goat Island) Seawalls, Condition Assessment Report* (Issue 5). Report prepared at the request of NSW National Parks and Wildlife Service.

- 2024, *Goat Island Demolition of Wharves – Demolition Specification*, viewed October 2024.

Cropper, S 1993, *Management of Endangered Plants*, CSIRO, Melbourne, Victoria.

Department of the Environment, 2013, Matters of National Environmental Significance: Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment, Canberra ACT.

Department of Environment, Climate Change and Water 2010, Due diligence code of practice for the protection of Aboriginal objects in New South Wales, viewed May 2024.

Department of Environment and Conservation 2004, Threatened Species Survey and Assessment: Guidelines for developments and activities (Working draft), New South Wales Department of Environment and Conservation, Hurstville, NSW.

Department of Primary Industries 2002, Critical Habitat of Grey Nurse Shark Notification 2002, viewed September 2024.

- 2013, Policy and guidelines for fish habitat conservation and management, viewed September 2024.

– n.d., Appendix F: Stream Order And Waterway Classification System, viewed September 2024

Department of Primary Industries and Regional Development 2024a, Fisheries NSW Spatial Data Portal – Key Fish Habitat (Sydney Metro), viewed September 2024.

- 2024b, NSW WeedWise – Priority weeds for the Greater Sydney, viewed September 2024.

- 2024c, Weeds of National Significance, viewed September 2024.

- 2024d, Register of critical habitat, viewed September 2024.

- 2024e, Estuarine Habitat Dashboard, viewed September 2024.

- 2024f, Threatened species distribution maps – Posidonia australis, viewed September 2024.

- 2024g, Threatened species lists, viewed September 2024.

- 2024h, Priorities Action Statement - Draft actions for White's Seahorse (*Hippocampus whitei*), viewed September 2024

Fairley, A and Moore, P 2010, *Native Plants of the Sydney Region*, Jacana Books, Allen & Unwin, Crows Nest, NSW.

Fisheries Scientific Committee 2019, Final Determination: White's Seahorse *Hippocampus whitei*, viewed September 2024.

Frith, HJ (Ed) 2007, *Complete book of Australian birds*, Readers Digest, Surry Hills, NSW.

Greencap 2022, *Sampling and Analysis Quality Plan (SAQP), Me Mel Goat Island, Sydney Harbour National Park*. Report prepared at the request of NSW Department of Planning and Environment (now NSW DCCEEW) by Greencap, North Ryde, NSW.

Harden, G (Ed) 1992-2002, *Flora of New South Wales Vol 1,2,3 and 4*, NSW University Press, Kensington, NSW.

Landcom 2004, Managing Urban Stormwater: Soils and Construction, Volume 1, 4<sup>th</sup> Edition, viewed September 2024.

Lesryk Environmental Pty Ltd 2023a, *Review of Environmental Factors: Me Mel Goat Island Remediation: Me Mel Goat Island Remediation: Broadside Wharf 4a and 2008 pontoon repairs within Lot 4 Part 16 DP 837196*. Report prepared at the request of NSW National Parks and Wildlife Service by Lesryk Environmental Pty Ltd, Heathcote, NSW.

- 2023b, *Aquatic survey Broadside Wharf 4a and 2008 Pontoon repairs Me Mel Goat Island, NSW*. Report prepared (as part of proposed repair works of Broadside Wharf 4a and 2008 Pontoon) at the request of NSW National Parks and Wildlife Service by Lesryk Environmental Pty Ltd, Heathcote, NSW.

- 2023c, *Review of Environmental Factors: Me Mel Goat Island Remediation: Wharf 54a demolition and Wharf 54b repairs*. Report prepared at the request of NSW National Parks and Wildlife Service by Lesryk Environmental Pty Ltd, Heathcote, NSW.

- 2024a, *Aquatic survey Northern Broadside Wharf 55b and Broadside Wharf 4a and 4b, Goat Island, NSW*. Report prepared (as part of proposed repair works of the Northern Seawall and Wharf 55b) at the request of NSW National Parks and Wildlife Service by Lesryk Environmental Pty Ltd, Heathcote, NSW.

- 2024b, *Review of environmental factors: Replacement of Barney's Cut Bridge, Goat Island*. Report prepared at the request of NSW National Parks and Wildlife Service by Lesryk Environmental Pty Ltd, Heathcote, NSW.

- 2024c, *Review of Environmental Factors: Goat Island Boatshed – Repair Options, Me Mel Goat Island*. Report prepared at the request of NSW National Parks and Wildlife Service by Lesryk Environmental Pty Ltd, Heathcote, NSW.

Marine Pollution Research Pty Ltd 2022, *Goat Island Wharf 54A&B Pile Repairs & Demolition Works Review of Environmental Factors – Aquatic Ecology Assessment*. Report prepared for NSW National Parks and Wildlife Service.

National Native Title Tribunal 2024a, Search Register of Native Title Claims [search: unincorporated], viewed September 2024.

- 2024b, Native Title Vision, viewed September 2024.

Newton, R., Daniels, M., and Agius, R 2024b, *Statement of Heritage Impact. Proposal to Demolish the Northern and Western Broadside Wharves (55B and 4B) and Repair and Renew the Northern Seawall* (Draft). Prepared for NSW Department of Climate Change, Energy, the Environment and Water (NSW National Parks and Wildlife Service).

NSW Environmental Protection Authority (EPA) 2009, Interim Construction Noise Guideline. Published by NSW Environment Protection Authority, Sydney, NSW.

- 2014, Waste Classification Guidelines Part 1: Classifying waste. Published by NSW Environment Protection Authority, Sydney, NSW.

- 2024, Contaminated land record (search: unincorporated LGA), viewed September 2024.

NSW Government 2024a, SEED map viewer, viewed September 2024.

- 2024b, NSW Planning Portal Spatial Viewer, viewed September 2024.

- 2024c, Health of our estuaries – Sydney Harbour, viewed September 2024.

- 2024d, BioNet Vegetation Classification, viewed September 2024.

- 2024e, Aboriginal Heritage Information Management System (AHIMS) Web Services, viewed May 2024.

- 2024f, State Heritage Inventory, viewed September 2024.

NSW Government – Environment and Heritage 2021, Neighbour relations policy (adopted 1996, updated 2021), viewed September 2024.

- 2022, Visitor safety policy (adopted 1989, updated 2022), viewed September 2024.

- 2024a, BioNet Atlas, viewed September 2024.

- 2024b, Areas of Outstanding Biodiversity Value register, viewed September 2024.

- 2024c, Maritime heritage database, viewed September 2024.

- 2024d, Me-Mel (Goat Island) – Remediation and conservation, viewed September 2024.

NSW National Parks and Wildlife Service 2004, Fire Management Plan: Sydney Harbour and Botany Bay (La Perouse Precinct) National Parks, viewed May 2024.

- 2024a, Assets of Intergenerational Significance Interactive Map, viewed September 2024.

NSW Reconstruction Authority 2024, State Disaster Mitigation Plan 2024-2026, viewed September 2024.

NSW Threatened Species Scientific Committee 2004, NSW Scientific Committee - final determination – Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments - key threatening process listing. Viewed September 2024.

Office of Environment and Heritage 2011a, Goat Island Conservation Management Plan, viewed September 2024.

- 2011b, Goat Island Conservation Management Plan - Volume 3 Site Database, viewed May 2024.

- 2011c, Construction Assessment Procedures, viewed May 2024.

- 2012, Sydney Harbour National Park Plan of Management, viewed September 2024.

- 2024, Threatened biodiversity profile search, viewed September 2024.

Simpson, K and Day, N 2010, *Field guide to the birds of Australia*, 8th Edition, Penguin Books Australia, Victoria.

State Government of NSW and NSW Department of Climate Change, Energy, the Environment and Water 2009, Soil Landscapes of the Sydney 1:100,000 Soil Landscape Sheet [SEED Dataset], viewed September 2024.

- 2019, Historic Heritage Information Management System (HHIMS) Sites, viewed September 2024.

- 2023, NSW State Vegetation Type Map, (release C2.0M2.0) [SEED Dataset], viewed September 2024.

State Government of NSW and NSW Department of Planning, Housing and Infrastructure 2024, Repealed - State Environmental Planning Policy (Coastal Management) 2018 [SEED Dataset], viewed September 2024.

State of NSW and Office of Environment and Heritage 2018, Threatened Species Test of Significance Guidelines, Office of Environment and Heritage, Sydney NSW, viewed September 2024.

Triggs, B 1996, *Tracks, scats and other traces: a field guide to Australian mammals*, Oxford University Press, Melbourne, Victoria.

Van Dyck, S and Strahan, R 2008, *The mammals of Australia* (3rd edition), Reed New Holland, Sydney, NSW.

## **Appendix A: Demolition Specification**

*Page left intentionally blank*

## Appendix B: Ecologically Sustainable Development

1. **The precautionary principle** – that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
2. **Inter-generational equity** – that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
3. **Conservation of biological diversity and ecological integrity** – should be a fundamental consideration [of the decision to undertake the activity].
4. **Improved valuation, pricing and incentive mechanisms** – that environmental factors should be included in the valuation of assets and services, such as:
  - (i) polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
  - (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
  - (iii) environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Ecologically Sustainable Development Principle	Application to the Proposal
Precautionary principle	The proposal does not pose a risk of serious or irreversible environmental damage. Any adverse impacts associated with the proposal would be minor, temporary and short-term. Measures to reduce adverse impacts as far as practicable have been identified within this REF.
Intergenerational equity	<p>The proposal is part of the island wide remediation program to ready Goat Island for its transfer to Aboriginal ownership and management.</p> <p>Ultimately, the proposed work would remove dilapidated and unsafe infrastructure to better support management of Goat Island; while conserving the natural, cultural heritage and recreational values of Goat Island.</p>
Conservation of biological diversity and ecological integrity	<p>The conservation of biological diversity and ecological integrity have been assessed within this REF, within the impact assessment of Section 9.</p> <p>Clause 171(2) of the EP&amp;A Regulations 2021 sets out 18 factors that need to be considered when assessing environmental impact under Part 5 of the EP&amp;A Act. These factors are addressed in this report and summarised in Section 11.</p>
Improved valuation and pricing of environmental resources	NPWS recognises the value of environmental resources and aims to minimise the impact of its activities by ensuring that appropriate mitigation measures are implemented for all aspects of the proposal.




## **Appendix C: Statement of Heritage Impact**

*Page left intentionally blank*

## Appendix D: DPIRD – Fisheries correspondence

Department of Primary Industries  
and Regional Development

Lesryk Environmental  
Attn: Deryk Engel  
PO Box 3001  
Bundeena NSW 2230



C24/1012  
19 December 2024

Re: s.199 FM Act notification - Goat Island Wharf Demolition - Sydney Harbour

Dear Deryk,

Thank you for your referral dated 2 December 2024 regarding the above stated matter. This notification complies with s.199(1)(a) of the Fisheries Management Act (FM Act) concerning the proposed dredging and reclamation activities.

DPIRD 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, DPIRD Fisheries ensures that developments comply with the requirements of the FM Act (namely the aquatic habitat protection and threatened species conservation provisions in Parts 7 and 7A of the Act, respectively), and the associated Policy and Guidelines for Fish Habitat Conservation and Management (2013). DPIRD Fisheries is also responsible for ensuring the sustainable management of commercial, recreational and Aboriginal cultural fishing, aquaculture, marine parks and aquatic reserves in NSW.

Thank you for this s199 referral. DPIRD Fisheries has no objections to the proposal, provided the environmental mitigation measures outlined in your letter (dated 2/12/24) are implemented on site and that they occur as described in the Review of Environmental Factors (Lesryk Environmental. 28/11/2024) for these works.

DPIRD Fisheries recommends that the following general environmental mitigation measures be implemented during construction:

1. A Part 7 permit for harm to marine vegetation under the FM Act is required from DPIRD Fisheries if any harm to macroalgae is proposed prior to any works on site. Permit application forms are available from the DPIRD Fisheries website at:  
<https://www.dpi.nsw.gov.au/fishing/habitat/help/permit>; and

---

Ahp.central@dpi.nsw.gov.au  
[dpi.nsw.gov.au](https://www.dpi.nsw.gov.au)

0455 794 560

1

2. Where piles to be removed occur adjacent to marine vegetation, it is recommended to cut the timbers at the seabed level as opposed to complete removal of the piles / jetting to limit disturbance to macroalgae.
3. Prior to works commencing the Seahorse Relocation Protocol (MPR, 2022) is to be sent to DPIRD Fisheries for review.
4. Erosion and sediment mitigation devices are to be erected in a manner consistent with current Best Management Practice (i.e. Managing Urban Stormwater: Soils and Construction 4<sup>th</sup> Edition Landcom, 2004) to prevent entry of sediment into the waterway prior to any earthworks being undertaken. These are to be maintained in good working order for the duration of the works and subsequently until the site has been stabilised and the risk of erosion and sediment movement from the site is minimal;
5. Any material removed from the waterway that is to be temporarily deposited or stockpiled on land is to be located well away from the waterway and to be contained by appropriate erosion and sediment control devices;
6. Prior to use at the site and/or entry into the waterway, machinery is to be appropriately cleaned degreased and serviced. Spill kits are to be available on site at all times during the works;
7. Adequate water depth must be maintained underneath all barges and propellers to ensure that marine vegetation is not impacted at any time. At least 600mm clearance must be maintained between the hull and the river bed, and also between the propeller and the river bed. Where adequate clearances beneath barges cannot be maintained at low tide, works should be restricted to high tide conditions.
8. When working near marine vegetation (seagrass, mangroves and saltmarsh), these areas need to be identified and appropriately delineated as "No Go" areas.
9. DPIRD Fisheries (1800 043 536) and the Environment Protection Authority (EPA) (131 555) are to be notified immediately if any fish kills occur in the vicinity of the works. In this situation, all works other than emergency response procedures are to cease until the issue is rectified and approval is given by DPIRD Fisheries and/or the EPA for the works to proceed.

For any further information, please contact me at [jess.hyland@dpi.nsw.gov.au](mailto:jess.hyland@dpi.nsw.gov.au)




Sincerely






Jess Hyland




Fisheries Manager Coastal Systems DPIRD Fisheries




## Appendix E: Photographic record

	<p>Broadside Wharf 4b within the Shipyard Precinct of Goat Island. Photo taken during April 2023.</p>
	<p>Photo taken looking north north-east through the collapsed Broadside Wharf 4b subject site. Photo taken during June 2024.</p>
	<p>The collapsed section of Broadside Wharf 4b. Photo taken during June 2024.</p>

	<p>Photo taken looking north through the retained (southern) section of Broadside Wharf; gangway and MOP in the foreground.</p>
	<p>Leatherjacket fish and cluster of Sydney rock oysters within the study area of Broadside Wharf. Urban refuse was also observed scattered throughout the site. Photo taken during April 2023.</p>
	<p>Diversity of aquatic vegetation found throughout the potential White's Seahorse habitat beyond the southern boundary of the Broadside Wharf. Photo taken during April 2023.</p>



	<p>Single Spiny Kelp stipe on the silt sea floor beyond the Broadside Wharf's boundary. Each stipe was inspected for the potential presence of the White's seahorse. Photo taken during April 2023.</p>
	<p>Low density vegetation including frondose algae growing on a supporting pile of Broadside Wharf. These observations were consistent across all piles surveyed. Photo taken during April 2023.</p>
	<p>Star fish observed on timber pier of Broadside Wharf (centre of photograph). Photo taken during April 2023.</p>

	<p>Sea Urchin observed on ballast (centre of photograph) and schooling Hula fish (bottom left of photograph). Photo taken during April 2023.</p>
	<p>Isolated patch of Spiny Kelp with Yellowfin Bream within the survey area of Broadside Wharf. Photo taken during April 2023.</p>
	<p>Photo taken looking South southwest adjacent to the collapsed Broadside Wharf 4b subject site. Photo taken during June 2024.</p>



Character of Blue Mussel encrusted on the ballast below Northern Broadside Wharf 55b. Photo taken during June 2024.



Character of Northern Broadside Wharf 55b (facing north-east). Photo taken during June 2024.



Character of Wharf 55b (facing north-west). Photo taken during June 2024.








Character of current Wharf 55b piles. Photo taken during June 2024.



Character of underside of Wharf 55b and northern seawall, featuring the natural sandstone, brickwork. Photo taken during June 2024.



Character of eastern end of Wharf 55b, northern seawall and adjacent modified environment and vegetation (facing west). Photo taken during June 2024.

	<p>Character of high-density patch of Spiny Kelp stipe beyond the wharf's boundary. Each stipe was inspected for the potential presence of the White's Seahorse. Photo taken during June 2024.</p>
	<p>Character of piles under water surface. Single Spiny Kelp stipe (low density), these present on a number of piles. Each stipe was inspected for the potential presence of the White's Seahorse. Photo taken during June 2024.</p>
	<p>Character of low-density isolated patch of Spiny Kelp on ballast. Photo taken during June 2024.</p>



	
	<p>Reaper Cuttlefish observed in the vicinity of Northern Broadside Wharf 55b. Photo taken during June 2024.</p>

## **Appendix F: Aquatic Ecology Assessments**

*Page left intentionally blank*

## Appendix G: Recorded species

### Aquatic fauna species

#### Key

1 – Lesryk 2024 study

2 – Lesryk 2023 study

Common name	Scientific name	1	2
<b>BIRDS</b>			
Silver Gull	<i>Chroicocephalus novaehollandiae</i>	x	x
Pied Cormorant	<i>Phalacrocorax varius</i>	x	
<b>FISH</b>			
Dusky Flathead	<i>Platycephalus fuscus</i>	x	
Smooth Toadfish	<i>Tetractenos glaber</i>	x	
Horned Blenny	<i>Parablennius intermedius</i>		x
Hoesse's Sandgoby	<i>Istigobius hoesei</i>	x	
Striped Cardinalfish	<i>Ostorhinchus cyanosoma</i> (syn. <i>Apogon cyanosoma</i> )	x	
Sydney Cardinalfish	<i>Apogon limenus</i>	x	
Senator Wrasse	<i>Pictilabrus laticlavius</i>	x	
Silver Drummer	<i>Kyphosus sydneyanus</i>	x	
Eastern Hulafish	<i>Trachinops taeniatus</i>	x	x
Fan-bellied Leatherjacket	<i>Monacanthus chinensis</i>	x	x
Yellowfin Bream	<i>Acanthopagrus australis</i>	x	x
<b>STARFISH</b>			
Sydney Seastar	<i>Anthenea sidneyensis</i>	x	x
<b>ASCIDIANS</b>			
Sponge sp.	<i>Didemnum sp.</i>	x	
Cunjevoi	<i>Alocasia brisbanensis</i>		x
<b>DEMOSPONGE</b>			
Finger Sponge	<i>Holopsamma laminaefavosa</i>		x
<b>CEPHALOPODS</b>			
Reaper Cuttlefish	<i>Sepia mestus</i>	x	
<b>GASTROPODS</b>			
Gold-mouthed Conniwink	<i>Bembicium auratum</i>	x	
Tall-ribbed Limpet	<i>Patelloida alticostata</i>	x	
Common Limpet	<i>Cellana tramoserica</i>	x	
Maltese Cross Limpet	<i>Patelloida insignis</i>	x	
<b>SEA URCHINS</b>			
Pebble Collector Urchin	<i>Pseudoboletia indiana</i>	x	
Shortspined Sea Urchin	<i>Heliocidaris erythrogramma</i>		x

Common name	Scientific name	1	2
<b>CRUSTACEANS</b>			
Acorn Barnacle	<i>Chthamalus antennatus</i>	x	
<b>BIVALVES</b>			
Sydney Rock Oyster	<i>Saccostrea glomerata</i>	x	x
Blue Mussel	<i>Mytilus edulis</i>	x	x
Razor-clam	<i>Pinna bicolor</i>	x	
Commercial Scallop	<i>Pecten fumata</i>	x	
Sydney Cockle	<i>Anadara trapezia</i>	x	

Terrestrial and Aquatic flora**Key**

1 – Lesryk 2024 study

2 – Lesryk 2023 study

Common name	Scientific name	1	2
<b>TERRESTRIAL PLANTS</b>			
Buffalo Grass	<i>Bouteloua dactyloides</i>	x	
Kikuyu Grass	<i>Cenchrus clandestinus</i>	x	
Couch Grass	<i>Elymus repens</i>	x	
Gum tree	<i>Eucalyptus spp.</i>	x	
Pig Face	<i>Carpobrotus aequilaterus</i>	x	
<b>AQUATIC PLANTS</b>			
Spiny Kelp	<i>Ecklonia radiata</i>	x	x
Brown Fan Weed	<i>Padina fraseri</i>	x	
Brown Algae	<i>Dictyota dichotoma</i>	x	x
Frondose Algae	<i>Dictyota sp.</i>		x
Turfing Red Alga	<i>Capreolia implexa</i>	x	x
Red Algae	<i>Pyropia spp.</i>	x	
Sea Lettuce	<i>Ulva spp.</i>	x	
Sargassum Weed	<i>Sargassum spp.</i>	x	x

## Appendix H: Likelihood of Occurrence table (BioNet Atlas)

A State or nationally listed threatened species is considered to have a:

Likelihood	Criteria
Recorded	The species was observed in the study area during the current survey.
High	The species has been recorded (via BioNet) within 10 km of the study area (within the last 10 years) and suitable habitat is present; or the species has the potential to fly over the site, is dependent on identified suitable habitat within the study area (i.e. for breeding or important lifecycle periods such as winter flowering resources), has been recently recorded (within five years), and is known or likely to visit the study area during regular seasonal movements or migration.
Moderate	The species has a predicted occurrence (via the BioNet geographic search) and there is potential habitat present, or the species is highly mobile and unlikely to maintain sedentary populations; however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e. for breeding or important lifecycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state.
Low	Based on a field assessment of the habitat constraints or microhabitats on the study area, the habitat is identified as being substantially degraded such that the species is unlikely to utilise the study area (or specific vegetation zones), an expert report states the species is unlikely to be present within the study area or specific vegetation zones, and the species has not been recently recorded within 10 km.  For fauna species, it may be an occasional visitor, but habitat similar to the study area is widely distributed in the locality, meaning that the species is not dependent (i.e. for breeding or important lifecycle periods such as winter flowering resources) on available habitats; or, the species is not highly mobile, is dependent on identified suitable habitat features (e.g. hollows, rocky outcrops) within the study area; however, has not been recorded in the locality in the last 10 years on BioNet.
None	Suitable habitat for a species is absent within the study area, regardless of whether they have been recorded within 10 km, or have a predicted occurrence.

### Key

V – vulnerable    E – endangered    Endangered population    M – migratory    Ma – marine

Note: The proposed work is not located within the Commonwealth marine area, this being from 3 to 200 nautical miles from the coast.



## Review of Environmental Factors: Wharf demolition and removal, Goat Island

Common Name	Status		Primary habitat requirements	No. of records	Likelihood of Occurrence <sup>7</sup>	Significance assessment undertaken
	EPBC Act	BC Act				
<b>PLANTS</b>						
Sunshine Wattle (Sydney region) <i>Acacia terminalis</i> subsp. <i>terminalis</i> MS	E	E	Coastal scrub and dry sclerophyll woodland on sandy soils.	34	Low. Not previously recorded on Goat Island.	No
Nielsen Park She-oak <i>Allocasuarina portuensis</i>	E	E	The original known habitat of the Nielsen Park She-oak is at Nielsen Park, in Woollahra local government area. There are no plants left at the original site where it was discovered. However, propagation material has been planted successfully at a number of locations at Nielsen Park and other locations in the local area, e.g. Gap Bluff, Hermit Point and Vaucluse House. Original habitat is tall closed woodland.	5	As above.	No
<i>Camarophyllopsis kearneyi</i>		E	Known only from its type locality in Lane Cove Bushland Park in the Lane Cove local government area in the Sydney metropolitan region.	1	As above.	No
Giant Spear Lily <i>Doryanthes palmeri</i>		V	In NSW, it occurs on the coastal ranges that are part of the Mt Warning Caldera. The species is currently known from eleven sites within NSW, five of which are conservation reserves. Most populations consist of only a few hundred individuals. Occurs on exposed rocky outcrops on infertile soils or on bare rock.	1	As above.	No
<i>Hygrocybe aurantipes</i>		V	Occurs in gallery warm temperate forests.	2	As above.	No
<i>Hygrocybe austropratensis</i>		E	Occurs in gallery warm temperate forests.	1	As above.	No
<i>Hygrocybe lanecovensensis</i>		E	Occurs in gallery warm temperate forests.	30	As above.	No
<i>Hygrocybe reesiaae</i>		V	Occurs in gallery warm temperate forests.	4	As above.	No

<sup>7</sup> For the site to support, and be important for the lifecycle requirements of, a locally viable population of this species.

## Review of Environmental Factors: Wharf demolition and removal, Goat Island

Common Name	Status		Primary habitat requirements	No. of records	Likelihood of Occurrence <sup>7</sup>	Significance assessment undertaken
	EPBC Act	BC Act				
Macadmaia Nut <i>Macadamia integrifolia</i>	V		Grows in remnant rainforest, preferring partially open areas such as rainforest edge.	4	As above.	No
Scrub Turpentine <i>Rhodamnia rubescens</i>	CE	CE	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	1	As above.	No
Magenta Lilly Pilly <i>Syzygium paniculatum</i>	V	E	Found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest.	24	As above.	No
<b>MAMMALS</b>						
Spotted-tailed Quoll <i>Dasyurus maculatus</i>	E	V	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	6	Low. Not previously recorded on Goat Island.	No
Koala <i>Phascolarctos cinereus</i>	E	E	Open eucalypt forest and woodland, containing a variety of 'preferred' food tree species.	9	As above.	No
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	V	V	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	1258	Moderate. Species may fly over, but would not rely on habitat within, the study area.	No
Yellow-bellied Sheath-tailbat <i>Saccolaimus flaviventris</i>		V	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	11	Moderate. Species may fly over or forage within the surrounding area on occasion; however, no suitable roosting habitat is present within the study area.	No
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	E	E	Cave-roosting bat that forages in timbered woodland and dry sclerophyll forest.	3	As above.	No
Eastern False Pipistrelle		V	Prefers moist habitats, with trees taller than 20 m.	5	As above.	No

## Review of Environmental Factors: Wharf demolition and removal, Goat Island

Common Name	Status		Primary habitat requirements	No. of records	Likelihood of Occurrence <sup>7</sup>	Significance assessment undertaken
	EPBC Act	BC Act				
<i>Falsistrellus tasmaniensis</i>			Generally, roosts in hollow-bearing trees (eucalypts), but has also been found under loose bark on trees or in buildings.			
Southern Myotis <i>Myotis macropus</i>		V	Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	43	As above.	No
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>		V	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Usually roosts in tree hollows but also in buildings.	4	As above.	No
Little Bent-winged Bat <i>Miniopterus australis</i>		V	Generally found in well-timbered areas. Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day.	20	As above.	No
Large Bent-winged Bat <i>Miniopterus orianae oceanensis</i>		V	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	34	As above.	No
Eastern Coastal Free-tailed Bat <i>Mormopterus norfolkensis</i>		V	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	1	As above.	No
Eastern Chestnut Mouse <i>Pseudomys gracilicaudatus</i>		V	Mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps.	1	Low. Not previously recorded on Goat Island. No suitable habitat present.	No
New Holland Mouse <i>Pseudomys novaehollandiae</i>	V		Open heathland, open woodland with a heathland understorey and vegetated sand dunes.	1	As above.	No
New Zealand Fur-seal <i>Arctocephalus forsteri</i>	Ma	V	Prefers rocky parts of islands with jumbled terrain and boulders.	23	Low. May occur within the surrounding harbour; no	No

## Review of Environmental Factors: Wharf demolition and removal, Goat Island

Common Name	Status		Primary habitat requirements	No. of records	Likelihood of Occurrence <sup>7</sup>	Significance assessment undertaken
	EPBC Act	BC Act				
					suitable habitat is present within the subject site.	
Australian Fur-seal <i>Arctocephalus pusillus doriferus</i>	Ma	V	Prefers rocky parts of islands with flat, open terrain. They occupy flatter areas than do New Zealand Fur-seals where they occur together.	2	As above.	No
<b>BIRDS</b>						
Superb Fruit-Dove <i>Ptilinopus superbus</i>		V	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	1	Low. No suitable habitat present.	No
Rose-crowned Fruit-Dove <i>Ptilinopus regina</i>		V	Occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	1	As above.	No
Australasian Bittern <i>Botaurus poiciloptilus</i>	E	E	Occupies shallow, vegetated freshwater or brackish swamps, usually dominated by tall, dense reed beds of <i>Typha</i> sp., <i>Juncus</i> sp. and <i>Phragmites</i> sp. Nests on platforms of reeds and rushes, usually built over water in dense cover.	1	As above.	No
Pied Oystercatcher <i>Haematopus longirostris</i>		E	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. The chisel-like bill is used to pry open or break into shells of oysters and other shellfish.	1	As above.	No
White-throated Needletail <i>Hirundapus caudacutus</i>	V, M, Ma	V	Almost exclusively aerial. Takes insects on wing over a range of habitat types. Recorded most often above wooded areas, including open forest and rainforest.	1	As above.	No
Bush Stone-curlew <i>Burhinus grallarius</i>		E	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.	1	As above.	No

## Review of Environmental Factors: Wharf demolition and removal, Goat Island

Common Name	Status		Primary habitat requirements	No. of records	Likelihood of Occurrence <sup>7</sup>	Significance assessment undertaken
	EPBC Act	BC Act				
Eastern Osprey <i>Pandion cristatus</i>	M, Ma	V	Occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands.	4	Low. Species may fly over but would not rely on habitat within the study area.	No
Square-tailed Kite <i>Lophoictinia isura</i>		V	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.	1	As above.	No
White-bellied Sea-eagle <i>Haliaeetus leucogaster</i>	Ma	V	Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia.	12	Low. Species may fly over but would not rely on the disturbed/modified habitat within the study area.	No
South-eastern Glossy Black-Cockatoo <i>Calyptorhynchus lathami lathami</i>	V	V	Inhabits eucalypt woodland and feeds almost exclusively on Casuarina fruits.	1	Low. No suitable habitat present.	No
Little Lorikeet <i>Glossopsitta pusilla</i>		V	Forages primarily in the open Eucalypt forest and woodland canopies, particularly along water courses; occasionally in Angophoras, Melaleucas and other tree species, also riparian habitats are used.	5	As above.	No
Swift Parrot <i>Lathamus discolor</i>	CE, Ma	E	Eucalypt forests. When over-wintering on the mainland, this species is dependent on winter-flowering eucalypt species.	3	As above.	No
Powerful Owl <i>Ninox strenua</i>		V	Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.	376	As above.	No
Barking Owl <i>Ninox connivens</i>		V	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland.	1	As above.	No
Masked Owl <i>Tyto novaehollandiae</i>		V	Lives in dry eucalypt forests and woodlands from sea level to 1100 m.	1	As above.	No



## Review of Environmental Factors: Wharf demolition and removal, Goat Island

Common Name	Status		Primary habitat requirements	No. of records	Likelihood of Occurrence <sup>7</sup>	Significance assessment undertaken
	EPBC Act	BC Act				
Painted Honeyeater <i>Grantiella picta</i>	V	V	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i> .	1	As above.	No
Varied Sittella <i>Daphoenositta chrysoptera</i>		V	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland.	1	As above.	No
<b>REPTILES</b>						
Pale-headed Snake <i>Holocephalus bitorquatus</i>		V	Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. A patchy distribution from north-east Queensland to the north-eastern quarter of NSW.	1	Low. No suitable habitat present.	No
<b>AMPHIBIANS</b>						
Red-crowned Toadlet <i>Pseudophryne australis</i>		V	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings.	3	Low. No suitable habitat present.	No
Green and Golden Bell Frog <i>Litoria aurea</i>	V	E	Inhabits a variety of environments, including disturbed sites, ephemeral ponds, wetlands, marshes, dams and stream-sides, particularly those that contain one or more of the following aquatic plants: bullrush ( <i>Typha</i> spp.), spikerush ( <i>Eleocharis</i> spp.), <i>Juncus kraussii</i> , <i>Schoenoplectus littoralis</i> and <i>Sporobolus virginicus</i> .	1	As above.	No
<b>INSECTA</b>						
Giant Dragonfly <i>Petalura gigantea</i>		E	Live in permanent swamps and bogs with some free water and open vegetation.	1	Low. No suitable habitat present.	No

## **Appendix I: Protected Matters Search Tool results**

*Page left intentionally blank*