Kamay Ferry Wharves

State significant infrastructure scoping report

Transport for NSW

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Approval and authorisation

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Draft 1	March 2020	Alice Smith, Bronte Linkhorn	Chris Fay
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Executive summary

Introduction and need

Transport for NSW is seeking approval to reinstate ferry wharves at La Perouse and Kurnell in Botany Bay.

The proposal includes the following key features:

- The reconstruction of maritime infrastructure at La Perouse and Kurnell suitable for the berthing of passenger ferries, tourism-related commercial vessels and recreational vessels
- The construction of amenities that are specifically needed to allow the safe and efficient operation of the maritime infrastructure.

Connection between La Perouse and Kurnell is currently only possible by road around Botany Bay with no direct link. There is limited public transport for visitors travelling to this area of Botany Bay. A ferry connection would open-up public transport access for visitors to the area and for residents to commute north to Sydney CBD, eastern suburbs and south to Cronulla.

Planning and assessment process

Transport for NSW has formed the opinion the proposal has the potential to significantly affect the environment pursuant to section 5.12 (3b) of the NSW *Environmental Planning and Assessment Act* (EP&A Act). On this basis, the proposal is declared to be State significant infrastructure (SSI) under section 5.12(2) of EP&A Act.

Proposed scope of the environmental impact statement

The report supports an application under section 5.15 of the EP&A Act and clause 192 of the Environmental Planning and Assessment Regulation 2000 to carry out state significant infrastructure. It aims to assist in the formulation of environmental assessment requirements by the Secretary of the Department of Planning, Industry and Environment under Section 5.16, which would inform the preparation of the environmental impact statement.

The outcomes of the preliminary environmental investigations indicate that the following key environmental issues will require further detailed assessment and may require proposal-specific impact mitigation measures:

- Aboriginal heritage
- Non-Aboriginal heritage
- Maritime archaeology
- Biodiversity
- Traffic and transport
- Landscape character and visual amenity
- Socioeconomic
- Contamination
- Noise and vibration
- Coastal processes
- Climate change.

A number of other environmental issues have also been identified. These issues are outlined within this report and are considered to be of lesser consequence taking into consideration

the proposal scope, the existing environment and the implementation of standard management and safeguard measures.

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1 Introduction

This chapter introduces the proposal and provides the context of the environmental assessment.

1.1 Overview of the proposal

Transport for NSW is seeking approval to reinstate public ferry wharves and associated infrastructure at La Perouse and Kurnell in Botany Bay (the proposal). The proposal would allow for the operation of the ferry service that ended in 1974 following a heavy storm that caused severe damage to the wharves. It would help connect La Perouse and Kurnell via an alternative means other than road. It would provide the infrastructure to allow a public ferry service to operate while providing supplementary temporary mooring for commercial vessels and recreational boating. The proposed infrastructure is located within Randwick City and Sutherland Shire local government areas (LGAs).

The proposal includes the following key features:

- The reconstruction of maritime infrastructure at La Perouse and Kurnell suitable for the berthing of passenger ferries, tourism-related commercial vessels and recreational vessels
- The construction of amenities that are specifically needed to allow the safe and efficient operation of the maritime infrastructure.

The design, as described in more detail in Chapter 3, will continue to evolve through the design development, consultation and environmental assessment process. The final concept design would be presented in the future environmental impact statement (EIS).

1.2 Statutory process

Transport for NSW has prepared this scoping report to support a State significant infrastructure application under section 5.12(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Transport for NSW has formed the opinion that the impact of the proposal on biodiversity, Aboriginal heritage and non-Aboriginal heritage has the potential to be significant and would require an EIS to be obtained under Part 5 of the EP&A Act. The proposal does not require development consent under Part 4 of the EP&A Act. Accordingly, as per section 5.12 (3b) of the EP&A Act the proposal can be classified State significant infrastructure under Division 5.2 of the EP&A Act and requires the approval of the Minister for Planning and Public Spaces.

The requirements of clause 192 of the Environmental Planning and Assessment Regulation 2000 for applications seeking approval of the Minister for Planning and Public Spaces to carry out State significant infrastructure are addressed in Attachment A to this report.

1.3 Purpose of the report

The purpose of this scoping report is to assist the formulation of environmental assessment requirements by the Secretary of the Department of Planning, Industry and Environment under section 5.16 of the EP&A Act. The scoping report does the following:

- Describes the proposal

- Considers the potential environmental issues for the proposal
- Identifies key environmental issues for the proposal.

The scoping report and Secretary's environmental assessment requirements (SEARs) would inform the preparation of an EIS for the proposal. The form and content of the EIS would be in accordance with clauses 6 and 8 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

Figure 1-1 shows the proposal's regional context in Botany Bay, which is about 14 kilometres south of the Sydney central business district (CBD).

Figure 1-1 Location of the proposal

2 Background

This chapter describes the need for the proposal in terms of its strategic setting and operational need.

2.1 Strategic context and proposal need

2.1.1 Need for the proposal

Kurnell and La Perouse are two historically significant areas located within the Kamay Botany Bay National Park, forming the entrance to Botany Bay. Botany Bay is known as a place of historical and cultural importance for Australia. Aboriginal cultural sites date back thousands of years and the area is the first meeting place between Aboriginal peoples and the crew of the Endeavour in 1770, in the area now known as Kamay Botany Bay National Park.

Today, there is no ferry service between La Perouse and Kurnell in Botany Bay. Between the late 1890s and 1974 a passenger ferry service operated between the former wharves at each site, with a 20-minute journey. Services ended in 1974 following severe damage to the wharves during a storm.

With no existing waterborne service, the connections between La Perouse and Kurnell Peninsula are restricted to travel by road. This limits the potential of both areas and people's ability to easily access the historical and culturally significant areas and means that there are no alternative commuting options for travellers and residents between the two locations.

A ferry connection would open-up public transport access for visitors. It would also help residents by allowing people to travel and commute north to Sydney CBD and eastern suburbs, and south to Cronulla, and Sutherland Shire.

The proposal would also support economic development and tourism at La Perouse, Kurnell and Kamay Botany Bay National Park.

The findings of the consultation carried out as part of the Feasibility Study (Arup, 2016) demonstrated community support for a reinstated ferry service to improve links to the wider area of Sydney for economic and tourism purposes.

2.1.2 Strategic planning and policy context

This section describes the proposal's strategic context under State policy.

Future Transport, 2056

The Future Transport Strategy 2056 (Transport for NSW, 2018a) sets the 40-year vision for transport in NSW and is supported by service and infrastructure plans and other more detailed issues-based or place-based planning documents. The proposal aligns with the visions of the Future Transport 2056 directive, by contributing to successful places, a strong economy and accessible services.

Building Momentum: State Infrastructure Strategy 2018-2028

The Building Momentum: State Infrastructure Strategy 2018 – 2028 (Infrastructure NSW, 2018) serves as the 20-year plan for the needs and priorities of infrastructure development in NSW. The strategy has a key objective that directly aligns with the proposal, which is to

ensure the transport systems create opportunities for people and businesses to access the services they need.

Botany Bay, Georges River and Port Hacking Regional Boating Plan, 2015

The proposal has been identified as a Priority Regional Project within the Botany Bay, Georges River and Port Hacking Regional Boating Plan (Transport for NSW, 2015). Key findings of the plan identified relatively few existing formal waterway access points in Botany Bay to service the catchment population. This proposal would provide to new access points for recreational and commercial boats.

Kamay Botany Bay National Park Master Plan, Kurnell, 2019

The Kamay Botany Bay National Park Master Plan, Kurnell (Neeson Murcutt Architects Pty Ltd *et al*., 2019) specifically identifies the proposed ferry wharves and ferry connection as an integral component of the design for the upgraded Kurnell Peninsula. The wharves would provide new visitor experiences.

Members of the Aboriginal community have indicated the ferry service would be a significant outcome of the Master Plan for cultural reasons, including improving connections between La Perouse and Kurnell and reinstating the service that Aboriginal peoples previously ran.

Kamay Botany Bay National Park Plan of Management, 2020

The Kamay Botany Bay National Park Plan of Management (Department of Planning, Industry and Environment (DPIE), 2020) makes provision for facilities for visitor access and enjoyment of the Park. The Plan states that building and reintroducing connections is a priority. The proposal aligns with this Plan as the re-establishment of the wharves and ferry service enables transport links to connect people with the National Park.

Meeting Plan Precinct – Conservation Management Plan, 2008

The Meeting Plan Precinct – Conservation Management Plan (DECCW, 2008) seeks to achieve long-term conservation of heritage sites in the Meeting Place Precinct in Kamay Botany Bay National Park. This includes the shoreline around the location of the previous public ferry wharf in Kurnell. One of the Plan's key strategies is to build transport connections. The proposal aligns with this by providing a waterborne transport link between La Perouse and Kurnell.

Randwick City Plan, 2012 and Vision 2040: Draft Local Strategic Planning Statement

The La Perouse ferry wharf and associated landside infrastructure would be built within the Randwick City LGA. The City Plan (Randwick City Council, 2012) and Local Strategic Planning Statement (LSPS) (Randwick City Council, 2019) provide the framework for land use planning and decision making over the next 20 years in the LGA. The proposal aims to aligns with these policy documents by helping provide and maintain a quality public space while valuing and protecting heritage.

Sutherland Shire Draft Local Strategic Planning Statement, 2019

The Kurnell ferry wharf and associated landside development would be built in Sutherland Shire LGA. The Sutherland Shire Draft LSPS (Sutherland Shire Council, 2019) discusses the vision and planning principles to guide land use decisions for the next 20 years.

The planning priorities are categorised into infrastructure and collaboration, liveability, productivity and sustainability. A specific priority under liveability is to create attractive public places and points to coastal destination areas of Sutherland; including Kurnell Peninsula. This is because the Peninsula is a primary focus for recreation and visitation. The proposal

would help contribute to improving Kurnell Peninsula as an attractive public place by improving accessibility to the National Park and improve the connection with La Perouse.

2.2 Proposal objectives

The objectives of the proposal include:

- Create waterborne access to the Kamay Botany Bay National Park for passenger ferries, tourism-related commercial vessels and recreational vessels
- Ensure safety is paramount during all proposal lifecycle phases
- Adopt a place-led approach to the services in accordance with the Movement and Place Framework (Transport for NSW, 2018b)
- Achieve value for money and efficiency in the development, delivery and operation of the proposal
- Ensure the proposal is completed within the proposal budget
- Complete the proposal as early as possible
- Ensure full compliance with all planning approvals
- Make the best use of available resources from private and public sectors
- Ensure robust, accountable and transparent governance systems and structures are implemented
- Ensure meaningful engagement with the Aboriginal community and that culturally sensitive outcomes are implemented
- Meet the needs and expectations of end users, community and key stakeholders
- Ensure the proposal promotes ecologically sustainable development principles.

2.3 Issues raised during consultation

The consultation to date includes that carried out for updated Feasibility Study (Arup, 2016) and the Kamay Botany Bay National Park Kurnell Master Plan (Neeson Murcutt Architects Pty Ltd *et al*, 2019). The consultation process described under the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI, Roads and Maritime, 2012) has been followed. Consultation has also been carried out as part of the Strategic Business Case (Arup, 2020) as detailed below.

Feasibility study

Consultation carried out for the Feasibility Study (Arup, 2016) was directed by a Project Control Group (PCG) that included Transport for NSW, NPWS, Randwick City Council and Sutherland Shire Council. The members of the PCG jointly established terms of reference for the study and contributed to regular progress meetings. The members reviewed the draft Feasibility Study and provided comments (submissions) that were addressed in updating the report in 2016. Further to this, feedback on the study was sought from NSW Ports, Port Authority of NSW and the La Perouse Local Aboriginal Land Council (LPLALC).

Community engagement sought public feedback on the draft Feasibility Report. The call for public feedback and comment was advertised via various methods including Transport for NSW's website, distribution of proposal flyers, and local newspaper advertisements. A total

of 111 submissions were received during the public comment period which ran from 5 July to 12 August 2016.

The outcome of this consultation showed that 74 per cent of submissions supported the reinstatement of ferry service due to the:

- Economic development and tourism opportunities
- Improved access to Kamay Botany Bay National Park
- Provision of an alternative to driving when traveling from La Perouse to Kurnell.

The main concerns raised by respondents were:

- Traffic and parking impacts
- Social impacts to residents in Kurnell and La Perouse
- Security of new facilities
- Land and marine environmental impacts, including impact on migratory birds.

The submitted comments were addressed in the updated Feasibility Report (Arup, 2016), which can be found online at: *https://www.transport.nsw.gov.au/sites/default/files/media/documents/2017/ferry-wharves-la-perouse-kurnell-feasibility-study-report.pdf*

Kamay Botany Bay National Park Kurnell master plan

As part of the development of the Kamay Botany Bay National Park Kurnell Master Plan (Neeson Murcutt Architects Pty Ltd *et al*., 2019), NPWS consulted with several parties to help guide its drafting; as summarised in the Summary of Community and Stakeholder Engagement, Kamay Botany Bay National Park (Office of Environment and Heritage, 2018).

Themes identified through the community and stakeholder engagement included the following:

- Valuing the connections with Kamay Botany Bay National Park
- Improving the maintenance of the National Park
- Sustaining Aboriginal connections to the National Park
- Marking the 250th anniversary of first contact in 2020
- Requesting more facilities for visitors within the National Park
- Creating an engaging experience by improving the National Park entrance, activating the National Park, storytelling, using digital interpretations, Aboriginal guides, nature interpretations and activity areas for children
- Improving the existing Environmental Education Centre
- Restoring the landscape to the natural bush landscape and historic landscape
- Improving public transport options to Kurnell.

Community engagement on the Master Plan is ongoing.

Aboriginal community involvement

The connection between La Perouse and Kurnell has cultural significance for Aboriginal peoples. As such, the Aboriginal community is a key stakeholder.

A core approach to the proposal's development is working closely with the Aboriginal community in its design, development and delivery. This approach is consistent with the Kamay Botany Bay National Park Plan of Management (DPIE, 2020), which recognises the long connection the Aboriginal peoples have with the area now known as the Kamay Botany Bay National Park and the surrounding land and sea. One of the key actions identified in the Plan of Management is supporting Aboriginal community engagement in the National Park's management.

Furthermore, the four-stage PACHCI (Roads and Maritime, 2012) is being followed to investigate the proposal's potential impacts. Stage 2 has involved early consultation with Aboriginal peoples, and the engagement of Strategic Advisor. This is to ensure that the role, function and views of Aboriginal peoples are considered and respected in a culturally appropriate way.

Engagement for this stage commenced with a meeting with the CEO of the LPLALC in January 2020. During this meeting, the La Perouse LALC indicated there is support for this proposal from the Board and members of the LPLALC and the boarder Aboriginal community, and that they have interest in seeing economic and cultural benefits as a result of a reinstated ferry service.

The Stage 2 PACHCI consultation was carried out onsite on Thursday 30 and Friday 31 January 2020. The LPLALC were represented onsite along with heritage specialists and staff from NPWS and Transport for NSW.

The PACHCI Stage 2 report is attached as Attachment B.

Strategic Business Case

Engagement with Randwick City Council, Sutherland Shire Council and Department of Primary Industries (Fisheries) has been carried out during the strategic business case phase, the outcomes of which have been fed into this Scoping Report. Key issues discussed included:

- Traffic, parking and connectivity
- Active transport provisions
- Seagrass and targeted marine surveys
- Recreational users of Botany Bay as well as surrounding areas.

2.4 Future consultation

Figure 2.1 provides a summary of the engagement activities planned for each proposal stage.

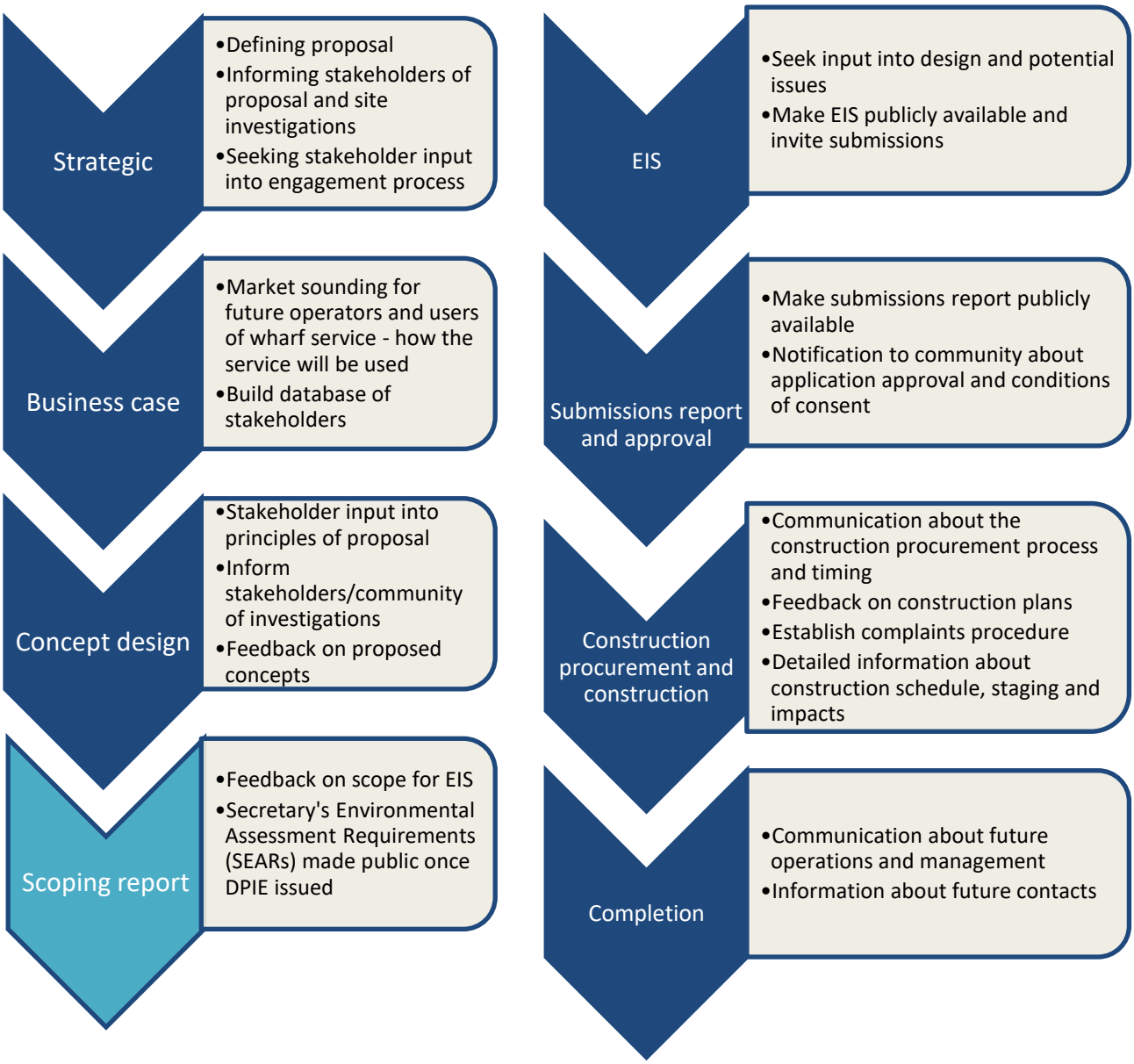

Figure 2-1 Consultation throughout the proposal process

3 Proposal description

This chapter describes the proposal including its main features.

Transport for NSW is seeking approval to reinstate two public ferry wharves and associated infrastructure at La Perouse and Kurnell in Botany Bay to allow the operation of a ferry service between the wharves (the proposal). The proposal would allow the reinstatement of the ferry service that ended in 1974 following a heavy storm. It would help connect La Perouse and Kurnell via an alternative means other than road. It would also provide temporary mooring for commercial vessels and recreational boating. The proposed infrastructure is located within Randwick City and Sutherland Shire LGAs.

The proposal includes the following key features:

- Building two new wharves, one at La Perouse and one at Kurnell to support reintroducing a passenger ferry service
- Ensuring the wharves can support a range of commercial and recreational vessel sizes
- Building land side amenities to help make the service an enjoyable and efficient customer experience
- Retaining ongoing ownership, operation and maintenance of the above infrastructure and amenities.

The ferry vessels would berth overnight and refuel at a separate location. This refuelling location has not been confirmed yet, however this may be at an existing berthing facility in Botany Bay.

The proposal location is shown on Figure 3-1.

Figure 3-1 Proposal area and swept ferry path

3.1 La Perouse

The proposed wharf at La Perouse would extend about 100 metres from the shore. It would include a main berth platform for commercial vessels, including the ferries. It may also include a lower level platform for recreational vessels.

3.2 Kurnell

The proposed wharf at Kurnell would extend about 200 metres from the shore. It would have the same features as the La Perouse wharf.

3.3 Construction

It would take about two years to build the proposal. While the construction method will be developed during concept design it would likely involve:

- Enabling works including ground investigations, establishing construction compound areas
- Main works including construction of the wharves and associated infrastructure
- Testing and commissioning
- Handover for operation.

4 Key environmental issues

This chapter describes the key environmental issues that are expected in building and operating the proposal that should be assessed in detail in the EIS.

4.1 Overview

Key issues are those that may have high or moderate impacts (actual or perceived) and assessment is necessary to determine the level of potential impact and to develop appropriate measures to mitigate and manage the impacts.

The outcomes of the preliminary environmental investigations indicate the following key environmental issues will require further detailed assessment and may require proposal specific impact mitigation measures.

- Aboriginal heritage
- Non-Aboriginal heritage
- Maritime archaeology
- Biodiversity
- Traffic and transport
- Landscape character and visual amenity
- Socioeconomic
- Contamination and pollution
- Noise and vibration
- Coastal processes
- Climate change.

A number of other environmental issues have also been identified. These issues are outlined in Chapter 5 and are considered to be of lesser consequence taking into consideration the proposal scope, the existing environment and the implementation of standard management and safeguard measures. It is expected that these other environment issues are unlikely be key issues. However, the potential impact of these other environmental issues will be assessed further in the EIS for the proposal.

The information below is based on desktop reviews and initial site visits. The study area used for this scoping report is shown on Figure 4-1 and Figure 4-2 and is referred to as the “proposal area”. The proposal area includes all areas where construction and operational activities are likely to be carried out.

Figure 4-1 Proposal area at La Perouse

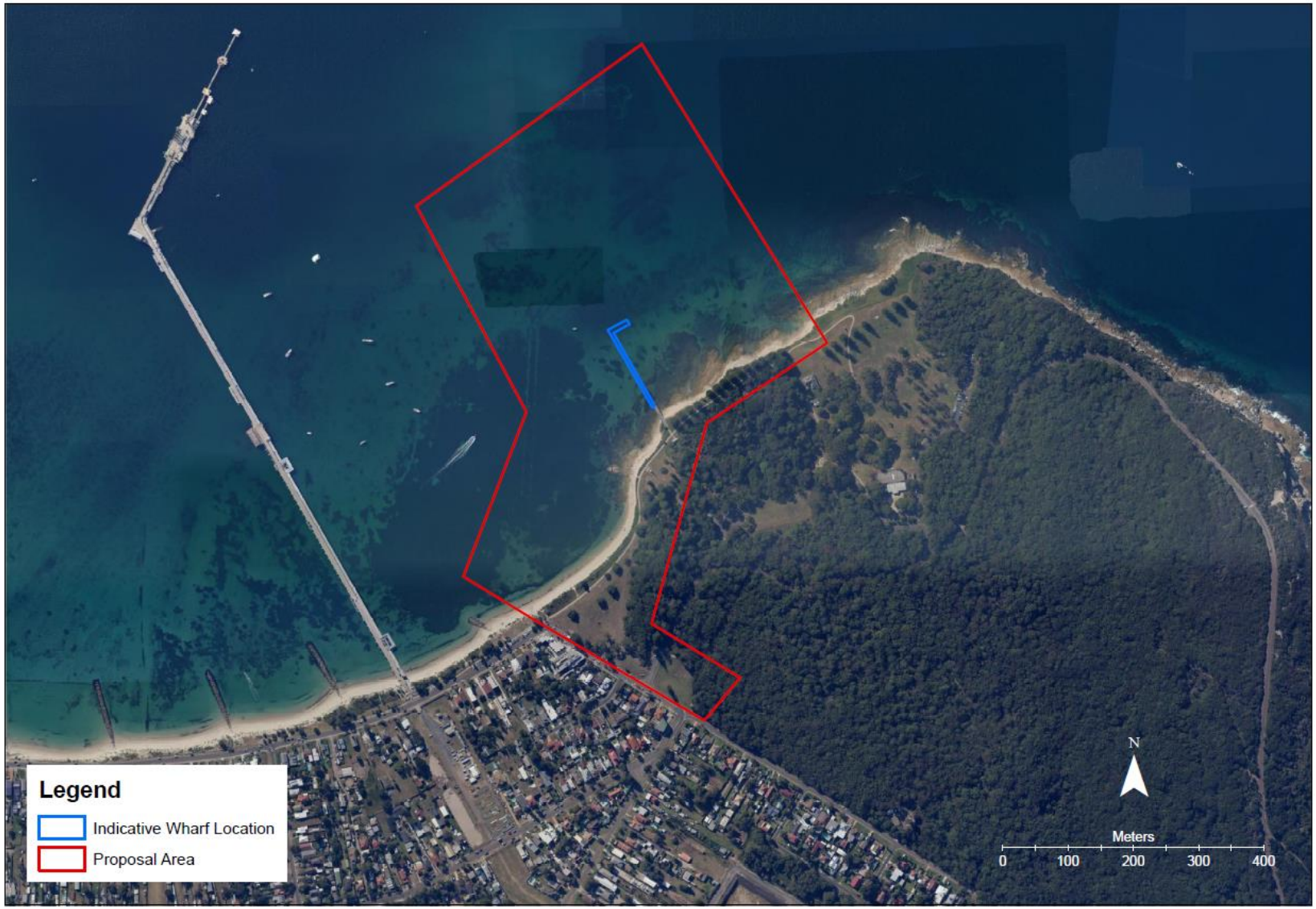

Figure 4-2 Proposal area at Kurnell

4.2 Aboriginal heritage

While the Aboriginal heritage, non-Aboriginal heritage and maritime archaeology sections of this report are written separately, it is acknowledged there is a strong connection between Aboriginal and non-Aboriginal heritage. La Perouse and Kurnell are also places of entangled, interwoven and “hidden” histories according to Nugent (2005) and Irish (2017). The heritage assessments carried out for the proposal would aim to recognise and incorporate the interacting perspectives to avoid providing a singular viewpoint.

4.2.1 Overview

History

Aboriginal peoples have lived in the Sydney Basin and surrounding areas for at least 36,000 years. The Botany Bay area was thought to have been characterised by freshwater valleys and swamplands before the sea reached its current level about 7,000 years ago. Following the inundation of the coastline, Aboriginal peoples would have primarily eaten fish and shellfish.

Records from European explorers account that Aboriginal peoples used bark canoes for line and spear fishing in Botany Bay and collected shellfish on the tidal banks. These accounts of Aboriginal diets are evidenced from the middens within the proposal area.

When Lieutenant James Cook landed in Botany Bay in April 1770, he contacted the Gweagal Aboriginal community of the Dhawaral nation. Due to the originally slow European settlement in Botany Bay, Aboriginal peoples continued to live around the foreshores during the 19th Century. Their population was drastically reduced from introduced diseases and violent encounters with Europeans.

Aboriginal people and communities continue to have a strong relationship with the land, with 37.4 per cent of the La Perouse population identifying as Aboriginal peoples in the 2016 census.

Listed Aboriginal heritage

There are 18 registered sites on the NSW Aboriginal Heritage Information Management System (AHIMS) within one kilometre of the proposal area as shown on Figure 4-3 and Figure 4-4.

- Some of the recorded sites are listed as ‘restricted’, meaning their location is not publicly available
- One burial site and one midden are located near the Kurnell proposal area
- Four features (middens and engravings) are located near the La Perouse proposal area
- Although one listing is shown outside the Kurnell proposal area to the east; an Aboriginal heritage assessment carried out for the NPWS (Coast History and Heritage, 2019) identified the locations of several recorded locations within the proposal area. Therefore, there are likely to be burial locations within the proposal area.

Figure 4-3 AHIMS registered sites in La Perouse

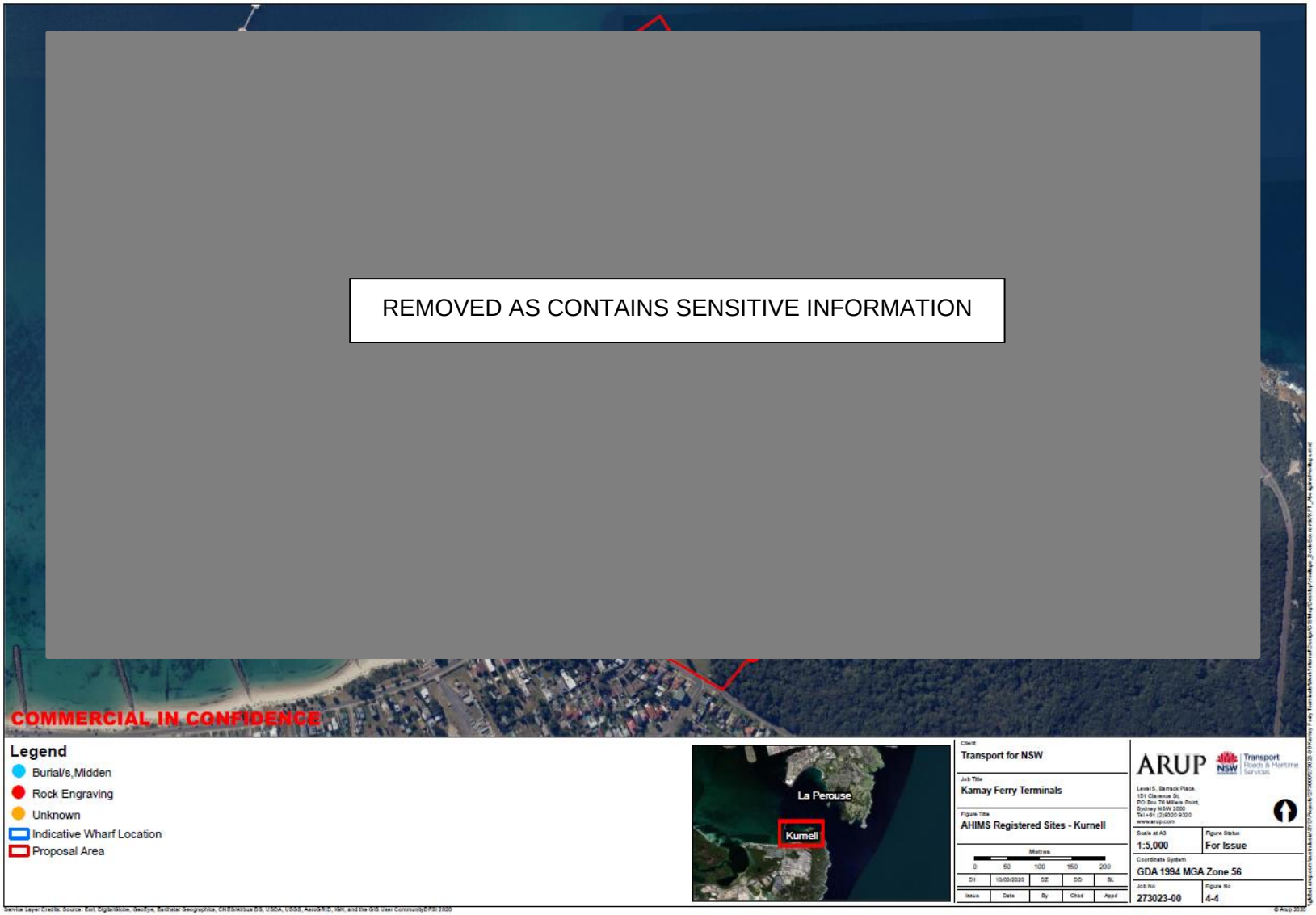

Figure 4-4 AHIMS registered sites in Kurnell

The AHIMS search results were supplemented by preliminary field surveys carried out as part of the PACHCI Stage 2 process (see Attachment B).

These involved a survey on foot carried out in accordance with the PACHCI (Roads and Maritime, 2012) and the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (Department of Environment, Climate Change and Water (DECCW), 2010a). Based on field surveys, it was determined that some of the recorded locations of the AHIMS archaeological sites were not correct. The PACHCI Stage 2 report (refer to Attachment B) refines the location of Aboriginal heritage sites based on site surveys (refer to Figure 4-5 and Figure 4-6).

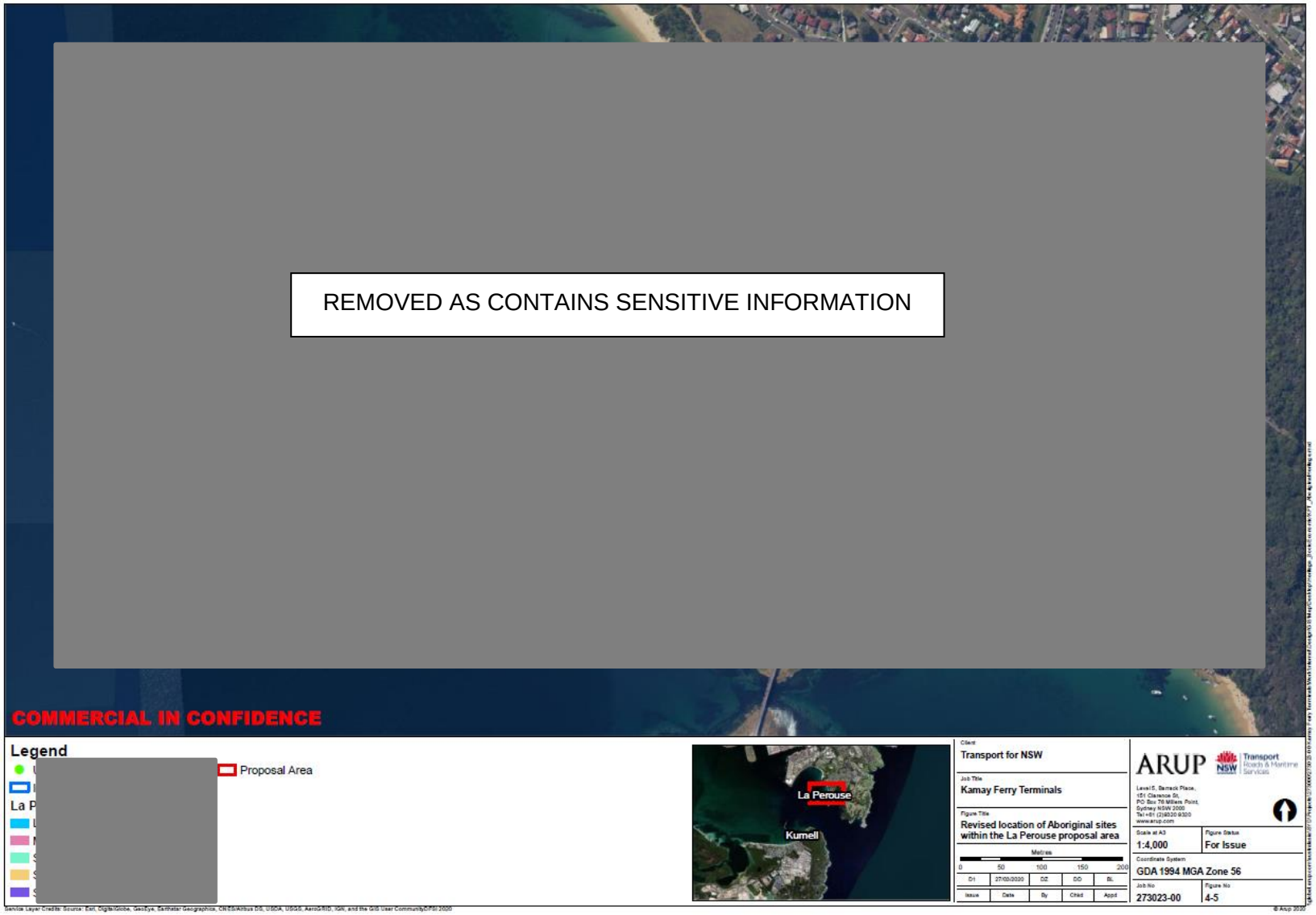

Figure 4-5 Revised location of Aboriginal sites within the La Perouse proposal area

Figure 4-6 Revised location of Aboriginal sites within the Kurnell proposal area

The PACHCI Stage 2 report also identified the value of the identified heritage items, as summarised in Table 4-1 below.

Table 4-1 Summary of scientific and archaeological significance (excerpt from Attachment B)

Site name	AHIMS ID	Research value	Scientific value	Representative value	Rarity	Overall archaeological significance
Site 1, La Perouse	REMOVED AS CONTAINS SENSITIVE INFORMATION	High	High	High	High	High
Site 2, La Perouse		High	High	Moderate	Moderate	High-moderate
Site 3, La Perouse		High	High	Moderate	Moderate	High-moderate
Site 4, La Perouse		High	High	Moderate	Moderate	High-moderate
Site 5, La Perouse		High	High	Moderate	Moderate	High-moderate
Site 6, La Perouse		High	High	Moderate	Moderate	High-moderate
La Perouse		High	High	Moderate	Moderate	High-moderate
La Perouse		High	High	Moderate	Low	High-moderate
La Perouse Midden 19-01		Unknown	Unknown	Unknown	Unknown	Unknown
Foreshore Midden - Captain Cook's Landing Place		High	High	High	High	High
K PAD 1		Unknown	Unknown	Unknown	Unknown	Unknown

As the proposal definition it is assumed that any heritage sites located in the proposal area may be impacted by the proposal.

Other Aboriginal heritage

Aboriginal community and cultural connections at La Perouse and Kurnell are strong and ongoing. In addition to the registered archaeological sites, other tangible and intangible cultural features, landscapes and values may also be present. Cultural features could have spiritual, natural resource usage, historical, social, educational or other type of significance and may not necessarily be associated with sites or be observable features.

4.2.2 Summary of issues

Construction

- Potential to disturb sub-surface sites and archaeology from activities such as the movement of vehicles and machinery not only during construction but also potentially during pre-construction activities such as geotechnical investigations
- Potential for indirect disturbance through ground settlement or vibration impacts
- Potential for indirect and temporary disturbance to Aboriginal heritage through the sense of place, landscape and cultural heritage associated with La Perouse and Kurnell.

Operation

- Increased visitation/foot traffic could indirectly impact items of Aboriginal heritage and impact the cultural sense of place Ongoing benefit of connection between La Perouse and Kurnell as a cultural value.

4.2.3 Proposed further assessments

A detailed Aboriginal heritage assessment would be prepared in line with the following guidelines:

- PACHCI (Roads and Maritime, 2012)
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010a).

The assessment would include (as a minimum):

- Assessment of the significance of the heritage to the Aboriginal community in consultation with relevant stakeholders
- Identification of the potential to disturb Aboriginal heritage
- Assessment of the extent and significance of impact
- Identification of requirements for in-situ conservation of items/areas, the need for further archaeological testing and/or detailed archaeological excavations
- Definition of the proposed avoidance, mitigation, management and monitoring measures in accordance with relevant guidelines.

4.3 Non-Aboriginal heritage

4.3.1 Overview

La Perouse and Kurnell proposal area have a history of European exploration, settlement, fortification, and as recreational destinations. There are National, State and locally listed heritage items recorded at both La Perouse and Kurnell. Items listed on the National Heritage List are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as matters of national environmental significance (MNES).

La Perouse

The name, La Perouse, originates from the European exploration by French naval captain Jean-Francois La Perouse who landed at Frenchmans Beach in 1788 during a scientific

expedition. La Perouse was developed for military purposes by Governor Macquarie in 1812 who closed the northern headland for settlement and established the area as a Government reserve. Macquarie Watchtower was erected between 1821 and 1822 to safeguard the Bay.

In 1883, a reserve was established by the 'Aborigines Protection Board', which segregated Aboriginal peoples from European colonists. This remained until 1984.

La Perouse was developed during the post war period with a wave of European migrants settling in the area. Since the late 20th Century La Perouse has been extensively developed.

Kurnell

Following Captain Cook's landing at the Kamay Botany Bay National Park in 1770, the headlands around Botany Bay were slow to be settled by Europeans. Early agricultural efforts on the Kurnell Peninsula were largely unsuccessful leading to forestry enterprises that resulted in the removal of native vegetation. The eastern Kurnell headland eventually became a Government reserve.

The early 20th Century saw the introduction of heavy and polluting industries onto the Kurnell Peninsula. The extensive sand dunes around the Peninsula resulted in the establishment of sand mining enterprises from the 1930s, which altered the natural landscape of the region. In 1956, the Kurnell Oil Refinery was built. This was followed by the development of heavy industry facilities, including chemical and petroleum plants, in the 1960s and 1970s. The Sydney Desalination Plant was constructed and became operational in 2010. While industrial development was occurring at the western end of the Peninsula, the headland itself remained as a Government reserve and was undeveloped. This resulted in little alteration to the landscape and the preservation of several Aboriginal and historic sites.

Listed heritage

La Perouse

The results of the heritage listings search results for La Perouse are shown in Table 4-2 and Figure 4-7.

Table 4-2 Heritage listing search results for La Perouse

Designated list	Heritage feature
National Heritage List	Kamay Botany Bay: Botanical Collection Sites (Place ID: 106162)
State Heritage Register	Bare Island Fort (No. 00978)
	Kamay Botany Bay National Park (North and South) and Towra Point Natural Reserve (No. 01918)
	La Perouse Aboriginal Mission Church (No. 01893) – about 100 metres from the proposal area
Randwick LEP 2012	Botany Bay National Park (Botany Bay National Park, La Perouse Headland, Yarra Bay and Frenchmans Bay, C5)
	Mission Church (I164) – not located within the proposal area however it is in the vicinity (about 120 metres from the proposal area)
	Macquarie Watchtower (I166)
	Tomb of Pere le Receveur (I167)

Designated list	Heritage feature
	La Perouse Museum (former Cable Station) (I168)
	La Perouse Memorial (I169)
	Bare Island Fort (I171)
	“Yarra Bay House” (I172)
	1920s bungalow (I173)
	Yarra Bay Beach and Reserve (I245)

Preliminary archaeological sites identified

Historical research and the La Perouse Headland Conservation Management Plan (DECCW, 2009b) identified 16 archaeological sites at La Perouse within or near the proposal area. These are listed below. The numbers correlate to Figure 4-8.

- Approach road to Bare Island Fort c.1881 construction (low potential; local significance) (12)
- Rock-cut steps (no potential; local significance) (11)
- Remains of slipway (low potential; local potential) (15)
- Footings of two cable tanks (low potential; national significance) (16)
- Slipway (low potential; local significance) (17)
- Wharf and approach road (low potential; local significance) (19)
- Remains of wharf buildings (low potential; local significance) (20)
- Rock cut trench (low potential; would not reach threshold of local significance) (21)
- Rock cut steps & other features (low potential; local significance) (22)
- Circular sandstone feature (low potential; local significance) (23)
- Circular sandstone feature (low potential; local significance) (24)
- La Perouse’s Garden (high potential; international significance) (37)
- La Perouse’s Stockade (high potential; international significance) (38)
- Edward Henning’s House (moderate potential; significance not assessed) (65)
- Edward Henning’s stables (moderate potential; significance not assessed) (75)
- Fisherman’s Boathouse (moderate potential; significance not assessed) (50).

COMMERCIAL IN CONFIDENCE

Legend

- Indicative wharf location
- Proposal Area
- National Heritage List
- State Heritage Items
- Local Heritage Items

Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Listed non-Aboriginal heritage at La Perouse

Metres
0 100 200 300 400

Issue	Date	By	Chkd	Appd
D1	10/03/2020	DZ	DD	BL

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Scale at A3: **1:15,000**
Figure Status: **For Issue**
Coordinate System: **GDA 1994 MGA Zone 56**
Job No: **273023-00**
Figure No: **4-7**

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Former French Stockade and Garden

Enclosure (overlaid by Artillery Quarters)

Enclosure

Enclosure

COMMERCIAL IN CONFIDENCE

Legend

- Indicative wharf location
- Proposal Area
- La Perouse Headland CMP Identified Archaeological Sites
- La Perouse Higginbotham Identified Archaeological Sites
- General Archaeological Potential

Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Areas of Archaeological Potential - La Perouse

Metres
0 50 100 150 200

Issue	Date	By	Chkd	Appd
D1	10/03/2020	DZ	DD	BL

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Scale at A3	Figure Status
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Coordinate System
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Job No	Figure No
273023-00	4-8

Kurnell

The results of the heritage listings search results for Kurnell are shown in Table 4-3 and Figure 4-9.

Table 4-3 Heritage listing search results at Kurnell

Designated list	Heritage feature
National Heritage List	Kamay Botany Bay: Botanical Collection Sites (Place ID: 106162)
	Kurnell Peninsula Headland (105812)
State Heritage Register	Kamay Botany Bay National Park (North and South) and Towra Point Natural Reserve (No. 01918)
Sutherland Shire LEP	Kurnell monuments (in Kamay Botany Bay National Park, 2503)
	Botany Bay National Park (2504)
	Silver Beach and roadway (2506)
	Captain Cook's landing place (A2510)
	Captain Cook's landing site (A2511)
	Banks memorial (A2512)
	Solander monument (A2513)
	Captain Cook monument (A2514)
	Forby Sutherland monument (A2515)
	Landing place wharf abutment (A2516)
	Alpha Farm site (A2517)
	Captain Cook's watering hole (A2518)
	Captain Cook watering well (A2519)
	Flagpole (A2520)

Preliminary archaeological sites identified

The Sutherland Shire LEP sites listed in Table 4-3 are also listed as archaeological sites. The numbers in the table above correspond to Figure 4-10.

The historical research additionally identified potential for archaeological remains associated with the following:

- Further evidence of Captain Cook's landing (1788)
- Early industry in the Kurnell area
- Early subdivision Kurnell
- Holt's Wharf
- James Birnie's land grant.

Legend

- Indicative wharf location
- Proposal Area
- National Heritage List
- State Heritage Items
- Local Heritage Items

Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Listed non-Aboriginal heritage at Kurnell

Metres
0 100 200 300 400

D1	10/03/2020	DZ	DD	BL
Issue	Date	By	Chkd	Appd

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Coordinate System
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Job No	Figure No
273023-00	4-9

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A2510
A2515
A2520
A2513
A2517
A2512
A2516
A2511
A2514
A2518
A2519
Boat Shed (c.1912)
Historic Wall
Historic, Silver Beach

Legend

- Indicative wharf location
- Proposal Area
- Sutherland Shire LEP Archaeological Sites
- Previously Identified Archaeological Potential
- General Archaeological Potential

Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Areas of Archaeological Potential - Kurnell

Metres
0 50 100 150 200

D1	10/03/2020	DZ	DD	BL
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Job No	Figure No
273023-00	4-10

4.3.2 Summary of issues

Construction

- Direct physical or indirect curtilage and setting impacts. This could include permanent impacts, such as partial or complete demolition due to subsurface and excavation works, or temporary curtilage and setting impacts due to the visual and amenity impacts of from work activities
- Long-term structural damage to a heritage item due to the vibration generated from piling and other work activities
- Temporary impacts on views to or from heritage items
- Potential for unexpected discovery.

Operation

- Establishment of new infrastructure that detracts from the values of a heritage item and or changes the visual outlook from a heritage item.

4.3.3 Proposed further assessments

A historical archaeological assessment and a heritage impact assessment would be prepared as part of the EIS. The assessment would be prepared in accordance with the following guidelines:

- Cultural Heritage Guidelines 15.517/PN285G01 (Roads and Maritime, 2015b)
- The NSW Heritage Manual (Heritage Office and Department of Urban Affairs and Planning, 1996).

The assessments will include (as a minimum):

- Identification of items and areas of heritage significance that could be impacted during construction and operation by field survey and research activities
- Assessment of the potential significance of impacts on heritage items and archaeological resources in and near the proposal area, including above and below ground items, and where such potential exists
- Definition of the proposed avoidance, mitigation, monitoring and management measures, including evaluation of their effectiveness, in accordance with relevant guidelines.

4.4 Maritime archaeology

4.4.1 Overview

The known listed heritage items located on the foreshore of La Perouse and Kurnell are listed in Section 4.2 Aboriginal heritage and Section 4.3 non-Aboriginal heritage. Unlisted maritime sites from previous reports and the PACHCI Stage 2 survey carried out in January 2020 are listed below.

La Perouse

The following was recorded by Higginbotham in 1989 and partially reported with their values rated in the La Perouse Headland Conservation Management Plan (DECCW, 2009b).

- The remains of infrastructure associated with the telegraph cable on the foreshore at La Perouse, including the circular footings of two submarine cable storage tanks located near the slipways to the southwest of the proposed wharf location. The tanks were assessed as having low potential and of national significance. These were sighted in the site survey.
- Two slipways were identified and surveyed to the southwest of the proposed wharf location. One was recorded as being in ruins during the survey, while the second was still in use in 1989. The remaining slipway included steel rails, bedded in concrete and a single storey rectangular structure housing a winch and electric motor, constructed of dry-pressed brick walls, and a corrugated iron roof. The remaining slipway was low potential and of local significance. These were sighted in the site survey.
- Remains of boat davits were identified but not assessed in the Conservation Management Plan. These were not sighted in the site survey.
- There are above-water remains of the former La Perouse ferry wharf and restaurant. Both were identified as having low potential and of local significance. These features were sighted in the site survey. There is also potential for below-water remains.

Kurnell

- There is visual evidence of the previous Kurnell ferry wharf, including timber piles and stone blocks under the existing wharf (adjacent to the proposed wharf location)
- There are pile stumps from an earlier wharf located about 50 metres south of the existing wharf.
- There is a plinth on a rock about 100 metres to the south of existing wharf, which commemorates Isaac Smith (one of Captain Cook's crew) stepping ashore.

The following maritime heritage features have the potential to be present at both La Perouse and Kurnell:

- Underwater archaeology at the anchorage locations for La Perouse's and Captain Cook's vessels
- Ballast mounds and anchors from vessels associated with the shell midden industry, that operated in Botany Bay (early 20th Century)
- Artefacts associated with fishing and recreation
- Submerged terrestrial (Aboriginal) sites buried under marine sediments
- Wrecks or wreckage from the 11 ships that were lost near Botany Bay between 1836 to 1902 (DAWE, 2020 and Office of Environment and Heritage, 2020).

4.4.3 Summary of issues

Construction

- Impact to known and potential maritime heritage sites such as 19th and 20th century jetty and slipway remains, shipwrecks, archaeological deposits, and landing site of 19th century telegraph cable
- Potential for unknown Aboriginal cultural heritage in the form of submerged terrestrial sites.

Operation

- Potential cumulative impact on some maritime heritage sites because of pedestrian traffic and propeller jet turbulence from the ferry services and other commercial and recreational vessels.

4.4.4 Proposed further assessments

A maritime archaeology impact assessment would be prepared as part of the EIS. The assessment would be carried out in accordance with the following guidelines:

- Guidelines for the Management of Australia's Shipwrecks (AIMA, 1994)
- Convention on the Protection of the Underwater Cultural Heritage (UNESCO, 2001).

The assessment would include (as a minimum):

- Identification of maritime archaeology potential within the proposal area
- Assessment of the direct and indirect impacts of the proposal on maritime archaeology
- Assessment of the significance of the impacts on maritime archaeology
- Identification of mitigation, management and monitoring measures.

4.5 Biodiversity

4.5.1 Overview

Preliminary biodiversity investigations were carried out over the proposal area in January 2020 including a database search of the NSW BioNet Atlas of Wildlife, the Commonwealth Protected Matters Search Tool (PMST) and various regional maps. A site walkover was carried out in February 2020.

Plant community types

Remnant native vegetation communities are present in and around the proposal area. The mapped Plant Community Types (PCTs) locally are shown on Figure 4-11 and Figure 4-12 and comprise:

- Seagrass meadows
- Maritime grasslands
- Coastal headland heaths
- Sydney coastal heaths
- Coastal dunes
- Coastal swamp forest
- Sydney coastal dry forest

COMMERCIAL IN CONFIDENCE

Legend

- Indicative Wharf Location
- Proposal Area
- Coastal Dune Dry Sclerophyll Forest
- Coastal Freshwater Lagoons
- Coastal Headland Heaths
- Maritime Grasslands
- Seagrass Meadows
- Sydney Coastal Dry Sclerophyll Forests
- Sydney Coastal Heaths
- Wallum Sand Heaths

Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Plant Community Types within La Perouse Study Area

Metres
0 50 100 150 200

Issue	Date	By	Chkd	Appd
D1	10/03/2020	DZ	DD	BL

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Scale at A3	Figure Status
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Coordinate System
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Job No	Figure No
273023-00	4-11

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COMMERCIAL IN CONFIDENCE

Legend

- Indicative Wharf Location
- Proposal Area
- Coastal Dune Dry Sclerophyll Forest
- Coastal Floodplain Wetlands
- Coastal Freshwater Lagoons
- Coastal Swamp Forests
- Maritime Grasslands
- North Coast Wet Sclerophyll Forests
- Seagrass Meadows
- Sydney Coastal Dry Sclerophyll Forests
- Sydney Coastal Heaths

Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Plant Community Types within Kurnell Study Area

Metres
0 50 100 150 200

Issue	Date	By	Chkd	Appd
D1	10/03/2020	DZ	DD	BL

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Job No	Figure No
273023-00	4-12

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Threatened ecological communities

The EPBC Act lists threatened ecological communities (TEC) as MNES. The EPBC Act PMST (accessed January 2020) identified 11 terrestrial and marine TECs as potentially occurring in and around the proposal area. These TECs are also listed under the NSW *Biodiversity Conservation Act 2016*. Based on a review of mapped vegetation communities, the following summarises the terrestrial TECs that are potentially present in the proposal area with their EPBC Act status:

Likely to occur:

- Coastal swamp oak forest (endangered)
- Eastern suburbs banksia scrub (endangered)
- Subtropical temperate coastal saltmarsh (vulnerable).

Possible to occur:

- Littoral rainforest and coastal vine thickets of eastern Australia (critically endangered)
- Coastal upland swamps in the Sydney basin bioregion (engendered).

There are no listed groundwater dependent ecosystems (GDE) in or local to the proposal area based on preliminary desktop studies. However, there are coastal wetlands located to the southeast of the Kurnell proposal area (as shown on Figure 4-14) which have the potential to be GDE. This would be confirmed during biodiversity surveys.

There is one marine TEC identified as potentially occurring in the proposal area known as *Posidonia australis* (seagrass meadows of the Manning-Hawkesbury ecoregion). It is a TEC consisting of assemblage of plants, animals and micro-organisms associated with seagrass meadows dominated by *Posidonia australis*. *Posidonia australis* is also protected under the *Fisheries Management Act 1994* as a listed endangered species. More information on the seagrass is provided below.

Significant flora and fauna species

Significant species have conservation significance due to their rarity or being endemic to the local area. These species are listed in the *Biodiversity Conservation Act 2016* as endangered, vulnerable or threatened and EPBC Act as vulnerable, endangered or critically endangered.

A search of the PMST database January 2020 identified 86 terrestrial and marine species as having the potential to occur within the proposal area (refer to Attachment C).

The BioNet Atlas of NSW Wildlife contains current and historical observations of native species. A search of this database in January 2020 was carried out to develop a list of species requiring further assessment.

Information on species records, habitat requirements and the presence of suitable habitats in the proposal area was assessed to determine the likelihood of candidate species occurring. Based on the assessment, the species which may occur within the proposal area include:

- 27 bird species
- Three reptile species
- 11 mammal species

- Two shark species
- Two fin fish species
- 14 plant species.

A full list is provided in Attachment C. Many of these species, particularly the seabirds are migratory species and highly transient.

Seagrass

Seagrass is a functional grouping of marine flowering plants mostly found in soft sediment in nearshore and estuarine environments.

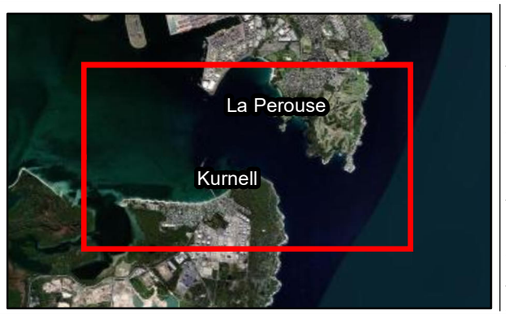
Commercially and recreationally important fish and invertebrate species have been recorded from seagrass beds in the northern section of Botany Bay (The Ecology Lab Pty Ltd, 2003), including bream, mullet, prawns, crabs, octopi, cuttlefish, squid and shrimp. Three types of seagrass, *Halophila spp., Zostera. muelleri subsp. capricorni*, and *Posidonia australis,* were recorded in studies documenting seagrass distribution and condition Botany Bay (The Ecology Lab Pty Ltd, 2003).

There is a gap in the currency of available data mapping the extent, condition and species mix of seagrass cover locally. The extensive study completed by Creese *et al* in 2009, which were used to produce the online Department of Primary Industries (Fisheries) mapping, and other studies focusing on small section of Botany Bay, such as Port Botany Long-term Seagrass Monitoring (Cardno, 2018) were completed within a 600-metre-long stretch of coastline associated with the port, to the northwest of the La Perouse proposal area. However, seagrass cover can vary annually. Therefore, given the length of time since the last extensive survey of the proposal area, there is potential for the known habitat to have shifted in cover and presence.

The seagrass beds of *Posidonia australis* seagrass in Botany Bay, as they are currently mapped, are shown on Figure 4-13. *Posidonia australis* is listed as a Type 1 Key Fish Habitat (KFH) under the NSW *Fisheries Management Act 1994*. Type 1 habitats are highly sensitive fish habitats. Presence of further Type 1, 2 and 3 KFH would be confirmed following marine ecological surveys.

Legend

- Proposal Area
- Seagrass



Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Known extent of *Posidonia Australis* in Botany Bay

Metres

0	200	400	600	800

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D1	18/02/2020	DZ	DD	BL

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Job No	Figure No
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Migratory fauna species

Migratory fauna are also listed as MNES under the EPBC Act. A total of 80 migratory species were identified in the PMST as having a range of potential occurrence that includes the proposal area. This includes marine, terrestrial and wetland migratory species.

Being located towards the mouth of Botany Bay, there is potential for migratory marine species to temporarily feed and rest in the proposal area. Several records exist for sightings of listed and non-listed species. Some locations in the proposal area have been disturbed or modified which reduces the likelihood for these species being present. However, species will need to be assumed be present as they may occur, yet these would be difficult to survey for (such as whales).

Protected areas

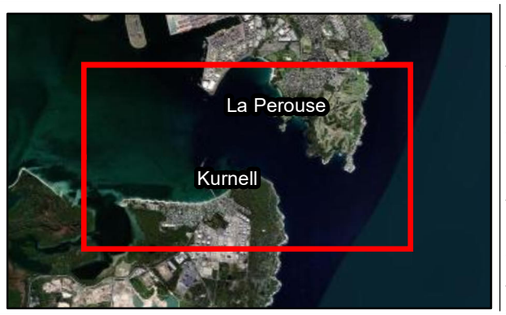
There are no marine protected areas as classified by the NSW Department of Primary Industries (Fisheries) in the proposal area. The nearest aquatic reserve, Cape Banks Aquatic Reserve, is located 1.2 kilometres east from the La Perouse proposal area at the mouth of Botany Bay. Towra Point Aquatic Reserve and the Towra Point Aquatic Reserve (Sanctuary) are located three kilometres to the south-west the Kurnell proposal area. These protected areas are shown on Figure 4-14.

Towra Point is an internationally important wetland (as defined under the terms of the 1971 Ramsar Convention). It is located about four kilometres west of the proposal area. The wetland wraps behind Bonna Point along the foreshore Kurnell of Quibray Bay. There are also designated coastal wetlands to the west within Quibray Bay. These wetlands are shown on Figure 4-14.

COMMERCIAL IN CONFIDENCE

Legend

- Proposal Area
- Marine Protected Area
- Ramsar Wetlands
- Coastal Wetlands
- Coastal Wetlands Proximity Area
- Recreational Fishing Havens - Botany



Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Protected marine areas, wetlands and recreational fishing areas

Metres

0	200	400	600	800

Issue	Date	By	Chkd	Appd
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Coordinate System
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Job No	Figure No
273023-00	4-14

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4.5.2 Summary of issues

Construction

- Potential disturbance to threatened and migratory species habitat due to noise, light and dust
- Potential mortality of threatened species from works, such as the risk of boat strike to marine fauna
- Potential disturbance and/or direct loss of TECs, including *Posidonia Australis* seagrass, and marine benthic habitats from work, including accidental fuel spills, vessel movement, and sediment disturbance
- Potential disturbance of contaminated soils/sediments leading to groundwater contamination and potential impacts to GDEs (if present)
- Potential for introduction of weeds, pest species and pathogens
- Underwater noise impacts from piling and other activities (refer to section 4.10 for more details)
- Potential permanent and temporary loss of seagrass habitat.

Operation

- Potential mortality of threatened species from ferry operations, such as the risk of boat strike to marine fauna
- Potential loss of light under the proposed wharves affecting habitat
- Potential propeller wash leading to erosion and scour impacts
- Potential impact on seagrass from vessel movements.

4.5.3 Proposed further assessments

Detailed terrestrial and marine biodiversity assessments will be prepared as part of the EIS. They will be carried out in accordance with:

- Biodiversity Assessment Method (Office of Environment and Heritage, 2017)
- Biodiversity Assessment, Environmental Impact Assessment Practice Note EIA-N06 (Roads and Maritime, 2015a)
- Ecologically Sustainable Development, Environmental Impact Assessment Practice Note EIA-N02 (Roads and Maritime, 2010).

The terrestrial biodiversity assessment will provide (as a minimum):

- Identification of listed flora and fauna species, habitat, populations, ecological communities and GDE, through desk study and field surveys
- Assessment of the direct and indirect impacts on terrestrial flora and fauna, populations, ecological communities and their habitats, and GDE
- Assessment of the significance of the impacts on listed species, ecological communities and populations listed under the EPBC Act, the BC Act and FM Act and GDE that occur or are considered likely to occur
- Identification of mitigation, management, monitoring, and offset measures determined in accordance with the Biodiversity Assessment Method (Office of

Environment and Heritage, 2017) and the EPBC Act Environmental Offsets Policy (Department of Sustainability, Environment, Water, Population and Communities, 2012).

The marine biodiversity assessment will provide (as a minimum):

- Identification of listed marine flora and fauna species, habitat, populations and ecological communities that occur or are considered likely to occur through a mix of desk and field surveys
- Assessment of the potential direct and indirect impacts on marine flora and fauna species, populations, ecological communities and their habitats
- Assessment of the significance of the potential impacts of the proposal on species, ecological communities and populations listed under the EPBC Act, the BC Act and FM Act that occur or are considered likely to occur
- Identification of mitigation, management, monitoring and offset measures determined in accordance with the *Fisheries Management Act 1994* and Fisheries NSW policy and guidelines for fish habitat conservation and management (Department of Primary Industries, 2013).

4.6 Traffic and transport

4.6.1 Overview

Marine transport

Maritime traffic within Botany Bay is mainly associated with Port Botany; located two kilometres to the northwest of the La Perouse headland. Port Botany is home to the State's largest container facility and is NSW's primary bulk liquid and gas port. On average, five ships both arrive and depart Botany Bay every day.

The Kurnell Terminal's port and berthing facility is located off Silver Beach in Botany Bay. The facility remains the sole entry point for the Terminal's feedstock of crude oil and finished petroleum product imports. It is used as a key distribution point for refined products across NSW and the ACT. There are tanker mooring buoys associated with the Kurnell Terminal port and berthing facility in Botany Bay. These in a water-side restricted zone. This is an area where security regulated ships may berth, anchor or moor. Other shipping is prevented from entering the area. These buoys would not be impacted by the proposal.

There are several commercial, private and public moorings at La Perouse within Frenchmans Bay. A small number of these would need relocating within the Bay to accommodate the wharf. It is unlikely that any moorings would be permanently lost. Also, the proposal would provide additional mooring for commercial and recreational vessels on the wharves. The Yarra Bay Sailing Club is located about 800 metres north of the La Perouse proposal area. It is not expected that the proposal would impact access to the sailing club.

There is one public mooring at Kurnell however it is located away from the proposed wharf and would not be impacted by the proposal.

The land based infrastructure of the proposal would not fall within Three Ports State Environmental Planning Policy (SEPP) 2013 land, however the ferry swept path to be used for the operation of the ferry service would fall within this land. The aims and

requirements of the SEPP for the operation of the proposal would be considered further in the EIS.

La Perouse

Road network and car parking

Anzac Parade is the main route to La Perouse. This is a classified road managed by Transport for NSW. It provides access to the eastern suburbs and Sydney CBD. Anzac Parade provides a one-way loop road around the La Perouse headland.

There are about 430 time-restricted on-street car parking spaces within 500 metres of the proposal area. They are mainly used at the weekend and all spaces are often full. During the week there tends to be spare capacity.

Public transport

A terminating bus stop is located on Anzac Parade north of the loop road. This provides access to the following bus service:

- 391 – La Perouse to Central Railway Square
- 393 – Little Bay to Central Railway Square
- 394/L94/X94 – La Perouse to City Circular Quay.

These services mainly operate at 15-minute intervals during the week and is less frequently at the weekends.

Pedestrian and cycling facilities

A shared pedestrian and cycle path is located on the eastern side of Anzac Parade. It extends north along Bunnerong Road towards Foreshore Road. There is a footpath along the outer edge of the one-way loop, which is heavily used on weekends. There are various walking tracks from La Perouse to the northern portion of the Kamay Botany Bay National Park and Malabar. Anzac Parade is also a popular road cycling route on weekends.

COMMERCIAL IN CONFIDENCE

Legend

- Footway
- Cycleway / Shared Path
- Bus Stops
- Bus Routes
- Parking Zone (Capacity)

Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Existing Transport Provisions (La Perouse)

Metres
0 20 40 60 80 100

Issue	Date	By	Chkd	Appd
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Scale at A3	Figure Status
1:2,500	For Issue

Coordinate System
GDA 1994 MGA Zone 56

Job No	Figure No
273023-00	4-15

Kurnell

Road network and car parking

Prince Charles Parade runs along the shoreline of Botany Bay. It joins into Captain Cook Drive, which borders the National Park.

There are about 115 unrestricted on-street car parking spaces within 250 m of the proposal area on Prince Charles Parade and Captain Cook Drive. Another 359 car parking spaces are available in the Kamay National Botany Bay National Park (some of which are time restricted and metered), with a further 175 spaces locally, mainly along Cape Solander Drive.

Public transport

Number 987 is the only bus that operates in the Kurnell area, with a stop located on the eastern side of Captain Cook Drive bordering the Kamay Botany Bay National Park. This is a loop service runs between Kurnell and Cronulla. It operates once an hour on weekdays and Saturdays, and less frequently on Sundays.

Pedestrian and cycling facilities

There are footpaths located on both sides of Prince Charles Parade and the western side of Captain Cook Drive where is borders the National Park. The footpath on the northern side of Prince Charles Parade continues along the shoreline into the Kamay Botany Bay National Park. No footpath currently exists that connects the bus stop on Captain Cook Drive to the wider network of footpaths. There are number of walking trails within the National Park. The Kurnell Peninsula is also popular with road cyclists during weekends.

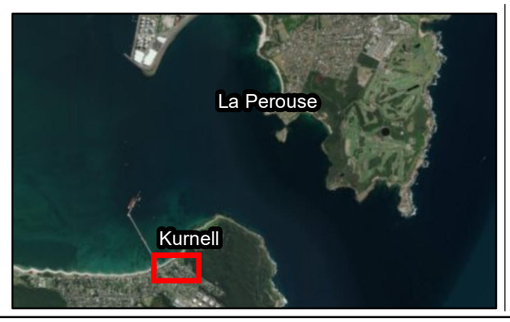
Monument Track
Cape Solander Drive
Prince Charles Parade
50
18
Captain Cook Lane
14
21
Polo Street
8
6
Polo Street
Cannon Street
Captain Cook Drive
Cook Street
Captain Cook Drive
Polo Street

Additional Parking within National Park (not considered)

COMMERCIAL IN CONFIDENCE

Legend

- Footway
- Cycleway / Shared Path
- Bus Stops
- Bus Routes
- Parking Zone (Capacity)



Client
Transport for NSW

Job Title
Kamay Ferry Terminals

Figure Title
Existing Transport Provisions (Kurnell)

Metres
0 10 20 30 40 50

Issue	Date	By	Chkd	Appd
D1	18/02/2020	DZ	DD	BL

ARUP
Transport Roads & Maritime Services
Level 5, Barrack Place,
151 Clarence St,
PO Box 76 Millers Point,
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Tel +61 (2)9320 9320
www.arup.com

Scale at A3	Figure Status
1:1,500	For Issue

Coordinate System
GDA 1994 MGA Zone 56

Job No	Figure No
273023-00	4-16

\\global.arup.com\australasia\SYD\Projects\273000\273023-00 Kamay Ferry Terminals\Work\Internal\Design\GIS\Map\Desktop\Traffic\KFT_Traffic_Map_v2.mxd

4.6.2 Summary of issues

Construction

- Temporary access loss to the coastal footpath at Kurnell
- Temporary loss of existing parking at Kurnell and La Perouse
- Temporary reduced access to Anzac Avenues loop at La Perouse
- Operational delays and journey-time disruption for road and public transport users when major work activities are taking place.

Operation

- Increased parking demand as people use the wharves, which would be likely greater in La Perouse
- Change in amenity due to a perception of increased road traffic
- Increase in pedestrians
- Increased marine traffic due to ferry operations
- Change in commercial and recreational marine traffic from the use of public ferry wharves
- Reinstatement of regular ferry service between La Perouse and Kurnell.

4.6.3 Proposed further assessments

A land traffic and transport assessment will be prepared as part of the EIS. It will be carried out in accordance with the following guidelines:

- Guide to Traffic Generating Development (Roads and Traffic Authority, 2002)
- Guide to Traffic Management Part 12: Traffic Impacts of Developments (Austroads, 2019).

The land traffic and transport assessment will include (as a minimum):

- Investigation of the existing land-based transport environment, including traffic, public transport, walking and cycling
- Analysis of passenger forecasting to better understand the impact on other modes
- Assessment of direct and indirect construction and operational impacts on the local transport network including consideration of public transport users, and implications for pedestrians and cyclists
- Consideration of cumulative traffic and transport impacts using surveyed data of the existing conditions
- Identification of appropriate mitigation, management and monitoring measures during construction and operation.

A marine transport assessment will be prepared as part of the EIS will include (as a minimum):

- Assessment of existing maritime transport and traffic within Botany Bay
- Assessment of the proposal impacts on maritime transport operations

- Consideration of the application of the Three Ports SEPP for the operation of the proposal
- Identification of mitigation, management and monitoring measures to ensure that impacts are maintained within acceptable limits.

4.7 Landscape character and visual amenity

4.7.1 Overview

Regional landscape character

Botany Bay spans a large area of 40 square-kilometres and stretches from the headlands at the entrance of the Bay to the flat shores of Monterey. Botany Bay is mainly industrial in character despite containing some naturally attractive areas in vicinity of the proposal area. It contains Port Botany, Sydney's main shipping port and Sydney airport, with runways built on reclaimed land within the Bay.

The entrance to Botany Bay is narrow compared to its size and is formed by the La Perouse headland to the north, and Kurnell Peninsula to the south. While La Perouse and Kurnell are socially and culturally connected as part of the Kamay Botany Bay National Park, the Bay's entrance creates a clear distinction between the headlands.

Local landscape character

La Perouse

The La Perouse coastline is characterised by rocky sandstone cliffs, that rise-up towards the east coastline. La Perouse Point and Bare Island are prominent landforms in the Botany Bay landscape. Bare Island is a low sandstone island about 30 metres from the shore at the southern end of La Perouse Headland. The island has been completely altered from its natural profile. The fortification complex comprises the battery, barracks buildings, parade and courtyard, access bridge, laboratory room and guards' quarters.

Anzac Parade forms a ring road around the La Perouse Headland, providing vehicle access to the coastal cliffs of La Perouse Point and vista's out towards Botany Bay and Kurnell. The Macquarie Watchtower and La Perouse Museum are located within this ring-road and are set within a grassed reserve that captures coastal views.

Frenchmans Beach is north of La Perouse Point. The beach is a popular swimming area. It curves around to Yarra Point and then on to Port Botany.

To the east of Bare Island are two small sandy beaches; Congwong and Little Congwong Beach. They are surrounded by dense bushland.

Along the cliffs of La Perouse, the sandy soils are covered with diverse native vegetation. The vegetation is low-to-medium height, typical of coastal conditions including sandy soils. Within the Kamay Botany Bay National Park to the east of La Perouse Headland, there is dense cover of shrubs and small-medium trees. In sandy areas there are groundcovers and tussock grasses.

The nearest residential landscape is located to the north of La Perouse Museum bounded by Anzac Parade and Endeavour Avenue. A small pocket of café and retail shops is located on Anzac Parade facing south towards the La Perouse Museum.

There are items and areas of heritage significance within the proposal area (refer to Section 4.1 and Section 4.2). The proposal area at La Perouse is within a Conservation Area. There are several heritage significant features; including Bare Island and Macquarie Watchtower that are visually prominent and form part of the existing landscape.

Kurnell

The proposal area is located on the west side of the Kurnell Peninsula. It is characterised by a narrow sandy beach and sandstone rock outcrop with small rockpools. There are low retaining walls alongside the coastal track that follow the coastline to the Captain Cook Monument and up to the Kurnell Visitor Centre. A small wharf extends some 30 metres from the shoreline next to the proposed Kurnell wharf location.

The Kurnell Terminal port and berthing facility wharf is located 100 metres south of the proposal area. It extends about 900 metres out into Botany Bay and is a prominent form in the Kurnell vista.

There are rock groins located every few hundred metres along Silver Beach farther to the west of the Kurnell Terminal,

The Kurnell headland forms the Kamay Botany Bay National Park; a protected environmental and heritage zone. The National Park is valued for recreational use. It can be accessed by walking tracks that cross the coastline and the native bush. The Kurnell Visitor Centre is located on Cape Solander Drive.

The nearest residential and commercial properties are on the corner of Prince Charles Parade and Captain Cook Drive. These properties have views out across Botany Bay to the west.

The vegetation along the coastal walkway within the proposal area consists of dense native vegetation of medium height, and distinct Norfolk Pines. The National Park is largely covered in vegetation, with open grassed areas surrounding the Kurnell Visitor Centre.

The Kurnell Peninsula is a National and State heritage significant area (refer to Section 4.2). The monument marking Captain Cooks Landing Place is visually prominent within the proposal area. Bronze sculptures have recently been erected at Kurnell to commemorate the 250th anniversary of the meeting of the Aboriginal people and the crew of the HMB Endeavour at Botany Bay on 29 April 1770.

Both proposal areas at La Perouse and Kurnell are important settings culturally, socially and environmentally for Aboriginal and non-Aboriginal heritage. The proposal areas evoke a sense of place, and the significance of this will be carefully acknowledged throughout the proposal design and EIS process including taking a holistic approach and linking heritage, landscape character and amenity and social values.

Key visual receivers

The key visual receivers that would be able to see the proposal are:

- Residents
- Business owners, employees and customers, including to the restaurants and cafés on Prince Charles Parade
- People:
    - Walking and cycling

        - Visiting Kamay Botany Bay National Park and its historic monuments
        - Undertaking water based recreational users including activities such as swimming, sailing and fishing
        - Using the surrounding beaches.
    - Other users of Botany Bay such as commercial vessels, charter boats, whale watching boats.

4.7.2 Summary of issues

Construction

- Temporary visual amenity loss to users of both La Perouse and Kurnell, including loss to views to and from heritage items.

Operation

- Potential for visual loss of continuity of the sandstone cliffs on La Perouse point for users of Frenchmans Beach and visitors to Bare Island
- Potential changes to coastal landscape character due to the built form and additional lighting
- Potential loss of the visibility of the existing landscape setting of National, State and locally significant heritage setting.

4.7.3 Proposed further assessments

A detailed landscape character and visual amenity assessment will be prepared as part of the EIS. It will be carried out in accordance with the following guidelines:

- Control of the Obtrusive Effects of Outdoor Lighting AS4282 (Standards Australia, 1997)
- Guidelines for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04 (Roads and Maritime, 2018)
- Landscape Design Guidelines (Roads and Maritime, 2019b)
- Beyond the Pavement 2020 (Transport for NSW, 2020a).

The assessment will include (as a minimum):

- Description of the existing area's landscape character and consideration of place, including its cultural heritage and amenity value
- Identification of the zones of visual influence (visual envelope), landscape character zones and sensitive visual receivers
- Identification of ambient light levels
- Assessment of temporary and permanent light spill impacts on the local area and any associated ecological impacts
- Assessment of the compatibility of proposal on the landscape character
- Assessment of visual impacts of the proposal during construction and operation

- Consideration of the whole landscape and place, not just individual elements or precincts which will ensure that the work contributes to the place and its heritage in keeping with the setting
- Identification of measures to avoid, minimise and mitigate against potential visual and landscape impacts.

4.8 Socioeconomic

4.8.1 Overview

The socioeconomic values of the proposal area are presented by National, regional and local importance.

National values

The proposal area is located within a National historic area of importance for Aboriginal and non-Aboriginal heritage. The Kurnell Peninsula is a site of one of the first meetings between Aboriginal peoples and the crew of the Endeavour led by Captain Cook.

Regional values

The proposal area is of regional historical importance for Aboriginal culture. The LPLALC has a strong presence in the area with historical ties to the previous ferry service that provided an important cultural connectivity between locations. Many Aboriginal peoples also used to run the ferry service.

La Perouse and Kurnell Peninsulas provide important recreational spaces for south-eastern Sydney.

La Perouse is identified as an iconic open space and recreation and tourist hub under the Randwick Draft Local Strategic Planning Statement and Sutherland Shire Council recognises the Kurnell Peninsula to be part of the Coastal Destination Area, which is a focus of recreation and visitors.

Local values

La Perouse

As mentioned above, La Perouse includes open space for recreation, and a historic site for visitors and residents. There are several tourist attractions including Bare Island and its fortifications, Macquarie Watchtower, Cable Station and La Perouse Museum. Residential housing is located to the north of the proposal area, while there are beaches along Frenchmans Bay and Congwong. The New South Wales Golf Club is located to the east of the proposal area.

La Perouse has been identified within the Randwick Draft Local Strategic Planning Statement as a tourism development opportunity area for the Aboriginal community.

The sensitive receivers identified within the proposal area include:

- Residents
- Local Aboriginal community
- Business owners, employees and customers, including the restaurants and cafés on Anzac Parade and Endeavour Avenue.

- Local students and trainees, including those attending Randwick Technical and Further Education (TAFE) programs
- People:
    - Walking and cycling
    - Visiting the La Perouse cultural heritage attractions and Kamay Botany Bay National Park
    - Undertaking water recreational based activities such as boating, fishing, diving, sailing and swimming
    - Using Congwong and Little Congwong Beach and Frenchmans Bay
    - New South Wales Golf Club users.

Kurnell

Kurnell is a tourist destination due to its proximity to Kamay Botany Bay National Park and the site of the first meeting place between Aboriginal peoples and the Cook expedition. The National Park includes an Environmental Education Centre, walking tracks, beaches and picnic areas. There are also historic monuments relating to the first landing of Captain Cook.

South of the National Park is the Kurnell Terminal. It includes a 900-metre port and berthing facility that extends north, from the Kurnell shoreline into Botany Bay.

Local shops and cafés are located to the west of the proposal area on Prince Charles Parade and Captain Cook Drive. They are typically used by residents, tourists, visitors and staff from the Kurnell Terminal. The nearest residential area is located to the west of the proposal area along Prince Charles Parade and Captain Cook Drive.

Sutherland Shire Council identifies the Kurnell Peninsula as part of the Green Grid. This provides a network of open spaces, natural areas and waterways stretching across the LGA and connecting into the broader Greater Sydney network.

The sensitive receivers identified within the Kurnell proposal area include:

- Residents
- Local Aboriginal community
- Business owners, employees and customers, including to the restaurants and cafés on Prince Charles Parade
- People:
    - Walking and cycling
    - Visiting Kamay Botany Bay National Park and its historic monuments
    - Undertaking water based recreational users including activities such as swimming, sailing and fishing
    - Using Silver Beach.

4.8.2 Summary of issues

Construction

- Potential temporary restriction on, or disruption to, recreational water-based activities

- Potential temporary disruption to the network of social, cultural and economic development opportunities being developed by the LPLALC
- Temporary amenity impacts for residents, business owners, employees, tourists, visitors, walkers and cyclists to the area, including noise disturbance, traffic delays, loss of access and visual impacts
- Temporary loss of access to public land and/or car parking

Operation

- Impacts to community value and sense of place because of context, setting and amenity changes to the National Park, including the possible loss of cultural heritage and amenity values
- Potential loss of visual amenity from the wharves and ancillary infrastructure on residents' views
- Potential disruption to the local community from an increase in visitor numbers to the area
- Increased in demand for public transport services, increased traffic on the road network and pressure on car parking as people seek to access the ferry service
- Reinstatement of recreational fishing from the wharf
- Potential increased revenue to the area for Aboriginal peoples and businesses to run the ferry service
- Potential economic injection into the local economy

4.8.3 Proposed further assessments

A detailed socioeconomic impact assessment will be prepared as part of the EIS. It will be carried out in accordance with:

- Socio-economic Assessment, Environmental Impact Assessment Practice Note EIA-N05 (Transport for NSW, 2020b)
- Social impact assessment guideline. For State significant mining, petroleum production and extraction industry development (Department of Planning and Environment, 2017).

The assessment will include (as a minimum):

- Identification of the existing socioeconomic environment including demographic characteristics, community/recreational facilities and community values
- Identification of potential socioeconomic impacts associated with the construction and operation of the proposal, including positive impacts
- Identification of potential mitigation, management and monitoring measures to reduce the socioeconomic impacts and maximise potential benefits.

4.9 Contamination

4.9.1 Overview

Contamination within the proposal area could occur in the soil and/or marine sediments. This could be due to their acid sulfate characteristics or due to current and historic surrounding land uses.

There is a low probability of encountering acid sulfate soils on land in La Perouse and Kurnell (six to 70 per cent). However, there is a high probability (>70 per cent) for acid sulfate soils in the marine sediments.

The following potential sources of contamination are:

- Per and polyfluorooctanesulfonic acid (PFAS) are a plausible source of contamination to the proposal due to the multiple sources of PFAS in the Botany Bay area, including Botany Industrial Park, Sydney Airport, Caltex Kurnell & Botany Bay which are all listed by the EPA as PFAS investigation sites. PFAS are highly soluble in water and resist chemical, physical and biological degradation, which means that PFAS can move long distances from their original source and bioaccumulate within the food chain. Given these factors, it is plausible that PFAS has impacted soil and groundwater within the study area
- Boat manufacturer and/or retailers were located within the proposal area. These may have resulted in isolated areas of contamination associated with manufacturing and repairs
- Historic development across the proposal area suggests the potential for fill material to be present
- Sediment sampling carried out around the Kurnell Terminal port and berthing facility 2012 confirmed the presence of hydrocarbon and tributyltin along with other contaminants in the marine sediments associated with the shipping and activities that have operated in that location since 1956
- Potential contamination from herbicide use in the area as NSW *Protection of the Environment Operations Act 1997* licenses have been issued
- A service station is shown to have operated near the Kurnell proposal area, which may indicate an area of potential hydrocarbon contamination
- A gravel, sand and/or soil supplier is shown to have operated near the Kurnell proposed area. It is unclear if quarrying took place here or if the site was used as a retailer. Quarrying activities can often suggest subsequent filling with uncontrolled fill.

4.9.2 Summary of issues

Construction

- Excavation activities could mobilise contaminated soil and marine sediment leading to surface water and groundwater pollution through creating migration pathways

- Encountering unexpected contaminated sediments and soil from handling, transporting and disposing of material could pose a risk to construction workers.

Operation

- There would be no ongoing contamination impacts once the proposal is operational.

4.9.3 Proposed further assessments

A preliminary site investigation (PSI) and detailed site investigation (DSI) will be prepared as part of the EIS. They will be carried out in accordance with:

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (Australian Government, as amended 2013).
- Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land (Department of Urban Affairs and Planning, and Environment Protection Authority, 1998)
- Guidelines for Consultants Reporting on Contaminated Sites (Office of Environment and Heritage, 2011)
- Acid Sulfate Soils Assessment Guidelines (Acid Sulfate Soils Management Advisory Committee, 1998)
- Per- and Poly-Fluoroalkyl Substances National Environment Management Plan (PFAS NEMP) (HEPA, 2018).

The assessment will include (as a minimum):

- Identification of contaminated soils, sediments, surface and groundwater within the proposal area
- Assessment of potential impacts involving acid sulfate soils
- Assessment of potential impacts involving contaminated land
- Identification of appropriate mitigation and management measures to safeguard the environment and people during construction and operation.

4.10 Noise and vibration

4.10.1 Overview

The proposal area at La Perouse is mainly open space with grassland, beaches and several heritage sites nearby (as outlined in section 4.2). The nearest noise sensitive receivers to the La Perouse proposal area are residents and employees on Anzac Parade and active and passive recreational users (visitors) in the area.

The proposal area at Kurnell is also mainly open space, with tourist sites, such as the Captain Cook's landing place. The community of Kurnell to the west of the Kamay Botany Bay National Park are mostly housed in low-rise residential property. There are several local shops along Captain Cook Drive and Prince Charles Parade.

A noise survey completed along Anzac Parade, La Perouse and Charles Parade, Kurnell by Wilkinson and Murray in 2006 measured ambient noise levels between 40 to

43 dBL_{A90}. The survey found noise from the ocean and local traffic to be the dominant sources at La Perouse, and distant port activity and local traffic to be the dominant sources at Kurnell. A more recent survey at Kurnell by Wilkinson Murray in 2013 identified similar background noise levels at Kurnell between 41 and 43 $dBAL_{A90}$.

As identified in section 4.5, there are likely to be marine fauna within the proposal area that could be impacted by noise.

The noise and vibration sensitive receivers within the proposal area include:

- Residents; the nearest of which are located on Anzac Parade, La Perouse and Captain Cook Drive, Kurnell
- Business owners, employees and customers
- Local students and trainees, including those attending Randwick Technical and Further Education (TAFE) programs
- People:
    - Walking and cycling
    - Visiting the La Perouse cultural heritage attractions, Kamay Botany Bay National Park and its historic monuments
    - Undertaking water recreational based activities such as boating, fishing, diving, sailing and swimming
    - Using Congwong and Little Congwong Beach, Frenchmans Bay, and Silver Beach
    - New South Wales Golf Club users
- Megafauna, fish and other species sensitive to underwater noise.

4.10.2 Summary of issues

Construction

- Temporary surface noise from land and water-based construction vehicles, machinery and activities affecting sensitive receivers
- Temporary surface vibration from land and water-based construction activities leading to amenity (human comfort) impacts or cosmetic or structural damage to (heritage-listed) buildings
- Temporary underwater noise from water-based construction activities.

Operation

- Land and water-based noise impacts from ferry operations, potentially including underwater noise impacts
- Land-based noise impacts from increased visitors to area.

4.10.3 Proposed further assessment

A land-based noise and vibration assessment will be prepared as part of the EIS. It will be carried out in accordance with:

- Assessing vibration: a technical guideline (Department of Environment and Conservation, 2006)

- Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009)
- NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011)
- Construction Noise and Vibration Guideline (Roads and Maritime, 2016)
- Noise Policy for Industry (Environment Protection Authority, 2017).

The assessment will include (as a minimum):

- Identification of potentially affected noise and vibration sensitive receivers
- Establishment of proposal-specific construction noise and vibration management levels
- Identification of out-of-hours work needed during construction
- An assessment of construction noise and vibration impacts on identified sensitive receivers
- An assessment of operational noise and vibration on identified sensitive receivers
- Recommendations for feasible and reasonable noise and vibration mitigation, management and monitoring measures.

An underwater noise and vibration assessment will be prepared as part of the EIS. It will be carried out with reference to:

- Underwater Piling Noise Guidelines (Department of Planning, Transport and Infrastructure, 2012).

The assessment will include (as a minimum):

- Confirmation of underwater noise generating activities
- Definition of associated sound pressure levels measured in decibels at one micro-pascal (dB re 1 µPa)
- Establishment of proposed specific sound exposure and peak impulsive and continuous noise criteria for identified noise sensitive fauna
- Definition of safe working distances to prevent health-based or physiological changes
- Recommendations for feasible and reasonable mitigation, management and monitoring measures.

4.11 Coastal processes

4.11.1 Overview

The existing coastal environment at La Perouse and Kurnell is influenced by tidal, wave and storm conditions. Over time, these conditions are expected to change in response to predicted climate change and sea-level rise.

Bathymetry

Botany Bay is typically less than five metres deep. Near the entrance to Botany Bay, the depth increases to 15 metres. The shipping channel to Port Botany is dredged to around 20 metres.

Sea level rise

The report Climate Change in Australia (CSIRO and BOM, 2015) documents regional sea level rise predictions based on the most recent Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report projections. Using the upper limit values for Representative Concentration Pathway (RCP8.5), the projected sea level rise from 2075 would be 0.64 metres higher than it is today.

Tides and storm conditions

There is around 12.5 hours between each high-tide in Botany Bay; termed a semi-diurnal tide pattern. The maximum and minimum tides are respectively about one metre above and below the mean water level. Currently mean water is about 0.1 metre above the datum; termed Australian Height Datum (AHD). By 2075 the mean water level would be about 0.7 metres above this datum. Table 4-4 shows the predicted maximum and minimum tide levels for 2019 and 2075 mean water level. These figures are taken from the Australian National Tide Tables (Australian Hydrographic Service, 2019) for Fort Denison, which is largely representative of the tide conditions in Botany Bay.

Table 4-4 Tide levels at Botany Bay adopted from Fort Denison, shown for 2019 and 2075

Tide level	Present day (2019)	Year 2075
	(mAHD)	(mAHD)
Highest Astronomical Tide (HAT)	1.2	1.8
Mean Water Level (MWL)	0.1	0.7
Lowest Astronomical Tide (LAT)	-0.9	-0.3
100-year Average Recurrence Interval (ARI) extreme water level	1.45	2.08

CD = Chart Datum which approximates to LAT and is about 0.93 m below Australian Height Datum (mAHD)

The tidal regime in Botany Bay has a tidal period of 12.4 hours. Generally, two high tides and two low tides occur each day, creating a semi-diurnal tidal environment.

Currents

Currents within the proposal area are mainly tidally driven and are relatively small with speeds of less than 0.5 m/s magnitude. Cardno (2007) reported a maximum recorded current speed of 0.36 m/s in a west north west direction. However, due to the potential for local effects within the proposal area, current speeds can reach 0.5 m/s.

Waves

The waves in Botany Bay are influenced by the weather generating swell, winds that blow across the Bay, and vessel movements. Offshore waves which start as eight to nine metres waves, can reach swell wave heights of two metres in Botany Bay. Wind waves can reach 0.5 metres, while vessel waves are typically localised and small.

Coastal erosion

At La Perouse, Frenchmans Bay is relatively stable from storm erosion, and Yarra Bay is stable following coastal improvement works.

At Kurnell, most of the shoreline along Silver Beach has experienced shoreline instability requiring protection from storm erosion by installing rock groynes. Furthermore, a sandbag seawall was constructed to stabilise the site from erosion. Within the Kurnell proposal area, the coastline is naturally protected and remains in a more natural state.

4.11.2 Summary of issues

Construction

- Work activities may be delayed during heavy storms and sea states.

Operation

- Existing structures at the site may experience localised coastal erosion and scour
- Proposed wharves could be impacted by coastal processes and sea-level rise
- Proposed wharves could affect coastal and shoreline processes.

4.11.3 Proposed further assessment

A coastal impact assessment will be prepared as part of the EIS. There are no specific assessment guidelines supporting coastal assessment; however, the proposal will include (as a minimum):

- Prediction of the coastal and hydrodynamic processes in Botany Bay through modelling
- Assessment of how the coastal processes and storm events could affect construction works
- Assessment of changes to coastal processes, including tidal flow/velocity, wave dynamics and effects on sediment transport patterns from the installed infrastructure
- Assessment of how future coastal process changes due to climate change would impact on the proposal's design
- Assessment of the scouring and erosion impacts on the shoreline by natural forces and vessel operations
- Assessment of localised scour around the wharves and of the seabed due to propeller wash
- Identification of appropriate mitigation and management measures to safeguard the environment during construction and operation.

4.12 Climate change

4.12.1 Overview

The Environmental Sustainability Strategy 2019-2023 (Roads and Maritime, 2019a) includes an objective to design and construct transport infrastructure to be resilient and adaptable to climate change impacts.

The proposal would be impacted by climate change due to more extreme temperatures, wind, rainfall, coastal processes and bushfires.

A summary of the likely changes in coastal processes including sea-level rise and storm surges is outlined in Section 4.11.

Temperature

Temperature data from NSW and ACT Regional Climate Modelling (NARCliM) show that between 1990 to 2009 average temperatures in Sydney reached a maximum of 20°C to 22°C and minimum of 8°C to 12°C. It is predicted that temperatures will increase by a minimum of 0.6°C by 2030, and by 1.9°C to 3.7°C by 2070.

Between 1990 to 2009, there were between 10 and 20 hot days (above 35°C). This is expected to increase by four-to-five days by 2030 and 10 to 13 days by 2070. The annual number of cold nights (below 2°C) is expected to reduce.

Within the last year NSW has recorded its warmest year on record, with the mean temperature 1.95 °C above average and 0.27 °C warmer than the previous warmest year in 2018 (BOM, 2020).

Rainfall

Sydney typically receives around 1,100 mm of rainfall a year according to data from Sydney (Kingsford Smith) Airport climate station. Rainfall is generally higher in the summer and autumn and lower in the winter and spring. NARCliM predicts that climate change will see rainfall decrease in spring and winter and increase in summer and autumn, with an overall increase in more extreme rainfall events.

Bushfire

Average fire weather and severe fire weather days are projected to increase in summer and spring. However, models predict a relatively small change in severe fire weather for coastal regions. Autumn is predicted to have a decrease in fire weather due to the increased predicted rainfall.

4.12.2 Summary of issues

Construction

- Climate change is expected to have a minimal impact over the two-year construction. However, there is still the potential need to work in more extreme weather conditions, whether caused by climate change or natural variations.

Operation

- Potential sea level rise leading to an increased flood risk on land and overtopping risk on the wharves
- Potential increased loss of service during an extreme weather event
- Health and safety impacts on staff and customers in extreme weather events and extreme temperature days
- Increased maintenance due to extreme weather events (eg extreme temperature days, wind, rainfall, storm surges) degrading the infrastructure at a quicker rate than currently predicted
- Potential structural damage due to increased wave energy, currents, stronger winds and heavy rain.

4.12.3 Proposed further assessment

A climate change risk assessment will be prepared for the EIS. It will be carried out in accordance with:

- Guideline for Climate Change Adaptation, Revision 2.1 (Australian Green Infrastructure Council, 2011)
- Risk Management: Principles and Guidelines: ISO 31000 (International Standards Organisation, 2009)
- Climate Change Adaption for Settlements and Infrastructure: A Risk-Based Approach: AS5334 (Australian Standard, 2013)
- Climate Change Risk Assessment Guideline (Transport for NSW, 2017).

The assessment will include (as a minimum):

- Qualitative assessment of anticipated climate change risks and impacts to the proposal based on climate variables identified in the NARCliM model
- Development of a climate change risk register with rated risks
- Identification of design recommendations, mitigation and/or management measures to be included in the design, construction and operation of the proposal.

5 Other environmental issues

This chapter describes the other environmental issues that are expected in building and operating the proposal that should be considered in the EIS.

5.1 Overview

Other environmental issues listed below are considered to be of lesser consequence than the key issues identified in Chapter 4 for the proposal, taking into account the scope of the proposal, the existing environment and the implementation of standard and best practice management and mitigation measures. It is considered unlikely that these would be key issues for the proposal; however, further assessment will be carried out as part of the EIS. Any environmental management and safeguard measures required to minimise and mitigate impacts will be documented as part of the EIS. Most impacts from these other environmental issues would be dealt with by implementation of a Construction Environment Management Plan (CEMP).

5.2 Soil and water

5.2.1 Overview

The following provides an overview of the existing soil, flooding, water quality and groundwater environment within the proposal area.

Soils

The proposal area is underlain by Hawkesbury Sandstone. Frenchmans Bay in La Perouse and southwest of the proposal area at Kurnell are underlain by Quaternary marine deposits comprising coarse quartz sand with varying amounts of shell fragments. The marine deposits are underlain by Hawkesbury Sandstone.

There is an east-west trending dyke in the south-eastern boundary of the La Perouse proposal area. No other geological structures are mapped within the proposal area.

Flooding

Flooding in the proposal areas at La Perouse and Kurnell is mainly tidally affected, rather than being caused by heavy rainfall, due to the coastal location.

The proposal areas are not near watercourses that discharge to the ocean.

The Sutherland Shire Council Kurnell Township Flood Study (WMA Water, 2009) identified areas of the suburb that are at risk of flooding. The proposed wharf location at Kurnell is not included in the extent of this flood study, however the potential car parking area near Captain Cook Drive is within a flood prone area.

There has been no such flood study prepared for La Perouse.

Surface water quality

Water quality of Botany Bay is influenced by runoff from Cooks River, Georges River and other smaller tributaries within the catchment. Botany Bay catchment covers an about 1,165 square-kilometres, of which about 40 per cent is used for residential, industrial and commercial purposes. A large proportion of the reminder is still parkland or bushland.

The Department of Planning, Industry and Environment (DPIE) monitors water quality at beaches across Sydney, including 15 sites in Botany Bay and the Lower Georges River. Water quality sampling occurs weekly between October and April, and monthly between May to September. In 2012 and 2013, 75 per cent of swimming sites were graded good or very good in terms of water quality.

Tributyltin (TBT) levels in Botany Bay have been associated with the shipping and activities that have operated in that location since 1956.

Suspended sediments concentration in Botany Bay vary. During calm conditions, concentrations recorded an average of 5 mg/L. After heavy rainfall, concentrations can significantly increase to around 25 mg/L across the Bay.

Groundwater depth

The groundwater environment is influenced by the local climate and rainfall (refer to section 4.12). The geology and hydrogeology also play an important role in the characteristics of the groundwater environment.

Based on preliminary desktop studies, it does not appear that there are any GDE in or local to the proposal area. However, the nearby wetlands have the potential to be GDE (refer to section 4.5), which would be confirmed during biodiversity surveys.

Boreholes located within two kilometres of the La Perouse proposal area are used for monitoring bores, irrigation, industrial or domestic purposes. The closest monitoring boreholes are located inland more than 200 metres from the La Perouse proposal area. There is no information on the depth to groundwater at the closest boreholes. Groundwater levels would be confirmed during field investigations.

Boreholes located within two kilometres of the Kurnell proposal area are used for mix of domestic, industrial, general, remediation and monitoring purposes. Most are groundwater remediation monitoring boreholes owned by Caltex. The groundwater level within the Kurnell section of the proposal area is expected to be close to the surface. Boreholes within 500 metres of the proposal area show groundwater level to be within three metres of the surface.

Groundwater quality

The groundwater within the proposal area is highly saline due to sea water intrusion. Groundwater is likely to flow towards Botany Bay discharging along the water's edge.

The La Perouse proposal area is within the Botany Bay Sands Aquifer. This is classified as a porous, extensive and highly productive. Due to the contamination of groundwater within Botany Bay Sands Aquifer, the La Perouse area has been divided into four management zones. Part of the La Perouse proposal area falls within Zone 4 which has domestic ban. While industrial use of groundwater is allowed within Zone 2 to Zone 4, industrial users are required to annually test their boreholes and provide results to DPIE. There is also an embargo on new applications for licences to extract groundwater from the Botany Sands Aquifer.

5.2.2 Summary of issues

Construction

- Surface water quality impacts from construction activities and stockpile runoff affecting Botany Bay's water quality through sediment and chemical discharge, and increased turbidity

- Groundwater quality impacts from spills, leaks, piling related activities and stockpile runoff affecting groundwater quality through contaminated soil or sediment mobilisation. This could affect GDEs near the proposal area. Groundwater pollution could lead to loss of water quality for other borehole users
- Changes to groundwater flow paths from piling and excavation
- Accidental fuel spills and leaks from machinery and equipment leading to infiltration of hydrocarbons.

Operation

- Potential flood risk at the proposed Kurnell car park
- Introduction of hardstand areas next to the wharves reducing surface infiltration affecting groundwater recharge and increasing scour and erosion at outfall points
- Sediment disturbance from propeller wash.

5.2.3 Proposed further assessment

The PSI and DSI (refer to section 4.9) will consider contamination and pollution impacts.

A surface water assessment will be prepared as part of the EIS. It will be carried out in accordance with:

- Derivation of the NSW Government's Sea Level Rise Planning Benchmarks. Technical Note (DECCW, 2009a)
- Flood Risk Management Guide: Incorporating Sea Level Rise Benchmarks in Flood Risk Assessments (DECCW, 2010b)
- Floodplain Development Manual. Department of Infrastructure, Planning and Natural Resources (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2005)
- Coastal Planning Guideline – Adapting to Sea Level Rise (Department of Planning, 2010)
- Australian Rainfall and Runoff: A Guide to Flood Estimation (Ball *et al*, 2019).

The surface water assessment will include (as a minimum):

- Identification of surface waters that may be impacted by the proposal
- Assessment of potential water quality, quantity and flooding impacts
- Assessment of erosion and sedimentation risk
- Identification of appropriate mitigation, management and monitoring measures during construction and operation.

A groundwater assessment will be prepared as part for the EIS. It will be carried out in accordance with:

- Acid Sulfate Soils Assessment Guidelines and Manual (Acid Sulfate Soils Management Advisory Committee, 1998)
- Guidelines for Fresh and Marine Water Quality (ANZECC, 2000)

- Guidelines for Controlled Activities on Waterfront Land (Department of Industry, 2018)
- Managing Urban Stormwater: Soils and Construction (Landcom, 2004)
- Risk Assessment Guidelines for Groundwater Dependent Ecosystems (Department of Primary Industries, 2012).

The assessment will include (as a minimum):

- Identification of existing groundwater characteristics and nearby users
- Conceptual groundwater modelling
- Assessment of potential groundwater impacts including quality and quantity and impacts to existing groundwater users, surface water features, groundwater dependent ecosystems (if present) and impacts on subsurface design features, utilities and structures
- Identification of appropriate mitigation and management measures to safeguard the environment during construction and operation.

5.2.4 Management and safeguard measures

During design of the proposal, Transport for NSW would seek to minimise surface water and groundwater impacts. The CEMP would include standard safeguard measures to control dust, noise, erosion and sedimentation during construction that are proven and tested in being effective.

5.3 Air quality

5.3.1 Overview

The National Environment Protection Measure (NEPM) (Department of Environment, 2015) and Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales ('Approved Methods') (EPA, 2016) provide standards against that ambient air quality can be assessed. They provide pollutant concentrations, referred to as 'goals' and 'standards' respectively, that can be used to determine if ambient air quality is contributing to public health issues.

The relevant air quality goals/standards are those related to particulate matter (total suspended particulates, PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), and sulphur dioxide (SO_2); given that these are pollutants that are likely to be generated by the proposal vessels.

The National Pollutant Inventory (NPI) identifies 14 industrial facilities or significant sources of air emissions within 3.5 kilometres of the proposal area. These are primarily made up of organic chemical manufacturers or liquid chemical storage facilities located in Port Botany Industrial Estate and the Kurnell Peninsula. Emissions from these locations contribute to local air quality in the proposal area.

The closest monitoring station to the proposal area is in Randwick; about eight kilometres from the proposal area. Air quality in Sydney is generally good with only occasional exceedances of the standards, which primarily relate to PM_{10} and $PM_{2.5}$. A comparison was made between the NEPM standards and data from the 2019 Randwick monitoring station, which indicated:

- An exceedance of the annual average $PM_{2.5}$ standard, which is common for locations across Sydney due to high background concentrations under certain meteorological conditions
- Exceedances of the 24-hour standard for PM_{10} and $PM_{2.5}$ mainly related to elevated particulate matter concentrations across Sydney forward of October 2019 due to bushfires in NSW affecting atmospheric conditions within the Sydney airshed
- No exceedances of the annual average NO_2 and PM_{10} standards.

In summary, the air quality within the surrounding area meets the relevant air quality standards except for PM_{10} and $PM_{2.5}$, which are commonly exceeded across Sydney and other urban centres. This is due to both natural and human sources including bushfires, dust storms, wood burning stoves, shipping and transportation.

It is likely that pollutant concentrations at the proposal area would be lower than those monitored at Randwick, because of the coast (ie better dispersion).

The organic nature of sediments within Botany Bay means that there is potential for the excavation of material to cause odour impacts once brought to the surface. Due to the limited excavation likely to be required for the proposal, the risk of any odour impacts is low.

5.3.2 Summary of issues

Construction

- Nuisance to sensitive receptors due to:
    - Dust emissions
    - Equipment and traffic emissions
    - Odour from disturbed marine sediment.

Operation

- Ferry vessel emissions.

5.3.3 Proposed further assessment

An air quality assessment will be prepared as part of the EIS. It will be carried out in accordance with:

- Assessment of Dust from Demolition and Construction (Institute of Air Quality Management (UK), 2009)
- NEPM (Department of Environment, 2015)
- Approved Methods (EPA, 2016)
- Guidance on the Assessment of Odour for Planning (Institute of Air Quality Management, 2018).

The assessment will include (as a minimum):

- Determination of baseline air quality conditions using existing monitoring data available from nearby stations
- Qualitative assessment of proposed works and worksites considering mitigation, management and monitoring measures to reduce and minimise

dust, odour and other pollutants emissions. This will follow a risk-based approach outlined in the Institute of Air Quality Management guidance

- Qualitative prediction and assessment of the operational air quality impacts of the ferry vessels
- Mitigation, management and monitoring measures to ensure that impacts are maintained within acceptable limits.

5.3.4 Management and safeguard measures

Management and safeguard measures:

- Dust management plan (as part of the CEMP)
- Odour management plan (as part of the CEMP) (if required).

5.4 Greenhouse gas

5.4.1 Overview

The NSW Government Resource Efficiency Policy (GREP) (Office of Environment and Heritage, 2019), requires agencies to reduce operating costs and lead by example in increasing the efficiency of energy, water, clean air and waste management. Transport for NSW's commitment to sustainability is articulated in its Environmental Sustainability Strategy 2019-2023 (Roads and Maritime, 2019a). This includes a key focus to minimise air quality impacts and reduce transport-related air emissions.

Greenhouse gas emission sources can be grouped and assessed under three scope categories (Australian Government Clean Energy Regulator):

- Scope 1 emissions are the direct result of an activity; for example, the burning of fuel in construction vehicles
- Scope 2 emissions are indirect emissions; such as, the use of electricity generated outside the proposal boundary
- Scope 3 includes emissions in the supply chain, or those from the use of a product; for example, the production and transport of materials used in construction.

5.4.2 Summary of issues

Construction

- Generation of direct and indirect greenhouse gas emissions through:
    - Traffic and equipment fuel use and combustion
    - Electricity use in running the equipment, machinery and site offices
    - Embodied energy in the materials used in construction, including their manufacture and transportation.

Operation

- Generation of greenhouse gas emissions through:

- Vessel and equipment fuel consumption
- Electricity use to power the amenities
- Embodied energy in the materials used for maintenance.

5.4.3 Proposed further assessment

A greenhouse gas assessment will be prepared as part of the EIS. It will be carried out in accordance with:

- Australian Government National Greenhouse and Energy Reporting Act 2007
- Australian Government National Greenhouse and Energy Reporting (Measurement) Determination 2008
- National Greenhouse Gas Factors: Australian National Greenhouse Accounts (Department of the Environment and Energy, 2019).

The assessment will include (as a minimum):

- Identification and quantification of the sources of greenhouse gas emissions associated with the construction, operation and maintenance of the proposal
- Identification of opportunities to reduce greenhouse gas emissions.

5.4.4 Management and safeguard measures

The assessment of greenhouse gas emissions and identification of initiatives to reduce emissions will be developed as the design advances in collaboration with the internal stakeholders.

5.5 Sustainability

5.5.1 Overview

The Environmental Sustainability Strategy 2019-2023 (Roads and Maritime, 2019a) identifies 10 focus areas to embed into delivery of infrastructure:

- Minimise:
    - Energy use and reduce carbon emissions
    - Air quality impacts
    - Use of non-renewable resources
    - Noise, water and land pollution
- Provide high-quality design outcomes
- Procure sustainable goods and services
- Develop infrastructure that is resilient and adaptable to climate change impacts
- Improve outcomes for biodiversity
- Manage and conserve cultural heritage
- Communicate sustainability objectives.

Further to the Environmental Sustainability Strategy (RMA, 2019a), the Transport for NSW Sustainable Design Guidelines will be implemented to drive better proposal sustainability outcomes. The guidelines are based around the achievement of a sustainability rating level. A target sustainability rating level for this proposal will be nominated during concept design stage when the full scope of the design is better understood. The target level will be included in the EIS.

5.5.2 Summary of issues

Construction

- Consumption of resources including energy, water and materials
- Generation of greenhouse gas emissions
- Generation and disposal of waste, including virgin excavated natural material (VENM) and excavated natural material (ENM)
- Social, heritage and ecological impacts
- Sustainable procurement of goods and services
- Communication and engagement with stakeholders and community.

Operation

- Consumption of resources including:
    - Fuels for vessel operation and maintenance of the assets
    - Energy and water for the operation of the asset
    - Energy for the land-based amenities and materials and fuels
- Generation of greenhouse gases from
    - Vessel and equipment fuel consumption
    - Electricity use to power the amenities
    - Embodied energy in the materials used for maintenance
- Climate change mitigation and adaption
- Ongoing social considerations.

5.5.3 Proposed further assessment

Further assessment and development of sustainability will be carried out. This will investigate, but not be limited to, design recommendations to ensure sustainable outcomes.

5.5.4 Management and safeguard measures

Management measures developed to mitigate other environmental impacts, such as greenhouse gas emissions, would also manage sustainability issues.

5.6 Air space

5.6.1 Overview

The proposal is located four kilometres to the southeast of Sydney (Kingsford Smith) Airport. The Australian Government *Airports Act 1996* and the Australian Government Airport Regulations 1997 define the Obstacle Limitation Surface (OLS) and Procedures for Air Navigation Services Aircraft Operations (PAN-OPS) airspace to protect aircraft landing and taking off. These take the form of height restrictions where activities cannot 'intrude' into this airspace.

The OLS and PAN-OPS for the La Perouse proposal area is 50 mAHD. For the Kurnell proposal area this varies between 51 mAHD to 70 mADH across the proposal area.

5.6.2 Summary of issues

Construction

The construction methodology would be designed to avoid penetrating the height restrictions. This would be confirmed following construction planning.

Operation

The proposed ferry wharves would not exceed the 50 mAHD height restrictions.

5.6.3 Proposed further assessment

The requirements of the Australian Government *Airports Act 1996* and the Australian Government Airport Regulations 1997 would be considered during constructability planning and design development.

5.6.4 Management and safeguard measures

Provided the OLS and PAN-OPS limits are not exceeded no management and safeguard measures would be needed.

5.7 Cumulative effects

5.7.1 Overview

Cumulative impacts relate to any combined impact resulting from multiple individual sources. Cumulative impacts may arise during construction and operation because of other major infrastructure projects taking place at the same time as the proposal.

There are four known major projects planned or underway near the proposal area:

- Cruise Terminal, Port Botany: a detailed business case is currently being prepared to investigate cruise capacity and assess potential sites for a cruise terminal
- Botany Cogeneration Plant: an EIS is currently being prepared for the construction of an energy recovery plant

- Kurnell Terminal Remediation: a modification has been approved for an asbestos contaminated soil containment cell and cooling water outlet pipe
- Kamay Botany Bay National Park Master Plan: the proposal part of this wider master plan; however, if components of the master plan are carried out at the same time, they could cause cumulative construction impacts.

There may be further future expansion or construction within existing developments such as potential expansion of the Sydney Desalination Plant.

5.7.2 Summary of issues

Where projects occur near and at similar timeframes to the proposal, the following impacts may arise:

Construction

- Temporary traffic disruption and access changes, which could extend across the road networks leading to La Perouse and Kurnell
- Temporary additive air quality and human health impacts from construction dust
- Temporary additive noise and vibration impacts
- Temporary additive socio-economic and amenity impacts from residents, employees, tourists and visitors.

Operation

- Changes to the cultural and amenity heritage across the area due to development.

5.7.3 Proposed further assessment

A cumulative impact assessment will be prepared as part of the EIS. It will be carried out utilising a similar methodology commensurate with the Socioeconomic Assessment, Environmental Impact Assessment Practice Note EIA-N05 (RMS, 2013).The assessment will include (as a minimum):

- Identification of approved and committed development that would be built or become operational in the area at the same time as the proposal by reviewing:
    - DPIE major project register
    - Public authority business plans
    - Publicly accessible EIS specialist studies
- Identification of the residual impacts expected from the above development and the receivers and values that would be affected
- Assessment of the cumulative impacts that could occur on these receivers due to the combined impacts from the proposal and any other committed and approved development.

5.7.4 Management and safeguard measures

Where necessary, management and safeguard measures would be developed to avoid or minimise the potential for cumulative impacts. These measures may include

consultation with nearby proponents, notification of consultation and coordination of construction activities.

6 Conclusion

Transport for NSW has formed the opinion that the proposal has the potential to significantly affect the environment and would require an EIS to be obtained under Part 5 of the EP&A Act. The proposal does not require development consent under Part 4 of the EP&A Act. Accordingly, as per section 5.12 (3b) of the EP&A Act the proposal can be classified State significant infrastructure under Division 5.2 of the EP&A Act.

The key environmental issues identified for the proposal include:

- Aboriginal heritage
- Non-Aboriginal heritage
- Maritime archaeology
- Biodiversity
- Traffic and transport
- Landscape character and visual amenity
- Socioeconomic
- Contamination
- Noise and vibration
- Coastal processes
- Climate change.

The EIS will include the following:

- A detailed description of the proposal including its components, construction activities and potential staging
- A comprehensive assessment of the potential impacts on the key issues including a description of the existing environment, assessment of potential direct and indirect and construction, operation and staging impacts
- Description of measures to be implemented to avoid, minimise, managed, mitigate, offset and/or monitor the potential impacts
- Identify and address issues raised by stakeholders.

7 References

Acid Sulfate Soils Management Advisory Committee, 1998. Acid Sulfate Soils Assessment Guidelines. NSW Government

Arup, 2020. Strategic Business Case

Arup, 2016. Ferry Wharves at La Perouse and Kurnell Final Feasibility Study Report

Arup, 2015, Ferry Wharves at La Perouse and Kurnell Draft Feasibility Study Report

Australian and New Zealand Environment and Conservation Council, 2000. Guidelines for Fresh Marine Water Quality

Australian Government, 2013. *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended in 2013

Australian Government, 2008. *National Greenhouse and Energy Reporting (Measurement) Determination*

Australian Government, 2007. *National Greenhouse and Energy Reporting Act*

Australian Government, 1996. *Airports Act*

Australian Government, 1997. *Airport Regulations*

Australian Green Infrastructure Council, 2011. Guideline for Climate Change Adaptation, Revision 2.1.

Australian Hydrographic Service, 2019. Australian National Tide Tables.

Australian Institute for Maritime Archaeology, 1994. Guidelines for the Management of Australia's Shipwrecks

Australian Standard, 2013. AS 5334 - 2013 Climate change adaption for settlements and infrastructure – A risk based approach

Australia Standard, 1997. AS 4282 Control of the Obtrusive Effects of Outdoor Lighting

Austroads, 2019. Guide to Traffic Management Part 12: Traffic Impacts of Developments

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors) 2019. Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia

Blacktown City Council, 2013. Water Quality and Water Conservation – Water Sensitive Urban Design Developer's Handbook Part 4

Bureau of Meteorology, 2020. Annual Climate Summary for NSW (published 9 January 2020).

Cardno, 2018. Port Botany Long-Term Seagrass Monitoring

Canadian Environmental Assessment Agency, 1999. Cumulative Effects: A Practitioners Guide

Coast History and Heritage, 2019. Aboriginal Cultural Heritage Assessment, Kamay Botany Bay National Park, Stage 1 Master Plan

Commonwealth of Australia, 2019. Australian Rainfall and Runoff: A Guide to Flood Estimation

Commonwealth Scientific and Industrial Resource Organisation (CSIRO) and Bureau of Meteorology (BOM), 2015. Climate Change in Australia

Creese RG, Glasby TM, West G and Gallen C, 2009. Mapping the habitats of NSW estuaries. Industry & Investment NSW Fisheries Final Report Series 113. Port Stephens, NSW, Australia. ISSN 1837-2112

Department of Agriculture, Water and the Environment, 2020. Australian Heritage Database. Australian Government

Department of the Environment, 2015. National Environment Protection (Ambient Air Quality) Measure. Australian Government

Department of Environment and Climate Change, 2009. Interim Construction Noise Guideline. NSW Government

Department of Environment and Conservation, 2006. Assessing vibration – a technical guideline. NSW Government

Department of Environment, Climate Change and Water, 2011. NSW Road Noise Policy. NSW Government

Department of Environment, Climate Change and Water, 2010a. Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW. NSW Government

Department of Environment, Climate Change and Water, 2010b. Flood Risk Management Guide: Incorporating Sea Level Rise Benchmarks in Flood Risk Assessments. NSW Government

Department of Environment, Climate Change and Water, 2009a. Derivation of the NSW Government's Sea Level Rise Planning Benchmarks. Technical Note. NSW Government

Department of Environment, Climate Change and Water, 2009b. La Perouse Headland Botany Bay, National Park Conservation Management Plan. NSW Government

Department of Environment, Climate Change and Water, 2008. Meeting Place Precinct: Conservation Management Plan. NSW Government

Department of the Environment, 2015. National Environment Protection (Ambient Air Quality) Measure (NEPM). Australian Government

Department of the Environment and Energy, 2019. National Greenhouse Accounts Factors – August 2019. Australian Government

Department of Industry, 2018. Guidelines for Controlled Activities on Waterfront Land, NSW Government

Department of Infrastructure, Planning and Natural Resources, 2005. Floodplain Development Manual. NSW Government

Department of Planning, 2010. Coastal Planning Guideline – Adapting to Sea Level Rise

Department of Planning and the Environment, 2017. Social Impact Assessment Guidelines for State Significant Mining, Petroleum Production, and Extractive Industry Development. NSW Government

Department of Planning, Industry and Environment, 2020. Kamay Botany Bay National Park Plan of Management. NSW Government

Department of Planning, Transport and Infrastructure, 2012. Underwater Piling Noise Guidelines. Government of South Australia

Department of Primary Industries, 2012. Risk Assessment Guidelines for Groundwater Dependent Ecosystems. NSW Government

Department of Primary Industries, 2013. Policy and guidelines for fish habitat conservation and management. NSW Government

Department of Urban Affairs and Planning, and Environment Protection Authority, 1998. Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land. NSW Government

Department of Sustainability, Environment, Water, Population and Communities, 2012. EPBC Act Environmental Offsets Policy. Australian Government

Environment Protection Authority, 2017. Noise Policy for Industry. NSW Government

Environment Protection Authority, 2016. Approved methods for the modelling and assessment of air pollutants in New South Wales. NSW Government

European Union, 1999. Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions

Heads of EPAs Australia and New Zealand (HEPA), 2018. Per- and Poly-Fluoroalkyl Substances National Environment Management Plan (PFAS NEMP)

Heritage Office and Department of Urban Affairs and Planning, 1996. NSW Heritage Manual. NSW Government

Higginbotham, 1989. La Perouse and Bare Island Historic Sites, La Perouse. Conservation Plan. Historical Archaeology

Infrastructure NSW, 2018. Building Momentum. State Infrastructure Strategy 2018-2038

Institute of Air Quality Management (UK), 2009. Assessment of Dust from Demolition and Construction

International Standards Organisation, 2009. Risk Management: Principles and Guidelines: ISO 31000

Irish, 2017. Hidden in Plain View – The Aboriginal People of Coastal Sydney. First Edition. University of New South Wales Press Ltd.

Landcom, 2004. Managing Urban Stormwater: Soils and Construction. Volume 1, 4th Edition

Neeson Murcutt Architects Pty Ltd, Sue Barnsley Design & Freeman Ryan Design, 2019. Kamay Botany Bay National Park Master Plan, Kurnell

NSW Government, 2011. *State Environmental Planning Policy (State and Regional Development)*

NSW Government, 2000. *Environmental Planning and Assessment Regulation*

Nugent, 2005. A Contextual History of Botany Bay National Park (Kurnell Section). Monash University.

Office of Environment and Heritage, 2020. NSW Maritime Heritage Sites register

Office of Environment and Heritage, 2019. NSW Government Resource Efficiency Policy

Office of Environment and Heritage, 2018. Summary of Community and Stakeholder Engagement, Kamay Botany Bay National Park

Office of Environment and Heritage, 2017. Biodiversity Assessment Method

Office of Environment and Heritage, 2011. Guidelines for Consultants Reporting on Contaminated Sites

Randwick City Council, 2019. Draft Local Strategic Planning Statement vision 2040

Randwick City Council, 2012. Randwick City Plan

Roads and Maritime, 2019a. Environmental Sustainability Strategy 2019-2023

Roads and Maritime, 2019b. Landscape Design Guidelines

Roads and Maritime, 2018. Guidelines for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04

Roads and Maritime, 2016. Construction Noise and Vibration Guideline

Roads and Maritime, 2015a. Biodiversity Assessment, Environmental Impact Assessment Practice Note EIA-N06.

Roads and Maritime, 2015b. Cultural Heritage Guidelines 15.517/PN285G01

Roads and Maritime, 2012. Procedure for Aboriginal Cultural Heritage Consultation and Investigation

Roads and Maritime, 2010. Ecologically Sustainable Development, Environmental Impact Assessment Practice Note EIA-N02.

Roads and Traffic Authority, 2002. Guide to Traffic Generating Development

Sutherland Shire Council, 2019. Draft Local Strategic Planning Statement

The Ecology Lab Pty Ltd, 2013. Port Botany Expansion. Aquatic Ecology, Conservation & Fisheries.

Transport for NSW, 2020a. Beyond the Pavement

Transport for NSW, 2020b. Socioeconomic Assessment, Environmental Impact Assessment Practice Note EIA-N05

Transport for NSW, 2019. Sustainable Design Guideline Version 4.0.

Transport for NSW, 2018a. Future Transport Strategy 2056

Transport for NSW, 2018b. Sydney city centre access. Movement and place framework.

Transport for NSW, 2017. Climate Change Risk Assessment Guideline

Transport for NSW, 2015. Regional Boating Plan Botany Bay, Georges River and Port Hacking Region

URS 2013. Kurnell Port and Berthing Facility Upgrade Environmental Impact Statement

UNESCO, 2001. Convention on the Protection of the Underwater Cultural Heritage

United States National Oceanic and Atmosphere Administration, 2013. Draft Guidelines for Assessing the Effects of Anthropogenic Sound on Marine Mammals

Wilkinson and Murry, 2013. Kurnell Refinery Conversion, Noise and Vibration Assessment

Wilkinson and Murray, 2006. Botany Bay Cable Project Construction and Operational Noise Assessment

WMA water, 2009. Sutherland Shire Council, Kurnell Township Flood Study

Abbreviations and glossary

Acid sulfate soils	Naturally acid clays, mud and other sediments usually found in swamps and estuaries. They may become extremely acidic when drained and exposed to oxygen and may produce acidic leachate run-off that can pollute waters and liberate toxins.
AHIMS	Aboriginal Heritage Information Management System A register of NSW Aboriginal heritage information maintained by DECCW.
AIMA	Australian Institute for Maritime Archaeology
BOM	Bureau of Meteorology
CBD	Central business district
CD	Chart datum
CEMP	Construction Environmental Management Plan
DAWE	Department of Agriculture, Water and the Environment
dBA	Decibels using the A-weighted scale measured according to the frequency of the human ear.
DECCW	Department of Environment, Climate Change and Water
DPIE	Department of Planning, Industry and Environment
DSI	Detailed site investigation
EIS	Environmental Impact Statement
EP&A Act	Environment Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
ENM	Excavated natural material
GDE	Ground dependent ecosystem
HAT	Highest astronomical tide
LPLALC	La Perouse Local Aboriginal Land Council
LAT	Lowest astronomical tide
LGA	Local government area
LSPS	Local strategic planning statement
mAHD	Metres above Australian height datum The standard reference level used to express the relative height of various features. A height given in metres AHD is essentially the height above sea level. Mean sea level is set as zero elevation.
MWL	Mean water level
NARCliM	NSW and ACT Regional Climate Modelling
NEPM	National environment protection measures (ambient air quality)
NO_2	Nitrogen dioxide
NPI	National Pollutant Inventory
NPWS	National Parks and Wildlife Services
NSW	New South Wales
OLS	Obstacle limitation services
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PAN-OPS	Procedures for air navigation services – aircraft operations.
PCG	Project control group
PCT	Plant community types
PFAS	Per- and poly-fluoroalkyl substances
PM	Particle matter
PMST	Protected Matters Search Tool
PSI	Preliminary site investigation

Roads and Maritime	Roads and Maritime Services
SEPP	State Environmental Planning Policy
SO_2	Sulphur dioxide
SSI	State significant infrastructure
TAFE	Technical and further education
TBT	Tributyltin
Transport for NSW	Transport for New South Wales
The proposal	The proposal of public ferry wharves at La Perouse and Kurnell and associated infrastructure
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VENM	Virgin excavated natural material

Attachment A Requirements of the Environmental Planning and Assessment Regulation 2000

Requirements of the Environmental Planning and Assessment Regulation 2000

Clause 192 of the Environmental Planning and Assessment Regulation 2000 requires that an application for approval of the Minister to carry out State significant infrastructure must include:

a) Details of any approval that would, but for section 5.23 of the EP&A Act, be required for the carrying out of the State significant infrastructure, and

b) Details of any authorisations that must be given under section 5.24 of the Act if the application is approved, and

c) A statement as to the basis on which the proposed infrastructure is State significant infrastructure, including, if relevant, the capital investment value of the proposed infrastructure.

Approvals that would otherwise apply

Approvals that may be required to carry out the SSI, if not for section 5.23 of the EP&A Act, include:

- Permit under section 201, 205, or 219 of the *Fisheries Management Act 1994* for dredging or reclamation work
- An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*
- An approval under Part 4, or an excavation permit for excavation under section 139 of the *Heritage Act 1977*
- Water use approval under section 89, a water management work approval under section 90 or an activity approval under section 91 of the *Water Management Act 2000.* Section 5.23 does not remove the need to obtain an aquifer interference approval under the *Water Management Act 2000*, if that were to be otherwise required.

Authorisations if the application is approved

Authorisations that may be required for the proposal under section 5.23 of the EP&A Act include:

- An environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997*
- An approval under Section 138 of the NSW *Roads Act 1993*.

State significant infrastructure statement

Clause 14(1) of State Environmental Planning Policy (State and Regional Development) 2011 provides that development is declared to be State significant infrastructure pursuant to section 5.12(2) of the Act if it is permissible without development consent under Part 4 of the Act under a State environmental planning policy; and is specified in the categories of development in Schedule 3.

Division 13 Clause 68(4) of the State Environment Planning Policy (Infrastructure) 2007 permits development “for the purpose of wharf or boating facilities to be carried out by a public authority without consent. However, such development may be carried out on land reserved under the *National Parks and Wildlife Act 1974* only if the development is

authorised by or under that Act", as defined by section 151A(1b) of the Act (ie purposes related to the sustainable visitor or tourist use and enjoyment of reserved land).

Clause 1(1) of Schedule 3 of State Environmental Planning Policy (State and Regional Development) 2011 provides that general public authority activities for infrastructure or other development that (but for Division 5.2 of the EP&A Act and within the meaning of Part 5 of the Act) would be an activity for which the proponent is also the determining authority, and would, in the opinion of the proponent, require an environmental impact statement to be obtained under the EP&A Act.

For the Kamay Ferry Wharves, Transport for NSW has formed the opinion that the impact of the proposal on biodiversity, Aboriginal heritage and non-Aboriginal heritage has the potential to be significant and would require an EIS to be obtained under Part 5 of the EP&A Act. The proposal does not require development consent under Part 4 of the EP&A Act. Accordingly, as per section 5.12 (3b) of the EP&A Act the proposal can be classified State significant infrastructure under Division 5.2 of the EP&A Act and requires the approval of the Minister for Planning and Public Spaces.

Attachment B PACHCI Stage 2 Report

Kamay Ferry Wharves Project

Aboriginal Archaeological Survey Report (PACHCI Stage 2)

Local Government Areas: Sutherlands Shire and City of Randwick

Report to Arup

May 2020

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EXECUTIVE SUMMARY

Transport for NSW (TfNSW) proposes to re-establish public wharves at La Perouse and the Kurnell Peninsula for commercial and recreational ferry service. The proposal would provide a service for commuters and tourists to the area. The associated wharf infrastructure would also provide for supplementary uses potentially including commercial vessels and recreational boating.

The proposal is located in Botany Bay at either side of the ocean entrance to the Bay (Figure 1.1). Botany Bay is location approximately 14 kilometres south of the Sydney CBD. La Perouse headland is located next to a residential area and commercial area of Port Botany. Within the headland La Perouse includes a museum and access to La Perouse park and beaches. New South Wales Golf Club is located approximately 900 metres east. The La Perouse headland is located within the City of Randwick Local Government Area (LGA). The Kurnell peninsula is located south of the ocean entrance within Kamay Botany Bay National Park. To the west of the Peninsula is Kurnell residential area and industrial area. Cronulla is located approximately 8 kilometres south and the Royal National Park approximately 18 kilometres south. The Kurnell peninsula is located within the Sutherlands Shire LGA.

Artefact Heritage has been engaged to conduct an Aboriginal archaeological survey and assessment of the proposal in accordance with Stage 2 of the Procedure for Aboriginal Cultural Heritage Consultation and Investigation guidelines (PACHCI) (Roads and Maritime 2011), and the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (Code of Practice) (Department of Environment Climate Change and Water [DECCW] 2010a).

Overview of findings

- The following eleven recorded Aboriginal sites are located within the mapped extend of the study area:
    - Site 1, La Perouse (AHIMS ID 45-6-0648)
    - Site 2, La Perouse (AHIMS ID 45-6-0649)
    - Site 3, La Perouse (AHIMS ID 45-6-0650)
    - Site 4, La Perouse (AHIMS ID 45-6-0651)
    - Site 5, La Perouse (AHIMS ID 45-6-0652)
    - Site 6, La Perouse (AHIMS ID 45-6-0653)
    - La Perouse (AHIMS ID 45-6-1144)
    - La Perouse (AHIMS ID 45-6-1403)
    - La Perouse Midden 19-01 (AHIMS ID Pending)
    - Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219)
    - Kurnell Potential Archaeological Deposit 1 (K PAD 1) (AHIMS ID 52-3-1366)
- The survey identified that the La Perouse Midden 19-01 (AHIMS ID Pending), Site 1, La Perouse (AHIMS ID 45-6-0648) and Site 2, La Perouse (AHIMS ID 45-6-0649) are located on the ground surface within the La Perouse portion of the study area
- Background research completed for this assessment has identified that remnant portions of the Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) are located within the Kurnell portion of the study area.

- Background research has found that Site 3, La Perouse (AHIMS ID 45-6-0650), Site 4, La Perouse (AHIMS ID 45-6-0651), Site 5, La Perouse (AHIMS ID 45-6-0652), Site 6, La Perouse (AHIMS ID 45-6-0653), La Perouse (AHIMS ID 45-6-1144) and La Perouse (AHIMS ID 45-6-1403) are likely to be buried within the La Perouse portion of the study area.

Recommendations

- Where possible, impacts to identified Aboriginal sites should be avoided
- Further assessment is completed in accordance with the PACHCI stage 3 requirements for inclusion in the EIS and will include:
    - A management strategy for Site 1, La Perouse (AHIMS ID 45-6-0648) and Site 2, La Perouse (AHIMS ID 45-6-0649)
    - A methodology for the identification and management of Site 3, La Perouse (AHIMS ID 45-6-0650), Site 4, La Perouse (AHIMS ID 45-6-0651), Site 5, La Perouse (AHIMS ID 45-6-0652), Site 6, La Perouse (AHIMS ID 45-6-0653), and La Perouse (AHIMS ID 45-6-1403)
    - Salvage methodology for La Perouse (AHIMS ID 45-6-1144)
    - A test excavation methodology for La Perouse Midden 19-01 (AHIMS ID Pending)
    - A test excavation methodology for Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) and Kurnell Potential Archaeological Deposit 1 (K PAD 1) (AHIMS ID 52-3-1366). The test excavation methodology will consider the results of a remote sensing program, the methodology and findings of previous archaeological excavations and the nature of the proposed impacts.
- Aboriginal stakeholder consultation must be carried out in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (the Consultation Requirements) [DECCW 2010]) and the National Parks Regulation 2019
- If any suspected human remains are located during any stage of the proposed works, work should stop immediately, and the procedures outlined in the Unexpected Heritage Items Procedure (Roads and Maritime 2015) and Requirement 25 of the Code of Practice must be followed
- Should any changes be made to the proposed works that would involve impacts outside of the study area, these changes would be assessed in accordance with Roads and Maritime PACHCI and further investigation may be necessary.

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FIGURES

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ABBREVIATIONS

ACHO	Aboriginal Cultural Heritage Officer (Roads and Maritime)
AHIP	Aboriginal Heritage Impact Permit
AHIMS	Aboriginal Heritage Information Management Systems
ALR Act	*Aboriginal Land Rights Act 1983*
Artefact Heritage	Artefact Heritage Services Pty Ltd
ATSIHP Act	*Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
CHAR	Cultural Heritage Assessment Report
DECCW	Former NSW Department of Environment, Climate Change and Water (now DPIE-Heritage)
DPIE - Heritage	Department of Planning Industry and Environment - Heritage
LALC	Local Aboriginal Land Council
LEP	Local Environment Plan
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974*
OEH	Former Office of Environment and Heritage (now DPIE-Heritage)
PACHCI	Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party
SSI	State significant infrastructure
TfNSW	Transport for NSW
the Code of Practice	Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010

1.0 INTRODUCTION

1.1 Background

Arup was commissioned by Transport for New South Wales (TfNSW) to undertake a feasibility study into the re-establishment of wharves and a ferry service between La Perouse and the Kurnell Peninsula for commercial and recreational use. Artefact Heritage Service Pty Ltd (Artefact Heritage) was been engaged by Arup to prepare a high-level overview of Aboriginal and non-Aboriginal (historical) heritage as part of the feasibility study.

Arup were subsequently appointed to produce a Preliminary Environmental Information Report (PEI) for the options study of the Kamay Ferry Wharfs proposal. Artefact Heritage was engaged to complete a PEI for Aboriginal heritage to identify key baseline constraints and potential impacts as well as provide recommendations for further assessments and recommendation on future design phases.

Artefact Heritage has been engaged to conduct an Aboriginal archaeological survey and assessment of the proposal in accordance with Stage 2 of the Procedure for Aboriginal Cultural Heritage Consultation and Investigation guidelines (PACHCI) (Roads and Maritime 2011), and the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (Code of Practice) (Department of Environment Climate Change and Water [DECCW] 2010a).

1.2 Proposal overview

TfNSW proposes to re-establish public wharves at La Perouse and the Kurnell Peninsula for commercial and recreational ferry service. The proposal would provide a service for commuters and tourists to the area. The associated wharf infrastructure would also provide for supplementary uses potentially including commercial vessels and recreational boating.

The proposal includes:

- Two wharves at La Perouse and Kurnell. These will consist of:
    - A wharf head that is utilised for vessel berthing/mooring and passenger transfer.
    - A jetty/trestle structure connecting the shoreline to the wharf head.
- Provision of additional parking spaces at each wharf.
- A passenger waiting area/shelter for each wharf.
- A Ticketing area for each wharf.
- Toilet amenities for each wharf.
- Pathway from car parking and transport connections for each wharf.
- Gate/security provisions for each wharf.

The new wharves would be required to be designed to meet the relevant legislation and guidance for disability access.

1.3 Study area

The proposal is located in Botany Bay at either side of the ocean entrance to the Bay (Figure 1.1). Botany Bay is location approximately 14 kilometres south of the Sydney CBD. La Perouse headland is located next to a residential area and commercial area of Port Botany. Within the headland La

Perouse includes a museum and access to La Perouse park and beaches. New South Wales Golf Club is located approximately 900 metres east. The La Perouse headland is located within the City of Randwick Local Government Area (LGA).

Kurnell peninsula is located south of the ocean entrance within Kamay Botany Bay National Park. To the west of the Peninsula is Kurnell residential area and industrial area. Cronulla is located approximately 8 kilometres south and the Royal National Park approximately 18 kilometres south. The Kurnell peninsula is located within the Sutherland Shire LGA.

1.4 Study objectives and scope

The proponent will seek project approval to be assessed under Part 5 Division 5.2 of the Environmental Planning & Assessment Act (1979) (EP&A Act). However, as the project has not been issued Secretary's Environmental Assessment Requirements (SEARs) under the EP&A Act. The Aboriginal heritage assessment will be conducted in accordance with the following approvals and guidelines:

- Aboriginal cultural heritage consultation requirements for proponents 2010 (Department of Environment, Climate Change & Water [DECCW] 2010a)
- The guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (Office of Environment & Heritage [OEH] 2011)
- The PACHCI guidelines (Roads and Maritime 2011) [now TfNSW]

The aim of this report is to identify whether Aboriginal objects or Places would be harmed by the proposal, and to recommend if management or mitigation measures are required.

The report includes:

- A description of the proposal and the extent of the study area.
- Outline of the environmental context of the study area.
- Outline of the Aboriginal and historical context of the study area.
- A summary of the archaeological context of the local region including a discussion of previous archaeological work, forming the background for an archaeological predictive model.
- Description and results of the archaeological survey.
- Description and analysis of the identified Aboriginal sites and areas of potential within the study area.
- A significance and impact assessment of the identified Aboriginal sites, addressing archaeological values.
- Recommend management and mitigation measures, based on the relevant guidelines and legislation.

1.5 Limitations

The scope of this assessment and associated field survey are based on information supplied by the proponent. Dense vegetation limited the scope of field investigation to sample survey. Additionally, large portions of the study area are located within the littoral zone and as a result, only the permanently terrestrial portions of the study area have been assessed within this report.

1.6 Authors

This report was prepared by Ryan Taddeucci (Senior Heritage Consultant, Artefact Heritage) with management input and review from Josh Symons (Principal, Artefact Heritage).

1.7 Report structure

The purpose of this report is to document the results of the investigation of Aboriginal heritage at the study area. The structure of this report includes:

- Section 1 - Introduction
- Section 2 – Statutory requirements: outlines relevant legislation for this assessment
- Section 3 - Environmental context: provides an overview of the environmental conditions to provide context for the predictive model
- Section 4 – Aboriginal context: presents the results of the background ethnohistoric and literature research and database searches. This section also presents a predictive model as background to the survey sampling strategy.
- Section 5 – Archaeological survey: discusses the aims, timing and personnel, constraints, survey sampling strategy, methodology and coverage.
- Section 6 – Results: presents the detailed results of the Aboriginal archaeological survey.
- Section 7 – Discussion: provides a discussion of the results of the archaeological survey
- Section 8 – Significance assessment: provides an assessment of archaeological significance of Aboriginal sites found.
- Section 9 – Impact assessment: assesses potential impacts to identified Aboriginal sites and areas of potential archaeological deposit
- Section 10 – Management and mitigation measures: outlines relevant management and mitigation measures for the proposal
- Section 11 – Recommendations
- Section 12 – References

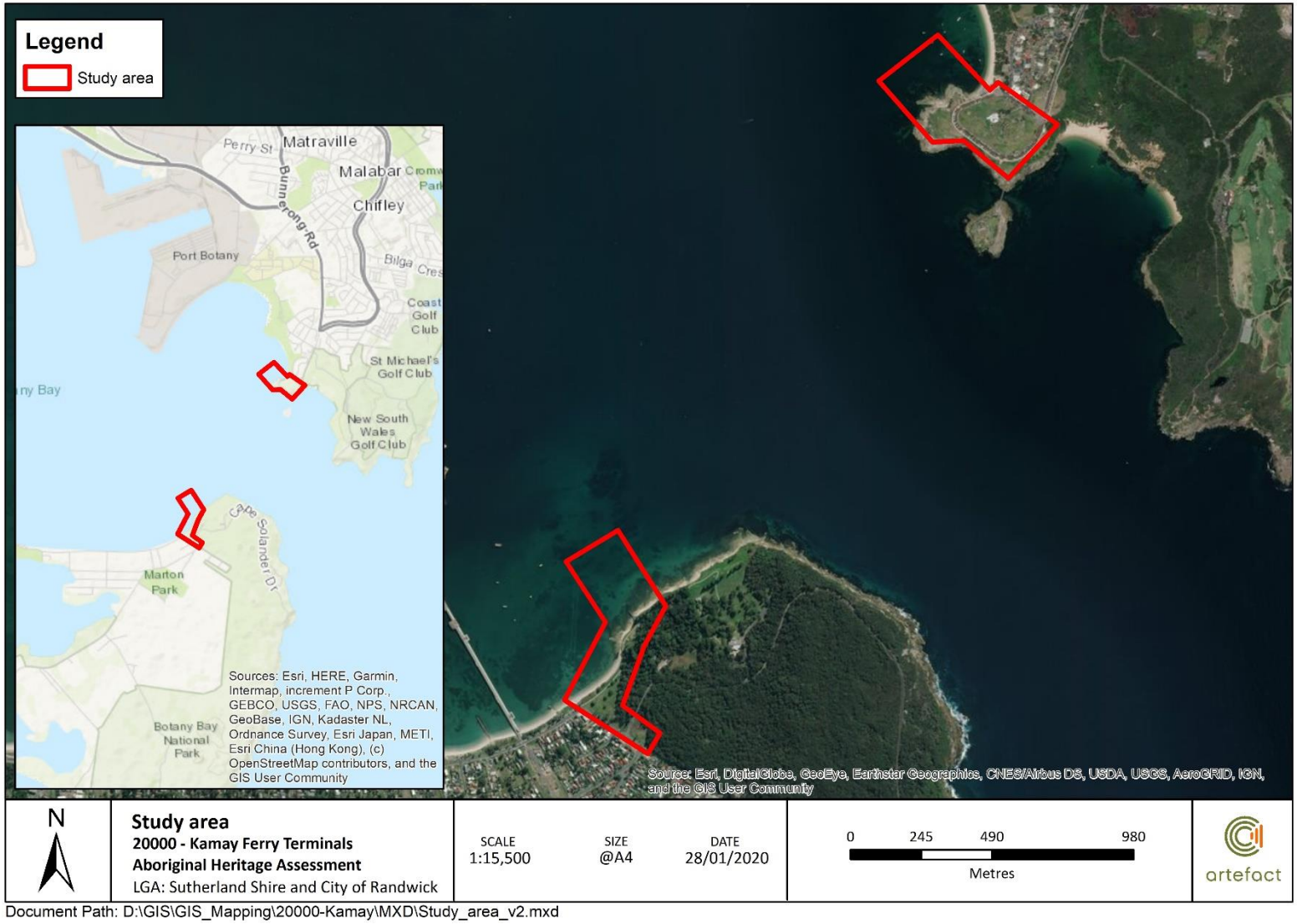

Figure 1.1: Location of the study area

2.0 LEGISLATIVE CONTEXT

2.1 State legislation

2.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the framework for cultural heritage values to be formally assessed in the land use planning, development assessment and environmental impact assessment processes. The EP&A Act consists of three main parts of direct relevance to Aboriginal cultural heritage; Part 3 which governs the preparation of planning instruments, Part 4 which relates to development assessment processes for local government (consent) authorities, and Part 5 which relates to activity approvals by governing (determining) authorities.

Part 3, Division 3.4 deals with the development of Local Environmental Plans (LEPs). Planning decisions within Local Government Areas (LGAs) are guided by LEPs. Each LGA is required to develop and maintain an LEP that includes Aboriginal and historical heritage items which are protected under the EP&A Act and the *Heritage Act 1977*. The study area is located across the boundaries of the Sutherland LGA and the Randwick LGA and is covered by the Sutherland Shire LEP and Randwick LEP respectively.

Six items are listed on the Sutherland Shire LEP within the study area and are considered to hold Aboriginal cultural heritage value:

- Kurnell monuments (in Kamay Botany Bay National Park) (Item no. 2503)
- Kurnell Historic Site (in Kamay Botany Bay National Park) (Item no. 2504)
- Captain Cook's landing site (Item no. A2511)
- Landing place wharf abutment (Item no. A2516)
- Captain Cook watering hole (Item no. A2518)
- Captain Cook watering well (Item no. A2519)

Three items listed on the Randwick LEP are located within the study area. However, none of these items have identified Aboriginal heritage value.

The proposal will be assessed under Division 5.2 of the EP&A Act, which establishes an assessment and approval regime for State Significant Infrastructure (SSI). Under section 5.23 of the EP&A Act, approvals or permits under section 90 of the NPW Act 1974 are not required for approved SSI. At the time this report was prepared, SEARs had not been issued for the project and the legislative requirements of the *National Parks and Wildlife Act 1974* (see below) still apply.

2.1.2 *National Parks and Wildlife Act 1974*

The *National Parks and Wildlife Act 1974* (NPW Act) provides statutory protection to all Aboriginal places and objects. An Aboriginal Place is declared by the Minister, under Section 84 of the Act, in recognition of its special significance with respect to Aboriginal culture. An Aboriginal object is defined as:

> *any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales,*

being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

The protection provided to Aboriginal objects applies irrespective of the level of their significance or issues of land tenure. However, areas are only gazetted as Aboriginal Places if the Minister is satisfied that sufficient evidence exists to demonstrate that the location was and/or is of special significance to Aboriginal culture. A search of the NSW Heritage database was completed on 5 March 2020 and no gazetted Aboriginal Places were identified within the study area.

Section 86 of the NPW Act identifies that it is an offence to harm or desecrate an Aboriginal object and/or an Aboriginal place. Section 86 outlines penalty units applicable where it is identified that a person or corporation is in breach of Section 86.

The NPW Act defines harm to an object or place as any act or omission that:

(a) destroys, defaces or damages the object or place, or

(b) in relation to an object moves the object from the land on which it had been situated, or

(c) is specified by the regulations, or

(d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c)

A section 90 permit is the only Aboriginal Heritage Impact Permit (AHIP) available under the NPW Act and is granted by DPIE Heritage. Various factors are considered by DPIE – Heritage in the AHIP application process, such as site significance, Aboriginal consultation requirements, Ecological Sustainable Development (ESD) principles, project justification and consideration of alternatives. The penalties and fines for damaging or defacing an Aboriginal object were increased in 2010.

Under section 5.23 of the EP&A Act, approvals or permits under section 90 of the NPW Act are not required for approved SSI. However, as this project has not yet been determined to be SSI, the requirements of the NPW Act will be applicable under the project has been determined as SSI.

2.1.3 *Aboriginal Lands Right Act 1983*

The *Aboriginal Land Rights Act 1983* (ALR Act) established Aboriginal Land Councils (at State and Local levels). These bodies have a statutory obligation under the ALR Act to:

(a) take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law, and

(b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

The study area is within the boundary of the La Perouse Local Aboriginal Land Council (LALC).

2.2 Commonwealth legislation

2.2.1 *Native Title Act 1994*

The *Native Title Act 1994* was introduced to work in conjunction with the Commonwealth *Native Title Act 1993*. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.

A search of the National Native Title Vision database was completed on 28 January 2020. At the time this report was prepared there were no Native Title claims registered in the study area.

2.2.2 *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment and Heritage Legislation Amendment Act (No.1) 2003* amends the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to include 'national heritage' as a matter of National Environmental Significance and protects listed places to the fullest extent under the Constitution. It also establishes the National Heritage List (NHL) and the Commonwealth Heritage List (CHL).

The *Australian Heritage Council Act 2003* (AHC Act) establishes a heritage advisory body - the Australian Heritage Council (AHC), to the Minister for the Environment and Heritage and retains the Register of the National Estate (RNE).

The *Australian Heritage Council (Consequential and Transitional Provisions) Act* 2003 repeals the *Australian Heritage Commission Act* 1975, amends various Acts as a consequence of this repeal and allows the transition to the current heritage system.

Together, the above three Acts provide protection for Australia's natural, Indigenous and non-Indigenous heritage. The features include:

- A NHL of places of national heritage significance
- A CHL of heritage places owned or managed by the Commonwealth
- The creation of the AHC, an independent expert body to advise the Minster on the listing and protection of heritage places
- Continued management of the Register of the National Estate (RNE).

National Heritage List

The NHL is a list of places with outstanding heritage value to the nation, including places which have Indigenous heritage values. The heritage values of these places are so important that they are protected under the EPBC Act. This means that a person cannot take an action that has, will have, or is likely to have, a significant impact on the national heritage values of a national heritage place without the approval of the Australian Government Minister for the Environment and Energy. It is a criminal offence not to comply with this law and there are significant penalties.

There are two places listed on the NHL within the study area with Aboriginal heritage values:

- Kurnell Peninsula Headland (NHL 105812)
- Kamay Botany Bay: Botanical Collection Sites (NHL 106162).

Commonwealth Heritage List

The CHL is a list of places managed or owned by the Australian Government. There are no places listed on the CHL within the study area.

Register of the National Estate

The RNE is an evolving record of Australia's natural, cultural and Aboriginal heritage places that are worth keeping for the future. The AHC compiles and maintains the RNE under the *Australian Heritage Council Act* 2003. Places on the RNE that are in Commonwealth areas, or subject to

actions by the Australian Government, are protected under the EPBC Act by the same provisions that protect Commonwealth heritage places (see above).

Following amendments to the *Australian Heritage Council Act* 2003, the RNE was frozen on 19 February 2007, meaning no new places can be added, or removed. From 2012 all references to the RNE were removed from the EPBC Act and the AHC Act. The RNE is now maintained on a non-statutory basis as a publicly available archive.

There are three places listed on the RNE within the study area. However, only one site (Kurnell Peninsula Towra Point Area, Captain Cook Dr, Kurnell, NSW, Australia [RNE 3337]) has listed Aboriginal heritage values.

2.2.3 *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*

The Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP Act), deals with Aboriginal cultural property (intangible heritage) in a wider sense. Such intangible heritage includes any places, objects and folklore that 'are of particular significance to Aboriginals in accordance with Aboriginal tradition'. These values are not currently protected under the NPW Act.

There is no cut-off date and the ATSIHP Act may apply to contemporary Aboriginal cultural property as well as ancient sites. The ATSIHP Act takes precedence over state cultural heritage legislation where there is conflict. The Commonwealth Minister who is responsible for administering the ATSIHP Act can make declarations to protect these areas and objects from specific threats of injury or desecration. The responsible Minister may make a declaration under Section 10 of the Commonwealth Act in situations where state or territory laws do not provide adequate protection of intangible heritage.

Where an Aboriginal individual or organisation is concerned that intangible values within the proposal are not being adequately protected, they can apply to the Minister for a declaration over a place. No intangible places were identified during the survey, however, further comprehensive consultation with registered Aboriginal parties for this project is continuing.

3.0 ENVIRONMENTAL CONTEXT

3.1 Geology

The study area is located at the opening of Botany Bay to the Tasman Sea, approximately 12 kilometres south of the Sydney CBD. The geology of this area consists of Triassic Hawkesbury sandstone partially overlaid with Quaternary marine sand and sand dune formations (Herbert 1983, Stroud 1985).

During the late Pleistocene, the Botany Bay area was a swampy sand plain surrounded by higher sandstone hills. With the rise in sea levels at the end of the Pleistocene, marine sands were deposited onto the advancing shore line. These beach sands were then wind-blown onto the surrounding sandstone outcrops, forming into coastal barrier sand dunes. When the sea level stabilised during the early Holocene approximately 7,000 years ago, these barrier dunes had altered the flow of local rivers to the present courses of the Cooks and Georges Rivers (Attenbrow 2010, 39).

3.2 Hydrology

The Georges River rises in the Illawarra Plateau and travels 96 kilometres before it flows into Botany Bay from the southwest. The Cooks River flows into Botany Bay from the northwest. It is partially canalled and operates as the primary stormwater runoff for residential suburbs in south Sydney. Botany Bay is a relatively shallow sand-floored inlet, with most of the bay floor being ten metres or less in depth. The tidal accumulation of sand and riverine deposition of silt on the bay floor requires frequent dredging to ensure safe navigation for shipping.

3.3 Soil landscapes

The natural soil landscapes on both the Kurnell and La Perouse peninsulas are mostly associated with the marine- and wind-deposited sand deposits at lower elevations, with sand dune formations stabilised against erosion with natural and re-planted vegetation. Marine-deposited siliceous and calcareous sands fringe the foreshore of Botany Bay. Hawkesbury sandstone predominates on the higher elevations in the study area, with thin layers of coarse sand and loam in areas resistant to erosional effects from vegetation cover. In the south-western part of the study area, estuarine soil landscapes have accumulated from the low energy silt discharge of the George's River on the tidal sandbanks of the southern floor of Botany Bay (AMBS 2013, 21-22 and Sheppard 2009, 11-14).

These soil landscapes have been disturbed from European agricultural and industrial activities. Vegetation clearance in some parts of the study area has exacerbated sand dune erosion. Dredging of the entrance to Botany Bay and foreshore stabilisation for navigation has altered the original shape of the headlands. Industrial facilities in the study area have also significantly disturbed the soil profile with deep ground excavation and the introduction of modern fill.

3.4 Land use

Lieutenant James Cook anchored the *Endeavour* in Botany Bay on the 29 of April 1770 and made several land expeditions in the area over the following eight days (Figure 3.1). On the first day he made contact with the Gweagal Aboriginal community of the Dhawaral nation at a place now commemorated in Kurnell as "Captain Cook's Landing Place' in the Kamay Botany Bay National Park. During this expedition his crew collected wood and fresh water, gathered plant specimens, while documenting the activities of the Aboriginal people that they saw.

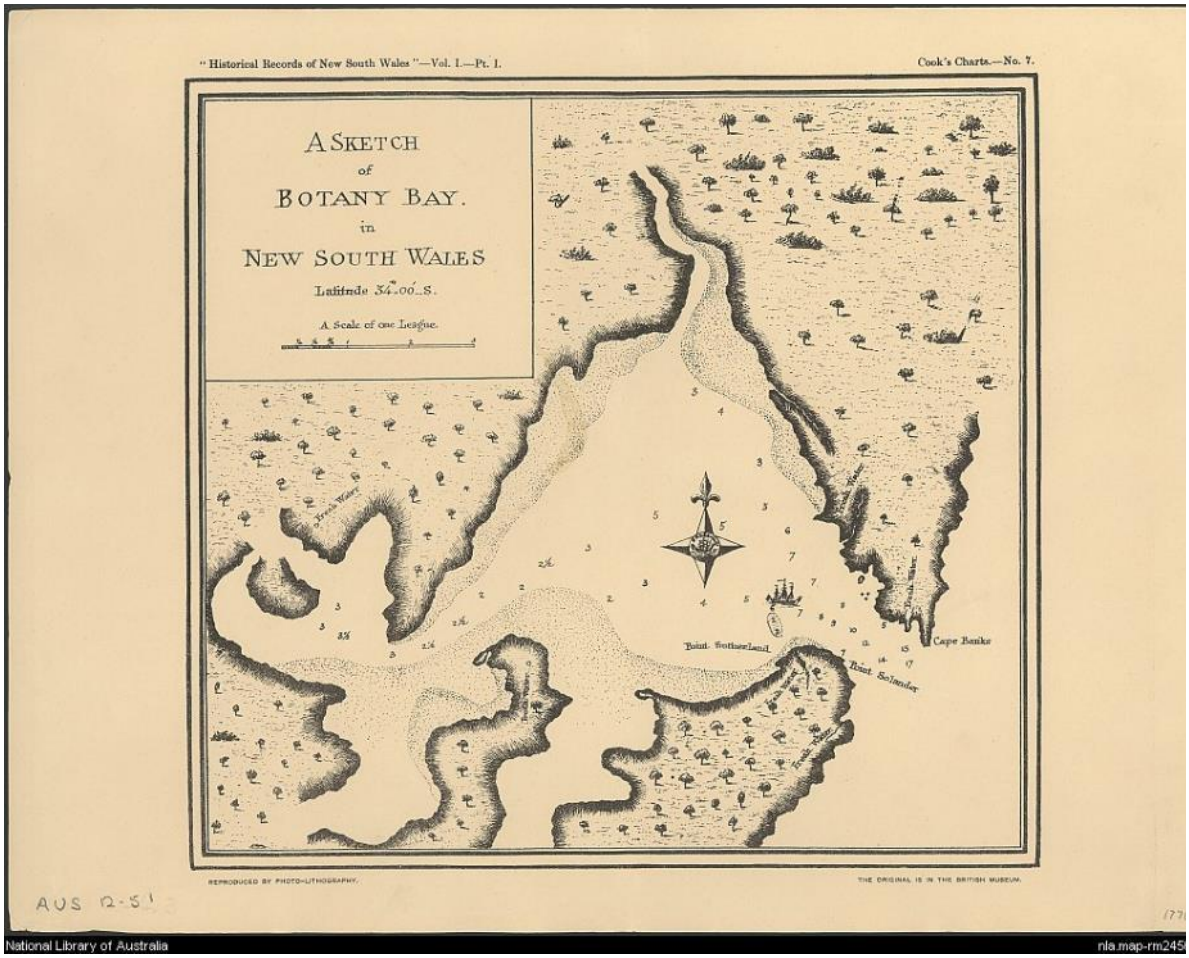

Figure 3.1: Lieutenant Cook's sketch of Botany Bay, 1770. Source: National Library of Australia.

After the British colony at Sydney Cove was established in 1788, the headlands around Botany Bay were slow to be settled by Europeans. The local environment was deemed unsuitable for settlement and in 1812 Governor Macquarie closed the northern headland for settlement and established a government reserve (Figure 3.2). In 1815 a grant was made to James Birnie, a ship owner and merchant, of 700 acres of land along with 160 acres of saltwater marsh, on the western side of the Kurnell peninsular. In 1821 this estate was acquired by John Connell, another early pioneer, who added it to his large land holdings in the area (Figure 3.3). The eastern Kurnell sandstone headland was held as a government reserve (Nugent 2005, 55-56).

Early agricultural efforts on the Kurnell peninsula were not overly successful. The most profitable enterprise up until the mid-19th century was timber-getting, which largely cleared the peninsula of its native vegetation. This forest clearing increased the rate of Aeolian erosion and resulted in the previously stable sand dunes to migrate across the area (Nugent 2005, 55-56).

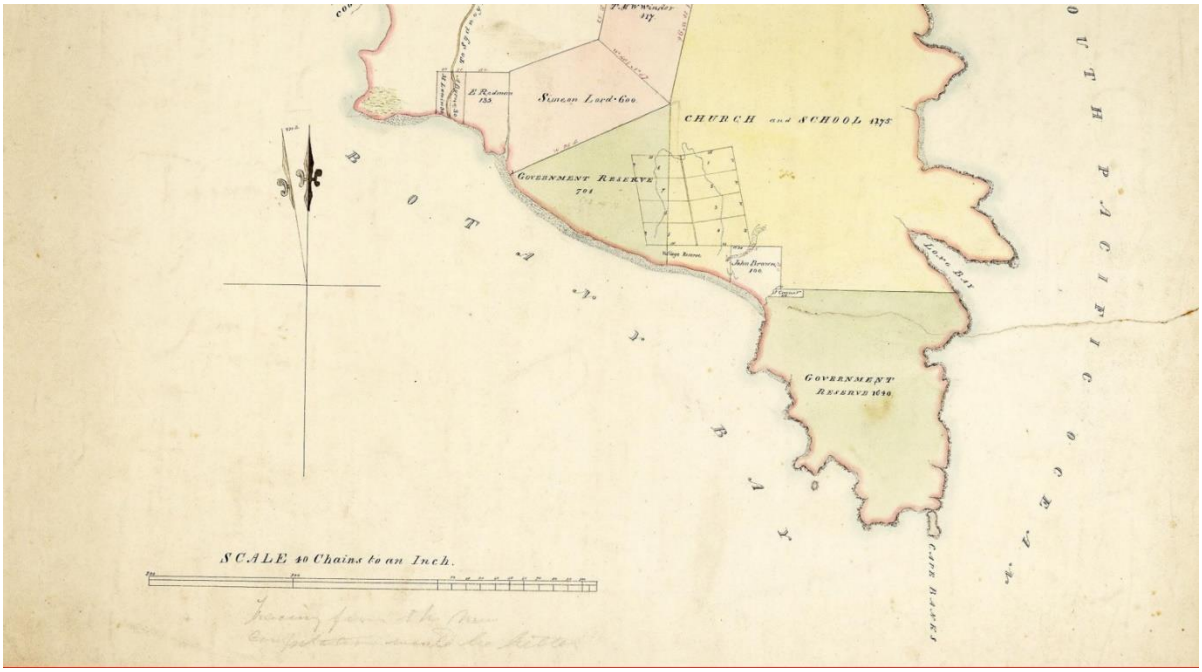

Figure 3.2: Botany parish map, 1830s, showing La Perouse government reserve. Source: LPI

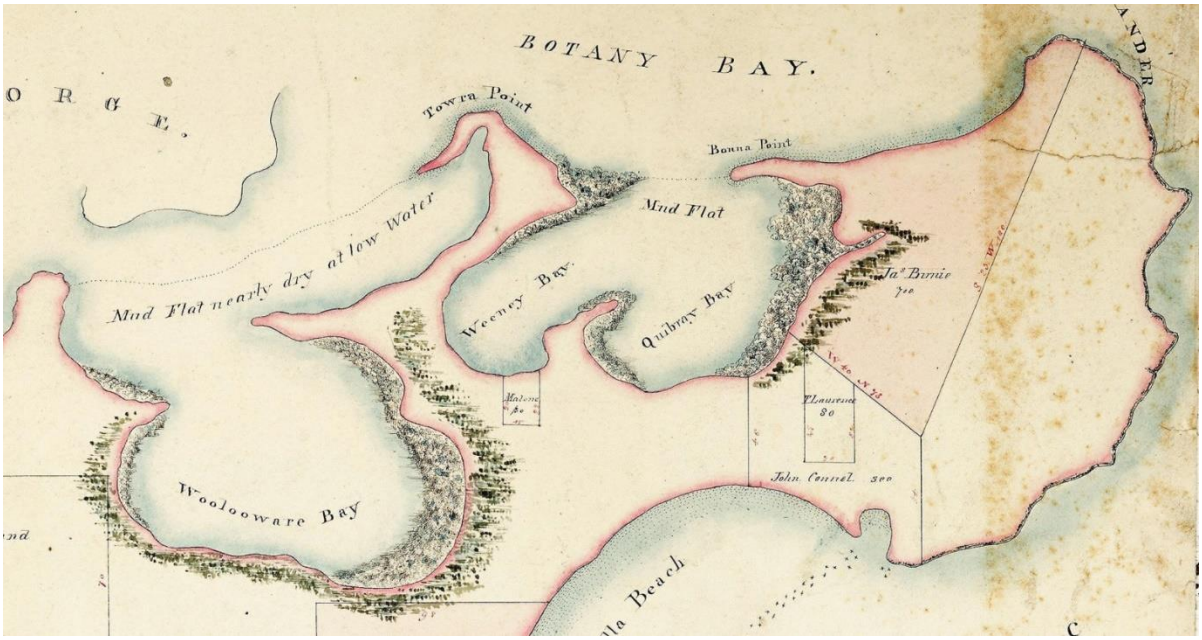

Figure 3.3: Sutherland parish map, 1830s, showing James Birnie's land grand. Area to the east of the Birnie land grant is a later government reserve. Source: LPI

Due to the low level of European settlement in the region, Aboriginal people continued to live around the Botany Bay foreshores. While their population had been drastically reduced from introduced diseases and violent encounters with the new settlers, numerous accounts of Aboriginal camps and communities were recorded by Europeans during the 19th century (Nugent 2005, 55-56).

In order to safeguard against foreign threats and smugglers, a tower was erected at La Perouse called the Macquarie Watchtower between 1821 and 1822. This tower, with modifications, still exists today. For most of the 19th century, this was the only government building in La Perouse and Kurnell, with the ocean-facing parts of the headland both being reserved for government use.

During the late 19th century, British Imperial fears of under preparedness in the face of invasion in their colonies led to a wave of fortification construction. The entrance to Botany Bay was viewed as an open door to the growing Sydney colony and new fortifications in the area were devised. The small tidal promontory of Bare Island was chosen as the site for a new fortification. The mass concrete fortification and battery was completed in 1889. A number of modifications were made to the structure since its original construction and the facility has had a variety of uses, including as a returning war veterans' home between 1912 and 1963 (Sheppard 2009, 70-76, 84-85).

Due to the relative abundance of open land in the Botany Bay area combined with its relative proximity to Sydney Harbour, the early twentieth century saw the introduction of noxious and polluting industries on the Kurnell peninsula. The extensive sand dunes around the Kurnell peninsula resulted in the establishment of sand mining enterprises from the 1930s onward, which heavily altered the natural landscape of the region (AMBS 2013, 47).

Following the Second World War, significant industrial development around Botany Bay continued to change the landscape and character of the area. In 1956 the Kurnell Oil Refinery was built, while the Port Botany Terminal was established in 1960. Other heavy industries, notably chemical and petroleum plants, were also opened at Kurnell during the 1960s and 1970s. These industrial facilities further increased the level of damage and disturbance to the natural landscape of Botany Bay (AMBS 2013, 47-48).

Throughout this period of industrialisation however, the headland foreshores of Botany Bay have largely remained undeveloped. Despite isolated areas of residential construction, most of these headland areas are encapsulated within the Kamay Botany Bay National Park. This area was held as government reserve until it was acquired by National Parks and Wildlife in 1967. Because of this relative lack of development and disturbance, many of the Aboriginal and historic sites remain in very good condition (OEH database).

4.0 ABORIGINAL CONTEXT

4.1 Ethnohistoric context

Aboriginal people have been living in the Sydney Basin and surrounding areas for at a minimum of 36,000 years, based upon evidence from archaeological sites located on the Parramatta and Nepean Rivers (JMCHM 2005 and AHMS 2013). Before the sea reached its present level around 7,000 years ago, the Botany Bay area would have been freshwater valleys and swamplands (Attenbrow, 2012, 1-2), with Aboriginal people subsisting on a diet of land animals and plants, supplemented with freshwater fish resources (Attenbrow 2010,70-79).

Following the inundation of the coastline, Aboriginal people in the study area primarily utilised marine foods of sea fish and shellfish for their subsistence needs (Attenbrow 2010, 70-79). The majority of archaeological evidence in the Sydney Basin has been dated as occurring within the last 3,000 to 5,000 years, possibly reflecting the increased use of the foreshore areas by Aboriginal people who occupied areas around the modern coastline. Older occupation sites are likely to exist along the now submerged coastline, consistent with a pattern of higher intensity utilisation of marine resources in supporting Aboriginal populations (AMBS 2013, 25).

Ethnographic accounts written by European explorers and settlers in the late 18th century emphasise the maritime way of life of the Aboriginal people around Botany Bay. Small groups of Aboriginal people were recorded to camp near freshwater sources, often residing in rock shelters or utilising bark huts. Bark canoes were regularly used for line fishing and spear fishing in Botany Bay. Collecting shellfish on the tidal banks of the bay was also recorded by Europeans (AMBS 2013, 25).

These accounts of Aboriginal diets have been corroborated by archaeological evidence from the numerous midden sites which are located on the foreshores of Sydney Harbour and Botany Bay. The shell midden site at Captain Cook's Landing Place in Kurnell, on the south-eastern foreshore of Botany Bay, was excavated between 1968 and 1971. Deposits at this site have been dated and show that they have been accumulating for at least 1,200 years. Based upon the large extent of materials recovered, it is likely that this shell midden site, and other nearby rock art and burial sites, extends for much of the Kurnell foreshore on either side of Cook's Creek (Attenbrow 2010, 172 and Irish 2007, 11-18).

Large quantities of Aboriginal artefacts, including shellfish-hooks (Figure 4.1), retouched stone artefact flakes, ground stone hatchets and bone points (Figure 4.2) were recovered. Fish bones and shell comprise the majority of food resource remains, including snapper, bream, mud oyster and Sydney cockle. Lesser quantities of land and sea animal bones, including dingo, seal, whale, dolphin, wallabies and mutton birds are also present in the midden site (Attenbrow 2010, 172-173).

Aboriginal people were also recorded as burying their dead in coastal sandy environments, in middens and in rock shelters. Archaeological evidence in the study area further substantiates this practice, with a number of Aboriginal burials along the Botany Bay foreshore having been identified. One rock shelter near Inscription Point on the Kurnell Peninsula has revealed up to 18 complete or partial sets of human remains, all of which have been reburied at the site at the request of the local Aboriginal community. Grave goods of stone artefacts and bone points were present in many of these burials, as well as midden deposits of discarded fish and animal bones (Irish 2007, 19).

Aboriginal people often utilised the exposed Hawkesbury sandstone rock faces around Sydney Harbour and Botany Bay to engrave and draw art. These sites are well-recorded and comprise 40% of all Aboriginal sites in the Sydney Basin (Attenbrow 2010, 146-147). Several rock art sites have been recorded on the exposed sandstone faces and caves at La Perouse near Bare Island, as well

as on the Kurnell foreshore. Motifs on rock art in the area show frequent engravings of footprints and fish (Irish 2007, 20).

The landscape at Botany Bay prior to the arrival of Europeans in the 18th century was significantly more forested than it is today. Sclerophyll woodland vegetation, consisting of eucalypts, angophoras and banksias, were pivotal in securing the barrier dunes of the Kurnell and Brighton-Le-Sands area from erosion. It is possible that the increase in the proportion of salt-tolerant shrubs such as *Leptospermum laevigatum* and *Monotoca elliptica* was the result of more intense Aboriginal settlement and human initiated fire-regimes around the shores of Botany Bay from around 2,000 years ago (Benson & Eldershaw 2007, 114).

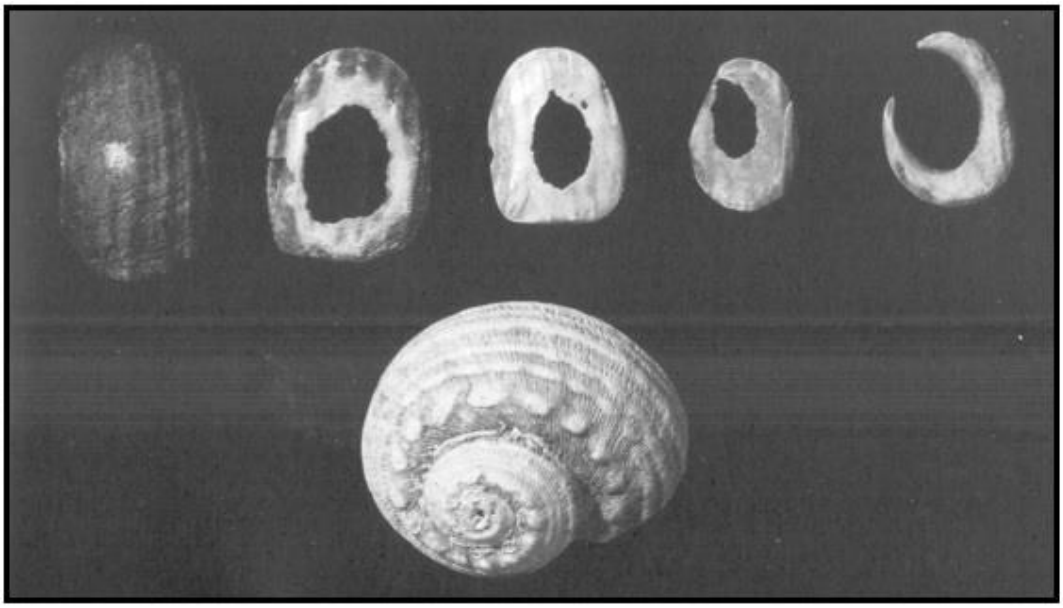

Figure 4.1: Shell fish hooks recovered from Captain Cook's Landing Place Midden site, image reproduced from Irish 2007, p 16.

Figure 4.2: Bone points recovered from Captain Cook's Landing Place Midden site, image reproduced from Irish 2007, p17.

4.2 Archaeological context

4.2.1 Kurnell

4.2.1.1 Early recording prior to archaeological investigations

In 1899, human remains were identified at Kurnell during excavations completed for the installation of a flagpole. The remains were found 0.9m below the ground surface and are likely to be the remains of an Aboriginal person (Coast History and Heritage 2019). In 1936 a human skull was recovered from a location between the Forby Sutherland Monument and the northernmost of two pine trees which were located in front of Alpha House. The current location of the human remains recovered in 1899 and 1936 is unknown. In 1947, ten stone artefacts were retrieved from excavations completed for the foundations of the Banks Monument. The assemblage was comprised of eight Bondi points and two flakes. In 1961, two skeletons were identified during an excavation for electrical cabling along the foreshore. The human remains are likely to be the remains of Aboriginal people and were reburied in an unspecified location.

4.2.1.2 Vincent Megaw archaeological investigations

Archaeological study – Vincent Megaw 1968

In 1968 Vincent Megaw conducted an archaeological investigation of the area west of Cook's Stream after human remains of two Aboriginal people (an elderly man and a child) were uncovered during an excavation to install an inspection vault for electrical cabling that had been laid along the foreshore. A series of auger cores were taken at the beginning of the investigation. It was demonstrated that shell midden was scattered throughout the area, with a substantial midden (greater than 1.8m depth in sections) identified in the vicinity of the stream. Artefacts recovered from the midden included fish bones, bone points, stone artefacts including four fishhook files, and some early historical artefacts (including a bone button, bottle glass, and handmade iron nail). These indicate that the midden continued to be in use after the first European contact in Sydney. The shell species included rock-platform species as well as species found in mudflats to the west, including mud oyster, hairy mussel, and edible mussel.

Archaeological study – Vincent Megaw 1970-71

More extensive archaeological investigations were undertaken in 1970 and 1971 to the east of Cook's Stream. The main feature was a large midden, of which more than 35m^2 was removed through archaeological excavation. The excavations located Aboriginal human remains along with faunal remains, a hearth, bone points, stone artefacts, and approximately 200 fishhooks and fishhook 'blanks'; the largest number of fishhooks yet found at any site in Australia. Charcoal taken from the trenches was initially dated to between 2,000-1,415 years ago, however recent reanalysis using charcoal retained from the original excavations has dated the midden as up to 2,000 years old; 500 years more than previously thought.

4.2.1.3 Master Plan works (Meeting Place Precinct)

Archaeological investigations were undertaken as part of a broader Aboriginal Cultural Heritage Assessment in relation to the formulation of a master plan (described as the 'Meeting Place Precinct') between 2004 and 2008. A map of the areas investigated as part of these assessments is included in Figure 4.3 below.

Aboriginal Cultural Heritage Assessment for Master Plan – McIntyre-Tamwoy 2004

The first test excavations occurred in 2004, overseen by Sue McIntyre-Tamwoy. Seven pits to the east of the study area were cut, however all pits contained fill or windblown sand and no Aboriginal archaeological remains were found.

Aboriginal Cultural Heritage Assessment for Master Plan – Paul Irish, La Perouse Aboriginal Land Council, and NPWS Towra Team 2007

In 2007, further excavations were conducted to inform the proposed master plan works to upgrade visitor facilities within the ‘’Meeting Place Precinct”. It was determined that proposed works should avoid impact to any *in situ* archaeological remains, due to their high degree of significance. Test excavations were conducted with the La Peruse Local Aboriginal Land Council and ‘Towra Team’ of NPWS Aboriginal workers to provide more information about the location and depth of Aboriginal archaeological remains within the Meeting Place Precinct. A total of 115 small shovel pits (approximately 200 x 500mm) were excavated to the depth of proposed works only, in order to minimise risk of impact on archaeological material (maximum depth of 400mm). Midden, stone artefacts, and loose shells were encountered in several pits. An attempt was also made to uncover rock engravings recorded in 1968 (AHIMS ID 52-3-0221), but they were not found. It is likely the sandstone outcrop where they were originally recorded has been since covered by vegetation.

Salvage excavations – Paul Irish, La Perouse Aboriginal Land Council, and NPWS Towra Team, 2008

Salvage excavations of the Cook’s Stream were undertaken in 2008 for it to be reopened to the public. The 2007 test excavations had shown there to be midden present in the stream; however, it was deemed to be fill from the surrounding creek bank as a result of dam construction in the early 20th century and not *in situ*. The stream was mechanically excavated until archaeological remains were uncovered, and then manually excavated in 2m x 2m squares. Shell material, gravel, glass, and some human bone was found. The bone was determined to be most likely Aboriginal, but an exact age or origin could not be determined.

Approximately 300kg of midden was excavated from the stream and sieved. It contained 78 stone artefacts, 4.3kg of fish and mammal bone, 26 bone point tools, 14 broken or complete fishhooks, and other shell artefacts. Microscopic analysis of some of these tools showed that some of the stone artefacts had been used for cutting shell, and bone points were used for piercing skin or hides. Most of the archaeological material collected during this excavation and the 2007 test excavations was reburied by the stream in 2019.

Archaeological Monitoring – Paul Irish 2008-2010

The Master Plan Works were monitored under an AHIP in locations where it had been determined by the 2007 test excavations that Aboriginal remains were likely to occur. This permit allowed for archaeological material, excluding human remains, that was uncovered from previously disturbed contexts to be recorded and collected. In most cases it was possible to protect the material by raising the impact above the level the material was observed. In these cases, the material was covered by geofabric and the location recorded. If the material could not be protected it was collected, including some shell, animal bone fragments, and stone.

Coast History and Heritage (2019) – Aboriginal Cultural Heritage Assessment Report Stage 1 Master Plan Works at Kamay Botany Bay National Park, Kurnell NSW, Sutherland LGA

Coast History and Heritage (2019) completed an Aboriginal Cultural Heritage Assessment Report for a portion of land which overlaps the current study area on behalf of NSW NPWS. The assessment was completed as a continuation of the Master Plan Works. As part of the assessment it was found that AHIMS ID 52-3-0221 is likely to be located 200m north of the location recorded on the AHIMS database. The report recommended that NSW NPWS apply for an AHIP to authorise proposed earthworks within the current study area (Figure 4.4). The proposed AHIP will include a ‘no harm’ area which encompasses the identified location of AHIMS ID 52-3-0221.

A search of the AHIP public register was completed on 24 February 2020, and it was found that the AHIP application has not been submitted to DPIE-Heritage.

4.2.1.4 Summary

The study area has been subject to several archaeological investigations from 1968 until present. The outcome of these previous assessments has resulted in the currently known extent of the Foreshore Midden (Figure 4.4). During the course of previous investigations and works human remains have been identified at multiple locations. Only the locations marked in Figure 4.4 are known to contain human remains. It is possible that further burials may be located within the study area that have not been identified by previous assessments.

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Figure 4.3: Location of test and salvage excavations (2004-2008) and archaeological monitoring (2008-2010)

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Figure 4.4: AHIP area proposed by Coast History and Heritage 2019

4.2.2 La Perouse

Botany Bay 132kV Electricity Cable Project: Cultural Heritage Assessment – Navin Officer 2006

In 2006, Navin Officer completed a Cultural Heritage Assessment of an area of land within the current study area. The assessment included an Aboriginal and non-Aboriginal archaeological survey. The assessment resulted in the identification of Kurnell Potential Archaeological Deposit 1 (AHIMS ID 52-3-1366) along the Kurnell foreshore. The site cards of all AHIMS sites within 1km of the Botany Bay 132kV Electricity Cable Project were reviewed by Navin Officer and a revised map was produced (Figure 4.5). The revised locations the AHIMS sites were not ground-truthed by the survey and as a result the AHIMS database was not updated with the revised site locations. Further discussion of the locations of the AHIMS site has been included in section 4.3 below.

La Perouse Headland, Botany Bay National Park, Conservation Management Plan: Stage 2 – Jill Sheppard Heritage Consultants 2009

In 2009 Jill Sheppard Heritage Consultants completed a field survey of the La Perouse side of the current study area. As part of the assessment, previously recorded AHIMS site were revisited and a revised AHIMS map was produced (Figure 4.6). However, the AHIMS database was not updated with the revised site co-ordinates.

The assessment found that the engravings located on the La Perouse Headland are deteriorating at a rate faster than other engravings in the Sydney area. The assessment identified that the community had expressed interest in having the engravings recut. However, Jill Sheppard Heritage Consultants recommended that an AHIP would be required to recut the engravings and proposed that the engravings should be recreated on suitable, adjacent sandstone platforms or outcrops using traditional techniques.

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Figure 4.5: Navin (2006) revised location of AHIMS sites (note: this map only reflects site assessed by Navin and not all AHIMS sites located within the study area)

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Figure 4.6: Jill Sheppard Heritage Consultants (2009) revised location of AHIMS sites (note: this map only reflects site assessed by Jill Sheppard Heritage Consultants and not all AHIMS sites located within the study area)

4.3 Aboriginal Heritage Information Management System

The location of Aboriginal sites is considered culturally sensitive information. It is advised that this information, including the AHIMS data appearing on the heritage map for the proposal be removed from this report if it is to enter the public domain.

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was undertaken on 9 January 2020 (Client ID: 475474).

An area of approximately 8 kilometres (east-west) by 7.6 kilometres (north-south) was searched to gain information on the archaeological context of the study area, and to ascertain whether any previously recorded Aboriginal sites are located within the study area. The details of the AHIMS search parameters are as follows:

GDA 1994 MGA 56	E 331433 - 339523 N 6233447 - 6240157
Buffer	0 m
Number of sites	72
AHIMS Search ID	475474

A total of 72 sites were identified by the extensive AHIMS search. AHIMS lists 20 standard site features that can be used to describe a site registered with AHIMS, and more than one feature can be used for each site. The frequency of recorded site types is summarised in Table 4.1. For the 72 sites within the search area, 12 site features were recorded. The majority of recorded sites are Shell, Artefacts (n=29, 42.03%) followed by Art (Pigment or Engraved) (n=15, 21.74%). The distribution of recorded sites within the AHIMS search area is shown in Figure 4.7.

Three restricted sites are also listed in the AHIMS search results. The location and details of restricted sites are not publicly available. Restricted sites are generally of high cultural significance. AHIMS was contacted on 2 March 2020 to confirm if the three restricted sites are located within the study area or are within close enough proximity that they may be impacted by the proposal. On 5 March 2020, AHIMS confirmed that the three restricted sites would not be impacted by works within the study area.

The nature and location of the registered sites reflects the past Aboriginal occupation from which they derive, but is also influenced by historical land-use, and the nature and extent of previous archaeological investigations. Although Aboriginal occupation covered the whole of the landscape, the availability of fresh water, and associated resources, was a significant factor in repeated and long-term occupation of specific areas within the landscape. Certain site types, such as culturally modified trees, are particularly vulnerable to destruction through historical occupation, while others, such as stone artefacts, are more resilient.

Table 4.1: Frequency of site features from AHIMS data.

Site Feature	Frequency	Percentage (%)
Restricted	*3*	*4.17*
Shell, Artefact	29	40.28
Artefact	6	8.33
Burial, Shell, Artefact	2	2.78

Site Feature	Frequency	Percentage (%)
Art (Pigment or Engraved)	15	20.83
Artefact, Potential Archaeological Deposit (PAD), Shell	2	2.78
Potential Archaeological Deposit (PAD)	7	9.72
Ochre Quarry	1	1.39
Burial	3	4.17
Artefact, Shell, Aboriginal Ceremony and Dreaming	1	1.39
Grinding Groove	1	1.39
Burial, Aboriginal Ceremony and Dreaming	1	1.39
Aboriginal Resource and Gathering, Shell	1	1.39
Total	**69**	**100.00**

Seven AHIMS registered sites are located within the study area and an additional 10 are located within 250 meters of the study area (Table 4.2).

Table 4.2: AHIMS registered sites within the study area or within close proximity

AHIMS ID	Site name	Site type	Distance from study area*
52-3-1366	Kurnell Potential Archaeological Deposit 1 (K PAD 1)	Potential Archaeological Deposit (PAD)	Within study area
45-6-0653	Site 6, La Perouse	Art (Pigment or Engraved)	Within study area
45-6-0650	Site 3, La Perouse	Art (Pigment or Engraved)	Within study area
45-6-1403	La Perouse	Art (Pigment or Engraved)	Within study area
45-6-1144	La Perouse	Shell, Artefact	Within study area
45-6-0649	Site 2, La Perouse	Art (Pigment or Engraved)	Within study area
45-6-0651	Site 4, La Perouse	Art (Pigment or Engraved)	Within study area
52-3-0219	Foreshore Midden - Captain Cook's Landing Place	Burial, Shell, Artefact	Within study area
52-3-0221	Kurnell Engraving - Captain Cook's Landing Place	Art (Pigment or Engraved)	Within 20 meters
52-3-1381	Cundlemongs Grave	Burial	Within 130 meters
45-5-2587	Frenchmans Bay Foredune	Shell, Artefact	Within 240 meters

AHIMS ID	Site name	Site type	Distance from study area*
45-6-0652	Site 5, La Perouse	Art (Pigment or Engraved)	Within 30 meters
45-6-1145	La Perouse	Shell, Artefact	Within 75 meters
45-6-0648	Site 1, La Perouse	Art (Pigment or Engraved)	Within 85 meters
45-6-1146	Congwong Cave, La Perouse	Art (Pigment or Engraved)	Within 135 meters
45-6-0561	Congwong Beach	Shell, Artefact	Within 150 meters
45-6-1762	Congwong Beach	Shell, Artefact	Within 150 meters

*based on geographical information for each site on the AHIMS site register

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Figure 4.7: Results of the extensive AHIMS search

4.3.1 La Perouse

La Perouse Site 1 (AHIMS ID 45-6-0648) Rock Engraving

This site was described both by Campbell in 1891 and by R. H. Matthews in 1898. It consists of an engraving of a whale and its calf on sandstone outcrop (Figure 4.8) about two metres above sea level. The site has been subject to natural weathering which has eroded the engraving and reduced visibility (Navin Officer 2006).

The site is registered at AGD 56 co-ordinates [redacted]. However, Navin Officer (2006) located the site at AGD 56 co-ordinates [redacted] with a handheld GPS. Jill Sheppard Heritage Consultants (2009) identified the site at [redacted].

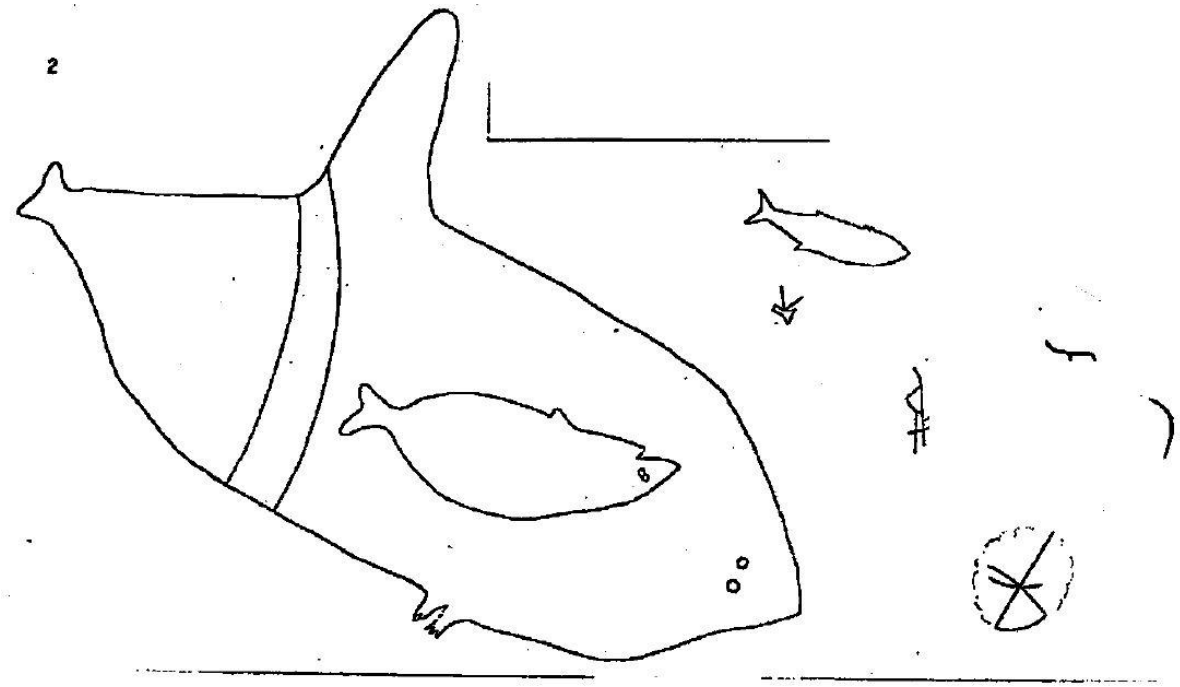

Figure 4.8: Whale and calf engraving. Source: AHIMS site card

La Perouse, (AHIMS ID 45-6-1144) Midden

Minimal information exists for this site which is described by R. Taplin in 1979 as, 'Facing Frenchmans Bay, on a raised rocky point is a much-disturbed midden, over a foot deep' (NPWS Site Card, 1979). This site was noted by Laila Haglund in the course of her survey of Bare Island and La Perouse headland as 'the possible remains of 45-6-1144, a shell midden … is poorly preserved and has suffered trampling and disturbance' (Haglund 1989). The remnants of this site are situated on the small rock promontory adjacent to the area on which the La Perouse jetty was situated.

La Perouse Sites (AHIMS ID 45-6-0649 to 45-6-0652) Rock Engravings

Sites AHIMS ID 45-6-0649 to 45-6-0651 are registered at [redacted] and AHIMS ID 45-6-0652 is registered at [redacted] However, Navin Officer (2006) located the all four sites at [redacted] with a handheld GPS. Jill Sheppard Heritage Consultants (2009) identified the AHIMS ID 45-6-0649 at [redacted] and 45-6-0651 at [redacted]. AHIMS ID 45-6-0650 could not be located. It was assumed that AHIMS ID 45-6-0652 was a duplicate recording of AHIMS ID 45-6-0649.

These sites are a collection of engravings, including that of a shark, located on a sandstone outcrop at the end of La Perouse peninsula. As well as the shark there are also segmented marks about 1.5 m in diameter and two boomerang-shaped marks on the outcrop. As with the above site these engravings were also described by Matthews (1898) and Campbell (1899).

Site 2, La Perouse (AHIMS ID 45-6-0649)

The site is an engraving of a fish and tomahawk. The fish has been partially restored, by a vandal rubbing across part of the earlier Aboriginal engraving fish outline creating a smaller fish using only part of the original. The tomahawk remains clear and distinct.

Site 3, La Perouse (AHIMS ID 45-6-0650)

The site is an engraving of a faint circle with segmental marks. Not relocated by Jill Sheppard Heritage Consultants (2009), or by Haglund's 1989 survey.

Site 4, La Perouse (AHIMS ID 45-6-0651)

The site is located within 10m of fish with engraving of two deeply cut boomerang like marks, one with a reverse curve. Located within 10m of fish with tomahawk.

Site 5, La Perouse (AHIMS ID 45-6-0652)

The site is recorded as a 4.1m long engraving of shark. Jill Sheppard Heritage Consultants (2009) noted that the site may be a re-recording of the fish at 45-6-0649. This was because the recorded position of AHIMS ID 45-6-0652, as described by the site card, [redacted] the approximate location of AHIMS ID 45-6-0649.

La Perouse Site 6 (AHIMS ID 45-6-0653) Rock Engraving

This site was originally recorded and described in 1960 by I. M. Sim (Mankind Volume 6, No 20) as,

> *On a vertical rock face which terminates the southern extremity of Frenchmans Bay. The figures are about 6 feet west of the road leading to the wharf and kiosk. 40 feet west of the figures and just above the waterline is a rock shelter about 20 feet long and 8 feet deep. Subjects '1 kangaroo; 2 curved lines' (NPWS Site Card).*

The site was re-visited/recorded in 1979 by R. Taplin. At that time, the site was described as,

> *Sydney 01 3 23 4-on vertical rock wall at back of beach a few feet north of previous, here is a cut kangaroo and part of another. Recorded by Mr Ian Sim, they were pointed out to me by Mrs Moore of Randwick historical society but are buried beneath the extended foundation of a road. Buried but not destroyed' ([second] NPWS Site Card).*

[redacted]

The site is registered at AGD 56 co-ordinates 336400 E 6237600 N. Neither Navin Officer (2006) or Jill Sheppard Heritage Consultants (2009) were able to locate the site during their assessments.

La Perouse (AHIMS ID 45-6-1145) Midden

This site was described by Guider in 1980 as, a concrete footpath cuts through the centre of what appears to have been a large shell midden.

> *As children take short cuts across the sandhills on both sides of this path and wind naturally displaces the sand many shells and bones are visible. Some of these shells and bones slide down the steep slope and onto the footpath.*

Congwong Cave, La Perouse (AHIMS ID 45-6-1146) Shelter with Art

This site was described by Taplin in 1975 as, a shelter with art that measures 15 feet long, 1 to 5 feet deep and 1 to 4 inches high. Its aspect is south, and it contains grey finger marks on its walls.

La Perouse (AHIMS ID 45-6-1403) Art (Pigment or Engraved)

The site is described as an engraving on a rock located in the middle of La Perouse Park. The subject of the engraving is undetermined.

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Figure 4.9: AHIMS registered sites in the proximity of the norther portion of the study area

4.3.2 Kurnell

Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) Burial, Shell, Artefact

The site was originally recorded in 1968 by Vincent Megaw following the completion of subsurface archaeological investigations that occurred after workman had identified the skulls of an elderly man and a child. Extensive archaeological investigations were subsequently undertaken from 1971 until as recently as 2019. These investigations identified additional human remains, stone artefacts and midden material. In findings of these investigations have been discussed in section 4.2.1 above.

Kurnell Engraving - Captain Cook's Landing Place (AHIMS ID 52-3-0221) Rock Engraving

The site is described as eight engravings of fish on a sandstone shelf. Coast History and Heritage (2019) noted that the site is likely to be located 200m north of the AHIMS recorded location.

Kurnell Potential Archaeological Deposit 1 (K PAD 1) (AHIMS ID 52-3-1366) Potential Archaeological Deposit (PAD)

An area of PAD was identified as part of an investigation completed by Navin Officer in 2006. The PAD is located on the Kurnell foreshore from the high-water mark to Torres Street. Captain Cook Drive is the easternmost limit of the PAD, and as such partially overlaps with the study area.

Cundlemongs Grave (AHIMS ID 52-3-1381) Burial

The site is a registration of the approximate location of the historically recorded burial of senior Aboriginal man Cundlemong in the 1840s.

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Figure 4.10: AHIMS registered sites in the proximity of the southern portion of the study area

4.4 Predictive modelling

Based on previous archaeological excavations completed within the Kurnell portion of the study area, it is anticipated that additional stone artefacts and midden material will be identified within the defined extent of AHIMS ID 52-3-0219. Coast 2019 predicted that in-situ midden material would not extend further than 70m from the shoreline. However, individual, pre-contact burials may be located elsewhere within the study area. It is also likely that low quantities of stone artefacts will be located across the Kurnell portion of the study area.

The La Perouse headland is likely to contain Aboriginal rock engravings and shell middens. However, it is unlikely that a surface survey will identify these engravings as it has been previously identified that the engravings have deteriorated, which has impacted site visibility. Information obtained from previous investigations with the La Perouse Headland has identified that some art sites were buried by previous works completed in the area. Therefore, it is likely that any surviving engravings will be located below the ground surface or within shelter environments like rock shelters.

The most common Aboriginal site types likely to be identified in the study area include:

- Midden and stone artefacts – These are the most frequently recorded site type in the 2 kilometres surrounding the study area. Middens and stone artefacts are mostly likely to be identified in areas of increased ground surface visibility such as rock outcrops or within rock shelters.
- Art sites – These are likely to be present in areas where suitable stone surfaces are present, including in rock shelters, outcroppings and cliff walls. Painted art sites may have faded beyond ready identification, however inscribed art may be more identifiable.
- Rock shelter – These will be found in suitable sandstone outcrops in the study area and may contain occupation deposit (potentially hearths, midden, stone artefacts and animal/fish bone). They may also contain art (pigment or engraved), grinding grooves and burials.
- Burials – These may occur at any point in the landscape where deep soils are present. They are most likely to occur in areas of sandy or soft soils. Burials are unlikely to be detected through surface survey.

With respect to potential to submerged terrestrial sites it can be expected that a very similar suite of site types identified in this study would have been present on the former ground surfaces prior to inundation. It would be expected that such sites would have become submerged in the last phases of sea level rise in the early Holocene.

The overwhelming issue with regards the presence of submerged terrestrial sites is whether they would have survived the impact of rising waters. Both study areas are situated in relatively high energy zones. Oceanic swells refract around both headlands and although diminished in power they break onto the present shorelines. Both study areas face westwards where there is a relatively large fetch over which westerly winds generate relatively small waves. Such wave action described would have had an accelerated erosive effect on exposed sites. Rock engravings would have been erased, middens and burials along the shoreline deflated and dispersed, deposits within rock shelters washed out.

The above statements are generalised based on the observations made during the site inspection. The Underwater Cultural Heritage Impact Assessment will examine site formation processes for submerged terrestrial site within the study areas further utilising marine geophysical and geotechnical

data obtained for this project. The report will indicate the likelihood of submerged terrestrial sites having survived inundation.

There is potential also within the marine portion of the study area for artefacts to be present within the marine sediments, either having eroded into the water from terrestrial sites and/or from fishing activities. Fishing related artefacts could be such objects as shell fishhooks. It is expected that the frequency of such artefacts across the study area would be relatively low.

5.0 ARCHAEOLOGICAL SURVEY

5.1 Aims

The primary aims of the survey are as follows:

- Undertake site survey in conjunction with key Aboriginal stakeholders (La Perouse LALC) in accordance with the PACHCI Stage 2 and the Code of Practice
- Identify and record Aboriginal sites and objects
- Identify landforms and/or areas which might contain potential archaeological deposit (PAD)
- Identify areas of ground disturbance which may have impacted on areas which might otherwise have been of archaeological potential
- Consult with Aboriginal stakeholders on potential mitigation and management measures for any Aboriginal cultural heritage found.

5.2 Timing and personnel

Consultation with La Perouse LALC was undertaken by Lee Davison (Aboriginal Cultural Heritage Officer, TfNSW) in accordance with PACHCI Stage 2. Richard Silva and David Ingrey (La Perouse LALC) participated in the archaeological survey and were given the opportunity to provide input on cultural significance. Cosmos Coroneos (Maritime archaeologist, Cosmos Archaeology) was present for the both days primarily to discuss with representatives of the La Perouse LALC issues relating to the presence of submerged cultural remains within the study area. The emphasis was on material cultural behaviour associated with fishing practices and other forms of resource exploitation in the marine environment. No diving was undertaken.

The archaeological survey was undertaken over two days from 30 – 31 January 2020. Personnel and timing for the archaeological survey are presented in Table 5.1.

Table 5.1: Timing and personnel for archaeological survey

Participant	Organisation	Role	Dates of participation
Ryan Taddeucci	Artefact Heritage	Senior Heritage Consultant	30-31 January 2020
Cosmos Coroneos	Cosmos Archaeology	Maritime archaeologist	30-31 January 2020
Chris Williams	TfNSW	Environment Officer	30-31 January 2020
Richard Silva	La Perouse LALC	Aboriginal Cultural Heritage Officer	30 January 2020
Anna Darby	Artefact Heritage	Heritage Consultant	31 January 2020
David Ingrey	La Perouse LALC	Aboriginal Cultural Heritage Officer	31 January 2020
Adele McCaul	TfNSW	Environmental Cadet	31 January 2020

Participant	Organisation	Role	Dates of participation
Ben Khan	NSW National Parks & Wildlife Service	Manager of Kamay National Park	31 January 2020

5.3 Constraints

Portions of the study area were inaccessible due to dense vegetation, vertical cliff facing or submerged within the littoral zone. Inaccessible areas were inspected from viewpoints in the public domain or were assessed by comparison of aerial imaging to locations that were accessible for survey.

5.4 Survey sampling strategy

The study area was divided into seven survey units, defined by property boundary and landform (Figure 5.1 and Figure 5.2). A sample survey is acceptable, with justification, under the Code of Practice. Full coverage survey of each survey unit was not practicable due to dense, impenetrable vegetation, commercial structures, vertical cliffs, steep slopes and littoral zones. Each survey unit was subject to sample survey, which included as much intensive investigation as was practicable given the access limitations.

5.5 Survey method

Archaeological survey of the study area was conducted on foot, in accordance with the Code of Practice and PACHCI stage 2. A handheld GPS was used to track the path of the survey team and record the coordinates of survey transects, as well as, the locations any Aboriginal sites. Detailed aerial maps marked with grid coordinates for each of the survey units were carried by the survey team in the field. The coordinate system projection used for all data recording was GDA1994 MGA 56. All ground exposures were inspected for Aboriginal objects while sandstone outcrops were examined for possible rock art and engravings.

The study area was divided into seven survey units, two on the Kurnell side and five on the La Perouse side. These are listed below (Section 5.6), and mapped in Figure 5.2 and Figure 5.1. A photographic record was kept during the survey. Photographs were taken to record aspects of survey units including stone outcrops, stone platforms, vegetation, disturbance and recorded Aboriginal sites. Photographic scales were used for photographs where appropriate.

Figure 5.1: Location of survey units on the La Perouse side

Figure 5.2: Location of survey units on the Kurnell side

5.6 Survey units

5.6.1 Survey unit 1

Survey unit 1 consists of the land located within the 'island' created by Anzac Parade (Figure 5.3). The area is located on a flat plateau which has been cleared of vegetation. The majority of the survey unit is covered by manicured grasses and frequent sandstone outcrops (Figure 5.4). One rock shelter was identified within the centre of the survey unit, which had been artificially filled (Figure 5.5). The survey unit includes the Macquarie Watchtower (Figure 5.6), the La Perouse Museum (Figure 5.7) and a monument (Figure 5.8).

[redacted]The sandstone outcrops within survey unit 1 were examined and no evidence of anthropogenic markings could be identified. [redacted]

[redacted]

Figure 5.3: View east across survey unit 1

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5.6.2 Survey unit 2

Survey unit 2 is located within the intertidal zone and is comprised of a quartz sand beach (Figure 5.9). A restaurant has been established in the eastern portion of survey unit 2 (Figure 5.10), and a large rock shelter was located in the western portion (Figure 5.11). It was found that the shelter had been partially filled in to establish the northwest portion of Anzac Parade (Figure 5.12). A drainage system has been established within the fill and may have resulted in a physical impact to the buried rock shelter (Figure 5.13).

The portions of the rock shelter that were not buried were inspected, and no Aboriginal objects were identified. Two hand outlines were identified during the inspection (Figure 5.33). However, the paint used to create the outline was found be very similar to graffiti it is likely that these are modern additions. David Ingrey (Site Officer, La Perouse LALC) noted that the rock shelter once contained an engraving and that the shelter has been partially filled when Anzac Parade was widened.

No AHIMS sites are registered within survey unit 2. [redacted] No midden material was identified during the current survey but it is likely that the site was obscured by sand at the time the survey was completed.

Figure 5.9: View west across survey unit 2

Figure 5.10: View east of restaurant established within survey unit 2

Figure 5.11: View west of the opening of a large rock shelter

Figure 5.12: View south of portions of the rock shelter that have been filled to establish Anzac Parade

Figure 5.13: View south of drainage established within survey unit 2, below the plateau

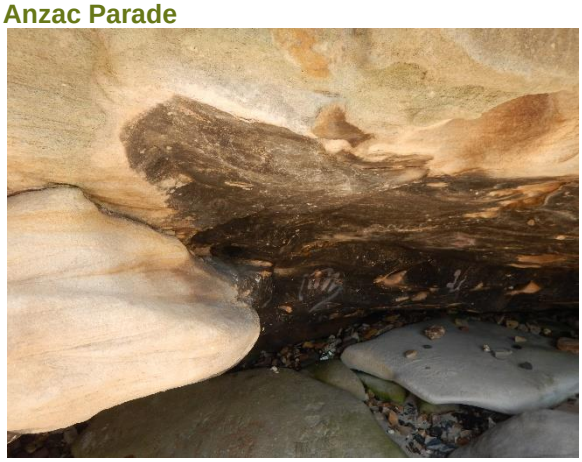

Figure 5.14: Hand outline within rock shelter

5.6.3 Survey unit 3

Survey unit 3 includes the northern section of the Anzac Parade loop and portions of several commercial structures (Figure 5.15 - Figure 5.18). The area is located on a plateau landform but has been extensively impacted by previous works. The rock shelter identified within survey unit 2 likely extends beneath the surface of survey unit 3 (Figure 5.19).

No artefacts, areas of PAD or previously recorded sites are located were identified within survey unit 3.

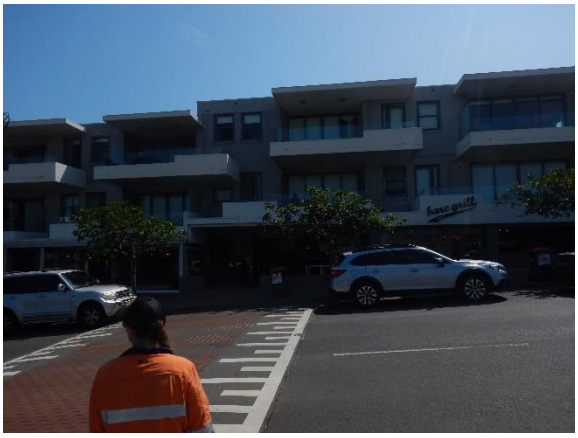

Figure 5.15: View north of buildings located in the northern portion of survey unit 3

Figure 5.16: View northwest of buildings of Anzac Parade

Figure 5.17: View south of carpark located in the southern portion of survey unit 3

Figure 5.18: View south from the northern most portion of survey unit 3

Figure 5.19: View southwest across road and footpath establish above a rock shelter

5.6.4 Survey unit 4

Survey unit 4 is comprised of the southern portion of the plateau landform, outside of the Anzac Parade loop. [redacted] Several sandstone outcrops were identified within the vicinity of the AHIMS sites, but none featured any anthropogenic features. It is possible that the

establishment of the footpath has resulted in the burial of sandstone outcrops and associated engravings. The engravings may be buried below the surface of the footpath and associated surrounding fill (Figure 5.21).

[redacted]

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5.6.5 Survey unit 5

Survey unit 5 consists of a small portion of the plateau landform which slopes down towards exposed bedrock and cliff faces located within the intertidal zone. The northern section of survey unit 5 featured the remains of an old wharf, including iron tracks (Figure 5.28) and the remains of wooden pylons (Figure 5.29). It appears that sections of the sandstone bedrock were removed during construction of the foundations of the wharf.

[redacted]

The remainder of survey unit 5 was comprised of sheer cliff faces adjoining a flat, bedrock platform located within an intertidal zone (Figure 5.32). The cliff faces and bedrock were examined for anthropogenic features, but none were located. Survey Unit 5 is very suspectable to erosional processes, and it is likely that any engravings located within survey unit 5 have been destroyed.

No Aboriginal objects or areas of PAD were identified within survey unit 5.

Figure 5.28: View north of iron tracks cut into the bedrock

Figure 5.29: View east of remanent wooden pylons

Figure 5.30: View west from the AHIMS registered location of AHIMS ID 45-6-0653

Figure 5.31: Ground surface at the location of AHIMS ID 45-6-0653

Figure 5.32: View east of cliff and intertidal zone

5.6.6 Survey unit 6

Survey unit 6 was bordered to the north by Polo Street and to the west by Solander Drive (Figure 5.33). The area was located on a flat plain which has been subject to vegetation clearance and landform modification. The majority of the survey unit was covered in manicured grass and included an area of dense, inaccessible vegetation to the east (Figure 5.34).

[redacted] Three sandstone outcrops were identified within survey unit 6 and they were inspected for evidence of engraving (Figure 5.33 and Figure 5.35). However, no anthropogenic features were identified on the sandstone outcrops. [redacted] No Aboriginal objects were identified on the ground surface.

Figure 5.33: View west across survey unit 6 and two sandstone outcrops in the centre

Figure 5.34: View east of the area of dense vegetation location within survey unit 6

Figure 5.35: View north across sandstone outcrop

5.6.7 Survey unit 7

Survey unit 7 was located on the Kurnell side of the study area and bordered the littoral zone to the northwest (Figure 5.36). The majority of the survey unit was covered by dense inaccessible vegetation on a steep slope rising to the east (Figure 5.37). The remainder of the survey unit was covered in manicured grass with occasional areas of erosion. Due to the logistical constraints within survey unit 7 the survey was completed through a single transect which roughly followed the alignment of monument track that runs along the western boundary of survey unit 7.

Survey unit 7 included three monuments, two in the middle (Figure 5.38 and Figure 5.39) and one in the northern most part of survey unit 7 (Figure 5.40). A utility vault was identified within the centre of survey unit 7, indicating that subsurface telecommunication infrastructure is present within the study area (Figure 5.41).

The southwest portion of survey unit 7 had been subject to vegetation clearance and landform modification. Retaining walls were identified along the western edge of survey unit 7, indicating that terrestrial portions of the study area are the result of reclamation works. It likely that these reclamation works would have included the importation of fill from adjacent land.

[redacted]

Figure 5.36: View northwest of littoral zone from Monument Track

Figure 5.37: View south of dense vegetation and steep slope bordering survey unit 7

Figure 5.38: View east of a monument location in the centre of survey unit 7

Figure 5.39: View north of a monument location in the centre of survey unit 7

Figure 5.40: View east of the monument in the northern most portion of survey unit 7

Figure 5.41: View northeast of utility vault

5.7 Coverage

A summary of survey coverage, in accordance with the Code of Practice, is outlined in Table 5.2 and Table 5.3 below.

Table 5.2: Survey coverage summary – Survey units

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility (%)	Exposure (%)	Effective Coverage Area (sq m)	Effective Coverage (%)
1	Plateau	38,341.65	90	1	345.07	0.9
2	Intertidal	2,604.81	66	60.74	1,048.18	40.24
3	Plateau	8,696.27	50	4.6	200	2.3
4	Plateau	26,123.03	90	1.5	352.66	1.35
5	Intertidal, cliff, plateau	7,524.3	90	72.72	4,924.65	65.45
6	Flat	8,808.78	70	0.1	6.17	0.07
7	Slope	35,103.06	50	0.1	17.55	0.05

Table 5.3: Landform survey coverage

Landform	Landform Area (sq m)	Area effectively surveyed (sq m)	% of landform effectively surveyed	Number of sites
Intertidal	2,604.81	1,048.18	40.24	2
Flat	8,808.78	6.17	0.07	0
Slope	35,103.06	17.55	0.05	1
Plateau	73,160.95	897.73	1.23	7
Intertidal, cliff, plateau	7,524.3	72.72	4,924.65	0

6.0 RESULTS

6.1 Kurnell

6.1.1 Kurnell Potential Archaeological Deposit 1 (K PAD 1)

AHIMS ID: 52-3-1366
Site Type: Potential Archaeological Deposit
Centroid: [redacted]
Site Extent: 860 m x 260 m

K PAD 1 had been previously identified by Navin Officer (2006) [redacted] While previous test excavations to the west of Polo Street (Irish 2007) did not identified any Aboriginal objects, these investigations were only completed to the depth of proposed impacts (400mm) and it is likely that stone artefacts, midden material and burials may be present below the depth previously investigated. As a result, K PAD 1 has been extended to the east as far as the identified extent of the Foreshore Midden, to facilitate additional subsurface investigations (Figure 6.2).

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6.1.2 Foreshore Midden - Captain Cook's Landing Place

AHIMS ID: 52-3-0219
Site Type: Burial, Shell, Artefact, Potential Archaeological Deposit
Centroid: [redacted]
Site Extent: 315 m x 35 m

[redacted] During the field survey, no Aboriginal objects were identified across the surface of the site.

Previous phases of excavation have resulted in the determination of the site extent and the identification of Aboriginal burials, midden material and stone artefacts. While the site has been subject to extensive test excavations, these investigations were only completed to the depth of proposed impacts (400mm). It is likely that additional Aboriginal objects will be present below the ground surface. As a result, this investigation has determined that the site should be updated to include an additional area of PAD to facilitate further subsurface investigations (Figure 6.11).

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Figure 6.11: Revised location of Aboriginal sites within the Kurnell portion of the study area

6.2 La Perouse

6.2.1 Site 1, La Perouse

AHIMS ID: 45-6-0648
Site Type: Art (Pigment or Engraved)
Centroid: [redacted]
Site Extent: 3 m x 2 m

The site is an engraving of a whale and calf, located on the south side of the headland. The site has been heavily eroded, which has severely impacted visibility. It was found that a NSW survey marker had been drilled into the ground, adjacent to the site (Figure 6.15).

6.2.2 Site 2, La Perouse

AHIMS ID: 45-6-0649
Site Type: Art (Pigment or Engraved)
Centroid: [redacted]
Site Extent: 3 m x 2 m

Very faint engravings were identified at this location. Further desktop study completed following the completion of the site survey indicated that the site is likely to be the remains of AHIMS ID 45-6-0649. The site card describes AHIMS ID 45-6-0649 as an engraving of a fish and tomahawk. However, as the site has been extremely eroded it was not possible to determine the site features during the survey.

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6.2.3 Site 3, La Perouse

AHIMS ID: 45-6-0650
Site Type: Art (Pigment or Engraved)
Centroid: [redacted]
Site Extent: Unknown

This site could not be identified during the current survey. However, based on the site description included in the site card, it is likely to be within the immediate vicinity of AHIMS ID 45-6-0649 and AHIMS ID 45-6-0651. The site is described as segmented marks on a circular rock. AHIMS ID 45-6-0649 was found to be significantly eroded and it is likely that 45-6-0650 has been eroded and is no longer visible.

6.2.4 Site 4, La Perouse

AHIMS ID: 45-6-0651
Site Type: Art (Pigment or Engraved)
Centroid: [redacted]
Site Extent: Unknown

This site could not be identified during the current survey. However, based on the site description included in the site card, it is likely to be within the immediate vicinity of AHIMS ID 45-6-0649 and AHIMS ID 45-6-0650. The site is described as two deep cuts in the shape of a boomerang, with one reverse curve. AHIMS ID 45-6-0649 was found to be significantly eroded and it is likely that 45-6-0650 has been eroded and is no longer visible.

6.2.5 Site 5, La Perouse

AHIMS ID: 45-6-0652
Site Type: Art (Pigment or Engraved)
Centroid: [redacted]
Site Extent: Unknown

This site could not be identified during the current survey. [redacted]

6.2.6 Site 6, La Perouse

AHIMS ID: 45-6-0653
Site Type: Art (Pigment or Engraved)
Centroid: [redacted]
Site Extent: Unknown

The site could not be identified by the field survey. [redacted]

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Redacted for public display

6.2.7 La Perouse (Art)

AHIMS ID: 45-6-1403
Site Type: Art (Pigment or Engraved), Rock Shelter
Centroid: [redacted]
Site Extent: Unknown

[redacted]

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6.2.8 La Perouse (Midden)

AHIMS ID: 45-6-1144
Site Type: Shell, Artefact
Centroid: [redacted]
Site Extent: Unknown

The site could not be identified by the site survey. [redacted]

6.2.9 La Perouse Midden 19-01 (AHIMS ID Pending)

Site type: Midden, Potential Archaeological Deposit, Rock Shelter
Centroid: [redacted]
Site length: 5 m
Site width: 5 m

The survey resulted in the identification of one newly recorded site. La Perouse Midden 19-01 (AHIMS ID Pending) [redacted] it is very unlikely that the material was deposited through natural processes. The shell midden was found to be eroding out of the bottom of a humic layer of sediment, less than 150mm thick (Figure 6.27 and Figure 6.28). The midden material has dispersed across the top of the cliff and collected in natural grooves (Figure 6.29).

[redacted]

As midden material was observed to be eroding out of a deposit of humic soil, it is likely that additional midden material is present below the ground surface. As a result, the site also includes an area of PAD (Figure 6.30).

The background research and field survey completed for this assessment have indicated that there are multiple unidentified subsurface and surface engravings located across the study area. As a result, the majority of the study area is considered to be an extended area of PAD. It is predicted that the centre portion of the site will contain engravings not visible by macroscope surface survey. Degraded engravings are likely to be present on the surface of sandstone outcrops or buried below the ground surface. There are two areas in the north and south of the site that are the likely locations of buried engravings (Site 5 and Site 6). The western most part of the site is likely to contain the engravings registered as Site 3 and Site 4 on the ground surface but are no longer visible due to erosion and site degradation. The remainder of the site is considered to have low potential to contain buried engravings and midden material but should be subject to further archaeological investigation.

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Figure 6.30: Revised location of Aboriginal sites within the La Perouse portion of the study area

7.0 DISCUSSION

In accordance with the Code of Practice, this section provides a discussion of the regional and local archaeological context of the study area, based on the desktop analysis completed for this assessment, and results of the survey.

7.1 Regional archaeological context

The archaeological understanding of the early Aboriginal settlement of the Sydney Basin and surrounds is constantly expanding and developing. At present, the earliest dated evidence for occupation in the Sydney area is associated with deposits on the Parramatta and Nepean Rivers, which were dated to c.25-30,000 years before present (JMCHM 2005) and 36,000 years before present (AHMS 2015). The archaeological material record provides evidence of this long occupation, but also provides evidence of a dynamic culture that has changed through time.

The existing archaeological record is limited to certain materials and objects that were able to withstand degradation and decay. As a result, the most common type of Aboriginal objects remaining in the archaeological record are stone artefacts, followed by bone and shell. There is potential for Aboriginal objects to occur across the landscape. The nature of the underlying geology and proximity of water sources to portions of the study area indicates the potential for the occurrence of artefact sites and/ or midden sites.

Stone artefacts are one of the most common types of Aboriginal objects remaining in the archaeological record. Archaeological analyses of these artefacts in their contexts have provided the basis for the interpretation of change in material culture over time. Technologies used for making tools changed, along with preference of raw material. Different types of tools appeared at certain times. It is argued that changes in material culture were an indication of changes in social organisation and behaviour.

Within the Sydney Basin, the most widely used terminology for the phases within what is currently known as the Eastern Regional Sequence are the Capertian, followed by the Early, Middle and Late Bondaian. This sequence continues to be refined by ongoing archaeological work in the region.

The Capertian comprises large, heavy stone artefacts. Tool types include uniface pebble tools, core tools, denticulate saws, scrapers, hammerstones, some bipolar and burins. The change from the Capertian to the Bondaian took place sometime after 5,000 years Before Present (BP) and is largely characterised by a shift in raw material use (and the proportions of raw materials), in addition to a developing predominance of smaller implements.

The three phases which are generally recognised within the Bondaian sequence are primarily based upon the introduction and subsequent decline of backed implements and the use of a bipolar flaking technique. Other technological innovations which are evident during the Bondaian include the introduction of ground-edge implements around 4,000 years BP and shellfish hooks during the last 1,000 years.

During the Early Bondaian, which is dated to between approximately 5,000 years BP and 2,800 years BP, the predominant raw materials for artefact manufacture appear to have been fine-grained siliceous cherts and silcretes. Features of the Capertian appear to have continued in many sites but backed and edge ground implements were also introduced.

The Middle Bondaian which dates between approximately 2,800 years BP and 1,600 years BP, displays a greater percentage of Bondi points (backed and pointed artefacts which are generally characteristic of Bondaian assemblages) to bipolar pieces. The proportion of quartz artefacts (a raw

material which is frequently 'reduced' by employing bipolar techniques) appears to increase within assemblages of this time frame. Some sites have also produced edge-ground implements.

The Late Bondaian which dates from approximately 1,600 years to the present, is dominated by artefacts of quartz, although other raw materials are present. Bondi points are absent. Eloueras and bipolar pieces are predominant within assemblages of this period. Edge-ground implements are also more common. Bone and shell implements occur in some sites.

At Contact, European observations of Aboriginal life around the Sydney region suggest that toolkits were fashioned largely on organic materials, such as wood, bark, palm leaves, shell and bone. The use of stone does not figure prominently within the early-European descriptions.

7.2 Local archaeological context

Previous archaeological investigations within the Kurnell portion of the study area have identified shellfish hooks indicating site occupation during the last 1,000 years, in accordance with the Eastern Regional Sequence. This interpretation is supported by conventional radiocarbon (14C) dating of charcoal samples obtained from Captain Cooks Landing Place which produced an age of 1,330 ± 100 years BP (ANU-721).

No stone artefact assemblages have been previously identified within the La Perouse portion of the study area. The nearest dated site north of Botany Bay is Sheas Creek, located 6.5 kilometres northwest of La Perouse. Sheas Creek produced a date of 5,520 ± 70 years BP) (WK 8616) from a sample of the dugong bones. This indicates that the northern portion of the study area was occupied from at least 6,000 BP and any identified assemblage is predicted to be consistent with the Capertian phase.

8.0 SIGNIFICANCE ASSESSMENT

8.1 Significance assessment criteria

An assessment of the cultural heritage significance of an item or place is required in order to form the basis of its management. The OEH (2011) provides guidelines for heritage assessment with reference to the Burra Charter (Australia ICOMOS 2013) and the Heritage Office guidelines (2001). OEH requires consideration that includes the following:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

It is important to note that heritage significance is a dynamic value.

8.2 Archaeological significance assessment

8.2.1 Site 1, La Perouse (AHIMS ID 45-6-0648)

Site 1, La Perouse (AHIMS ID 45-6-0648) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. The site is part of a complex which includes nearby engravings at La Perouse sites 2-6 which are representative of local land use patterns. Together the sites have the potential to contribute to greater understanding of ceremonial life and art history.

Site 1, La Perouse (AHIMS ID 45-6-0648) is an Art (Pigment or Engraved) site, which is uncommon within the regional context, accounting for only 20.83% of sites within the regional context. However, the whale and calf engraving are considered be to an especially rare motif in the region as only a small number of whale depictions have been identified along the Sydney coastline (Jill Sheppard Heritage Consultants 2009). As a result, the site is considered to be of high rarity and representative value.

8.2.2 Site 2, La Perouse (AHIMS ID 45-6-0649)

Site 2, La Perouse (AHIMS ID 45-6-0649) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. The site is part of a complex which includes nearby engravings that are representative of local land use patterns. Together the sites have the potential to contribute to greater understanding of ceremonial life and art history.

Site 2, La Perouse (AHIMS ID 45-6-0649) is an Art (Pigment or Engraved) site, which is uncommon within the regional context. As these sites only account for only 20.83% of sites within the regional context, the site is considered to be of moderate rarity and representative value.

8.2.3 Site 3, La Perouse (AHIMS ID 45-6-0650)

Site 3, La Perouse (AHIMS ID 45-6-0650) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. The site is part of a complex which includes nearby engravings that are representative of local land use patterns. Together the sites have the potential to contribute to greater understanding of ceremonial life and art history.

Site 3, La Perouse (AHIMS ID 45-6-0650) is an Art (Pigment or Engraved) site, which is uncommon within the regional context. As these sites only account for only 20.83% of sites within the regional context, the site is considered to be of moderate rarity and representative value.

8.2.4 Site 4, La Perouse (AHIMS ID 45-6-0651)

Site 4, La Perouse (AHIMS ID 45-6-0651) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. The site is part of a complex which includes nearby engravings that are representative of local land use patterns. Together the sites have the potential to contribute to greater understanding of ceremonial life and art history.

Site 4, La Perouse (AHIMS ID 45-6-0651) is an Art (Pigment or Engraved) site, which is uncommon within the regional context. As these sites only account for only 20.83% of sites within the regional context, the site is considered to be of moderate rarity and representative value.

8.2.5 Site 5, La Perouse (AHIMS ID 45-6-0652)

Site 5, La Perouse (AHIMS ID 45-6-0652) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. The site is part of a complex which includes nearby engravings that are representative of local land use patterns. Together the sites have the potential to contribute to greater understanding of ceremonial life and art history.

Site 5, La Perouse (AHIMS ID 45-6-0652) is an Art (Pigment or Engraved) site, which is uncommon within the regional context. As these sites only account for only 20.83% of sites within the regional context, the site is considered to be of moderate rarity and representative value.

8.2.6 Site 6, La Perouse (AHIMS ID 45-6-0653)

Site 6, La Perouse (AHIMS ID 45-6-0653) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. The site is part of a complex which includes nearby engravings that are representative of local land use patterns. Together the sites have the potential to contribute to greater understanding of ceremonial life and art history.

Site 6, La Perouse (AHIMS ID 45-6-0653) is an Art (Pigment or Engraved) site, which is uncommon within the regional context. As these sites only account for only 20.83% of sites within the regional context, the site is considered to be of moderate rarity and representative value.

8.2.7 La Perouse (AHIMS ID 45-6-1403)

La Perouse (AHIMS ID 45-6-1403) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. The site is part of a complex which includes nearby engravings that are

representative of local land use patterns. Together the sites have the potential to contribute to greater understanding of ceremonial life and art history.

La Perouse (AHIMS ID 45-6-1403) is an Art (Pigment or Engraved) site, which is uncommon within the regional context. As these sites only account for only 20.83% of sites within the regional context, the site is considered to be of moderate rarity and representative value.

8.2.8 La Perouse (AHIMS ID 45-6-1144)

La Perouse (AHIMS ID 45-6-1144) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. Research themes investigation may include Aboriginal subsistence practices, trade, occupation, stone tool technology, and ceremonial life. The site provides a rare opportunity to investigate technological adaption to a coastal environmental and marine resources.

La Perouse (AHIMS ID 45-6-1144) is a Shell, Artefact site, which is relatively common within the regional context. As these sites only account for the majority of sites within the regional context (40.28%), the site is considered to be of low rarity and moderate representative value.

8.2.9 La Perouse Midden 19-01 (AHIMS ID Pending)

La Perouse Midden 19-01 (AHIMS ID Pending) is considered to be of high research and educational potential due to the ability for the site to demonstrate changing patterns of Aboriginal cultural history and use of local resources. Research themes investigation may include Aboriginal subsistence practices, trade, occupation, stone tool technology, and ceremonial life. The site provides a rare opportunity to investigate technological adaption to a coastal environmental and marine resources.

As the La Perouse Midden 19-01 (AHIMS ID Pending) includes an area of PAD, the full extent and nature of the site is unknown and cannot be fully assessed. The significance of the site will need to be revised following further investigation.

8.2.10 Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219)

The Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) is considered to be of high scientific significance due to the range and quantity of shell, stone and bone artefacts (including the largest documented number of shellfish hooks in Australia). The site also provides evidence of continued Aboriginal occupation of an area post-European contact. Archaeological research at the site has the potential to answer questions about the rapid change to Aboriginal lifestyles from pre-contact to post-contact. Therefore, the site is considered to be of high research potential. The outcomes of this research and the site itself, as a tangible expression of Aboriginal history, has high education potential.

Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) is a Burial, Shell, Artefact site, which is uncommon within the regional context. As these sites only account for only 2.78% of sites within the regional context, the site is considered to be of high rarity and representative value.

8.2.11 Kurnell Potential Archaeological Deposit 1 (K PAD 1) (AHIMS ID 52-3-1366)

Investigations at K PAD 1 (AHIMS ID 52-3-1366) have to potential to reveal further information regarding the distribution of stone artefacts and midden material as well as the location of Aboriginal burials. Therefore, the site of considered to have to potential to be of high research and scientific valve. However, as no Aboriginal objects have been identified in the PAD the significance of the site is unknown and will need to be revised following further investigation.

Table 8.1: Summary of scientific and archaeological significance

Site name	AHIMS ID	Research value	Scientific value	Representative value	Rarity	Overall archaeological significance
Site 1, La Perouse	45-6-0648	High	High	High	High	High
Site 2, La Perouse	45-6-0649	High	High	Moderate	Moderate	High-moderate
Site 3, La Perouse	45-6-0650	High	High	Moderate	Moderate	High-moderate
Site 4, La Perouse	45-6-0651	High	High	Moderate	Moderate	High-moderate
Site 5, La Perouse	45-6-0652	High	High	Moderate	Moderate	High-moderate
Site 6, La Perouse	45-6-0653	High	High	Moderate	Moderate	High-moderate
La Perouse	45-6-1144	High	High	Moderate	Moderate	High-moderate
La Perouse	45-6-1403	High	High	Moderate	Low	High-moderate
La Perouse Midden 19-01	Pending	Unknown	Unknown	Unknown	Unknown	Unknown
Foreshore Midden - Captain Cook's Landing Place	52-3-0219	High	High	High	High	High
K PAD 1	52-3-1366	Unknown	Unknown	Unknown	Unknown	Unknown

9.0 IMPACT ASSESSMENT

As the Kamay Ferry Wharfs Project is currently in the planning phase, the impacts to the terrestrial portion of the study area is unknown. Until detailed designs are generated, it is assumed that any site or portion of a site located within the current study area will be harmed by the proposed works.

Table 9.1: Summary of potential impacts

Site name	Type of harm	Degree of harm	Consequence of harm
Site 1, La Perouse	Direct	Total	Total loss of value
Site 2, La Perouse	Direct	Total	Total loss of value
Site 3, La Perouse	Direct	Total	Total loss of value
Site 4, La Perouse	Direct	Total	Total loss of value
Site 5, La Perouse	Direct	Total	Total loss of value
Site 6, La Perouse	Direct	Total	Total loss of value
La Perouse	Direct	Total	Total loss of value
La Perouse	Direct	Total	Total loss of value
La Perouse Midden 19-01	Direct	Total	Total loss of value
Foreshore Midden - Captain Cook's Landing Place	Direct	Partial	Partial loss of value
K PAD 1	Direct	Partial	Partial loss of valve

With respect to submerged terrestrial sites, the proposed works appear to be confined to piling for the jetties. This would be a number of localised impacts over a relatively large area. Should there be potential for the survival of submerged terrestrial sites within the study areas the scale of impact to this resource could range from negligible to partial impact to loss of value.

10.0 MANAGEMENT AND MITIGATION MEASURES

10.1 Guiding principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal sites would be conserved. If conservation is not practical, measures would be taken to mitigate against impacts to Aboriginal sites.

10.2 Further assessment under a PACHCI Stage 3

Where unavoidable impacts occur then measures to mitigate and manage impacts are proposed. Mitigation measures primarily concern preserving the heritage values of sites beyond the physical existence of the site. The most common methods involve detailed recording of Aboriginal objects, archaeological test and salvage excavations, artefact analysis and, where appropriate, reburial of Aboriginal objects in a location determined by the registered Aboriginal parties.

Mitigation measures vary depending on the assessment of archaeological significance of a particular Aboriginal site and are based on its research potential, rarity, representatives and educational value. In general, the significance of a site would influence the choice of preferred conservation outcomes and appropriate mitigation measures, usually on the following basis:

- Low archaeological significance - Conservation where possible, but usually no mitigation required if impacts are unavoidable
- Moderate archaeological significance - Conservation where possible. If conservation is not practicable, salvage excavations or similar mechanisms determined in consultation with the Aboriginal community may be necessary
- High archaeological significance - Conservation as a priority. Only if all practicable alternatives have been exhausted would impacts be considered justified. Comprehensive salvage excavations may be necessary

To fully assess the level of significance and determine adequate mitigation and management measures, further assessment completed in accordance with PACHCI Stage 3 must be undertaken.

An assessment of the cultural heritage significance of an item or place is required in order to form the basis of its management. The Guide (OEH 2011: 10) provides guidelines, in accordance with the Burra Charter (Australia ICOMOS 2013) for significance assessment with assessments being required to consider the following criteria:

- Social values – does the area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Historic values – is the area important to the cultural or natural history of the local area and/or region and/or state
- Scientific values - does the area have the potential to yield information that will contribute to an understanding of the cultural and natural history of the local area and/or region and/or state
- Aesthetic values – is the area important in demonstrating aesthetic characteristics in the local area and/or region and/or state.

A CHAR should be produced in compliance with the PACHCI Stage 3 requirements, the Guide and the Consultation Requirements. The Aboriginal heritage significance of the study area would be

assessed, based on comments received from the RAPs, the background research and the results of this PACHCI Stage 2 report.

The CHAR would also include a revised impact assessment based on detailed design plans and would include recommendations based on the updated significance and impact assessments.

10.2.1 Aboriginal Stakeholder Consultation

Investigations conducted in accordance with the PACHCI Stage 3 will require comprehensive Aboriginal stakeholder consultation. Consultation with Registered Aboriginal Parties (RAPs) would be conducted by TfNSW and would include holding an Aboriginal Focus Group (AFG) meeting during review of the draft PACHCI Stage 3 reports. Any comments and feedback from RAPs would form an integral part of the assessment.

The objective of community consultation is to ensure that RAPs have the opportunity to improve assessment outcomes by:

- providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s)
- influencing the design of the method to assess cultural and scientific significance of Aboriginal object(s) and/or place(s)
- actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed project area
- commenting on draft assessment reports before they are submitted by the proponent to the relevant approval's authority.

Consultation and feedback from RAPs is an integral part of the preparation of an CHAR, which would be prepared as part of the AHIP application.

10.2.2 Tasks required under the PACHCI stage 3

Site 1, La Perouse (AHIMS ID 45-6-0648) and Site 2, La Perouse (AHIMS ID 45-6-0649)

Site 1, La Perouse (AHIMS ID 45-6-0648) and Site 2, La Perouse (AHIMS ID 45-6-0649) are engravings that were inspected during the current survey of the study area. It is recommended that impacts to these sites are avoided. Where impacts are unavoidable, mitigation and management measures would be developed in consultation with the RAPs during the preparation of the PACHCI stage 3.

Site 3, La Perouse (AHIMS ID 45-6-0650) and Site 4, La Perouse (AHIMS ID 45-6-0651)

The locations of Site 3, La Perouse (AHIMS ID 45-6-0650) and Site 4, La Perouse (AHIMS ID 45-6-0651) could not be determined by the current survey. Based on previous assessments completed within the study area and review of the AHIMS database, it is likely that these sites are located on exposed sandstone outcrops within the vicinity of Site 1, La Perouse (AHIMS ID 45-6-0648) and Site 2, La Perouse (AHIMS ID 45-6-0649) (Figure 10.2). Therefore, it is recommended that a targeted survey of the likely site locations is undertaken. This survey should be undertaken at different times of day as the shift in light may influence the visibility of the site features. Alternatively, a technical specialist should be engaged to scan and photograph the area and process the data through imaging software to assist in the identification of the sites.

Site 5, La Perouse (AHIMS ID 45-6-0652) and Site 6, La Perouse (AHIMS ID 45-6-0653)

Site 5, La Perouse (AHIMS ID 45-6-0652) and Site 6, La Perouse (AHIMS ID 45-6-0653) could not be located doing the current survey and are likely to be located below the ground surface (Figure 10.2). Therefore, it is recommended that a test excavation program is completed at targeted locations to determine the location of the sites. Where the sites cannot be identified through test excavation it may be necessary to monitor ground disturbing activities for impacts to subsurface sandstone outcrops. These management measures should only be undertaken if works are proposed in the areas where these sites may be located.

La Perouse (AHIMS ID 45-6-1403)

La Perouse (AHIMS ID 45-6-1403) could not be identified during the current survey and it is possible that the site is located below the ground surface or on exposed outcrops within the Anzac Parade 'Island' (Figure 10.2). Therefore, it is recommended that a survey of the area is completed at different times of day or in conjunction with an imaging specialist. Where the survey is unable to identify the site, it may be necessary to complete test excavation to locate the site underground. These management measures should only be undertaken if works are proposed in the area where this site may be located.

La Perouse (AHIMS ID 45-6-1144)

La Perouse (AHIMS ID 45-6-1144) midden was not identified during the current survey (Figure 10.2). However, previous assessments completed within the study area have identified the location of the midden and indicate that it is unlikely to extend below the ground surface. Therefore, it is recommended that Aboriginal stakeholders are provided with the opportunity to complete a survey collection of Aboriginal objects located at the site.

La Perouse Midden 19-01 (AHIMS ID Pending) and K PAD 1 (AHIMS ID 52-3-1366)

Two areas of PAD, La Perouse Midden 19-01 (AHIMS ID Pending) and K PAD 1 (AHIMS ID 52-3-1366), have been identified within the study area (Figure 10.1 and Figure 10.2). It is recommended that a test excavation methodology is developed, and test excavation is completed to determine the full extent of any subsurface Aboriginal objects.

Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219)

Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) was identified as containing an area of PAD not previously recorded on the AHIMS database (Figure 10.1). It is understood that NSW NPWS is currently planning on submitting an AHIP to authorise proposed works within the Kurnell portion of the study area. An update to the AHIMS register to authorise test excavation within the Foreshore Midden would require NSW NPWS to produce an addendum to the CHAR completed by Coast History and Heritage (2019) and impact the AHIP application. It is recommended that NSW NPWS as consulted regarding the timing for their AHIP submission and the requirements of the current proposal.

As both the Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) and K PAD 1 (AHIMS ID 52-3-1366) have to potential to contain burials, it is recommended that a program of remote sensing is completed prior to test excavation. The outcome of the remote sensing program will be used to inform the test excavation methodology and provide further advice on mitigation measures.

The Kurnell area has been subject to several phases of archaeological excavations, as outlined in section 4.2.1, and a test excavation methodology should be informed by the findings of these assessments. Test excavations completed by Irish (2007) were limited to the impact footprint of the

proposed works, and a similar methodology may be developed for the proposed test excavation program within the Kurnell portion of the study area. Areas of artefact bearing fill were also identified by McIntyre-Tamwoy (2004) and Irish (2010). The proposed test excavation methodology should aim to further investigate nature of the fill material and the archaeological integrity of the artefact assemblage.

Summary

Due to the variation in site types, condition and site locations, specific mitigation measures have been developed for each site and summarised in Table 10.1.

There are two NHL listed places with Aboriginal heritage values located within the study area (NHL 105812 and NHL 106162). Further assessment will be required to identify the Aboriginal heritage values and assess any impacts that the project will have on the values. This will inform the EPBC referral prepared for the project at the EIS stage.

Table 10.1: Summary of site mitigation measures

Site name	AHIMS ID	Mitigation measures
Site 1, La Perouse	45-6-0648	To be determined through detailed design, comprehensive Aboriginal stakeholder consultation, and the completion of a CHAR
Site 2, La Perouse	45-6-0649	To be determined through detailed design, comprehensive Aboriginal stakeholder consultation, and the completion of a CHAR
Site 3, La Perouse	45-6-0650	Additional survey with the assistance of imagery technology
Site 4, La Perouse	45-6-0651	Additional survey with the assistance of imagery technology
Site 5, La Perouse	45-6-0652	Archaeological test excavation and monitoring
Site 6, La Perouse	45-6-0653	Archaeological test excavation and monitoring
La Perouse	45-6-1144	Surface collection of midden material and any other Aboriginal objects by Aboriginal stakeholders
La Perouse	45-6-1403	Additional survey with the assistance of imagery technology and archaeological test excavation and monitoring
La Perouse Midden 19-01	Pending	Archaeological test excavation
Foreshore Midden - Captain Cook's Landing Place	52-3-0219	The proponent should contact NSW NPWS for advice on the timing of the AHIP and implications updating the AHIMS database with the findings of this assessment Program of remote sensing.
Kurnell Potential Archaeological Deposit 1 (K PAD 1)	52-3-1366	Program of remote sensing ahead of test excavation

Mitigation measures will be proposed in the Underwater Cultural Heritage Impact Assessment once the potential for the presence of the submerged terrestrial sites is assessed. Possible mitigation measures could entail, but not be confined to:

- Repositioning piles to avoid prospective locations
- Obtain core samples at piling for examination (includes sieving the samples)
- Diver based excavation

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Figure 10.1: Revised location of Aboriginal sites within the Kurnell portion of the study area

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Figure 10.2: Revised location of Aboriginal sites within the La Perouse portion of the study area

10.3 Approvals pathway

It is understood that an application will be made for the proposal to be assessed as SSI under Division 5.2 of the EP&A Act. However, prior to this determination, the proponent is proposing to complete pre-SSI approval investigatory activities.

Under the Code of Practice sub-surface investigation will not be excluded from harm where they are carried out:

- in or within 50 m of an area where burial sites are known or are likely to exist
- in or within 50 m of a declared Aboriginal place
- in or within 50 m of a rock shelter, shell midden or earth mound
- in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes

As a result, any pre-SSI sub-surface investigations to be completed within the study area will require an AHIP. Where sub-surface investigations are to be carried out under the SEARs an AHIP may not be required, depending on the provisions of the SEARs and types of impact permitted for investigatory activities.

See Table 10.2 below for an overview of site-specific approval requirement for further investigations. Post SSI approvals mitigation and management measures will be further outlined in the PACHCI Stage 3 reporting (CHAR), EIS mitigation measures, and further documents prepared as part of the SSI approvals process (such as REMMs).

Table 10.2: Approval pathways

Site name	AHIMS ID	Requirements for further investigations
Site 1, La Perouse	45-6-0648	The location and significance of the site has been determined and it is recommended that any impacts or implementation of management measures that may result in impact to the site must be authorised by an AHIP or Conditions of Approval. SEARs will not authorise this action.
Site 2, La Perouse	45-6-0649	The location and significance of the site has been determined and it is recommended that any impacts or implementation of management measures that may result in impact to the site must be authorised by an AHIP or Conditions of Approval. SEARs will not authorise this action.
Site 3, La Perouse	45-6-0650	The site is likely to be a surface engraving within an identified area. No approvals will be required to complete further survey that will not impact the site.
Site 4, La Perouse	45-6-0651	The site is likely to be a surface engraving within an identified area. No approvals will be required to complete further survey that will not impact the site.
Site 5, La Perouse	45-6-0652	The site is an engraving that is likely to be located below Anzac Parade. Due to the possibility of encountering midden material and rock shelters, test excavation should be completed under an AHIP, or under SEARs were possible.

Site name	AHIMS ID	Requirements for further investigations
Site 6, La Perouse	45-6-0653	The site is an engraving that is likely to be located within a rock shelter below Anzac Parade. As a result, test excavation should be completed under an AHIP, or under SEARs were possible
La Perouse	45-6-1144	The site is an engraving that may be located on exposed sandstone outcrops or buried under ground. No approvals will be required to complete further survey that will not impact the site. However, test excavation will need to be completed under an AHIP, or under SEARs were possible.
La Perouse	45-6-1403	The site is a shell midden located on bedrock of known archaeological significance. As a result, no further archaeological investigations are required. It is recommended that a surface collection of Aboriginal objects is completed as a mitigation measure. A surface collection is considered harm under the NPW Act and should be completed under an AHIP or Conditions of Consent. SEARs will not authorise this action.
La Perouse Midden 19-01	Pending	The site is a shell midden and PAD. Test excavation should be completed under an AHIP, or under SEARs were possible.
Foreshore Midden - Captain Cook's Landing Place	52-3-0219	The site includes midden material and burials. A remote sensing program that does not impact the site can be completed without approvals. Test excavations may be completed under SEARs where possible. Test excavations could be authorised under an AHIP. However, it is recommended that NSW NPWS is consulted prior to altering the site extent of the site on the AHIMS database or applying for a completing AHIP. However, human remains identified by remote sensing cannot be impacted by test excavations.
Kurnell Potential Archaeological Deposit 1 (K PAD 1)	52-3-1366	The site is a PAD that has potential to contain midden material and burials. A remote sensing program can be completed without approvals. Test excavation may be completed under an AHIP, or under SEARs were possible. However, human remains identified by remote sensing cannot be impacted by test excavations.

10.4 Discovery of human remains

If any human remains are discovered and/or harmed in, on or under the land, the following actions must be taken:

- Do not further move or disturb these remains
- Immediately cease all works at the particular location
- Secure the area so as to avoid further harm to the remains
- Notify the NSW police
- Notify DPIE-Heritage's Environment Line on 131 555 as soon as practicable and provide any available details of the remains and their location
- Not recommence any work at the particular location unless authorised in writing by DPIE-Heritage.

Impacts to human skeletal remains would not be approved under an AHIP.

11.0 RECOMMENDATIONS

The following recommendations were based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended
- The results of the background research, site survey and assessment.
- The likely impacts of the proposed development.
- The PACHIC Stage 2 requirements.
- The interests of La Perouse LALC.
- The proposed approval pathways

The findings of report are:

- The following eleven recorded Aboriginal sites are located within the mapped extend of the study area:
    - Site 1, La Perouse (AHIMS ID 45-6-0648)
    - Site 2, La Perouse (AHIMS ID 45-6-0649)
    - Site 3, La Perouse (AHIMS ID 45-6-0650)
    - Site 4, La Perouse (AHIMS ID 45-6-0651)
    - Site 5, La Perouse (AHIMS ID 45-6-0652)
    - Site 6, La Perouse (AHIMS ID 45-6-0653)
    - La Perouse (AHIMS ID 45-6-1144)
    - La Perouse (AHIMS ID 45-6-1403)
    - La Perouse Midden 19-01 (AHIMS ID Pending)
    - Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219)
    - Kurnell Potential Archaeological Deposit 1 (K PAD 1) (AHIMS ID 52-3-1366)
- The survey identified that the La Perouse Midden 19-01 (AHIMS ID Pending), Site 1, La Perouse (AHIMS ID 45-6-0648) and Site 2, La Perouse (AHIMS ID 45-6-0649) are located on the ground surface within the La Perouse portion of the study area
- Background research completed for this assessment has identified that remnant portions of the Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) are located within the Kurnell portion of the study area.
- Background research has found that Site 3, La Perouse (AHIMS ID 45-6-0650), Site 4, La Perouse (AHIMS ID 45-6-0651), Site 5, La Perouse (AHIMS ID 45-6-0652), Site 6, La Perouse (AHIMS ID 45-6-0653), La Perouse (AHIMS ID 45-6-1144) and La Perouse (AHIMS ID 45-6-1403) are likely to be buried within the La Perouse portion of the study area.

It is therefore recommended that:

- Where possible, impacts to identified Aboriginal sites should be avoided
- Further assessment is completed in accordance with the PACHCI stage 3 requirements for inclusion in the EIS and will include:

  - A management strategy for Site 1, La Perouse (AHIMS ID 45-6-0648) and Site 2, La Perouse (AHIMS ID 45-6-0649)
  - A methodology for the identification and management of Site 3, La Perouse (AHIMS ID 45-6-0650), Site 4, La Perouse (AHIMS ID 45-6-0651), Site 5, La Perouse (AHIMS ID 45-6-0652), Site 6, La Perouse (AHIMS ID 45-6-0653), and La Perouse (AHIMS ID 45-6-1403)
  - Salvage methodology for La Perouse (AHIMS ID 45-6-1144)
  - A test excavation methodology for La Perouse Midden 19-01 (AHIMS ID Pending)
  - A test excavation methodology for Foreshore Midden - Captain Cook's Landing Place (AHIMS ID 52-3-0219) and Kurnell Potential Archaeological Deposit 1 (K PAD 1) (AHIMS ID 52-3-1366). The test excavation methodology will consider the results of a remote sensing program, the methodology and findings of previous archaeological excavations and the nature of the proposed impacts.
- Aboriginal stakeholder consultation must be carried out in accordance with the Aboriginal cultural heritage consultation requirements for proponents 2010 (the Consultation Requirements) [DECCW 2010]) and the National Parks Regulation 2019
- If any suspected human remains are located during any stage of the proposed works, work should stop immediately, and the procedures outlined in the Unexpected Heritage Items Procedure (Roads and Maritime 2015) and Requirement 25 of the Code of Practice must be followed
- Should any changes be made to the proposed works that would involve impacts outside of the study area, these changes would be assessed in accordance with Roads and Maritime PACHCI and further investigation may be necessary.

12.0 REFERENCES

Australian Museum Business Services (AMBS) 2013. Caltex Kurnell Refinery Conversion: Heritage Impact Assessment, prepared for URS Australia PTY LTD.

Attenbrow, V. 2010. Sydney's Aboriginal Past: Investigating the archaeological and historical records (2nd edition). University of New South Wales, Sydney.

Benson, D. & Eldershaw, G. 2007. "Backdrop to encounter: the 1770 landscape of Botany Bay, the plants collected by Banks and Solander and rehabilitation of natural vegetation at Kurnell. Cunninghamia 10(1): 113 – 137.

Campbell, W. D, 1899 Aboriginal Carvings of Port Jackson and Broken Bay. Government Press, Sydney.

Coast History and Heritage 2019. Aboriginal Cultural Heritage Assessment Report Stage 1 Master Plan Works Kamay Botany Bay. Report prepared for NSW National Park and Wildlife Services.

Herbert, C 1983. Sydney 1:100000 Geological Map Sheet. NSW Department of Mineral Resources.

Haglund, L. 1989 Assessment of the Prehistoric Heritage of Bare Island and La Perouse Headland. Report prepared for NSW National Parks and Wildlife Services.

Irish, P. 2007. Overview of Documented Aboriginal Cultural Heritage, Meeting Place Precinct, Botany Bay National Park, Kurnell, NSW. Report prepared for DEC and the Government Architects Office.

Irish, P. 2010. Australian Archaeological Consulting Monograph Series Vol. 3. Final Report on Aboriginal Archaeological Monitoring and Salvage Excavations Meeting Place Precinct, Botany Bay National Park, Kurnell, NSW. Report to Design Landscapes Pty Ltd and DECCW (Australian Association of Consulting Archaeologists Inc).

Jill Sheppard Heritage Consultants 2009. La Perouse Headland Botany Bay National Park Conservation Management Plan, Stage 2 – Final Report [Volume 2 of 3]. Report prepared for the NSW Department of Environment, Climate Change & Water Parks & Wildlife Group Sydney Region.

JMCHM. 2005. Archaeological salvage excavation of site CG1 (NPWS #45-5-2648), at the corner of Charles and George Streets, Parramatta, NSW. Report for Meriton Apartments Pty Ltd.

McIntyre-Tamwoy, S. 2004. Kurnell Meeting Place Enhancement Works. Results of archaeological test excavations, Report to NSW DEC.

Megaw, J.V.S. 1968. 'Trial excavations in the Captain Cook Landing Place Reserve, Kurnell, N.S.W.', Australian Institute of Aboriginal Studies Newsletter 2(9):17-20.

Megaw, J.V.S. 1969a. 'Captain Cook and the Australian Aborigine', Australian Natural History 16(8):255-60.

Megaw, J.V.S. 1969b. 'Captain Cooks and bone barbs at Botany Bay', Antiquity XLIII:213-6.

Megaw, J.V.S. 1974. 'The recent archaeology of the South Sydney district – a summary', in J.V.S. Megaw (ed.), The Recent Archaeology of the Sydney District: excavations 1964-1967 (Australian Institute of Aboriginal Studies, Canberra):35-38.

Mathews, R. H. 1898 Gravures & peintures sur rochers par les Aborigines D'Australie in Extrait des Bulletins de la Societe d'Anthropologie de Paris, tome 9, series 4.

Navin Officer 2006. Botany Bay 132kV Electricity Cable Project – Cultural Heritage Assessment. Report prepared for Molino Stewart Pty Ltd.

Nugent, M. 2005. A Contextual History of Botany Bay National Park (Kurnell Section). Unpublished thesis, Monash University, Melbourne.

Office of Environment & Heritage (OEH) 2011, Shell Middens. http://www.environment.nsw.gov.au/nswcultureheritage/ShellMiddens.htm, accessed 7 February 2012.

Sheppard, J. 2009. La Perouse Headland Conservation Management Plan Stage 2, prepared for NSW Department of Environment, Climate Change and Water (now DPIE – Heritage).

Sim, I.M. 1960. Record of rock engravings of the Sydney District. Mankind Volume 6, No 20

APPENDIX 1 – LA PEROUSE LALC SITE OFFICER REPORT

APPENDIX 2 – AHIMS DATABASE SEARCH RESULTS

artefact

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PACHCI Stage 2 Report

Attachment C Biodiversity data

Biodiversity data (PSMT and BioNet data, and potential significant fauna and flora species within the proposal area)

Potential significant fauna and flora species within the proposal area

Scientific Name	Common Name	BC Status	EPBC Status	Likelihood
Birds				
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered	Likely
Calidris alba	Sanderling	Vulnerable	-	Possible
Calidris ferruginea	Curlew Sandpiper	Endangered	Critically endangered	Possible
Calidris tenuirostris	Great Knot	Vulnerable	Critically endangered	Possible
Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable		Possible
Charadrius leschenaultii	Greater Sand-plover	Vulnerable	Vulnerable	Possible
Charadrius mongolus	Lesser Sand-plover	Vulnerable	Endangered	Possible
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	-	Possible
Diomedea epomophora	Southern Royal Albatross	-	Vulnerable	Possible
Diomedea sanfordi	Northern Royal Albatross	-	Endangered	Possible
Epthianura albifrons	White-fronted Chat	Vulnerable	-	Possible
Gygis alba	White Tern	Vulnerable	-	Possible
Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	-	Possible
Haematopus longirostris	Pied Oystercatcher	Endangered	-	Likely
Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	-	Likely
Limosa	Black-tailed Godwit	Vulnerable	-	Possible
Neophema chrysogaster	Orange-bellied Parrot	Endangered	Critically endangered	Possible
Ninox strenua	Powerful Owl	Vulnerable		Possible
Rostratula australis	Australian Painted Snipe	Endangered	Endangered	Possible
Sternula albifrons	Little Tern	Endangered	-	Possible
Thalassarche bulleri	Buller's Albatross	-	Vulnerable	Possible

Scientific Name	Common Name	BC Status	EPBC Status	Likelihood
Thalassarche bulleri platei	Northern Buller's Albatross	-	Vulnerable	Possible
Thalassarche cauta steadi	White-capped Albatross	-	Vulnerable	Possible
Thalassarche eremita	Chatham Albatross	-	Endangered	Possible
Thalassarche impavida	Campbell Albatross	-	Vulnerable	Possible
Thalassarche salvini	Salvin's Albatross	-	Vulnerable	Possible
Thinornis rubricollis	Hooded Plover	Endangered	Vulnerable	Possible
Reptiles				
Caretta	Loggerhead Turtle	Endangered	Endangered	Possible
Crinia tinnula	Wallum Froglet	Vulnerable	-	Likely
Litoria aurea	Green and Golden Bell Frog	Endangered	Vulnerable	Likely
Mammals				
Balaenoptera edeni	Bryde's Whale	-	-	Possible
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Vulnerable	Possible
Dugong dugon	Dugong	Endangered	-	Possible
Eubalaena australis	Southern Right Whale	Endangered	Endangered	Possible
Isoodon obesulus	Southern Brown Bandicoot	Endangered	Endangered	Possible
Megaptera novaeangliae	Humpback Whale	Vulnerable	Vulnerable	Possible
Miniopterus australis	Little Bent-winged Bat	Vulnerable	-	Likely
Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	-	Likely
Myotis macropus	Southern Myotis	Vulnerable	-	Likely
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	Possible
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable		Possible
Sharks				
Carcharias taurus (east coast population)	Grey Nurse Shark (east coast population)	-	Critically endangered	Possible
Carcharodon carcharias	Great White Shark	-	Vulnerable	Possible
Fin fish				
Epinephelus daemelii	Black Rockcod	Vulnerable	Vulnerable	Possible
Hippocampus whitei)	White’s Seahorse	Endangered		Possible

Scientific Name	Common Name	BC Status	EPBC Status	Likelihood
Plants				
Acacia bynoeana	Bynoe's Wattle	Endangered	Vulnerable	Possible
Acacia pubescens	Downy Wattle	Vulnerable	Vulnerable	Possible
Acacia terminalis	Sunshine Wattle	Endangered	Endangered	Likely
Allocasuarina glareicola	-	Endangered	Endangered	Possible
Caladenia tessellata	Thick-lipped Spider-orchid	Endangered	Vulnerable	Possible
Callistemon linearifolius	Netted Bottle Brush	Vulnerable	-	Likely
Cryptostylis hunteriana	Leafless Tongue-orchid	Vulnerable	Vulnerable	Possible
Epacris purpurascens var. purpurascens	-	Vulnerable	-	Possible
Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Vulnerable	Possible
Prostanthera densa	Villous Mintbush	-	Vulnerable	Possible
Pterostylis sp. Botany Bay	Botany Bay Bearded Orchid	Endangered	Endangered	Likely
Senecio spathulatus	Coast Groundsel	Endangered	-	Likely
Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Vulnerable	Likely
Thelymitra atronitida	Black-hooded Sun Orchid	Endangered	-	Possible

Australian Government
Department of the Environment and Energy

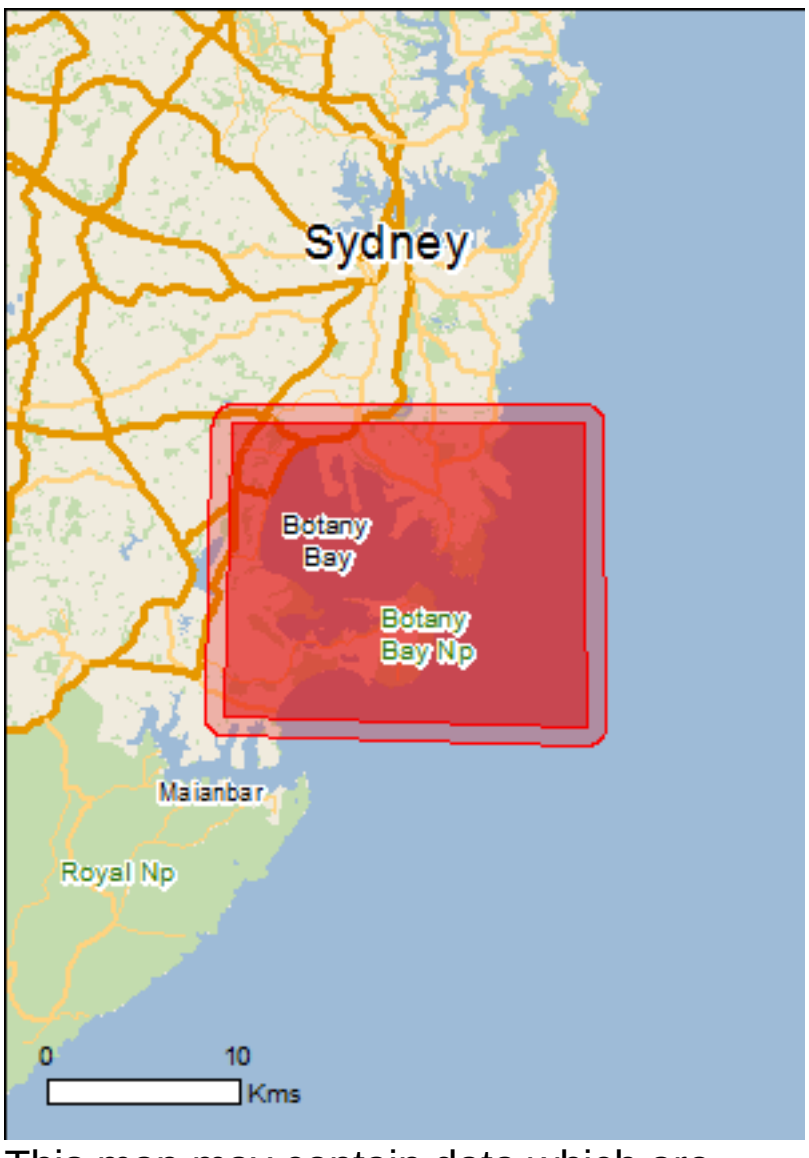
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

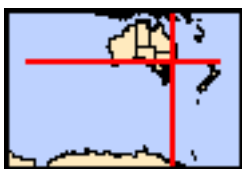
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 08/01/20 15:37:00



Coordinates

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	11
Listed Threatened Species:	86
Listed Migratory Species:	80

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	14
Commonwealth Heritage Places:	5
Listed Marine Species:	104
Whales and Other Cetaceans:	16
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	None
Invasive Species:	49
Nationally Important Wetlands:	3
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

National Heritage Properties [Resource Information]

Name	State	Status
Historic		
Kamay Botany Bay: botanical collection sites	NSW	Listed place
Kurnell Peninsula Headland	NSW	Listed place

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Towra point nature reserve	Within Ramsar site

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name
EEZ and Territorial Sea

Marine Regions [Resource Information]

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name
Temperate East

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community likely to occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Eastern Suburbs Banksia Scrub of the Sydney Region	Endangered	Community known to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion	Endangered	Community likely to occur within area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		

Name	Status	Type of Presence
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Status	Type of Presence
Thinornis rubricollis rubricollis		
Hooded Plover (eastern) [66726]	Vulnerable	Species or species habitat known to occur within area
Fish		
Epinephelus daemelii		
Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Heleioporus australiacus		
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria littlejohni		
Littlejohn's Tree Frog, Heath Frog [64733]	Vulnerable	Species or species habitat may occur within area
Litoria raniformis		
Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat may occur within area
Insects		
Synemon plana		
Golden Sun Moth [25234]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus		
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae		
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
Acacia pubescens Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area
Acacia terminalis subsp. terminalis MS Sunshine Wattle (Sydney region) [88882]	Endangered	Species or species habitat known to occur within area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Genoplesium baueri Yellow Gnat-orchid [7528]	Endangered	Species or species habitat likely to occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat likely to occur within area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat likely to occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat may occur within area
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
[Pterostylis saxicola](#)		
Sydney Plains Greenhood [64537]	Endangered	Species or species habitat likely to occur within area
[Pterostylis sp. Botany Bay (A.Bishop J221/1-13)](#)		
Botany Bay Bearded Greenhood, Botany Bay Bearded Orchid [64965]	Endangered	Species or species habitat likely to occur within area
[Syzygium paniculatum](#)		
Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area
[Thelymitra kangaloonica](#)		
Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat may occur within area
[Thesium australe](#)		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
[Caretta caretta](#)		
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
[Chelonia mydas](#)		
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Dermochelys coriacea](#)		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
[Eretmochelys imbricata](#)		
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Hoplocephalus bungaroides](#)		
Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area
[Natator depressus](#)		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
[Carcharias taurus (east coast population)](#)		
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat known to occur within area
[Carcharodon carcharias](#)		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
[Rhincodon typus](#)		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
[Anous stolidus](#)		
Common Noddy [825]		Species or species habitat likely to occur within area
[Apus pacificus](#)		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]		Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or

Name	Threatened	Type of Presence
		related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur

Name	Threatened	Type of Presence within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -
Commonwealth Land - Airservices Australia
Commonwealth Land - Australian & Overseas Telecommunications Corporation
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Defence Housing Authority
Commonwealth Land - Defence Service Homes Corporation
Commonwealth Land - Defence Service Homes Corporation & Alice Isabel Patterson
Commonwealth Land - Director of War Service Homes
Commonwealth Land - Telstra Corporation Limited
Defence - BANKSMEADOW DEPOT (Sydney Workshop Company)
Defence - ENDEAVOUR HOUSE - COOGEE
Defence - RANDWICK BARRACKS
Defence - ROCKDALE TRAINING DEPOT

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
Malabar Headland	NSW	Listed place
Historic		
Botany Post Office	NSW	Listed place
Cape Baily Lighthouse	NSW	Listed place
Cronulla Post Office	NSW	Listed place
Sydney Airport Air Traffic Control Tower	NSW	Listed place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Roosting known to occur within area
Heteroscelus incanus Wandering Tattler [59547]		Roosting known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Puffinus griseus Sooty Shearwater [1024]		Species or species habitat likely to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
Sterna albifrons Little Tern [813]		Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely

Name	Threatened	Type of Presence
		to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat known to occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known

Name	Threatened	Type of Presence
		to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Stenella attenuata		
Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus		
Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str.		
Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Kamay Botany Bay	NSW
Malabar Headland	NSW
Towra Point	NSW
Wolli Creek	NSW

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis		
Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris		
European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata		
Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus		
Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern,		Species or species

Name	Status	Type of Presence
Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425] Asparagus asparagoides		habitat likely to occur within area
Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473] Asparagus plumosus		Species or species habitat likely to occur within area
Climbing Asparagus-fern [48993] Asparagus scandens		Species or species habitat likely to occur within area
Asparagus Fern, Climbing Asparagus Fern [23255] Cabomba caroliniana		Species or species habitat likely to occur within area
Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Chrysanthemoides monilifera		Species or species habitat likely to occur within area
Bitou Bush, Boneseed [18983] Chrysanthemoides monilifera subsp. monilifera		Species or species habitat may occur within area
Boneseed [16905] Chrysanthemoides monilifera subsp. rotundata		Species or species habitat likely to occur within area
Bitou Bush [16332] Cytisus scoparius		Species or species habitat likely to occur within area
Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934] Dolichandra unguis-cati		Species or species habitat likely to occur within area
Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119] Eichhornia crassipes		Species or species habitat likely to occur within area
Water Hyacinth, Water Orchid, Nile Lily [13466] Genista linifolia		Species or species habitat likely to occur within area
Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800] Genista monspessulana		Species or species habitat likely to occur within area
Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126] Genista sp. X Genista monspessulana		Species or species habitat likely to occur within area
Broom [67538] Lantana camara		Species or species habitat may occur within area
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Lycium ferocissimum		Species or species habitat likely to occur within area
African Boxthorn, Boxthorn [19235] Opuntia spp.		Species or species habitat likely to occur within area
Prickly Pears [82753] Pinus radiata		Species or species habitat likely to occur within area
Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780] Rubus fruticosus aggregate		Species or species habitat may occur within area
Blackberry, European Blackberry [68406]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Botany Wetlands	NSW
Eve St. Marsh, Arncliffe	NSW
Towra Point Estuarine Wetlands	NSW

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-33.93917 151.134935,-33.93917 151.299387,-34.056724 151.300417,-34.052742 151.131159,-33.940879 151.134248,-33.93917 151.134935

Acknowledgements

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

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

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

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Data from the BioNet BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1Â°; ^^ rounded to 0.01Â°). Copyright the State of NSW through the Office of Environment and Heritage. Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) ,Commonwealth listed ,Protected ,CAMBA listed ,JAMBA listed ,ROKAMBA listed or Native listed Entities in selected area [North: -33.95 West: 151.17 East: 151.30 South: -34.05] returned a total of 21,603 records of 1,251 species.
Report generated on 9/01/2020 10:18 AM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3134	*Crinia signifera*		Common Eastern Froglet	P		111	
Animalia	Amphibia	Myobatrachidae	T118	*Crinia sp.*			P		2	
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P		36	
Animalia	Amphibia	Myobatrachidae	3058	*Limnodynastes dumerilii*		Eastern Banjo Frog	P		18	
Animalia	Amphibia	Myobatrachidae	3902	*Limnodynastes dumerilii grayi*			P		7	
Animalia	Amphibia	Myobatrachidae	3061	*Limnodynastes peronii*		Brown-striped Frog	P		132	
Animalia	Amphibia	Myobatrachidae	3063	*Limnodynastes tasmaniensis*		Spotted Grass Frog	P		3	
Animalia	Amphibia	Myobatrachidae	3103	*Paracrinia haswelli*		Haswell's Froglet	P		1	
Animalia	Amphibia	Myobatrachidae	3117	*Pseudophryne bibronii*		Bibron's Toadlet	P		2	
Animalia	Amphibia	Myobatrachidae	3158	*Uperoleia laevigata*		Smooth Toadlet	P		6	
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P	V	134	
Animalia	Amphibia	Hylidae	3180	*Litoria dentata*		Bleating Tree Frog	P		14	
Animalia	Amphibia	Hylidae	3183	*Litoria fallax*		Eastern Dwarf Tree Frog	P		12	
Animalia	Amphibia	Hylidae	3190	*Litoria jervisiensis*		Jervis Bay Tree Frog	P		29	
Animalia	Amphibia	Hylidae	3191	*Litoria latopalmata*		Broad-palmed Frog	P		2	
Animalia	Amphibia	Hylidae	3316	*Litoria lesueuri*		Lesueur's Frog	P		1	
Animalia	Amphibia	Hylidae	3204	*Litoria peronii*		Peron's Tree Frog	P		50	
Animalia	Amphibia	Hylidae	3214	*Litoria tyleri*		Tyler's Tree Frog	P		5	
Animalia	Amphibia	Hylidae	3215	*Litoria verreauxii*		Verreaux's Frog	P		8	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	3	
Animalia	Reptilia	Cheloniidae	2008	*Eretmochelys imbricata*		Hawksbill Turtle	P	V	1	
Animalia	Reptilia	Chelidae	2017	*Chelodina longicollis*		Eastern Snake-necked Turtle	P		12	
Animalia	Reptilia	Chelidae	9057	*Emydura sp.*		Unidentified Emydura	P		2	
Animalia	Reptilia	Gekkonidae	2118	*Amalosia lesueurii*		Lesueur's Velvet Gecko	P		4	
Animalia	Reptilia	Gekkonidae	2077	*Diplodactylus vittatus*		Wood Gecko	P		2	
Animalia	Reptilia	Gekkonidae	2129	*Phyllurus platurus*		Broad-tailed Gecko	P		1	
Animalia	Reptilia	Pygopodidae	2170	*Lialis burtonis*		Burton's Snake-lizard	P		2	
Animalia	Reptilia	Pygopodidae	2174	*Pygopus lepidopodus*		Common Scaly-foot	P		12	
Animalia	Reptilia	Scincidae	2464	*Acritoscincus platynota*		Red-throated Skink	P		6	
Animalia	Reptilia	Scincidae	2331	*Cryptoblepharus virgatus*		Cream-striped Shinning-skink	P		2	
Animalia	Reptilia	Scincidae	2375	*Ctenotus robustus*		Robust Ctenotus	P		6	
Animalia	Reptilia	Scincidae	2386	*Ctenotus taeniolatus*		Copper-tailed Skink	P		44	
Animalia	Reptilia	Scincidae	2866	*Cyclodomorphus michaeli*		Mainland She-oak Skink	P		1	
Animalia	Reptilia	Scincidae	2557	*Eulamprus quoyii*		Eastern Water-skink	P		58	
Animalia	Reptilia	Scincidae	2559	*Eulamprus tenuis*		Barred-sided Skink	P		3	
Animalia	Reptilia	Scincidae	2450	*Lampropholis delicata*		Dark-flecked Garden Sunskink	P		77	
Animalia	Reptilia	Scincidae	2451	*Lampropholis guichenoti*		Pale-flecked Garden Sunskink	P		21	
Animalia	Reptilia	Scincidae	T117	*Lampropholis sp.*		unidentified grass skink	P		1	
Animalia	Reptilia	Scincidae	2430	*Liopholis whitii*		White's Skink	P		5	
Animalia	Reptilia	Scincidae	2542	*Saiphos equalis*		Three-toed Skink	P		14	
Animalia	Reptilia	Scincidae	2452	*Saproscincus mustelinus*		Weasel Skink	P		5	
Animalia	Reptilia	Scincidae	2580	*Tiliqua scincoides*		Eastern Blue-tongue	P		121	

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Reptilia	Agamidae	2194	*Amphibolurus muricatus*		Jacky Lizard	P		41	
Animalia	Reptilia	Agamidae	2252	*Intellagama lesueurii*		Eastern Water Dragon	P		5	
Animalia	Reptilia	Agamidae	2177	*Pogona barbata*		Bearded Dragon	P		2	
Animalia	Reptilia	Agamidae	2182	*Rankinia diemensis*		Mountain Dragon	P		4	
Animalia	Reptilia	Varanidae	2283	*Varanus varius*		Lace Monitor	P		4	
Animalia	Reptilia	Typhlopidae	2599	*Anilios nigrescens*		Blackish Blind Snake	P		2	
Animalia	Reptilia	Pythonidae	2625	*Morelia spilota*		Carpet & Diamond Pythons	P		1	
Animalia	Reptilia	Colubridae	2633	*Dendrelaphis punctulatus*		Common Tree Snake	P		3	
Animalia	Reptilia	Elapidae	2647	*Cacophis squamulosus*		Golden-crowned Snake	P		1	
Animalia	Reptilia	Elapidae	5136	*Cryptophis nigrescens*		Eastern Small-eyed Snake	P		2	
Animalia	Reptilia	Elapidae	2655	*Demansia psammophis*		Yellow-faced Whip Snake	P		8	
Animalia	Reptilia	Elapidae	2674	*Hemiaspis signata*		Black-bellied Swamp Snake	P		15	
Animalia	Reptilia	Elapidae	2754	*Hydrophis elegans*		Elegant Seasnake	P		3	
Animalia	Reptilia	Elapidae	2770	*Pelamis platurus*		Yellow-bellied Seasnake	P		2	
Animalia	Reptilia	Elapidae	2693	*Pseudechis porphyriacus*		Red-bellied Black Snake	P		62	
Animalia	Reptilia	Elapidae	2699	*Pseudonaja textilis*		Eastern Brown Snake	P		12	
Animalia	Reptilia	Elapidae	2734	*Vermicella annulata*		Bandy-bandy	P		1	
Animalia	Aves	Phasianidae	0009	*Coturnix pectoralis*		Stubble Quail	P		2	
Animalia	Aves	Phasianidae	9046	*Coturnix sp.*		Unidentified Quail	P		3	
Animalia	Aves	Phasianidae	0011	*Coturnix ypsilophora*		Brown Quail	P		29	
Animalia	Aves	Phasianidae	0012	*Excalfactoria chinensis*		King Quail	P		1	
Animalia	Aves	Anatidae	0210	*Anas castanea*		Chestnut Teal	P		27	
Animalia	Aves	Anatidae	0211	*Anas gracilis*		Grey Teal	P		14	
Animalia	Aves	Anatidae	0208	*Anas superciliosa*		Pacific Black Duck	P		40	
Animalia	Aves	Anatidae	0215	*Aythya australis*		Hardhead	P		7	
Animalia	Aves	Anatidae	0202	*Chenonetta jubata*		Australian Wood Duck	P		4	
Animalia	Aves	Anatidae	0203	*Cygnus atratus*		Black Swan	P		33	
Animalia	Aves	Anatidae	0213	*Malacorhynchus membranaceus*		Pink-eared Duck	P		1	
Animalia	Aves	Anatidae	0216	*Oxyura australis*		Blue-billed Duck	V,P		1	
Animalia	Aves	Anatidae	0207	*Tadorna tadornoides*		Australian Shelduck	P		1	
Animalia	Aves	Phaethontidae	0108	*Phaethon lepturus*		White-tailed Tropicbird	P	C,J	1	
Animalia	Aves	Podicipedidae	0062	*Poliocephalus poliocephalus*		Hoary-headed Grebe	P		1	
Animalia	Aves	Podicipedidae	0061	*Tachybaptus novaehollandiae*		Australasian Grebe	P		13	
Animalia	Aves	Columbidae	0028	*Columba leucomela*		White-headed Pigeon	P		1	
Animalia	Aves	Columbidae	0032	*Geopelia humeralis*		Bar-shouldered Dove	P		5	
Animalia	Aves	Columbidae	0044	*Leucosarcia melanoleuca*		Wonga Pigeon	P		1	
Animalia	Aves	Columbidae	0029	*Macropygia amboinensis*		Brown Cuckoo-Dove	P		1	
Animalia	Aves	Columbidae	0043	*Ocyphaps lophotes*		Crested Pigeon	P		49	
Animalia	Aves	Columbidae	0035	*Phaps elegans*		Brush Bronzewing	P		6	
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P		1	
Animalia	Aves	Podargidae	0313	*Podargus strigoides*		Tawny Frogmouth	P		15	
Animalia	Aves	Caprimulgidae	0330	*Eurostopodus mystacalis*		White-throated Nightjar	P		3	
Animalia	Aves	Apodidae	0335	*Apus pacificus*		Fork-tailed Swift	P	C,J,K	2	
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*		White-throated Needletail	P	C,J,K	8	
Animalia	Aves	Oceanitidae	0064	*Garrodia nereis*		Grey-backed Storm-Petrel	P		2	
Animalia	Aves	Oceanitidae	0063	*Oceanites oceanicus*		Wilson's Storm-Petrel	P	J	2	
Animalia	Aves	Oceanitidae	0065	*Pelagodroma marina*		White-faced Storm-Petrel	P		4	
Animalia	Aves	Diomedeidae	0086	*Diomedea exulans*		Wandering Albatross	E1,P	E,J	1412	
Animalia	Aves	Diomedeidae	0847	*Diomedea gibsoni*		Gibson's Albatross	V,P	V	1	
Animalia	Aves	Diomedeidae	0091	*Thalassarche cauta*		Shy Albatross	V,P	V	2	
Animalia	Aves	Diomedeidae	0089	*Thalassarche chlororhynchos*		Yellow-nosed Albatross	P		2	

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Aves	Diomedeidae	0088	*Thalassarche melanophris*		Black-browed Albatross	V,P	V	8	
Animalia	Aves	Procellariidae	0072	*Ardenna carneipes*		Flesh-footed Shearwater	V,P	J,K	4	
Animalia	Aves	Procellariidae	0070	*Ardenna grisea*		Sooty Shearwater	P	C,J	3	
Animalia	Aves	Procellariidae	0069	*Ardenna pacificus*		Wedge-tailed Shearwater	P	J	7	
Animalia	Aves	Procellariidae	0071	*Ardenna tenuirostris*		Short-tailed Shearwater	P	J,K	11	
Animalia	Aves	Procellariidae	0080	*Daption capense*		Cape Petrel	P		1	
Animalia	Aves	Procellariidae	0081	*Halobaena caerulea*		Blue Petrel	P	V	1	
Animalia	Aves	Procellariidae	0929	*Macronectes giganteus*		Southern Giant Petrel	E1,P	E	125	
Animalia	Aves	Procellariidae	0937	*Macronectes halli*		Northern Giant-Petrel	V,P	V	5	
Animalia	Aves	Procellariidae	0942	*Pachyptila belcheri*		Slender-billed Prion	P		1	
Animalia	Aves	Procellariidae	0084	*Pachyptila desolata*		Antarctic Prion	P		1	
Animalia	Aves	Procellariidae	0941	*Pachyptila salvini*		Salvin's Prion	P		1	
Animalia	Aves	Procellariidae	0083	*Pachyptila turtur*		Fairy Prion	P		3	
Animalia	Aves	Procellariidae	0082	*Pachyptila vittata*		Broad-billed Prion	P		1	
Animalia	Aves	Procellariidae	0085	*Pelecanoides urinatrix*		Common Diving-Petrel	P		2	
Animalia	Aves	Procellariidae	0916	*Procellaria westlandica*		Westland Petrel	P		1	
Animalia	Aves	Procellariidae	0920	*Pseudobulweria rostrata*		Tahiti Petrel	P		1	
Animalia	Aves	Procellariidae	0918	*Pterodroma cookii*		Cook's Petrel	P		1	
Animalia	Aves	Procellariidae	8684	*Pterodroma leucoptera leucoptera*		Gould's Petrel	V,P	E	1	
Animalia	Aves	Procellariidae	0075	*Pterodroma macroptera*		Great-winged Petrel	P		1	
Animalia	Aves	Procellariidae	0955	*Pterodroma nigripennis*		Black-winged Petrel	V,P		1	
Animalia	Aves	Procellariidae	0971	*Pterodroma solandri*		Providence Petrel	V,P	J	1	
Animalia	Aves	Procellariidae	0067	*Puffinus assimilis*		Little Shearwater	V,P		1	
Animalia	Aves	Procellariidae	0068	*Puffinus gavia*		Fluttering Shearwater	P		3	
Animalia	Aves	Procellariidae	0913	*Puffinus huttoni*		Hutton's Shearwater	P		1	
Animalia	Aves	Spheniscidae	0005	*Eudyptula minor*		Little Penguin	P		37	
Animalia	Aves	Fregatidae	0095	*Fregata ariel*		Lesser Frigatebird	P	C,J,K	1	
Animalia	Aves	Sulidae	0104	*Morus serrator*		Australasian Gannet	P		22	
Animalia	Aves	Sulidae	0102	*Sula leucogaster*		Brown Booby	P	C,J,K	4	
Animalia	Aves	Anhingidae	8731	*Anhinga novaehollandiae*		Australasian Darter	P		40	
Animalia	Aves	Phalacrocoracidae	0100	*Microcarbo melanoleucos*		Little Pied Cormorant	P		525	
Animalia	Aves	Phalacrocoracidae	0096	*Phalacrocorax carbo*		Great Cormorant	P		249	
Animalia	Aves	Phalacrocoracidae	T021	*Phalacrocorax sp.*		Unidentified Cormorant	P		14	
Animalia	Aves	Phalacrocoracidae	0097	*Phalacrocorax sulcirostris*		Little Black Cormorant	P		426	
Animalia	Aves	Phalacrocoracidae	0099	*Phalacrocorax varius*		Pied Cormorant	P		401	
Animalia	Aves	Pelecanidae	0106	*Pelecanus conspicillatus*		Australian Pelican	P		366	
Animalia	Aves	Ardeidae	0977	*Ardea ibis*		Cattle Egret	P	C,J	9	
Animalia	Aves	Ardeidae	0186	*Ardea intermedia*		Intermediate Egret	P		5	
Animalia	Aves	Ardeidae	8712	*Ardea modesta*		Eastern Great Egret	P		39	
Animalia	Aves	Ardeidae	0189	*Ardea pacifica*		White-necked Heron	P		1	
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*		Australasian Bittern	E1,P	E	3	
Animalia	Aves	Ardeidae	0193	*Butorides striatus*		Striated Heron	P		16	
Animalia	Aves	Ardeidae	0185	*Egretta garzetta*		Little Egret	P		24	
Animalia	Aves	Ardeidae	0188	*Egretta novaehollandiae*		White-faced Heron	P		165	
Animalia	Aves	Ardeidae	0191	*Egretta sacra*		Eastern Reef Egret	P	C	89	
Animalia	Aves	Ardeidae	0192	*Nycticorax caledonicus*		Nankeen Night Heron	P		6	
Animalia	Aves	Threskiornithidae	0181	*Platalea regia*		Royal Spoonbill	P		20	
Animalia	Aves	Threskiornithidae	0178	*Plegadis falcinellus*		Glossy Ibis	P	C	2	
Animalia	Aves	Threskiornithidae	0179	*Threskiornis molucca*		Australian White Ibis	P		92	
Animalia	Aves	Accipitridae	0222	*Accipiter cirrocephalus*		Collared Sparrowhawk	P		4	

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Aves	Accipitridae	0221	*Accipiter fasciatus*		Brown Goshawk	P		18	
Animalia	Aves	Accipitridae	0220	*Accipiter novaehollandiae*		Grey Goshawk	P		1	
Animalia	Aves	Accipitridae	0224	*Aquila audax*		Wedge-tailed Eagle	P		1	
Animalia	Aves	Accipitridae	0219	*Circus approximans*		Swamp Harrier	P		7	
Animalia	Aves	Accipitridae	0232	*Elanus axillaris*		Black-shouldered Kite	P		32	
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*		White-bellied Sea-Eagle	V,P	C	37	
Animalia	Aves	Accipitridae	0228	*Haliastur sphenurus*		Whistling Kite	P		7	
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*		Square-tailed Kite	V,P,3		1	
Animalia	Aves	Accipitridae	8739	*^^Pandion cristatus*		Eastern Osprey	V,P,3		7	
Animalia	Aves	Falconidae	0239	*Falco berigora*		Brown Falcon	P		5	
Animalia	Aves	Falconidae	0240	*Falco cenchroides*		Nankeen Kestrel	P		42	
Animalia	Aves	Falconidae	0235	*Falco longipennis*		Australian Hobby	P		1	
Animalia	Aves	Falconidae	0237	*Falco peregrinus*		Peregrine Falcon	P		12	
Animalia	Aves	Falconidae	9043	*Falco sp.*		Unidentified Falcon	P		1	
Animalia	Aves	Rallidae	0059	*Fulica atra*		Eurasian Coot	P		8	
Animalia	Aves	Rallidae	0056	*Gallinula tenebrosa*		Dusky Moorhen	P		17	
Animalia	Aves	Rallidae	0046	*Gallirallus philippensis*		Buff-banded Rail	P		2	
Animalia	Aves	Rallidae	0045	*Lewinia pectoralis*		Lewin's Rail	P		5	
Animalia	Aves	Rallidae	0058	*Porphyrio porphyrio*		Purple Swamphen	P		20	
Animalia	Aves	Rallidae	0049	*Porzana fluminea*		Australian Spotted Crake	P		1	
Animalia	Aves	Rallidae	0050	*Porzana pusilla*		Baillon's Crake	P		2	
Animalia	Aves	Rallidae	0051	*Porzana tabuensis*		Spotless Crake	P		1	
Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*		Sooty Oystercatcher	V,P		183	
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*		Pied Oystercatcher	E1,P		152	
Animalia	Aves	Recurvirostridae	0146	*Himantopus himantopus*		Black-winged Stilt	P		69	
Animalia	Aves	Charadriidae	0145	*Charadrius australis*		Inland Dotterel	P		1	
Animalia	Aves	Charadriidae	0140	*Charadrius bicinctus*		Double-banded Plover	P		175	
Animalia	Aves	Charadriidae	0141	*Charadrius leschenaultii*		Greater Sand-plover	V,P	V,C,J,K	10	
Animalia	Aves	Charadriidae	0139	*Charadrius mongolus*		Lesser Sand-plover	V,P	E,C,J,K	48	
Animalia	Aves	Charadriidae	0143	*Charadrius ruficapillus*		Red-capped Plover	P		89	
Animalia	Aves	Charadriidae	0142	*Charadrius veredus*		Oriental Plover	P	J,K	2	
Animalia	Aves	Charadriidae	0144	*Elseyornis melanops*		Black-fronted Dotterel	P		10	
Animalia	Aves	Charadriidae	9023	*Pluvialis dominicus*		American Golden Plover	P		3	
Animalia	Aves	Charadriidae	8006	*Pluvialis fulva*		Pacific Golden Plover	P	C,J,K	171	
Animalia	Aves	Charadriidae	0136	*Pluvialis squatarola*		Grey Plover	P	C,J,K	16	
Animalia	Aves	Charadriidae	0138	*Thinornis rubricollis*		Hooded Plover	E4A,P	V	1	
Animalia	Aves	Charadriidae	0133	*Vanellus miles*		Masked Lapwing	P		88	
Animalia	Aves	Charadriidae	0134	*Vanellus miles novaehollandiae*		[Spur-winged Plover]	P		2	
Animalia	Aves	Charadriidae	0135	*Vanellus tricolor*		Banded Lapwing	P		3	
Animalia	Aves	Scolopacidae	0157	*Actitis hypoleucos*		Common Sandpiper	P	C,J,K	8	
Animalia	Aves	Scolopacidae	0129	*Arenaria interpres*		Ruddy Turnstone	P	C,J,K	190	
Animalia	Aves	Scolopacidae	0163	*Calidris acuminata*		Sharp-tailed Sandpiper	P	C,J,K	50	
Animalia	Aves	Scolopacidae	0166	*Calidris alba*		Sanderling	V,P	C,J,K	23	
Animalia	Aves	Scolopacidae	0890	*Calidris bairdii*		Baird's Sandpiper	P	J,K	1	
Animalia	Aves	Scolopacidae	0164	*Calidris canutus*		Red Knot	P	E,C,J,K	56	
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*		Curlew Sandpiper	E1,P	CE,C,J,K	60	
Animalia	Aves	Scolopacidae	0978	*Calidris melanotos*		Pectoral Sandpiper	P	J,K	2	
Animalia	Aves	Scolopacidae	0162	*Calidris ruficollis*		Red-necked Stint	P	C,J,K	276	
Animalia	Aves	Scolopacidae	0165	*Calidris tenuirostris*		Great Knot	V,P	CE,C,J,K	18	
Animalia	Aves	Scolopacidae	0168	*Gallinago hardwickii*		Latham's Snipe	P	C,J,K	5	
Animalia	Aves	Scolopacidae	0167	*Limicola falcinellus*		Broad-billed Sandpiper	V,P	C,J,K	5	
Animalia	Aves	Scolopacidae	0153	*Limosa lapponica*		Bar-tailed Godwit	P	C,J,K	264	
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*		Black-tailed Godwit	V,P	C,J,K	5	
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*		Eastern Curlew	P	CE,C,J,K	188	
Animalia	Aves	Scolopacidae	0150	*Numenius phaeopus*		Whimbrel	P	C,J,K	111	
Animalia	Aves	Scolopacidae	0934	*Philomachus pugnax*		Ruff	P	C,J,K	1	
Animalia	Aves	Scolopacidae	0155	*Tringa brevipes*		Grey-tailed Tattler	P	C,J,K	89	
Animalia	Aves	Scolopacidae	0154	*Tringa glareola*		Wood Sandpiper	P	C,J,K	2	
Animalia	Aves	Scolopacidae	0156	*Tringa incana*		Wandering Tattler	P	J	17	
Animalia	Aves	Scolopacidae	0158	*Tringa nebularia*		Common Greenshank	P	C,J,K	1	

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Animalia	Aves	Scolopacidae	0887	*Tryngites subruficollis*		Buff-breasted Sandpiper	P	J,K	1	
Animalia	Aves	Scolopacidae	0160	*Xenus cinereus*		Terek Sandpiper	V,P	C,J,K	9	
Animalia	Aves	Turnicidae	0014	*Turnix varius*		Painted Button-quail	P		2	
Animalia	Aves	Stercorcariidae	0980	*Catharacta skua*		Great Skua	P		1	
Animalia	Aves	Stercorcariidae	0128	*Stercorarius parasiticus*		Arctic Jaeger	P	J,K	5	
Animalia	Aves	Stercorcariidae	0945	*Stercorarius pomarinus*		Pomarine Jaeger	P	C,J	3	
Animalia	Aves	Laridae	0122	*Anous stolidus*		Common Noddy	P	C,J	1	
Animalia	Aves	Laridae	0110	*Chlidonias hybrida*		Whiskered Tern	P		9	
Animalia	Aves	Laridae	0109	*Chlidonias leucopterus*		White-winged Black Tern	P	C,J,K	7	
Animalia	Aves	Laridae	0884	*Chlidonias niger*		Black Tern	P	C,J	1	
Animalia	Aves	Laridae	0125	*Chroicocephalus novaehollandiae*		Silver Gull	P		629	
Animalia	Aves	Laridae	0111	*Gelochelidon nilotica*		Gull-billed Tern	P	C	1	
Animalia	Aves	Laridae	0972	*Gygis alba*		White Tern	V,P		1	
Animalia	Aves	Laridae	0112	*Hydroprogne caspia*		Caspian Tern	P	C,J	38	
Animalia	Aves	Laridae	0981	*Larus dominicanus*		Kelp Gull	P		150	
Animalia	Aves	Laridae	0126	*Larus pacificus*		Pacific Gull	P		10	
Animalia	Aves	Laridae	0120	*Onychoprion fuscata*		Sooty Tern	V,P		1	
Animalia	Aves	Laridae	9926	*Procelsterna cerulea*		Grey Ternlet	V,P		1	
Animalia	Aves	Laridae	0953	*Sterna hirundo*		Common Tern	P	C,J,K	81	
Animalia	Aves	Laridae	0952	*Sterna paradisaea*		Arctic Tern	P		1	
Animalia	Aves	Laridae	0114	*Sterna striata*		White-fronted Tern	P		20	
Animalia	Aves	Laridae	0117	*Sternula albifrons*		Little Tern	E1,P	C,J,K	458	
Animalia	Aves	Laridae	0118	*Sternula nereis*		Fairy Tern	P		2	
Animalia	Aves	Laridae	0115	*Thalasseus bergii*		Crested Tern	P		410	
Animalia	Aves	Cacatuidae	0269	*Cacatua galerita*		Sulphur-crested Cockatoo	P		49	
Animalia	Aves	Cacatuidae	0271	*Cacatua sanguinea*		Little Corella	P		6	
Animalia	Aves	Cacatuidae	T187	*Cacatua sp.*			P		3	
Animalia	Aves	Cacatuidae	0272	*Cacatua tenuirostris*		Long-billed Corella	P		3	
Animalia	Aves	Cacatuidae	0268	*^^Callocephalon fimbriatum*		Gang-gang Cockatoo	V,P,3		1	
Animalia	Aves	Cacatuidae	0267	*Calyptorhynchus funereus*		Yellow-tailed Black-Cockatoo	P		36	
Animalia	Aves	Cacatuidae	0265	*^Calyptorhynchus lathami*		Glossy Black-Cockatoo	V,P,2		1	
Animalia	Aves	Cacatuidae	0273	*Eolophus roseicapillus*		Galah	P		30	
Animalia	Aves	Cacatuidae	0274	*Nymphicus hollandicus*		Cockatiel	P		2	
Animalia	Aves	Psittacidae	0281	*Alisterus scapularis*		Australian King-Parrot	P		1	
Animalia	Aves	Psittacidae	0258	*Glossopsitta concinna*		Musk Lorikeet	P		7	
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*		Little Lorikeet	V,P		1	
Animalia	Aves	Psittacidae	0309	*^^Lathamus discolor*		Swift Parrot	E1,P,3	CE	2	
Animalia	Aves	Psittacidae	0305	*^^Neophema chrysogaster*		Orange-bellied Parrot	E4A,P,3	CE	1	
Animalia	Aves	Psittacidae	8913	*^^Pezoporus wallicus wallicus*		Eastern Ground Parrot	V,P,3		2	
Animalia	Aves	Psittacidae	0286	*Platycercus adscitus*		Pale-headed Rosella	P		1	
Animalia	Aves	Psittacidae	E/PH	*Platycercus adscitus adscitus x eximius*		Eastern/Pale-headed Rosella	P		1	
Animalia	Aves	Psittacidae	0282	*Platycercus elegans*		Crimson Rosella	P		34	
Animalia	Aves	Psittacidae	8893	*Platycercus elegans elegans*			P		1	
Animalia	Aves	Psittacidae	0288	*Platycercus eximius*		Eastern Rosella	P		19	
Animalia	Aves	Psittacidae	T039	*Platycercus sp.*		Unidentified Rosella	P		5	
Animalia	Aves	Psittacidae	0277	*^^Polytelis swainsonii*		Superb Parrot	V,P,3	V	1	
Animalia	Aves	Psittacidae	0295	*Psephotus haematonotus*		Red-rumped Parrot	P		3	
Animalia	Aves	Psittacidae	0256	*Trichoglossus chlorolepidotus*		Scaly-breasted Lorikeet	P		2	
Animalia	Aves	Psittacidae	9947	*Trichoglossus haematodus*		Rainbow Lorikeet	P		260	
Animalia	Aves	Psittacidae	8882	*Trichoglossus haematodus moluccanus*			P		1	
Animalia	Aves	Centropodidae	0349	*Centropus phasianinus*		Pheasant Coucal	P		3	

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Animalia	Aves	Cuculidae	0338	*Cacomantis flabelliformis*		Fan-tailed Cuckoo	P		32	
Animalia	Aves	Cuculidae	0337	*Cacomantis pallidus*		Pallid Cuckoo	P		3	
Animalia	Aves	Cuculidae	0339	*Cacomantis variolosus*		Brush Cuckoo	P		2	
Animalia	Aves	Cuculidae	0342	*Chalcites basalis*		Horsfield's Bronze-Cuckoo	P		14	
Animalia	Aves	Cuculidae	0343	*Chalcites lucidus*		Shining Bronze-Cuckoo	P		5	
Animalia	Aves	Cuculidae	0347	*Eudynamys orientalis*		Eastern Koel	P		16	
Animalia	Aves	Cuculidae	0348	*Scythrops novaehollandiae*		Channel-billed Cuckoo	P		5	
Animalia	Aves	Strigidae	9922	*Ninox novaeseelandiae*		Southern Boobook	P		11	
Animalia	Aves	Strigidae	0248	*^^Ninox strenua*		Powerful Owl	V,P,3		7	
Animalia	Aves	Tytonidae	9923	*Tyto javanica*		Eastern Barn Owl	P		5	
Animalia	Aves	Tytonidae	0252	*^^Tyto longimembris*		Eastern Grass Owl	V,P,3		16	
Animalia	Aves	Alcedinidae	0319	*Ceyx azureus*		Azure Kingfisher	P		2	
Animalia	Aves	Alcedinidae	0322	*Dacelo novaeguineae*		Laughing Kookaburra	P		76	
Animalia	Aves	Alcedinidae	0326	*Todiramphus sanctus*		Sacred Kingfisher	P		20	
Animalia	Aves	Coraciidae	0318	*Eurystomus orientalis*		Dollarbird	P		9	
Animalia	Aves	Climacteridae	0558	*Cormobates leucophaea*		White-throated Treecreeper	P		4	
Animalia	Aves	Maluridae	0529	*Malurus cyaneus*		Superb Fairy-wren	P		120	
Animalia	Aves	Maluridae	0536	*Malurus lamberti*		Variegated Fairy-wren	P		23	
Animalia	Aves	Maluridae	8131	*Malurus lamberti lamberti*			P		1	
Animalia	Aves	Maluridae	9038	*Malurus sp.*		Unidentified Fairy-wren	P		2	
Animalia	Aves	Maluridae	0526	*Stipiturus malachurus*		Southern Emu-wren	P		30	
Animalia	Aves	Dasyornithidae	0519	*^Dasyornis brachypterus*		Eastern Bristlebird	E1,P,2	E	1	
Animalia	Aves	Acanthizidae	0486	*Acanthiza chrysorrhoa*		Yellow-rumped Thornbill	P		5	
Animalia	Aves	Acanthizidae	0470	*Acanthiza lineata*		Striated Thornbill	P		2	
Animalia	Aves	Acanthizidae	0471	*Acanthiza nana*		Yellow Thornbill	P		32	
Animalia	Aves	Acanthizidae	0475	*Acanthiza pusilla*		Brown Thornbill	P		8	
Animalia	Aves	Acanthizidae	0484	*Acanthiza reguloides*		Buff-rumped Thornbill	P		2	
Animalia	Aves	Acanthizidae	9042	*Acanthiza sp.*		Unidentified Thornbill	P		1	
Animalia	Aves	Acanthizidae	0460	*Gerygone levigaster*		Mangrove Gerygone	P		6	
Animalia	Aves	Acanthizidae	0454	*Gerygone mouki*		Brown Gerygone	P		6	
Animalia	Aves	Acanthizidae	0498	*Hylacola pyrrhopygia*		Chestnut-rumped Heathwren	P		2	
Animalia	Aves	Acanthizidae	0488	*Sericornis frontalis*		White-browed Scrubwren	P		52	
Animalia	Aves	Acanthizidae	0465	*Smicrornis brevirostris*		Weebill	P		3	
Animalia	Aves	Pardalotidae	0565	*Pardalotus punctatus*		Spotted Pardalote	P		37	
Animalia	Aves	Pardalotidae	8160	*Pardalotus punctatus punctatus*			P		1	
Animalia	Aves	Pardalotidae	0976	*Pardalotus striatus*		Striated Pardalote	P		1	
Animalia	Aves	Meliphagidae	0591	*Acanthorhynchus tenuirostris*		Eastern Spinebill	P		8	
Animalia	Aves	Meliphagidae	0638	*Anthochaera carunculata*		Red Wattlebird	P		71	
Animalia	Aves	Meliphagidae	0710	*Anthochaera chrysoptera*		Little Wattlebird	P		100	
Animalia	Aves	Meliphagidae	0603	*Anthochaera phrygia*		Regent Honeyeater	E4A,P	CE	3	
Animalia	Aves	Meliphagidae	T210	*Anthochaera sp.*		Unidentified Wattlebird	P		4	
Animalia	Aves	Meliphagidae	0614	*Caligavis chrysops*		Yellow-faced Honeyeater	P		18	
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*		White-fronted Chat	V,P		38	
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*		White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P		38	
Animalia	Aves	Meliphagidae	0593	*Gliciphila melanops*		Tawny-crowned Honeyeater	P		17	
Animalia	Aves	Meliphagidae	0597	*Lichmera indistincta*		Brown Honeyeater	P		10	
Animalia	Aves	Meliphagidae	0634	*Manorina melanocephala*		Noisy Miner	P		104	
Animalia	Aves	Meliphagidae	0605	*Meliphaga lewinii*		Lewin's Honeyeater	P		2	
Animalia	Aves	Meliphagidae	0583	*Melithreptus brevirostris*		Brown-headed Honeyeater	P		1	
Animalia	Aves	Meliphagidae	0578	*Melithreptus lunatus*		White-naped Honeyeater	P		22	

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Animalia	Aves	Meliphagidae	0586	*Myzomela sanguinolenta*		Scarlet Honeyeater	P		1	
Animalia	Aves	Meliphagidae	0645	*Philemon corniculatus*		Noisy Friarbird	P		3	
Animalia	Aves	Meliphagidae	0632	*Phylidonyris niger*		White-cheeked Honeyeater	P		3	
Animalia	Aves	Meliphagidae	0631	*Phylidonyris novaehollandiae*		New Holland Honeyeater	P		134	
Animalia	Aves	Meliphagidae	0613	*Ptilotula fuscus*		Fuscous Honeyeater	P		1	
Animalia	Aves	Meliphagidae	0625	*Ptilotula penicillatus*		White-plumed Honeyeater	P		3	
Animalia	Aves	Psophodidae	0421	*Psophodes olivaceus*		Eastern Whipbird	P		5	
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*		Varied Sittella	V,P		1	
Animalia	Aves	Campephagidae	0424	*Coracina novaehollandiae*		Black-faced Cuckoo-shrike	P		50	
Animalia	Aves	Campephagidae	8525	*Coracina novaehollandiae melanops*			P		1	
Animalia	Aves	Campephagidae	0430	*Lalage sueurii*		White-winged Triller	P		2	
Animalia	Aves	Pachycephalidae	0408	*Colluricincla harmonica*		Grey Shrike-thrush	P		6	
Animalia	Aves	Pachycephalidae	0398	*Pachycephala pectoralis*		Golden Whistler	P		14	
Animalia	Aves	Pachycephalidae	0401	*Pachycephala rufiventris*		Rufous Whistler	P		9	
Animalia	Aves	Oriolidae	0671	*Oriolus sagittatus*		Olive-backed Oriole	P		2	
Animalia	Aves	Oriolidae	0432	*Sphecotheres vieilloti*		Australasian Figbird	P		11	
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*		Dusky Woodswallow	V,P		2	
Animalia	Aves	Artamidae	0700	*Cracticus nigrogularis*		Pied Butcherbird	P		7	
Animalia	Aves	Artamidae	T022	*Cracticus sp.*		Unidentified Butcherbird	P		3	
Animalia	Aves	Artamidae	0705	*Cracticus tibicen*		Australian Magpie	P		186	
Animalia	Aves	Artamidae	8499	*Cracticus tibicen tibicen*			P		1	
Animalia	Aves	Artamidae	0702	*Cracticus torquatus*		Grey Butcherbird	P		41	
Animalia	Aves	Artamidae	8489	*Cracticus torquatus torquatus*			P		4	
Animalia	Aves	Artamidae	0694	*Strepera graculina*		Pied Currawong	P		113	
Animalia	Aves	Artamidae	T906	*Strepera sp.*			P		10	
Animalia	Aves	Dicruridae	0673	*Dicrurus bracteatus*		Spangled Drongo	P		9	
Animalia	Aves	Rhipiduridae	0361	*Rhipidura albiscapa*		Grey Fantail	P		32	
Animalia	Aves	Rhipiduridae	0364	*Rhipidura leucophrys*		Willie Wagtail	P		61	
Animalia	Aves	Rhipiduridae	0362	*Rhipidura rufifrons*		Rufous Fantail	P		1	
Animalia	Aves	Corvidae	0930	*Corvus coronoides*		Australian Raven	P		155	
Animalia	Aves	Corvidae	0954	*Corvus mellori*		Little Raven	P		1	
Animalia	Aves	Corvidae	9067	*Corvus sp.*		Unidentified Corvid	P		8	
Animalia	Aves	Monarchidae	0415	*Grallina cyanoleuca*		Magpie-lark	P		73	
Animalia	Aves	Monarchidae	0373	*Monarcha melanopsis*		Black-faced Monarch	P		4	
Animalia	Aves	Monarchidae	9955	*Myiagra inquieta*		Restless Flycatcher	P		4	
Animalia	Aves	Monarchidae	0365	*Myiagra rubecula*		Leaden Flycatcher	P		4	
Animalia	Aves	Petroicidae	0392	*Eopsaltria australis*		Eastern Yellow Robin	P		23	
Animalia	Aves	Petroicidae	0380	*Petroica boodang*		Scarlet Robin	V,P		1	
Animalia	Aves	Petroicidae	0384	*Petroica rosea*		Rose Robin	P		2	
Animalia	Aves	Cisticolidae	0525	*Cisticola exilis*		Golden-headed Cisticola	P		15	
Animalia	Aves	Acrocephalidae	0524	*Acrocephalus australis*		Australian Reed-Warbler	P		11	
Animalia	Aves	Megaluridae	0508	*Cincloramphus cruralis*		Brown Songlark	P		1	
Animalia	Aves	Megaluridae	0522	*Megalurus gramineus*		Little Grassbird	P		7	
Animalia	Aves	Megaluridae	0523	*Megalurus timoriensis*		Tawny Grassbird	P		5	
Animalia	Aves	Timaliidae	0574	*Zosterops lateralis*		Silvereye	P		99	
Animalia	Aves	Hirundinidae	0357	*Hirundo neoxena*		Welcome Swallow	P		105	
Animalia	Aves	Hirundinidae	8568	*Hirundo neoxena neoxena*			P		2	
Animalia	Aves	Hirundinidae	0360	*Petrochelidon ariel*		Fairy Martin	P		5	
Animalia	Aves	Hirundinidae	0359	*Petrochelidon nigricans*		Tree Martin	P		5	
Animalia	Aves	Nectariniidae	0564	*Dicaeum hirundinaceum*		Mistletoebird	P		9	

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Animalia	Aves	Estrildidae	0663	*Neochmia ruficauda*		Star Finch	E4,P	E	1	
Animalia	Aves	Estrildidae	0662	*Neochmia temporalis*		Red-browed Finch	P		33	
Animalia	Aves	Estrildidae	8621	*Neochmia temporalis temporalis*			P		3	
Animalia	Aves	Estrildidae	0652	*Stagonopleura guttata*		Diamond Firetail	V,P		2	
Animalia	Aves	Estrildidae	0655	*Taeniopygia bichenovii*		Double-barred Finch	P		1	
Animalia	Aves	Estrildidae	0653	*Taeniopygia guttata*		Zebra Finch	P		1	
Animalia	Aves	Motacillidae	0647	*Anthus novaeseelandiae*		Australian Pipit	P		26	
Animalia	Mammalia	Tachyglossidae	1003	*Tachyglossus aculeatus*		Short-beaked Echidna	P		3	
Animalia	Mammalia	Vombatidae	1165	*Vombatus ursinus*		Common Wombat	P		1	
Animalia	Mammalia	Petauridae	1138	*Petaurus breviceps*		Sugar Glider	P		3	
Animalia	Mammalia	Pseudocheiridae	1129	*Pseudocheirus peregrinus*		Common Ringtail Possum	P		25	
Animalia	Mammalia	Phalangeridae	T082	*Trichosurus sp.*		brushtail possum	P		14	
Animalia	Mammalia	Phalangeridae	1113	*Trichosurus vulpecula*		Common Brushtail Possum	P		220	
Animalia	Mammalia	Macropodidae	1265	*Macropus giganteus*		Eastern Grey Kangaroo	P		1	
Animalia	Mammalia	Macropodidae	T085	*Macropus sp.*		kangaroo / wallaby	P		2	
Animalia	Mammalia	Pteropodidae	1282	*Pteropus alecto*		Black Flying-fox	P		4	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*		Grey-headed Flying-fox	V,P	V	108	
Animalia	Mammalia	Pteropodidae	T087	*Pteropus sp.*		Flying-fox	P		21	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*		Yellow-bellied Sheathtail-bat	V,P		1	
Animalia	Mammalia	Molossidae	1324	*Austronomus australis*		White-striped Freetail-bat	P		11	
Animalia	Mammalia	Molossidae	9065	*Mormopterus norfolkensis/sp 1*		Unidentified Mastiff-bat	P		1	
Animalia	Mammalia	Molossidae	1938	*Mormopterus ridei*		Eastern Free-tailed Bat	P		7	
Animalia	Mammalia	Molossidae	T091	*Mormopterus sp.*		mastiff-bat	P		1	
Animalia	Mammalia	Vespertilionidae	1349	*Chalinolobus gouldii*		Gould's Wattled Bat	P		53	
Animalia	Mammalia	Vespertilionidae	1351	*Chalinolobus morio*		Chocolate Wattled Bat	P		13	
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*		Southern Myotis	V,P		2	
Animalia	Mammalia	Vespertilionidae	1335	*Nyctophilus geoffroyi*		Lesser Long-eared Bat	P		26	
Animalia	Mammalia	Vespertilionidae	1334	*Nyctophilus gouldi*		Gould's Long-eared Bat	P		6	
Animalia	Mammalia	Vespertilionidae	T092	*Nyctophilus sp.*		long-eared bat	P		8	
Animalia	Mammalia	Vespertilionidae	1377	*Vespadelus pumilus*		Eastern Forest Bat	P		1	
Animalia	Mammalia	Vespertilionidae	T088	*Vespadelus sp.*		Unidentified Eptesicus	P		1	
Animalia	Mammalia	Vespertilionidae	1379	*Vespadelus vulturnus*		Little Forest Bat	P		51	
Animalia	Mammalia	Muridae	1395	*Rattus fuscipes*		Bush Rat	P		2	
Animalia	Mammalia	Muridae	T094	*Rattus sp.*		rat	P		3	
Animalia	Mammalia	Dugongidae	1558	*Dugong dugon*		Dugong	E1,P		4	
Animalia	Mammalia	Otariidae	1543	*Arctocephalus forsteri*		New Zealand Fur-seal	V,P		4	
Animalia	Mammalia	Otariidae	1882	*Arctocephalus pusillus doriferus*		Australian Fur-seal	V,P		4	
Animalia	Mammalia	Otariidae	T099	*Arctocephalus sp.*		Unidentified Fur-seal	P		1	
Animalia	Mammalia	Otariidae	1013	*Arctocephalus tropicalis*		Subantarctic Fur-seal	P		1	
Animalia	Mammalia	Otariidae	1539	*Neophoca cinerea*		Australian Sea-lion	P		1	
Animalia	Mammalia	Otariidae	9040	*Seal sp.*		Unidentified Seal	P		5	
Animalia	Mammalia	Phocidae	1549	*Hydrurga leptonyx*		Leopard Seal	P		5	
Animalia	Mammalia	Balaenidae	1561	*Eubalaena australis*		Southern Right Whale	E1,P	E	3	

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Animalia	Mammalia	Balaenopteridae	1570	*Balaenoptera acutorostrata*		Dwarf Minke Whale	P		1	
Animalia	Mammalia	Balaenopteridae	1575	*Megaptera novaeangliae*		Humpback Whale	V,P	V	16	
Animalia	Mammalia	Balaenopteridae	9041	*Whale sp.*		Unidentified Whale	P		1	
Animalia	Mammalia	Kogiidae	1581	*Kogia breviceps*		Pygmy Sperm Whale	P		1	
Animalia	Mammalia	Ziphiidae	1591	*Mesoplodon layardii*		Strap-toothed Beaked Whale	P		1	
Animalia	Mammalia	Delphinidae	1616	*Delphinus delphis*		Common Dolphin	P		4	
Animalia	Mammalia	Delphinidae	9039	*Dolphin sp.*		Unidentified Dolphin	P		1	
Animalia	Mammalia	Delphinidae	1603	*Pseudorca crassidens*		False Killer Whale	P		2	
Animalia	Mammalia	Delphinidae	1619	*Stenella coeruleoalba*		Striped Dolphin	P		1	
Animalia	Mammalia	Delphinidae	1900	*Tursiops truncatus*		Bottlenose Dolphin	P		5	
Animalia	Arachnida	Buthidae	I129	*Lychas marmoreus*		Marbled Scorpion			1	
Animalia	Gastropoda	Camaenidae	I093	*Meridolum sp.*					1	
Animalia	Unknown	Unknown Fauna	T202	*(Microchiroptera suborder) (Microchiroptera*		Unidentified Microbat			1	
Animalia	Unknown	Unknown Fauna	9113	*Bird sp.*		Feathers (unknown species)			1	
Animalia	Unknown	Unknown Fauna	T350	*Fauna sp.*		Unidentified Fauna			22	
Animalia	Unknown	Unknown Fauna	9114	*Insect sp.*		Insect Remains			1	
Animalia	Unknown	Unknown Fauna	T351	*Mammal sp.*		Unidentified Mammal			2	
Animalia	Unknown	Unknown Fauna	9117	*Reptile sp.*		Unidentified Reptile			1	
Plantae	Flora	Acanthaceae	10427	*Avicennia marina subsp. australasica*		Grey Mangrove			3	
Plantae	Flora	Adiantaceae	8444	*Pellaea falcata*		Sickle Fern			2	
Plantae	Flora	Adiantaceae	8010	*Pellaea paradoxa*					1	
Plantae	Flora	Adoxaceae	SAMB	*Sambucus spp.*					1	
Plantae	Flora	Agavaceae	YUCC	*Yucca spp.*					3	
Plantae	Flora	Aizoaceae	1025	*Carpobrotus glaucescens*		Pigface			34	
Plantae	Flora	Aizoaceae	CARO	*Carpobrotus spp.*					1	
Plantae	Flora	Aizoaceae	11185	*Tetragonia tetragonioides*		New Zealand Spinach			8	
Plantae	Flora	Alismataceae	1043	*Alisma plantago-aquatica*		Water Plantain			1	
Plantae	Flora	Amaryllidaceae	3539	*Crinum pedunculatum*		Swamp Lily			5	
Plantae	Flora	Anthericaceae	3535	*Caesia parviflora*		Pale Grass-lily			1	
Plantae	Flora	Anthericaceae	3567	*Sowerbaea juncea*		Vanilla Plant			3	
Plantae	Flora	Anthericaceae	3572	*Thysanotus juncifolius*					1	
Plantae	Flora	Anthericaceae	6427	*Thysanotus tuberosus subsp. tuberosus*					1	
Plantae	Flora	Anthericaceae	7355	*Tricoryne elatior*		Yellow Autumn-lily			1	
Plantae	Flora	Anthericaceae	TRIC	*Tricoryne spp.*					3	
Plantae	Flora	Apiaceae	1094	*Actinotus helianthi*		Flannel Flower	P		43	
Plantae	Flora	Apiaceae	1095	*Actinotus minor*		Lesser Flannel Flower			13	
Plantae	Flora	Apiaceae	11823	*Apium prostratum var. filiforme*					4	
Plantae	Flora	Apiaceae	1106	*Centella asiatica*		Indian Pennywort			12	
Plantae	Flora	Apiaceae	1128	*Hydrocotyle laxiflora*		Stinking Pennywort			1	
Plantae	Flora	Apiaceae	7961	*Hydrocotyle sibthorpioides*					4	
Plantae	Flora	Apiaceae	1132	*Hydrocotyle tripartita*		Pennywort			3	
Plantae	Flora	Apiaceae	1133	*Hydrocotyle verticillata*		Shield Pennywort			1	
Plantae	Flora	Apiaceae	1143	*Platysace ericoides*					4	

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Plantae	Flora	Apiaceae	1144	*Platysace lanceolata*		Shrubby Platysace			25	
Plantae	Flora	Apiaceae	1145	*Platysace linearifolia*					2	
Plantae	Flora	Apiaceae	PLAT	*Platysace spp.*					1	
Plantae	Flora	Apiaceae	1146	*Platysace stephensonii*					7	
Plantae	Flora	Apiaceae	1162	*Xanthosia pilosa*		Woolly Xanthosia			41	
Plantae	Flora	Apiaceae	XANO	*Xanthosia spp.*					2	
Plantae	Flora	Apiaceae	1163	*Xanthosia tridentata*		Rock Xanthosia			10	
Plantae	Flora	Apocynaceae	1234	*Marsdenia rostrata*		Milk Vine			8	
Plantae	Flora	Apocynaceae	1235	*Marsdenia suaveolens*		Scented Marsdenia			5	
Plantae	Flora	Apocynaceae	1185	*Parsonsia straminea*		Common Silkpod			28	
Plantae	Flora	Arecaceae	1221	*Livistona australis*		Cabbage Palm	P		4	
Plantae	Flora	Aspleniaceae	7415	*Asplenium difforme*					2	
Plantae	Flora	Aspleniaceae	8033	*Asplenium flabellifolium*		Necklace Fern			2	
Plantae	Flora	Asteraceae	13920	*Actites megalocarpus*		Dune Thistle			1	
Plantae	Flora	Asteraceae	9242	*Adenostemma lavenia var. lavenia*		Sticky Daisy			1	
Plantae	Flora	Asteraceae	1337	*Calotis cuneifolia*		Purple Burr-Daisy			1	
Plantae	Flora	Asteraceae	1360	*Cassinia aculeata*		Dolly Bush			1	
Plantae	Flora	Asteraceae	8559	*Chrysocephalum apiculatum*		Common Everlasting			1	
Plantae	Flora	Asteraceae	13745	*Coronidium elatum*					3	
Plantae	Flora	Asteraceae	1412	*Cotula australis*		Common Cotula			4	
Plantae	Flora	Asteraceae	14807	*Enydra woollsii*					1	
Plantae	Flora	Asteraceae	7425	*Epaltes australis*		Spreading Nut-heads			3	
Plantae	Flora	Asteraceae	11439	*Euchiton japonicus*					1	
Plantae	Flora	Asteraceae	9690	*Euchiton sphaericus*		Star Cudweed			1	
Plantae	Flora	Asteraceae	11960	*Lagenophora stipitata*		Common Lagenophora			2	
Plantae	Flora	Asteraceae	9203	*Leptinella longipes*					1	
Plantae	Flora	Asteraceae	1565	*Melanthera biflora*					4	
Plantae	Flora	Asteraceae	7780	*Pseudognaphalium luteoalbum*		Jersey Cudweed			6	
Plantae	Flora	Asteraceae	7914	*Senecio diaschides*					3	
Plantae	Flora	Asteraceae	1660	*Senecio glomeratus*					3	
Plantae	Flora	Asteraceae	1664	*Senecio hispidulus*		Hill Fireweed			6	
Plantae	Flora	Asteraceae	1666	*Senecio lautus*		Variable Groundsel			1	
Plantae	Flora	Asteraceae	1667	*Senecio linearifolius*		Fireweed Groundsel			1	
Plantae	Flora	Asteraceae	12811	*Senecio pinnatifolius var. pinnatifolius*					7	
Plantae	Flora	Asteraceae	9458	*Senecio spathulatus*		Coast Groundsel	E1		6	
Plantae	Flora	Asteraceae	SENE	*Senecio spp.*		Groundsel, Fireweed			4	
Plantae	Flora	Asteraceae	1679	*Senecio vagus*					1	
Plantae	Flora	Asteraceae	SONC	*Sonchus spp.*		Sowthistle			1	
Plantae	Flora	Asteraceae	TARA	*Taraxacum spp.*		Dandelion			1	
Plantae	Flora	Asteraceae	7433	*Vernonia cinerea*					1	
Plantae	Flora	Azollaceae	8049	*Azolla pinnata*					2	
Plantae	Flora	Bignoniaceae	1740	*Pandorea pandorana*		Wonga Wonga Vine			3	
Plantae	Flora	Bignoniaceae	10485	*Pandorea pandorana subsp. pandorana*		Wonga Wonga Vine			1	
Plantae	Flora	Blandfordiaceae	3529	*Blandfordia nobilis*		Christmas Bells	P		2	
Plantae	Flora	Blechnaceae	8051	*Blechnum camfieldii*					4	
Plantae	Flora	Blechnaceae	7760	*Blechnum minus*		Soft Water Fern			1	
Plantae	Flora	Blechnaceae	8063	*Blechnum wattsii*		Hard Water Fern			2	
Plantae	Flora	Blechnaceae	14930	*Telmatoblechnum indicum*		Swamp Water Fern			21	
Plantae	Flora	Boraginaceae	1747	*Cynoglossum australe*					2	
Plantae	Flora	Brassicaceae	7746	*Cardamine paucijuga*					1	
Plantae	Flora	Brassicaceae	6643	*Lepidium pseudohyssopifolium*		Peppercress			2	
Plantae	Flora	Campanulaceae	ISOT	*Isotoma spp.*					1	
Plantae	Flora	Campanulaceae	10465	*Lobelia anceps*					20	
Plantae	Flora	Campanulaceae	14464	*Lobelia andrewsii*		Trailing Lobelia			1	
Plantae	Flora	Campanulaceae	1917	*Lobelia gibbosa*		Tall Lobelia			2	

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Plantae	Flora	Campanulaceae	14415	*Lobelia purpurascens*		whiteroot			1	
Plantae	Flora	Campanulaceae	LOBE	*Lobelia spp.*					2	
Plantae	Flora	Campanulaceae	1929	*Wahlenbergia communis*		Tufted Bluebell			1	
Plantae	Flora	Campanulaceae	1934	*Wahlenbergia gracilis*		Sprawling Bluebell			8	
Plantae	Flora	Casuarinaceae	9009	*Allocasuarina diminuta subsp. mimica*					3	
Plantae	Flora	Casuarinaceae	2010	*Allocasuarina distyla*					99	
Plantae	Flora	Casuarinaceae	2012	*Allocasuarina littoralis*		Black She-Oak			24	
Plantae	Flora	Casuarinaceae	2015	*Allocasuarina paludosa*					3	
Plantae	Flora	Casuarinaceae	ALLC	*Allocasuarina spp.*					2	
Plantae	Flora	Casuarinaceae	2017	*Allocasuarina torulosa*		Forest Oak			4	
Plantae	Flora	Casuarinaceae	2018	*Allocasuarina verticillata*		Drooping Sheoak			2	
Plantae	Flora	Casuarinaceae	9006	*Casuarina cunninghamiana subsp. cunninghamiana*		River Oak			1	
Plantae	Flora	Casuarinaceae	9247	*Casuarina equisetifolia subsp. incana*		Coastal She-oak			1	
Plantae	Flora	Casuarinaceae	2022	*Casuarina glauca*		Swamp Oak			64	
Plantae	Flora	Centrolepidaceae	2038	*Centrolepis fascicularis*					7	
Plantae	Flora	Centrolepidaceae	8807	*Centrolepis strigosa subsp. strigosa*					5	
Plantae	Flora	Chenopodiaceae	2046	*Atriplex australasica*					3	
Plantae	Flora	Chenopodiaceae	2070	*Atriplex semibaccata*		Creeping Saltbush			1	
Plantae	Flora	Chenopodiaceae	2110	*Einadia hastata*		Berry Saltbush			4	
Plantae	Flora	Chenopodiaceae	7808	*Rhagodia candolleana subsp. candolleana*					12	
Plantae	Flora	Chenopodiaceae	7923	*Salsola kali var. kali*		Buckbush			3	
Plantae	Flora	Chenopodiaceae	9423	*Sarcocornia quinqueflora subsp. quinqueflora*					26	
Plantae	Flora	Chenopodiaceae	2200	*Suaeda australis*					8	
Plantae	Flora	Clusiaceae	7240	*Hypericum gramineum*		Small St John's Wort			4	
Plantae	Flora	Colchicaceae	3533	*Burchardia umbellata*		Milkmaids			3	
Plantae	Flora	Commelinaceae	2209	*Commelina cyanea*		Native Wandering Jew			39	
Plantae	Flora	Commelinaceae	COMM	*Commelina spp.*					1	
Plantae	Flora	Convolvulaceae	2215	*Calystegia marginata*					1	
Plantae	Flora	Convolvulaceae	2218	*Calystegia soldanella*					2	
Plantae	Flora	Convolvulaceae	CUSC	*Cuscuta spp.*		Dodder			1	
Plantae	Flora	Convolvulaceae	2222	*Dichondra repens*		Kidney Weed			9	
Plantae	Flora	Convolvulaceae	IPOM	*Ipomoea spp.*					2	

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Plantae	Flora	Crassulaceae	7745	*Crassula decumbens var. decumbens*		Spreading Stonecrop			1	
Plantae	Flora	Crassulaceae	2242	*Crassula sieberiana*		Australian Stonecrop			2	
Plantae	Flora	Crassulaceae	CRAS	*Crassula spp.*		Stonecrop			1	
Plantae	Flora	Cunoniaceae	2267	*Bauera capitata*					9	
Plantae	Flora	Cunoniaceae	2268	*Bauera rubioides*		River Rose			1	
Plantae	Flora	Cunoniaceae	2272	*Ceratopetalum gummiferum*		Christmas Bush			11	
Plantae	Flora	Cupressaceae	2285	*Callitris rhomboidea*		Port Jackson Pine			1	
Plantae	Flora	Cupressaceae	CALR	*Callitris spp.*					1	
Plantae	Flora	Cyatheaceae	8076	*Cyathea cooperi*		Straw Treefern	P		1	
Plantae	Flora	Cyperaceae	2294	*Baumea acuta*					6	
Plantae	Flora	Cyperaceae	2295	*Baumea arthrophylla*					2	
Plantae	Flora	Cyperaceae	2296	*Baumea articulata*		Jointed Twig-rush			6	
Plantae	Flora	Cyperaceae	2297	*Baumea gunnii*					3	
Plantae	Flora	Cyperaceae	2299	*Baumea juncea*					45	
Plantae	Flora	Cyperaceae	2301	*Baumea nuda*					2	
Plantae	Flora	Cyperaceae	2302	*Baumea rubiginosa*					13	
Plantae	Flora	Cyperaceae	BAUM	*Baumea spp.*					5	
Plantae	Flora	Cyperaceae	2303	*Baumea teretifolia*					10	
Plantae	Flora	Cyperaceae	2305	*Bolboschoenus caldwellii*					4	
Plantae	Flora	Cyperaceae	2306	*Bolboschoenus fluviatilis*		Marsh Club-rush			1	
Plantae	Flora	Cyperaceae	2310	*Carex appressa*		Tall Sedge			3	
Plantae	Flora	Cyperaceae	2313	*Carex breviculmis*					1	
Plantae	Flora	Cyperaceae	2321	*Carex fascicularis*		Tassel Sedge			2	
Plantae	Flora	Cyperaceae	2335	*Carex pumila*					2	
Plantae	Flora	Cyperaceae	CARE	*Carex spp.*					1	
Plantae	Flora	Cyperaceae	2341	*Caustis flexuosa*		Curly Wig	P		4	
Plantae	Flora	Cyperaceae	2342	*Caustis pentandra*		Thick Twist Rush	P		6	
Plantae	Flora	Cyperaceae	2344	*Chorizandra cymbaria*					4	
Plantae	Flora	Cyperaceae	2345	*Chorizandra sphaerocephala*		Roundhead Bristle-sedge			2	
Plantae	Flora	Cyperaceae	2346	*Cladium procerum*					4	
Plantae	Flora	Cyperaceae	2347	*Cyathochaeta diandra*					25	
Plantae	Flora	Cyperaceae	2379	*Cyperus laevigatus*					6	
Plantae	Flora	Cyperaceae	2380	*Cyperus laevis*					1	
Plantae	Flora	Cyperaceae	2383	*Cyperus lucidus*		Leafy Flat Sedge			1	
Plantae	Flora	Cyperaceae	8483	*Cyperus polystachyos*					17	
Plantae	Flora	Cyperaceae	2395	*Cyperus sanguinolentus*					2	
Plantae	Flora	Cyperaceae	CYPE	*Cyperus spp.*					4	
Plantae	Flora	Cyperaceae	2414	*Eleocharis gracilis*					3	
Plantae	Flora	Cyperaceae	6988	*Eleocharis sphacelata*		Tall Spike Rush			4	
Plantae	Flora	Cyperaceae	12416	*Ficinia nodosa*		Knobby Club-rush			52	
Plantae	Flora	Cyperaceae	7328	*Fimbristylis ferruginea*					2	
Plantae	Flora	Cyperaceae	2431	*Gahnia aspera*		Rough Saw-sedge			3	
Plantae	Flora	Cyperaceae	2432	*Gahnia clarkei*		Tall Saw-sedge			17	
Plantae	Flora	Cyperaceae	2433	*Gahnia erythrocarpa*					2	
Plantae	Flora	Cyperaceae	2442	*Gahnia sieberiana*		Red-fruit Saw-sedge	P		16	
Plantae	Flora	Cyperaceae	GAHN	*Gahnia spp.*					3	
Plantae	Flora	Cyperaceae	2445	*Gymnoschoenus sphaerocephalus*		Button Grass			3	
Plantae	Flora	Cyperaceae	2448	*Isolepis cernua*		Nodding Club-rush			5	
Plantae	Flora	Cyperaceae	2450	*Isolepis fluitans*		Floating Club-rush			2	
Plantae	Flora	Cyperaceae	2454	*Isolepis inundata*		Club-rush			3	
Plantae	Flora	Cyperaceae	ISOL	*Isolepis spp.*		Club-rush			1	
Plantae	Flora	Cyperaceae	8380	*Lepidosperma concavum*					42	
Plantae	Flora	Cyperaceae	2465	*Lepidosperma filiforme*					7	
Plantae	Flora	Cyperaceae	2467	*Lepidosperma forsythii*					5	
Plantae	Flora	Cyperaceae	6402	*Lepidosperma laterale*		Variable Sword-sedge			36	
Plantae	Flora	Cyperaceae	2469	*Lepidosperma limicola*					1	
Plantae	Flora	Cyperaceae	2470	*Lepidosperma longitudinale*		Pithy Sword-sedge			1	
Plantae	Flora	Cyperaceae	2471	*Lepidosperma neesii*					8	

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Plantae	Flora	Cyperaceae	LEPD	*Lepidosperma spp.*					18	
Plantae	Flora	Cyperaceae	2475	*Lepidosperma urophorum*					2	
Plantae	Flora	Cyperaceae	11028	*Lepidosperma viscidum*					16	
Plantae	Flora	Cyperaceae	8956	*Ptilothrix deusta*					1	
Plantae	Flora	Cyperaceae	2489	*Schoenoplectus pungens*					1	
Plantae	Flora	Cyperaceae	11946	*Schoenoplectus subulatus*					1	
Plantae	Flora	Cyperaceae	2490	*Schoenoplectus validus*					6	
Plantae	Flora	Cyperaceae	2491	*Schoenus apogon*		Fluke Bogrush			5	
Plantae	Flora	Cyperaceae	2492	*Schoenus brevifolius*					9	
Plantae	Flora	Cyperaceae	2495	*Schoenus ericetorum*					11	
Plantae	Flora	Cyperaceae	2496	*Schoenus imberbis*					3	
Plantae	Flora	Cyperaceae	9057	*Schoenus lepidosperma subsp. pachylepis*					1	
Plantae	Flora	Cyperaceae	2499	*Schoenus maschalinus*					4	
Plantae	Flora	Cyperaceae	2500	*Schoenus melanostachys*					3	
Plantae	Flora	Cyperaceae	2502	*Schoenus nitens*					3	
Plantae	Flora	Cyperaceae	2504	*Schoenus paludosus*					3	
Plantae	Flora	Cyperaceae	2507	*Schoenus turbinatus*					2	
Plantae	Flora	Cyperaceae	2518	*Tricostularia pauciflora*					2	
Plantae	Flora	Davalliaceae	8088	*Nephrolepis cordifolia*		Fishbone Fern			6	
Plantae	Flora	Dennstaedtiaceae	7271	*Histiopteris incisa*		Bat's Wing Fern			15	
Plantae	Flora	Dennstaedtiaceae	7749	*Hypolepis muelleri*		Harsh Ground Fern			7	
Plantae	Flora	Dennstaedtiaceae	HYPL	*Hypolepis spp.*					1	
Plantae	Flora	Dennstaedtiaceae	6403	*Pteridium esculentum*		Bracken			121	
Plantae	Flora	Dicksoniaceae	8341	*Calochlaena dubia*		Rainbow Fern			7	
Plantae	Flora	Dilleniaceae	2526	*Hibbertia aciculatis*					8	
Plantae	Flora	Dilleniaceae	2527	*Hibbertia aspera*		Rough Guinea Flower			1	
Plantae	Flora	Dilleniaceae	8349	*Hibbertia circumdans*					1	
Plantae	Flora	Dilleniaceae	10863	*Hibbertia empetrifolia subsp. empetrifolia*					1	
Plantae	Flora	Dilleniaceae	2536	*Hibbertia fasciculata*					17	
Plantae	Flora	Dilleniaceae	2539	*Hibbertia linearis*					6	
Plantae	Flora	Dilleniaceae	2542	*Hibbertia obtusifolia*		Hoary Guinea Flower			5	
Plantae	Flora	Dilleniaceae	2545	*Hibbertia riparia*					2	
Plantae	Flora	Dilleniaceae	2548	*Hibbertia scandens*		Climbing Guinea Flower			47	
Plantae	Flora	Dilleniaceae	2550	*Hibbertia serpyllifolia*		Hairy Guinea Flower			1	
Plantae	Flora	Dilleniaceae	HIBB	*Hibbertia spp.*					6	
Plantae	Flora	Dilleniaceae	9398	*Hibbertia virgata subsp. virgata*		Twiggy Guinea Flower			2	
Plantae	Flora	Doryanthaceae	1019	*Doryanthes excelsa*		Gymea Lily		P	1	
Plantae	Flora	Droseraceae	2557	*Drosera binata*		Forked Sundew			5	
Plantae	Flora	Droseraceae	12073	*Drosera burmanni*					1	
Plantae	Flora	Droseraceae	2560	*Drosera pygmaea*		Pymgy Sundew			6	
Plantae	Flora	Droseraceae	2561	*Drosera spatulata*					4	
Plantae	Flora	Droseraceae	DROS	*Drosera spp.*					1	
Plantae	Flora	Elaeocarpaceae	2574	*Elaeocarpus reticulatus*		Blueberry Ash			53	
Plantae	Flora	Elaeocarpaceae	6204	*Tetratheca ericifolia*					1	
Plantae	Flora	Ericaceae	2581	*Acrotriche divaricata*					2	
Plantae	Flora	Ericaceae	2584	*Astroloma humifusum*		Native Cranberry			4	
Plantae	Flora	Ericaceae	2585	*Astroloma pinifolium*		Pine Heath			22	
Plantae	Flora	Ericaceae	2586	*Brachyloma daphnoides*		Daphne Heath			19	

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Plantae	Flora	Ericaceae	10689	*Brachyloma daphnoides subsp. daphnoides*					2	
Plantae	Flora	Ericaceae	10842	*Epacris gunnii*					1	
Plantae	Flora	Ericaceae	2598	*Epacris longiflora*		Fuchsia Heath			34	
Plantae	Flora	Ericaceae	2599	*Epacris microphylla*		Coral Heath			30	
Plantae	Flora	Ericaceae	2602	*Epacris obtusifolia*		Blunt-leaf Heath			17	
Plantae	Flora	Ericaceae	2605	*Epacris pulchella*		Wallum Heath			4	
Plantae	Flora	Ericaceae	2606	*Epacris purpurascens*					1	
Plantae	Flora	Ericaceae	7752	*Epacris purpurascens var. purpurascens*			V		1	
Plantae	Flora	Ericaceae	2616	*Leucopogon ericoides*		Pink Beard-heath			57	
Plantae	Flora	Ericaceae	2617	*Leucopogon esquamatus*					2	
Plantae	Flora	Ericaceae	2629	*Leucopogon microphyllus*					3	
Plantae	Flora	Ericaceae	2630	*Leucopogon muticus*		Blunt Beard-heath			1	
Plantae	Flora	Ericaceae	2632	*Leucopogon parviflorus*		Coastal Beard-heath			20	
Plantae	Flora	Ericaceae	LEUC	*Leucopogon spp.*		A Beard-heath			2	
Plantae	Flora	Ericaceae	2639	*Leucopogon virgatus*					12	
Plantae	Flora	Ericaceae	2647	*Monotoca elliptica*		Tree Broom-heath			139	
Plantae	Flora	Ericaceae	2648	*Monotoca ledifolia*					2	
Plantae	Flora	Ericaceae	2649	*Monotoca scoparia*					20	
Plantae	Flora	Ericaceae	2654	*Sprengelia incarnata*		Pink Swamp Heath	P		7	
Plantae	Flora	Ericaceae	12948	*Sprengelia incarnata f. B*			P		5	
Plantae	Flora	Ericaceae	12949	*Sprengelia incarnata f. 'incarnata'*			P		3	
Plantae	Flora	Ericaceae	2658	*Styphelia laeta*					3	
Plantae	Flora	Ericaceae	STYP	*Styphelia spp.*					1	
Plantae	Flora	Ericaceae	2660	*Styphelia triflora*		Pink Five-Corners			4	
Plantae	Flora	Ericaceae	12953	*Styphelia triflora subsp. group C*					1	
Plantae	Flora	Ericaceae	2662	*Styphelia viridis*					9	
Plantae	Flora	Ericaceae	9227	*Styphelia viridis subsp. viridis*					6	
Plantae	Flora	Ericaceae	2664	*Woollsia pungens*					41	
Plantae	Flora	Eriocaulaceae	2670	*Eriocaulon scariosum*					1	
Plantae	Flora	Escalloniaceae	3228	*Quintinia sieberi*		Possumwood			2	
Plantae	Flora	Euphorbiaceae	2677	*Amperea xiphoclada*					5	
Plantae	Flora	Euphorbiaceae	9713	*Amperea xiphoclada var. xiphoclada*					2	
Plantae	Flora	Euphorbiaceae	8560	*Chamaesyce drummondii*		Caustic Weed			1	
Plantae	Flora	Euphorbiaceae	11947	*Homalanthus populifolius*					45	
Plantae	Flora	Euphorbiaceae	2736	*Micrantheum ericoides*					4	
Plantae	Flora	Euphorbiaceae	2738	*Monotaxis linifolia*					2	
Plantae	Flora	Euphorbiaceae	2756	*Pseudanthus orientalis*					4	
Plantae	Flora	Euphorbiaceae	2759	*Ricinocarpos pinifolius*		Wedding Bush			41	
Plantae	Flora	Fabaceae (Caesalpinioideae)	CASS	*Cassia spp.*					4	
Plantae	Flora	Fabaceae (Faboideae)	8364	*Almaleea paludosa*					2	
Plantae	Flora	Fabaceae (Faboideae)	2770	*Aotus ericoides*					45	
Plantae	Flora	Fabaceae (Faboideae)	AOTU	*Aotus spp.*					2	
Plantae	Flora	Fabaceae (Faboideae)	2778	*Bossiaea ensata*		Sword Bossiaea			13	

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Plantae	Flora	Fabaceae (Faboideae)	2780	*Bossiaea heterophylla*		Variable Bossiaea			39	
Plantae	Flora	Fabaceae (Faboideae)	2789	*Bossiaea scolopendria*					27	
Plantae	Flora	Fabaceae (Faboideae)	2824	*Daviesia mimosoides*					7	
Plantae	Flora	Fabaceae (Faboideae)	7211	*Daviesia mimosoides subsp. mimosoides*					3	
Plantae	Flora	Fabaceae (Faboideae)	2839	*Desmodium rhytidophyllum*					2	
Plantae	Flora	Fabaceae (Faboideae)	2840	*Desmodium varians*		Slender Tick-trefoil			2	
Plantae	Flora	Fabaceae (Faboideae)	11077	*Dillwynia elegans*					2	
Plantae	Flora	Fabaceae (Faboideae)	2843	*Dillwynia floribunda*					12	
Plantae	Flora	Fabaceae (Faboideae)	2844	*Dillwynia glaberrima*					19	
Plantae	Flora	Fabaceae (Faboideae)	2849	*Dillwynia ramosissima*					1	
Plantae	Flora	Fabaceae (Faboideae)	2850	*Dillwynia retorta*					47	
Plantae	Flora	Fabaceae (Faboideae)	7950	*Dillwynia rudis*					2	
Plantae	Flora	Fabaceae (Faboideae)	2851	*Dillwynia sericea*		Egg and Bacon Peas, Parrot Peas			1	
Plantae	Flora	Fabaceae (Faboideae)	DILL	*Dillwynia spp.*					6	
Plantae	Flora	Fabaceae (Faboideae)	2860	*Glycine clandestina*		Twining glycine			14	
Plantae	Flora	Fabaceae (Faboideae)	13001	*Glycine clandestina var. sericea*					1	
Plantae	Flora	Fabaceae (Faboideae)	7208	*Glycine microphylla*		Small-leaf Glycine			5	
Plantae	Flora	Fabaceae (Faboideae)	2861	*Glycine tabacina*		Variable Glycine			2	
Plantae	Flora	Fabaceae (Faboideae)	2864	*Gompholobium glabratum*		Dainty Wedge Pea			4	
Plantae	Flora	Fabaceae (Faboideae)	2865	*Gompholobium grandiflorum*		Large Wedge Pea			7	
Plantae	Flora	Fabaceae (Faboideae)	2866	*Gompholobium latifolium*		Golden Glory Pea			1	
Plantae	Flora	Fabaceae (Faboideae)	2867	*Gompholobium minus*		Dwarf Wedge Pea			2	
Plantae	Flora	Fabaceae (Faboideae)	2873	*Hardenbergia violacea*		False Sarsaparilla			30	
Plantae	Flora	Fabaceae (Faboideae)	2892	*Jacksonia scoparia*		Dogwood			1	
Plantae	Flora	Fabaceae (Faboideae)	2898	*Kennedia rubicunda*		Dusky Coral Pea			13	
Plantae	Flora	Fabaceae (Faboideae)	LOTU	*Lotus spp.*					1	
Plantae	Flora	Fabaceae (Faboideae)	2938	*Mirbelia rubiifolia*		Heathy Mirbelia			9	
Plantae	Flora	Fabaceae (Faboideae)	MIRB	*Mirbelia spp.*					2	
Plantae	Flora	Fabaceae (Faboideae)	2949	*Oxylobium cordifolium*		Heart-leaved Shaggy Pea			14	
Plantae	Flora	Fabaceae (Faboideae)	2958	*Phyllota phylicoides*		Heath Phyllota			3	
Plantae	Flora	Fabaceae (Faboideae)	14702	*Platylobium parviflorum*		Small-flowered Flat-pea			1	
Plantae	Flora	Fabaceae (Faboideae)	2985	*Pultenaea daphnoides*		Large-leaf Bush-pea			6	
Plantae	Flora	Fabaceae (Faboideae)	2986	*Pultenaea dentata*					4	
Plantae	Flora	Fabaceae (Faboideae)	3002	*Pultenaea linophylla*					7	

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Plantae	Flora	Fabaceae (Faboideae)	3014	*Pultenaea retusa*					4	
Plantae	Flora	Fabaceae (Faboideae)	3015	*Pultenaea rosmarinifolia*					1	
Plantae	Flora	Fabaceae (Faboideae)	3016	*Pultenaea scabra*					2	
Plantae	Flora	Fabaceae (Faboideae)	3033	*Sphaerolobium vimineum*					2	
Plantae	Flora	Fabaceae (Faboideae)	3105	*Viminaria juncea*		Native Broom			19	
Plantae	Flora	Fabaceae (Mimosoideae)	7060	*Acacia baueri subsp. baueri*		Tiny Wattle			4	
Plantae	Flora	Fabaceae (Mimosoideae)	3717	*Acacia binervia*		Coast Myall			4	
Plantae	Flora	Fabaceae (Mimosoideae)	3723	*Acacia brownii*		Heath Wattle			2	
Plantae	Flora	Fabaceae (Mimosoideae)	3758	*Acacia dealbata*		Silver Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3761	*Acacia decora*		Western Silver Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3762	*Acacia decurrens*		Black Wattle			2	
Plantae	Flora	Fabaceae (Mimosoideae)	3768	*Acacia elata*		Mountain Cedar Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3771	*Acacia falcata*					2	
Plantae	Flora	Fabaceae (Mimosoideae)	3774	*Acacia fimbriata*		Fringed Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3777	*Acacia floribunda*		White Sally			3	
Plantae	Flora	Fabaceae (Mimosoideae)	3792	*Acacia implexa*		Hickory Wattle			2	
Plantae	Flora	Fabaceae (Mimosoideae)	6472	*Acacia irrorata subsp. irrorata*		Green Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3816	*Acacia longifolia*					44	
Plantae	Flora	Fabaceae (Mimosoideae)	10790	*Acacia longifolia subsp. longifolia*		Sydney Golden Wattle			39	
Plantae	Flora	Fabaceae (Mimosoideae)	10791	*Acacia longifolia subsp. sophorae*		Coastal Wattle			123	
Plantae	Flora	Fabaceae (Mimosoideae)	3821	*Acacia maidenii*		Maiden's Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3823	*Acacia mearnsii*		Black Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3834	*Acacia myrtifolia*		Red-stemmed Wattle			10	
Plantae	Flora	Fabaceae (Mimosoideae)	3846	*Acacia parramattensis*		Parramatta Wattle			3	

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Plantae	Flora	Fabaceae (Mimosoideae)	3847	*Acacia parvipinnula*		Silver-stemmed Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	10922	*Acacia penninervis var. penninervis*		Mountain Hickory			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3853	*Acacia podalyriifolia*		Queensland Silver Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3863	*Acacia quadrilateralis*					5	
Plantae	Flora	Fabaceae (Mimosoideae)	3871	*Acacia saliciformis*					1	
Plantae	Flora	Fabaceae (Mimosoideae)	3874	*Acacia schinoides*		Green Cedar Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	ACAC	*Acacia spp.*		Wattle			1	
Plantae	Flora	Fabaceae (Mimosoideae)	3880	*Acacia stricta*		Straight Wattle			3	
Plantae	Flora	Fabaceae (Mimosoideae)	3881	*Acacia suaveolens*		Sweet Wattle			76	
Plantae	Flora	Fabaceae (Mimosoideae)	3885	*Acacia terminalis*		Sunshine Wattle			11	
Plantae	Flora	Fabaceae (Mimosoideae)	10793	*Acacia terminalis subsp. angustifolia*					11	
Plantae	Flora	Fabaceae (Mimosoideae)	10794	*Acacia terminalis subsp. aurea*					2	
Plantae	Flora	Fabaceae (Mimosoideae)	10795	*Acacia terminalis subsp. botrycephala*					2	
Plantae	Flora	Fabaceae (Mimosoideae)	9672	*Acacia terminalis subsp. terminalis*		Sunshine Wattle	E1	E	46	
Plantae	Flora	Fabaceae (Mimosoideae)	3893	*Acacia ulicifolia*		Prickly Moses			30	
Plantae	Flora	Gentianaceae	13834	*Schenkia spicata*		Spike Centaury			3	
Plantae	Flora	Geraniaceae	3148	*Geranium homeanum*					3	
Plantae	Flora	Geraniaceae	3152	*Geranium potentilloides*					1	
Plantae	Flora	Geraniaceae	3156	*Geranium solanderi*		Native Geranium			1	
Plantae	Flora	Geraniaceae	8226	*Geranium solanderi var. solanderi*					1	
Plantae	Flora	Geraniaceae	GERA	*Geranium spp.*					1	
Plantae	Flora	Geraniaceae	3157	*Pelargonium australe*		Native Storksbill			23	
Plantae	Flora	Geraniaceae	13119	*Pelargonium australe subsp. australe*					1	
Plantae	Flora	Geraniaceae	3161	*Pelargonium inodorum*					1	
Plantae	Flora	Geraniaceae	PELA	*Pelargonium spp.*					6	
Plantae	Flora	Gleicheniaceae	7138	*Gleichenia dicarpa*		Pouched Coral Fern			33	
Plantae	Flora	Gleicheniaceae	6708	*Gleichenia microphylla*		Scrambling Coral Fern			3	
Plantae	Flora	Goodeniaceae	3172	*Dampiera purpurea*					1	
Plantae	Flora	Goodeniaceae	3174	*Dampiera stricta*					28	
Plantae	Flora	Goodeniaceae	3175	*Goodenia bellidifolia*					2	

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Plantae	Flora	Goodeniaceae	8711	*Goodenia bellidifolia subsp. bellidifolia*					1	
Plantae	Flora	Goodeniaceae	8755	*Goodenia heterophylla subsp. eglandulosa*					1	
Plantae	Flora	Goodeniaceae	3192	*Goodenia ovata*		Hop Goodenia			2	
Plantae	Flora	Goodeniaceae	7057	*Goodenia paniculata*					18	
Plantae	Flora	Goodeniaceae	GOOD	*Goodenia spp.*					1	
Plantae	Flora	Goodeniaceae	3197	*Goodenia stelligera*		Spiked Goodenia			8	
Plantae	Flora	Goodeniaceae	3203	*Scaevola calendulacea*					5	
Plantae	Flora	Goodeniaceae	3210	*Selliera radicans*		Swamp Weed			8	
Plantae	Flora	Haemodoraceae	6435	*Haemodorum corymbosum*					1	
Plantae	Flora	Haemodoraceae	3236	*Haemodorum planifolium*					7	
Plantae	Flora	Haemodoraceae	13128	*Haemodorum planifolium subsp. planifolium*					1	
Plantae	Flora	Haloragaceae	3243	*Gonocarpus micranthus*					5	
Plantae	Flora	Haloragaceae	8649	*Gonocarpus micranthus subsp. micranthus*					4	
Plantae	Flora	Haloragaceae	3246	*Gonocarpus salsoloides*					7	
Plantae	Flora	Haloragaceae	3247	*Gonocarpus tetragynus*		Poverty Raspwort			4	
Plantae	Flora	Haloragaceae	3248	*Gonocarpus teucrioides*		Germander Raspwort			47	
Plantae	Flora	Haloragaceae	7456	*Myriophyllum gracile var. lineare*					1	
Plantae	Flora	Iridaceae	3301	*Patersonia glabrata*		Leafy Purple-flag			3	
Plantae	Flora	Iridaceae	3303	*Patersonia sericea*		Silky Purple-Flag			3	
Plantae	Flora	Juncaceae	3320	*Juncus caespiticius*					4	
Plantae	Flora	Juncaceae	3326	*Juncus continuus*					11	
Plantae	Flora	Juncaceae	7430	*Juncus kraussii subsp. australiensis*		Sea Rush			19	
Plantae	Flora	Juncaceae	3338	*Juncus pallidus*					10	
Plantae	Flora	Juncaceae	3340	*Juncus planifolius*					12	
Plantae	Flora	Juncaceae	3342	*Juncus prismatocarpus*					1	
Plantae	Flora	Juncaceae	JUNC	*Juncus spp.*		A Rush			10	
Plantae	Flora	Juncaceae	3348	*Juncus subsecundus*		Finger Rush			2	
Plantae	Flora	Juncaceae	3350	*Juncus usitatus*					14	
Plantae	Flora	Juncaginaceae	9253	*Triglochin microtuberosa*					1	
Plantae	Flora	Juncaginaceae	3368	*Triglochin procera*		Water Ribbons			7	
Plantae	Flora	Juncaginaceae	3369	*Triglochin striata*		Streaked Arrowgrass			2	
Plantae	Flora	Lamiaceae	6243	*Chloanthes stoechadis*					3	
Plantae	Flora	Lamiaceae	6484	*Clerodendrum tomentosum*		Hairy Clerodendrum			5	
Plantae	Flora	Lamiaceae	3376	*Hemigenia purpurea*					6	
Plantae	Flora	Lamiaceae	3380	*Lycopus australis*		Australian Gipsywort			1	
Plantae	Flora	Lamiaceae	3397	*Plectranthus parviflorus*					1	
Plantae	Flora	Lamiaceae	3459	*Westringia fruticosa*		Coastal Rosemary			49	
Plantae	Flora	Lauraceae	3467	*Cassytha glabella*					13	
Plantae	Flora	Lauraceae	9274	*Cassytha glabella f. glabella*					4	
Plantae	Flora	Lauraceae	3469	*Cassytha pubescens*		Downy Dodder-laurel			44	
Plantae	Flora	Lauraceae	CASY	*Cassytha spp.*					9	

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Plantae	Flora	Lauraceae	3495	*Endiandra sieberi*		Hard Corkwood			7	
Plantae	Flora	Lentibulariaceae	3507	*Utricularia dichotoma*		Fairy Aprons			4	
Plantae	Flora	Lentibulariaceae	7257	*Utricularia uliginosa*		Asian Bladderwort			2	
Plantae	Flora	Lindsaeaceae	6406	*Lindsaea linearis*		Screw Fern			11	
Plantae	Flora	Lindsaeaceae	LIND	*Lindsaea spp.*					1	
Plantae	Flora	Loganiaceae	3595	*Mitrasacme polymorpha*					2	
Plantae	Flora	Lomandraceae	6297	*Lomandra confertifolia*		Matrush			1	
Plantae	Flora	Lomandraceae	6298	*Lomandra cylindrica*					10	
Plantae	Flora	Lomandraceae	6511	*Lomandra filiformis subsp. coriacea*		Wattle Matt-rush			1	
Plantae	Flora	Lomandraceae	6304	*Lomandra glauca*		Pale Mat-rush			18	
Plantae	Flora	Lomandraceae	6305	*Lomandra gracilis*					4	
Plantae	Flora	Lomandraceae	6308	*Lomandra longifolia*		Spiny-headed Mat-rush			156	
Plantae	Flora	Lomandraceae	8802	*Lomandra multiflora subsp. multiflora*		Many-flowered Mat-rush			9	
Plantae	Flora	Lomandraceae	6312	*Lomandra obliqua*					3	
Plantae	Flora	Lomandraceae	LOMA	*Lomandra spp.*		Mat-rush			4	
Plantae	Flora	Loranthaceae	3613	*Dendrophthoe vitellina*					2	
Plantae	Flora	Loranthaceae	3619	*Muellerina celastroides*					4	
Plantae	Flora	Loranthaceae	3620	*Muellerina eucalyptoides*					1	
Plantae	Flora	Luzuriagaceae	6015	*Eustrephus latifolius*		Wombat Berry			24	
Plantae	Flora	Luzuriagaceae	6016	*Geitonoplesium cymosum*		Scrambling Lily			48	
Plantae	Flora	Lycopodiaceae	6409	*Lycopodium deuterodensum*		Bushy Clubmoss	P		1	
Plantae	Flora	Lythraceae	3623	*Lythrum hyssopifolia*		Hyssop Loosestrife			4	
Plantae	Flora	Malvaceae	14590	*Commersonia dasyphylla*					2	
Plantae	Flora	Malvaceae	14591	*Commersonia hermanniifolia*					19	
Plantae	Flora	Malvaceae	3641	*Hibiscus diversifolius*		Swamp Hibiscus			1	
Plantae	Flora	Malvaceae	3645	*Hibiscus splendens*		Pink Hibiscus			1	
Plantae	Flora	Malvaceae	HIBI	*Hibiscus spp.*					1	
Plantae	Flora	Malvaceae	3650	*Lagunaria patersonia*		Norfolk Island Hibiscus			9	
Plantae	Flora	Malvaceae	6139	*Lasiopetalum ferrugineum*					3	
Plantae	Flora	Malvaceae	9008	*Lasiopetalum ferrugineum var. ferrugineum*					1	
Plantae	Flora	Malvaceae	6143	*Lasiopetalum parviflorum*					5	
Plantae	Flora	Meliaceae	3680	*Melia azedarach*		White Cedar			5	
Plantae	Flora	Meliaceae	11178	*Synoum glandulosum subsp. glandulosum*		Scentless Rosewood			1	
Plantae	Flora	Menispermaceae	3688	*Sarcopetalum harveyanum*		Pearl Vine			5	
Plantae	Flora	Menispermaceae	3690	*Stephania japonica*		Snake vine			6	
Plantae	Flora	Menispermaceae	8428	*Stephania japonica var. discolor*		Snake Vine			15	
Plantae	Flora	Menyanthaceae	14804	*Liparophyllum exaltatum*					13	
Plantae	Flora	Moraceae	3922	*Ficus macrophylla*					3	
Plantae	Flora	Moraceae	3924	*Ficus rubiginosa*		Port Jackson Fig			8	
Plantae	Flora	Moraceae	3928	*Maclura cochinchinensis*		Cockspur Thorn			24	

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Plantae	Flora	Myoporaceae	7906	*Myoporum acuminatum*		Boobialla			6	
Plantae	Flora	Myrtaceae	3968	*Acmena smithii*		Lilly Pilly			12	
Plantae	Flora	Myrtaceae	3969	*Angophora bakeri*		Narrow-leaved Apple			1	
Plantae	Flora	Myrtaceae	3970	*Angophora costata*		Sydney Red Gum			82	
Plantae	Flora	Myrtaceae	3971	*Angophora floribunda*		Rough-barked Apple			3	
Plantae	Flora	Myrtaceae	3972	*Angophora hispida*		Dwarf Apple			3	
Plantae	Flora	Myrtaceae	ANGO	*Angophora spp.*					2	
Plantae	Flora	Myrtaceae	3984	*Backhousia myrtifolia*		Grey Myrtle			1	
Plantae	Flora	Myrtaceae	3986	*Baeckea brevifolia*					2	
Plantae	Flora	Myrtaceae	3993	*Baeckea diosmifolia*		Fringed Baeckea			4	
Plantae	Flora	Myrtaceae	3995	*Baeckea imbricata*					51	
Plantae	Flora	Myrtaceae	3997	*Baeckea linifolia*		Weeping Baeckea	P		1	
Plantae	Flora	Myrtaceae	4004	*Callistemon citrinus*		Crimson Bottlebrush			51	
Plantae	Flora	Myrtaceae	4007	*^^Callistemon linearifolius*		Netted Bottle Brush	V,3		3	
Plantae	Flora	Myrtaceae	4008	*Callistemon linearis*		Narrow-leaved Bottlebrush			21	
Plantae	Flora	Myrtaceae	4013	*Callistemon pinifolius*		Pine-leaved Bottlebrush			10	
Plantae	Flora	Myrtaceae	4014	*Callistemon rigidus*		Stiff Bottlebrush			9	
Plantae	Flora	Myrtaceae	4015	*Callistemon salignus*		Willow Bottlebrush			3	
Plantae	Flora	Myrtaceae	CALL	*Callistemon spp.*					3	
Plantae	Flora	Myrtaceae	4021	*Calytrix tetragona*		Common Fringe-myrtle			10	
Plantae	Flora	Myrtaceae	9687	*Corymbia gummifera*		Red Bloodwood			46	
Plantae	Flora	Myrtaceae	9601	*Corymbia intermedia*		Pink Bloodwood			1	
Plantae	Flora	Myrtaceae	9692	*Corymbia maculata*		Spotted Gum			3	
Plantae	Flora	Myrtaceae	4027	*Darwinia fascicularis*					24	
Plantae	Flora	Myrtaceae	6508	*Darwinia fascicularis subsp. fascicularis*					22	
Plantae	Flora	Myrtaceae	4030	*Darwinia leptantha*					4	
Plantae	Flora	Myrtaceae	4037	*Eucalyptus agglomerata*		Blue-leaved Stringybark			2	
Plantae	Flora	Myrtaceae	4040	*Eucalyptus amplifolia*		Cabbage Gum			2	
Plantae	Flora	Myrtaceae	4060	*Eucalyptus botryoides*		Bangalay			45	
Plantae	Flora	Myrtaceae	9959	*Eucalyptus botryoides <--> saligna*					2	
Plantae	Flora	Myrtaceae	4069	*Eucalyptus capitellata*		Brown Stringybark			2	
Plantae	Flora	Myrtaceae	4074	*Eucalyptus crebra*		Narrow-leaved Ironbark			2	
Plantae	Flora	Myrtaceae	4097	*Eucalyptus globoidea*		White Stringybark			5	
Plantae	Flora	Myrtaceae	4104	*Eucalyptus haemastoma*		Broad-leaved Scribbly Gum			10	
Plantae	Flora	Myrtaceae	12527	*Eucalyptus haemastoma x racemosa*					5	
Plantae	Flora	Myrtaceae	4128	*Eucalyptus microcorys*		Tallowwood			1	
Plantae	Flora	Myrtaceae	4134	*Eucalyptus nicholii*		Narrow-leaved Black Peppermint	V	V	1	
Plantae	Flora	Myrtaceae	4141	*Eucalyptus oblonga*		Stringybark			1	
Plantae	Flora	Myrtaceae	10029	*Eucalyptus obstans*		Port Jackson Mallee			6	
Plantae	Flora	Myrtaceae	4150	*Eucalyptus parramattensis*		Parramatta Red Gum			1	
Plantae	Flora	Myrtaceae	4155	*Eucalyptus pilularis*		Blackbutt			1	
Plantae	Flora	Myrtaceae	4156	*Eucalyptus piperita*		Sydney Peppermint			15	
Plantae	Flora	Myrtaceae	4165	*Eucalyptus punctata*		Grey Gum			1	
Plantae	Flora	Myrtaceae	9450	*Eucalyptus resinifera subsp. resinifera*					2	
Plantae	Flora	Myrtaceae	4171	*Eucalyptus robusta*		Swamp Mahogany			33	
Plantae	Flora	Myrtaceae	4177	*Eucalyptus saligna*		Sydney Blue Gum			1	
Plantae	Flora	Myrtaceae	4178	*Eucalyptus sclerophylla*		Hard-leaved Scribbly Gum			1	
Plantae	Flora	Myrtaceae	4181	*Eucalyptus sideroxylon*		Mugga Ironbark			1	
Plantae	Flora	Myrtaceae	4182	*Eucalyptus sieberi*		Silvertop Ash			1	
Plantae	Flora	Myrtaceae	4183	*Eucalyptus signata*		Scribbly Gum			2	
Plantae	Flora	Myrtaceae	EUCA	*Eucalyptus spp.*					1	
Plantae	Flora	Myrtaceae	4189	*Eucalyptus stricta*		Blue Mountains Mallee Ash			1	
Plantae	Flora	Myrtaceae	4191	*Eucalyptus tereticornis*		Forest Red Gum			3	

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Plantae	Flora	Myrtaceae	4196	*Eucalyptus umbra*		Broad-leaved White Mahogany			1	
Plantae	Flora	Myrtaceae	4204	*Kunzea ambigua*		Tick Bush	P		72	
Plantae	Flora	Myrtaceae	4207	*Kunzea capitata*			P		2	
Plantae	Flora	Myrtaceae	4208	*Kunzea ericoides*		Burgan			2	
Plantae	Flora	Myrtaceae	4213	*Leptospermum arachnoides*					11	
Plantae	Flora	Myrtaceae	4221	*Leptospermum juniperinum*		Prickly Tea-tree			8	
Plantae	Flora	Myrtaceae	4222	*Leptospermum laevigatum*		Coast Teatree			164	
Plantae	Flora	Myrtaceae	9080	*Leptospermum polyanthum*					1	
Plantae	Flora	Myrtaceae	7245	*Leptospermum polygalifolium*		Tantoon			8	
Plantae	Flora	Myrtaceae	4235	*Leptospermum scoparium*		Manuka			1	
Plantae	Flora	Myrtaceae	4239	*Leptospermum squarrosum*					33	
Plantae	Flora	Myrtaceae	8486	*Leptospermum trinervium*		Slender Tea-tree			31	
Plantae	Flora	Myrtaceae	4242	*Lophostemon confertus*		Brush Box			3	
Plantae	Flora	Myrtaceae	11117	*Melaleuca armillaris subsp. armillaris*		Bracelet Honey-myrtle			65	
Plantae	Flora	Myrtaceae	6391	*Melaleuca ericifolia*		Swamp Paperbark			20	
Plantae	Flora	Myrtaceae	4254	*Melaleuca hypericifolia*		Hillock bush			1	
Plantae	Flora	Myrtaceae	4257	*Melaleuca linariifolia*		Flax-leaved Paperbark			6	
Plantae	Flora	Myrtaceae	4258	*Melaleuca nodosa*					83	
Plantae	Flora	Myrtaceae	4260	*Melaleuca quinquenervia*		Broad-leaved Paperbark			65	
Plantae	Flora	Myrtaceae	4261	*Melaleuca sieberi*					1	
Plantae	Flora	Myrtaceae	4262	*Melaleuca squamea*		Swamp Honey-myrtle			13	
Plantae	Flora	Myrtaceae	4263	*Melaleuca squarrosa*		Scented Paperbark			3	
Plantae	Flora	Myrtaceae	4264	*Melaleuca styphelioides*		Prickly-leaved Tea Tree			4	
Plantae	Flora	Myrtaceae	4266	*Melaleuca thymifolia*		Thyme Honey-myrtle			17	
Plantae	Flora	Myrtaceae	METR	*Metrosideros spp.*					1	
Plantae	Flora	Myrtaceae	4272	*Micromyrtus ciliata*		Fringed Heath-myrtle			23	
Plantae	Flora	Myrtaceae	13751	*Sannantha pluriflora*					3	
Plantae	Flora	Myrtaceae	6688	*Syncarpia glomulifera*		Turpentine			3	
Plantae	Flora	Myrtaceae	6778	*Syzygium australe*		Brush Cherry			1	
Plantae	Flora	Myrtaceae	7201	*Syzygium oleosum*		Blue Lilly Pilly			1	
Plantae	Flora	Myrtaceae	4293	*Syzygium paniculatum*		Magenta Lilly Pilly	E1	V	29	
Plantae	Flora	Myrtaceae	4297	*Tristaniopsis laurina*		Kanooka			1	
Plantae	Flora	Najadaceae	6985	*Najas tenuifolia*		Waternymph			1	
Plantae	Flora	Nyctaginaceae	4302	*Pisonia umbellifera*		Birdlime Tree			2	
Plantae	Flora	Oleaceae	4318	*Notelaea longifolia*		Large Mock-olive			39	
Plantae	Flora	Oleaceae	6653	*Notelaea longifolia f. glabra*					2	
Plantae	Flora	Oleaceae	6909	*Notelaea longifolia f. intermedia*					1	
Plantae	Flora	Oleaceae	6423	*Notelaea longifolia f. longifolia*					7	
Plantae	Flora	Oleaceae	4321	*Notelaea ovata*					2	
Plantae	Flora	Onagraceae	7951	*Epilobium billardierianum subsp. billardierianum*					3	
Plantae	Flora	Onagraceae	7375	*Ludwigia peploides subsp. montevidensis*		Water Primrose			2	
Plantae	Flora	Ophioglossaceae	8144	*Botrychium australe*		Parsley Fern			1	
Plantae	Flora	Orchidaceae	4353	*Acianthus fornicatus*		Pixie Caps	P		1	
Plantae	Flora	Orchidaceae	ACIA	*Acianthus spp.*		Mosquito Orchid	P		5	
Plantae	Flora	Orchidaceae	6838	*Caladenia alata*		Fairy Orchid	P		1	
Plantae	Flora	Orchidaceae	6703	*Caladenia catenata*		White Caladenia	P		6	
Plantae	Flora	Orchidaceae	7588	*Caladenia picta*			P		3	

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Plantae	Flora	Orchidaceae	CALA	*Caladenia spp.*			P		1	
Plantae	Flora	Orchidaceae	4389	*Caleana major*		Large Duck Orchid	P		6	
Plantae	Flora	Orchidaceae	4394	*Calochilus paludosus*		Red Beard Orchid	P		2	
Plantae	Flora	Orchidaceae	4395	*Calochilus robertsonii*		Purplish Beard Orchid	P		5	
Plantae	Flora	Orchidaceae	CALO	*Calochilus spp.*			P		1	
Plantae	Flora	Orchidaceae	4407	*Corybas fimbriatus*		Fringed Helmet Orchid	P		1	
Plantae	Flora	Orchidaceae	CORY	*Corybas spp.*			P		3	
Plantae	Flora	Orchidaceae	4412	*Corybas unguiculatus*		Small Helmet Orchid	P		1	
Plantae	Flora	Orchidaceae	4414	*Cryptostylis erecta*		Tartan Tongue Orchid	P		9	
Plantae	Flora	Orchidaceae	CRYT	*Cryptostylis spp.*			P		4	
Plantae	Flora	Orchidaceae	4417	*Cryptostylis subulata*		Large Tongue Orchid	P		6	
Plantae	Flora	Orchidaceae	4432	*Dendrobium speciosum*		Rock Lily	P		1	
Plantae	Flora	Orchidaceae	7888	*Dipodium variegatum*			P		1	
Plantae	Flora	Orchidaceae	4464	*^Genoplesium baueri*		Bauer's Midge Orchid	E1,P,2	E	1	
Plantae	Flora	Orchidaceae	4466	*Glossodia minor*		Small Waxlip Orchid	P		1	
Plantae	Flora	Orchidaceae	4472	*Lyperanthus suaveolens*		Brown Beaks	P		2	
Plantae	Flora	Orchidaceae	7622	*Microtis parviflora*		Slender Onion Orchid	P		3	
Plantae	Flora	Orchidaceae	7101	*Microtis rara*		Scented Onion Orchid	P		1	
Plantae	Flora	Orchidaceae	MICO	*Microtis spp.*			P		1	
Plantae	Flora	Orchidaceae	4473	*Microtis unifolia*		Common Onion Orchid	P		1	
Plantae	Flora	Orchidaceae	4491	*Prasophyllum australe*		Southern Leek Orchid	P		3	
Plantae	Flora	Orchidaceae	4497	*Prasophyllum elatum*		Tall Leek Orchid	P		3	
Plantae	Flora	Orchidaceae	4535	*Pterostylis acuminata*		Pointed Greenhood	P		4	
Plantae	Flora	Orchidaceae	4539	*Pterostylis baptistii*		King Greenhood	P		1	
Plantae	Flora	Orchidaceae	4544	*Pterostylis concinna*		Trim Greenhood	P		6	
Plantae	Flora	Orchidaceae	4545	*Pterostylis curta*		Blunt Greenhood	P		1	
Plantae	Flora	Orchidaceae	4562	*Pterostylis nutans*		Nodding Greenhood	P		3	
Plantae	Flora	Orchidaceae	13354	*Pterostylis oblonga*			P		1	
Plantae	Flora	Orchidaceae	4563	*Pterostylis obtusa*		Blue-tongue Greenhood	P		2	
Plantae	Flora	Orchidaceae	4566	*Pterostylis parviflora*		Tiny Greenhood	P		1	
Plantae	Flora	Orchidaceae	4567	*Pterostylis pedoglossa*		Prawn Greenhood	P		3	
Plantae	Flora	Orchidaceae	4572	*Pterostylis revoluta*			P		3	
Plantae	Flora	Orchidaceae	9479	*^Pterostylis sp. Botany Bay*		Botany Bay Bearded Orchid	E1,P,2	E	12	
Plantae	Flora	Orchidaceae	PTER	*Pterostylis spp.*		Greenhood	P		4	
Plantae	Flora	Orchidaceae	10853	*Pyrorchis nigricans*			P		8	
Plantae	Flora	Orchidaceae	11877	*Spiranthes australis*		Ladies' Tresses	P		3	
Plantae	Flora	Orchidaceae	11638	*^Thelymitra atronitida*		Black-hooded Sun Orchid	E4A,P,2		2	
Plantae	Flora	Orchidaceae	4592	*Thelymitra carnea*		Tiny Sun Orchid	P		3	
Plantae	Flora	Orchidaceae	8968	*Thelymitra ixioides var. ixioides*		Dotted Sun Orchid	P		2	
Plantae	Flora	Orchidaceae	7037	*Thelymitra malvina*		Mauve-tuft Sun Orchid	P		4	
Plantae	Flora	Orchidaceae	11639	*Thelymitra peniculata*			P		1	
Plantae	Flora	Orchidaceae	THEL	*Thelymitra spp.*			P		4	
Plantae	Flora	Orobanchaceae	7778	*Euphrasia collina subsp. paludosa*		Eyebright			1	
Plantae	Flora	Oxalidaceae	4615	*Oxalis exilis*					1	
Plantae	Flora	Oxalidaceae	4621	*Oxalis perennans*					1	
Plantae	Flora	Oxalidaceae	4625	*Oxalis rubens*					5	
Plantae	Flora	Oxalidaceae	OXAL	*Oxalis spp.*					7	
Plantae	Flora	Philydraceae	7065	*Philydrum lanuginosum*		Frogsmouth			4	
Plantae	Flora	Phormiaceae	3540	*Dianella caerulea*		Blue Flax-lily			30	
Plantae	Flora	Phormiaceae	6811	*Dianella caerulea var. assera*					1	
Plantae	Flora	Phormiaceae	6700	*Dianella caerulea var. caerulea*					8	
Plantae	Flora	Phormiaceae	7337	*Dianella caerulea var. producta*					36	
Plantae	Flora	Phormiaceae	7864	*Dianella congesta*					11	
Plantae	Flora	Phormiaceae	7865	*Dianella crinoides*					1	
Plantae	Flora	Phormiaceae	7783	*Dianella longifolia*		Blueberry Lily			8	
Plantae	Flora	Phormiaceae	8725	*Dianella longifolia var. longifolia*		A Blue Flax Lily			1	
Plantae	Flora	Phormiaceae	6912	*Dianella prunina*					2	
Plantae	Flora	Phormiaceae	3542	*Dianella revoluta*		Blueberry Lily			32	

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Plantae	Flora	Phormiaceae	7580	*Dianella revoluta var. revoluta*		A Blue Flax Lily			4	
Plantae	Flora	Phormiaceae	DIAN	*Dianella spp.*					2	
Plantae	Flora	Phormiaceae	7664	*Thelionema caespitosum*		Tufted Blue-lily			2	
Plantae	Flora	Phormiaceae	6461	*Thelionema umbellatum*					7	
Plantae	Flora	Phrymaceae	14731	*Thyridia repens*		Creeping Monkey-flower			1	
Plantae	Flora	Phyllanthaceae	2695	*Breynia oblongifolia*		Coffee Bush			63	
Plantae	Flora	Phyllanthaceae	7866	*Glochidion ferdinandi*		Cheese Tree			14	
Plantae	Flora	Phyllanthaceae	9360	*Glochidion ferdinandi var. ferdinandi*		Cheese Tree			22	
Plantae	Flora	Phyllanthaceae	8821	*Glochidion ferdinandi var. pubens*		Hairy Cheese Tree			15	
Plantae	Flora	Phyllanthaceae	2746	*Phyllanthus gunnii*					1	
Plantae	Flora	Phyllanthaceae	8216	*Phyllanthus hirtellus*		Thyme Spurge			3	
Plantae	Flora	Phyllanthaceae	2753	*Poranthera corymbosa*					1	
Plantae	Flora	Phyllanthaceae	7395	*Poranthera microphylla*		Small Poranthera			7	
Plantae	Flora	Phyllanthaceae	PORA	*Poranthera spp.*					1	
Plantae	Flora	Pittosporaceae	4671	*Billardiera scandens*		Hairy Apple Berry			58	
Plantae	Flora	Pittosporaceae	11204	*Pittosporum multiflorum*		Orange Thorn			1	
Plantae	Flora	Pittosporaceae	4683	*Pittosporum revolutum*		Rough Fruit Pittosporum			26	
Plantae	Flora	Pittosporaceae	4685	*Pittosporum undulatum*		Sweet Pittosporum			83	
Plantae	Flora	Plantaginaceae	4697	*Plantago hispida*					1	
Plantae	Flora	Plantaginaceae	PLAA	*Plantago spp.*		Plantain			3	
Plantae	Flora	Plantaginaceae	4705	*Plantago varia*					1	
Plantae	Flora	Plantaginaceae	6009	*Veronica plebeia*		Trailing Speedwell			2	
Plantae	Flora	Poaceae	AGRO	*Agrostis spp.*		Bent Grass			1	
Plantae	Flora	Poaceae	4749	*Anisopogon avenaceus*		Oat Speargrass			8	
Plantae	Flora	Poaceae	14896	*Anthosachne scabra*		Wheatgrass, Common Wheatgrass			1	
Plantae	Flora	Poaceae	4755	*Aristida benthamii*		Three-awned spear grass			1	
Plantae	Flora	Poaceae	4756	*Aristida calycina*					1	
Plantae	Flora	Poaceae	4770	*Aristida ramosa*		Purple Wiregrass			4	
Plantae	Flora	Poaceae	ARIS	*Aristida spp.*		A Wiregrass			3	
Plantae	Flora	Poaceae	4773	*Aristida vagans*		Threeawn Speargrass			1	
Plantae	Flora	Poaceae	6594	*Austrofestuca littoralis*		Beach Fescue			2	
Plantae	Flora	Poaceae	10393	*Austrostipa mollis*		Soft Speargrass			8	
Plantae	Flora	Poaceae	9603	*Austrostipa pubescens*					1	
Plantae	Flora	Poaceae	AUSO	*Austrostipa spp.*		A Speargrass			4	
Plantae	Flora	Poaceae	14952	*Cenchrus purpurascens*					1	
Plantae	Flora	Poaceae	4841	*Cymbopogon refractus*		Barbed Wire Grass			2	
Plantae	Flora	Poaceae	6540	*Cynodon dactylon*		Common Couch			73	
Plantae	Flora	Poaceae	4891	*Deyeuxia quadriseta*					6	
Plantae	Flora	Poaceae	7645	*Dichanthium sericeum subsp. sericeum*		Queensland Bluegrass			1	
Plantae	Flora	Poaceae	4897	*Dichelachne crinita*		Longhair Plumegrass			15	
Plantae	Flora	Poaceae	4898	*Dichelachne micrantha*		Shorthair Plumegrass			12	
Plantae	Flora	Poaceae	DICE	*Dichelachne spp.*		A Plumegrass			3	
Plantae	Flora	Poaceae	4904	*Digitaria didactyla*		Queensland Blue Couch			6	

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Plantae	Flora	Poaceae	4913	*Digitaria parviflora*		Small-flowered Finger Grass			2	
Plantae	Flora	Poaceae	DIGI	*Digitaria spp.*		A Finger Grass			1	
Plantae	Flora	Poaceae	4929	*Echinopogon caespitosus*		Bushy Hedgehog-grass			1	
Plantae	Flora	Poaceae	4946	*Entolasia marginata*		Bordered Panic			26	
Plantae	Flora	Poaceae	ENTO	*Entolasia spp.*					3	
Plantae	Flora	Poaceae	4947	*Entolasia stricta*		Wiry Panic			50	
Plantae	Flora	Poaceae	7921	*Eragrostis brownii*		Brown's Lovegrass			22	
Plantae	Flora	Poaceae	4955	*Eragrostis elongata*		Clustered Lovegrass			1	
Plantae	Flora	Poaceae	4960	*Eragrostis leptostachya*		Paddock Lovegrass			1	
Plantae	Flora	Poaceae	ERAG	*Eragrostis spp.*		A Lovegrass			1	
Plantae	Flora	Poaceae	5001	*Hemarthria uncinata*		Matgrass			4	
Plantae	Flora	Poaceae	7871	*Hemarthria uncinata var. uncinata*					1	
Plantae	Flora	Poaceae	6803	*Imperata cylindrica*		Blady Grass			67	
Plantae	Flora	Poaceae	5017	*Isachne globosa*		Swamp Millet			1	
Plantae	Flora	Poaceae	11388	*Lachnagrostis filiformis*					3	
Plantae	Flora	Poaceae	LACH	*Lachnagrostis spp.*					1	
Plantae	Flora	Poaceae	5037	*Microlaena stipoides*		Weeping Grass			36	
Plantae	Flora	Poaceae	7707	*Microlaena stipoides var. stipoides*		Weeping Grass			7	
Plantae	Flora	Poaceae	5044	*Oplismenus aemulus*					7	
Plantae	Flora	Poaceae	5045	*Oplismenus imbecillis*					15	
Plantae	Flora	Poaceae	5066	*Panicum simile*		Two-colour Panic			3	
Plantae	Flora	Poaceae	7172	*Paspalidium distans*					18	
Plantae	Flora	Poaceae	PASA	*Paspalidium spp.*					1	
Plantae	Flora	Poaceae	5087	*Paspalum distichum*		Water Couch			2	
Plantae	Flora	Poaceae	5089	*Paspalum orbiculare*		Ditch Millet			4	
Plantae	Flora	Poaceae	PASP	*Paspalum spp.*					1	
Plantae	Flora	Poaceae	5113	*Phragmites australis*		Common Reed			24	
Plantae	Flora	Poaceae	5117	*Plinthanthesis paradoxa*					3	
Plantae	Flora	Poaceae	5120	*Poa affinis*					18	
Plantae	Flora	Poaceae	11143	*Poa poiformis var. poiformis*					5	
Plantae	Flora	Poaceae	5147	*Pseudoraphis paradoxa*		Slender Mudgrass			3	
Plantae	Flora	Poaceae	14313	*Rytidosperma monticola*		Mountain Wallaby Grass			1	
Plantae	Flora	Poaceae	RYTI	*Rytidosperma spp.*					2	
Plantae	Flora	Poaceae	14323	*Rytidosperma tenuius*		A Wallaby Grass			2	
Plantae	Flora	Poaceae	5155	*Sacciolepis indica*		Indian Cupscale Grass			1	
Plantae	Flora	Poaceae	7843	*Spinifex sericeus*		Hairy Spinifex			18	
Plantae	Flora	Poaceae	5179	*Sporobolus creber*		Slender Rat's Tail Grass			1	
Plantae	Flora	Poaceae	5184	*Sporobolus virginicus*					13	
Plantae	Flora	Poaceae	9224	*Sporobolus virginicus var. minor*		Marine Couch			4	
Plantae	Flora	Poaceae	7770	*Themeda triandra*					37	
Plantae	Flora	Poaceae	5243	*Zoysia macrantha*		Prickly Couch			7	
Plantae	Flora	Podocarpaceae	5248	*Podocarpus spinulosus*		Spiny-leaf Podocarp			1	
Plantae	Flora	Polygalaceae	5253	*Comesperma ericinum*		Pyramid Flower			20	
Plantae	Flora	Polygalaceae	POLY	*Polygala spp.*					1	
Plantae	Flora	Polygonaceae	7568	*Persicaria decipiens*		Slender Knotweed			8	
Plantae	Flora	Polygonaceae	5281	*Persicaria hydropiper*		Water Pepper			2	
Plantae	Flora	Polygonaceae	5282	*Persicaria lapathifolia*		Pale Knotweed			5	
Plantae	Flora	Polygonaceae	PERC	*Persicaria spp.*		Knotweed			2	
Plantae	Flora	Polygonaceae	5286	*Persicaria strigosa*					1	
Plantae	Flora	Polygonaceae	RUME	*Rumex spp.*		Dock			1	
Plantae	Flora	Portulacaceae	5324	*Portulaca oleracea*		Pigweed			5	
Plantae	Flora	Potamogetonaceae	13488	*Potamogeton octandrus*					1	
Plantae	Flora	Potamogetonaceae	5332	*Potamogeton pectinatus*		Sago Pondweed			1	
Plantae	Flora	Primulaceae	7459	*Aegiceras corniculatum*		River Mangrove			3	

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Plantae	Flora	Primulaceae	11953	*Myrsine variabilis*					6	
Plantae	Flora	Primulaceae	5337	*Samolus repens*		Creeping Brookweed			9	
Plantae	Flora	Proteaceae	5339	*Banksia aemula*		Wallum Banksia			45	
Plantae	Flora	Proteaceae	5342	*Banksia ericifolia*		Heath-leaved Banksia			97	
Plantae	Flora	Proteaceae	11049	*Banksia ericifolia subsp. ericifolia*					15	
Plantae	Flora	Proteaceae	5343	*Banksia integrifolia*		Coast Banksia			138	
Plantae	Flora	Proteaceae	6603	*Banksia integrifolia subsp. integrifolia*		Coastal Banksia			15	
Plantae	Flora	Proteaceae	5344	*Banksia marginata*		Silver Banksia			1	
Plantae	Flora	Proteaceae	5345	*Banksia oblongifolia*		Fern-leaved Banksia			11	
Plantae	Flora	Proteaceae	7066	*Banksia oblongifolia x robur*					1	
Plantae	Flora	Proteaceae	10874	*Banksia paludosa subsp. paludosa*					2	
Plantae	Flora	Proteaceae	5347	*Banksia robur*		Swamp Banksia			8	
Plantae	Flora	Proteaceae	5348	*Banksia serrata*		Old-man Banksia			73	
Plantae	Flora	Proteaceae	5349	*Banksia spinulosa*		Hairpin Banksia	P		5	
Plantae	Flora	Proteaceae	7488	*Banksia spinulosa var.*			P		2	
Plantae	Flora	Proteaceae	BANK	*Banksia spp.*					2	
Plantae	Flora	Proteaceae	9136	*Conospermum ellipticum*					11	
Plantae	Flora	Proteaceae	9976	*Conospermum ericifolium*					4	
Plantae	Flora	Proteaceae	8612	*Conospermum longifolium subsp. longifolium*					1	
Plantae	Flora	Proteaceae	CONO	*Conospermum spp.*					1	
Plantae	Flora	Proteaceae	5352	*Conospermum taxifolium*		Variable Smoke-bush			10	
Plantae	Flora	Proteaceae	5364	*Grevillea buxifolia*		Grey Spider Flower			2	
Plantae	Flora	Proteaceae	5385	*Grevillea mucronulata*					14	
Plantae	Flora	Proteaceae	5396	*Grevillea robusta*		Silky Oak			2	
Plantae	Flora	Proteaceae	5399	*Grevillea sericea*		Pink Spider Flower			1	
Plantae	Flora	Proteaceae	10979	*Grevillea sericea subsp. sericea*					1	
Plantae	Flora	Proteaceae	GREV	*Grevillea spp.*					5	
Plantae	Flora	Proteaceae	5409	*Hakea dactyloides*		Finger Hakea			20	
Plantae	Flora	Proteaceae	5415	*Hakea gibbosa*					13	
Plantae	Flora	Proteaceae	11254	*Hakea laevipes*					6	
Plantae	Flora	Proteaceae	5421	*Hakea propinqua*					1	
Plantae	Flora	Proteaceae	5424	*Hakea salicifolia*		Willow-leaved Hakea			1	
Plantae	Flora	Proteaceae	10806	*Hakea salicifolia subsp. salicifolia*					1	
Plantae	Flora	Proteaceae	5425	*Hakea sericea*		Needlebush			15	
Plantae	Flora	Proteaceae	5427	*Hakea teretifolia*		Needlebush			48	
Plantae	Flora	Proteaceae	10808	*Hakea teretifolia subsp. teretifolia*					3	
Plantae	Flora	Proteaceae	5433	*Isopogon anemonifolius*		Broad-leaf Drumsticks	P		21	
Plantae	Flora	Proteaceae	6839	*Isopogon anethifolius*		Narrow-leaf Drumsticks	P		10	
Plantae	Flora	Proteaceae	5440	*Lambertia formosa*		Mountain Devil			18	
Plantae	Flora	Proteaceae	5445	*Lomatia silaifolia*		Crinkle Bush	P		10	
Plantae	Flora	Proteaceae	5460	*Persoonia lanceolata*		Lance Leaf Geebung	P		60	
Plantae	Flora	Proteaceae	5461	*Persoonia laurina*		Laurel Geebung	P		1	
Plantae	Flora	Proteaceae	5462	*Persoonia levis*		Broad-leaved Geebung	P		11	
Plantae	Flora	Proteaceae	5463	*Persoonia linearis*		Narrow-leaved Geebung	P		4	
Plantae	Flora	Proteaceae	5468	*Persoonia oblongata*			P		1	
Plantae	Flora	Proteaceae	5469	*Persoonia pinifolia*		Pine-leaved Geebung	P		1	
Plantae	Flora	Proteaceae	5479	*Petrophile pulchella*		Conesticks	P		12	
Plantae	Flora	Proteaceae	5480	*Petrophile sessilis*			P		4	
Plantae	Flora	Proteaceae	PETO	*Petrophile spp.*			P		3	
Plantae	Flora	Proteaceae	5485	*Symphionema paludosum*					5	
Plantae	Flora	Proteaceae	5490	*Xylomelum pyriforme*		Woody Pear	P		26	
Plantae	Flora	Psilotaceae	8165	*Psilotum nudum*		Skeleton Fork-Fern			1	
Plantae	Flora	Pteridaceae	8007	*Cheilanthes sieberi subsp. sieberi*		Rock Fern			1	

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Plantae	Flora	Pteridaceae	8177	*Pteris vittata*		Chinese Brake			2	
Plantae	Flora	Ranunculaceae	5493	*Clematis aristata*		Old Man's Beard			11	
Plantae	Flora	Ranunculaceae	5495	*Clematis glycinoides*		Headache Vine			12	
Plantae	Flora	Ranunculaceae	6903	*Clematis glycinoides var. glycinoides*					1	
Plantae	Flora	Ranunculaceae	5507	*Ranunculus inundatus*		River Buttercup			1	
Plantae	Flora	Restionaceae	10607	*Baloskion gracile*					1	
Plantae	Flora	Restionaceae	10612	*Baloskion tetraphyllum*					7	
Plantae	Flora	Restionaceae	10614	*Baloskion tetraphyllum subsp. meiostachyum*		Plume Rush			3	
Plantae	Flora	Restionaceae	13528	*Chordifex fastigiatus*					10	
Plantae	Flora	Restionaceae	5532	*Empodisma minus*					10	
Plantae	Flora	Restionaceae	10615	*Eurychorda complanata*					13	
Plantae	Flora	Restionaceae	5533	*Hypolaena fastigiata*					35	
Plantae	Flora	Restionaceae	5534	*Leptocarpus tenax*					37	
Plantae	Flora	Restionaceae	5535	*Lepyrodia anarthria*					2	
Plantae	Flora	Restionaceae	5540	*Lepyrodia muelleri*					4	
Plantae	Flora	Restionaceae	5541	*Lepyrodia scariosa*					27	
Plantae	Flora	Restionaceae	10603	*Sporadanthus gracilis*					8	
Plantae	Flora	Rhamnaceae	5554	*Cryptandra amara*		Bitter Cryptandra			3	
Plantae	Flora	Rhamnaceae	5556	*Cryptandra ericoides*		Heathy Cryptandra			7	
Plantae	Flora	Rhamnaceae	5562	*Cryptandra spinescens*					1	
Plantae	Flora	Rosaceae	RUBU	*Rubus spp.*					1	
Plantae	Flora	Rubiaceae	5697	*Opercularia aspera*		Coarse Stinkweed			26	
Plantae	Flora	Rubiaceae	5698	*Opercularia diphylla*		Stinkweed			1	
Plantae	Flora	Rubiaceae	5699	*Opercularia hispida*		Hairy Stinkweed			1	
Plantae	Flora	Rubiaceae	5701	*Opercularia varia*		Variable Stinkweed			4	
Plantae	Flora	Rubiaceae	5703	*Pomax umbellata*		Pomax			19	
Plantae	Flora	Rutaceae	5749	*Boronia parviflora*		Swamp Boronia	P		9	
Plantae	Flora	Rutaceae	5750	*Boronia pinnata*			P		1	
Plantae	Flora	Rutaceae	5754	*Boronia rigens*		Stiff Boronia	P		3	
Plantae	Flora	Rutaceae	10046	*Correa alba var. alba*		White Correa			19	
Plantae	Flora	Rutaceae	5772	*Correa reflexa*		Native Fuschia			10	
Plantae	Flora	Rutaceae	8801	*Correa reflexa var. reflexa*		Native Fuschia			1	
Plantae	Flora	Rutaceae	10797	*Correa reflexa var. speciosa*					8	
Plantae	Flora	Rutaceae	5775	*Crowea saligna*			P		1	
Plantae	Flora	Rutaceae	5776	*Eriostemon australasius*			P		15	
Plantae	Flora	Rutaceae	10728	*Leionema diosmeum*					2	
Plantae	Flora	Rutaceae	10577	*Philotheca buxifolia*			P		15	
Plantae	Flora	Rutaceae	10578	*Philotheca buxifolia subsp. buxifolia*			P		14	
Plantae	Flora	Rutaceae	10579	*Philotheca buxifolia subsp. obovata*			P		1	
Plantae	Flora	Rutaceae	10586	*Philotheca hispidula*			P		3	
Plantae	Flora	Rutaceae	10588	*Philotheca myoporoides*		Long-leaf Wax Flower	P		1	
Plantae	Flora	Rutaceae	10593	*Philotheca myoporoides subsp. myoporoides*			P		1	
Plantae	Flora	Rutaceae	5831	*Philotheca salsolifolia*			P		22	
Plantae	Flora	Rutaceae	10596	*Philotheca salsolifolia subsp. salsolifolia*			P		4	
Plantae	Flora	Rutaceae	10600	*Philotheca trachyphylla*		Rock Waxflower	P		1	
Plantae	Flora	Rutaceae	5841	*Zieria laevigata*		Smooth Zieria			7	
Plantae	Flora	Rutaceae	5845	*Zieria pilosa*		Pilose-leafed Zieria			9	
Plantae	Flora	Santalaceae	5860	*Exocarpos cupressiformis*		Cherry Ballart			4	
Plantae	Flora	Santalaceae	5865	*Leptomeria acida*		Sour Currant Bush			1	

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Plantae	Flora	Santalaceae	5867	*Omphacomeria acerba*					1	
Plantae	Flora	Sapindaceae	5884	*Cupaniopsis anacardioides*		Tuckeroo			50	
Plantae	Flora	Sapindaceae	DODO	*Dodonaea spp.*		A Hopbush			1	
Plantae	Flora	Sapindaceae	5911	*Dodonaea triquetra*		Large-leaf Hop-bush			33	
Plantae	Flora	Schizaeaceae	8181	*Schizaea bifida*		Forked Comb Fern			1	
Plantae	Flora	Schizaeaceae	8182	*Schizaea dichotoma*		Branched Comb Fern			4	
Plantae	Flora	Schizaeaceae	8183	*Schizaea fistulosa*					1	
Plantae	Flora	Schizaeaceae	SCHZ	*Schizaea spp.*					1	
Plantae	Flora	Selaginellaceae	8187	*Selaginella uliginosa*		Swamp Selaginella			18	
Plantae	Flora	Smilacaceae	7592	*Smilax australis*		Lawyer Vine			2	
Plantae	Flora	Smilacaceae	6022	*Smilax glyciphylla*		Sweet Sarsparilla			60	
Plantae	Flora	Solanaceae	7043	*Solanum americanum*		Glossy Nightshade			5	
Plantae	Flora	Solanaceae	6065	*Solanum aviculare*		Kangaroo Apple			2	
Plantae	Flora	Solanaceae	6095	*Solanum opacum*		Green-berry Nightshade			1	
Plantae	Flora	Solanaceae	SOLA	*Solanum spp.*					1	
Plantae	Flora	Sphagnaceae	SPHG	*Sphagnum spp.*					3	
Plantae	Flora	Stackhousiaceae	6122	*Stackhousia nuda*					1	
Plantae	Flora	Stackhousiaceae	STAC	*Stackhousia spp.*					1	
Plantae	Flora	Stackhousiaceae	6125	*Stackhousia viminea*		Slender Stackhousia			2	
Plantae	Flora	Stylidiaceae	6157	*Stylidium graminifolium*		Grass Triggerplant			4	
Plantae	Flora	Stylidiaceae	6159	*Stylidium lineare*		Narrow-leaved Triggerplant			1	
Plantae	Flora	Thelypteridaceae	8190	*Cyclosorus interruptus*					6	
Plantae	Flora	Thymelaeaceae	7642	*Pimelea glauca*		Smooth Rice-flower			2	
Plantae	Flora	Thymelaeaceae	6180	*Pimelea latifolia*					1	
Plantae	Flora	Thymelaeaceae	6182	*Pimelea linifolia*		Slender Rice Flower			38	
Plantae	Flora	Thymelaeaceae	6814	*Pimelea linifolia subsp. linifolia*					29	
Plantae	Flora	Typhaceae	7224	*Typha domingensis*		Narrow-leaved Cumbungi			4	
Plantae	Flora	Typhaceae	6217	*Typha orientalis*		Broad-leaved Cumbungi			22	
Plantae	Flora	Typhaceae	TYPH	*Typha spp.*					1	
Plantae	Flora	Ulmaceae	CELT	*Celtis spp.*					1	
Plantae	Flora	Verbenaceae	VERE	*Verbena spp.*					1	
Plantae	Flora	Violaceae	6266	*Hybanthus monopetalus*		Slender Violet-bush			12	
Plantae	Flora	Violaceae	11863	*Viola banksii*					6	
Plantae	Flora	Violaceae	6272	*Viola hederacea*		Ivy-leaved Violet			7	
Plantae	Flora	Vitaceae	6281	*Cayratia clematidea*		Native Grape			16	
Plantae	Flora	Vitaceae	6282	*Cissus antarctica*		Water Vine			4	
Plantae	Flora	Vitaceae	6283	*Cissus hypoglauca*		Giant Water Vine			7	
Plantae	Flora	Xanthorrhoeaceae	6315	*Xanthorrhoea arborea*			P		8	
Plantae	Flora	Xanthorrhoeaceae	6319	*Xanthorrhoea media*			P		5	
Plantae	Flora	Xanthorrhoeaceae	6321	*Xanthorrhoea resinosa*			P		36	
Plantae	Flora	Xanthorrhoeaceae	XANT	*Xanthorrhoea spp.*			P		10	
Plantae	Flora	Xyridaceae	7247	*Xyris complanata*					1	
Plantae	Flora	Xyridaceae	6322	*Xyris gracilis*					2	
Plantae	Flora	Xyridaceae	6324	*Xyris operculata*					4	
Plantae	Flora	Xyridaceae	XYRI	*Xyris spp.*					2	
Plantae	Flora	Zamiaceae	6327	*Macrozamia communis*		Burrawang	P		29	
Plantae	Flora	Zamiaceae	6335	*Macrozamia spiralis*			P		8	
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*		Little Bent-winged Bat	V,P		4	

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Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*		Large Bent-winged Bat	V		23	