

Review of Environmental Factors

Operation Crayweed Manly – Temporary structure to the subtidal rocky reef at Cabbage Tree Bay

*Prepared pursuant to Part 5 of the Environmental
Planning and Assessment Act, 1979*

Natural Environment and Climate Change

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Table of Contents

1	INTRODUCTION AND BACKGROUND	3
1.0	Introduction	3
1.1	Background	3
2	THE SITE AND PROPOSAL	4
2.0	Site Information	4
2.1	Physical Characteristics	5
2.2	Ecological Environment	5
2.3	Social and Cultural Environment	6
2.4	Description of the Proposed Activity	6
2.5	Justification of the Proposal	8
2.6	Consideration of Alternatives	8
4	IMPACT ASSESSMENT	28
4.0	Soils and Erosion	28
4.1	Water	29
4.2	Flood Affected Land	29
4.3	Coastal Land	30
4.4	Chemical and Waste	30
4.5	Dust, odours, noise, vibration	30
4.6	Flora and fauna	31
4.7	Impact on the community	31
4.8	Visual Assessment and Recreation Values	32
4.9	Natural resource	32
4.10	Aboriginal heritage	33
4.11	Other Cultural heritage	33
4.12	Cumulative environmental impacts	33
	TABLE 1 ENVIRONMENTAL IMPACTS AND MANAGEMENT	34
5	WORK HEALTH AND SAFETY	43
6	CONCLUSIONS & RECOMMENDATIONS	43
7	DECLARATION	45
8	REFERENCES	46
9	APPENDICES	47

1 Introduction and Background

1.0 Introduction

The Sydney Institute of Marine Science proposes to install temporary structures to the subtidal rocky reef of Cabbage Tree Bay Reserve to facilitate the restoration of crayweed (*Phyllospora comosa*), a habitat forming brown macroalga that went locally extinct in Sydney.

This endemic species went extinct along 70 km of Sydney coastline sometime in the 1970's – 80's. We believe this was due to anthropogenic disturbances, i.e. pollution by onshore sewage outfalls. The water quality along the Sydney coast has improved since, with the installation of deep-sea outfalls. However, crayweed has not been able to re-establish and has remained absent from the Sydney coastline until recent restoration efforts by the Sydney Institute of Marine Science. We propose to restore crayweed to its former native habitat in CTB following successful restoration at other sites along the Sydney coastline.

This Review of Environmental Factors (REF) has been prepared to seek consent to undertake works that involve the addition of temporary structures to the ocean floor to facilitate the restoration and to address the requirements in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). For this proposal, Northern Beaches Council is both a public authority proponent (EP&A Act s.4) and the determining authority (EP&A Act s.110). The REF has been prepared in accordance with Clause 228 of the EP&A Regulation (2000).

1.1 Background

As the proposed installations are located within environmentally sensitive areas, the works are to be assessed under Part 5 of the *Environmental Planning & Assessment Act 1979* (EP&A Act 1979) with the Northern Beaches Council (herein referred to as Council) as the determining authority.

This Review of Environmental Factors (REF) will assess all environmental factors listed in clause 228 of the *Environmental Planning & Assessment Regulation 2000* (EP&A Regulation, 2000); and outline impact mitigation measures to be undertaken, in line with Council's policies and procedures.

The proposed works will be conducted by a team within the Sydney Institute of Marine Science, a leading multidisciplinary marine facility in NSW. The 'Operation Crayweed' restoration team includes scientists from the University of New South Wales (Prof. Peter Steinberg, A/Prof. Adriana Vergés), University of Sydney (Dr Ezequiel Marzinelli), Southern Cross University (Prof. Brendan Kelaher), the Department of Primary Industries (Dr Melinda Coleman) and University of the Sunshine Coast (Dr Alexandra Campbell).

The team has over 120 years of combined experience working in marine coastal ecosystems, including rocky reefs in the Greater Sydney region and surrounding areas. They have been active in monitoring the impacts of macrophyte disappearance, particularly the local extinction of crayweed and the potential effects of restoration for over a decade. This includes high quality, long-term data demonstrating the positive effects of crayweed restoration for multiple restoration

sites. The members of the team will also be aided by a group of highly qualified marine biologists, experienced in restoration, SCUBA and boating.

2 The Site and Proposal

2.0 Site Information

The site locations (Figure 1.) where work is proposed in Cabbage Tree Bay, Manly NSW.

Location	Habitat description	Area of works
Site 1 (-33.79, 151.29)	Shallow subtidal rocky reef	25 x 10 m ²
Site 2 (-33.79, 151.29)	Shallow subtidal rocky reef	2 x 4 m ²
Site 3 (-33.79, 151.29)	Shallow subtidal rocky reef	1 x 6 m ²

The area is within a parcel of “land” owned by the Crown which is under the care, control and management of both Northern Beaches Council and NSW DPI (as managers of Cabbage Tree Bay Aquatic Reserve). The proposed sites are zoned W1 Natural Waterways under the provisions of the Manly Local Environment Plan 2013.



Figure 1. Aerial view of Cabbage Tree Bay showing the three proposed site locations.

2.1 Physical Characteristics

Cabbage Tree Bay features seven main habitat types; sandy beaches, rocky shores, rocky reefs, kelp, seagrass beds, sandy seabed and open water. All works will be conducted on subtidal (0.5-5.0 m), bare rocky reefs, seaward of Marine Parade, Manly.

2.2 Ecological Environment

Despite being surrounded by residential and commercial zoning, Cabbage Tree Bay is an Aquatic Reserve and part of the NSW marine estate that is managed to conserve marine biodiversity and support marine science, recreation and education.

A permit to conduct the proposed works within the Aquatic Reserve was obtained on 30th November 2018 (*Marine Estate Management Act 2014, Marine Estate Management Regulation 2017 and the Aquatic Reserve Notification 2015*).

NSW Department of Primary Industries – Aquatic Reserve Permit
Permit No: AR1-2018
Permittee: Sydney Institute of Marine Science

Halophila spp. are present in Cabbage Tree Bay. All seagrasses are protected under *NSW Fisheries Management Act 1994*. Seagrass will not be disturbed or removed during this project. The proposed sites for installation are on rocky reefs barren of macro-vegetation. Microscopic turfing algae may be present on these reefs although impacts by the proposed works are negligible.

This work complies with the Aquatic Reserves Notice (2015) as it does not take, gather, destroy, injure or interfere with any fish or marine vegetation. Under the Environmental Planning and Assessment Act 1979, if the activity is likely to have a significant impact, or will be carried out in a declared area of outstanding biodiversity value, the proponent must prepare a species impact statement (SIS). Because works will not impact seagrass beds a SIS is not required.

Terrestrial vegetation will not be impacted by the works.

2.3 Social and Cultural Environment

Cabbage Tree Bay and its surrounds are popular with residents and visitors for recreational activities

There are no listed state heritage items in close vicinity to the study area. The nearest are St Patricks Seminary College and North Head Quarantine Station, approximately 400m and 1km away. Local Heritage items are listed in the Manly LEP (2013) and include the ocean foreshore (Figure 11.) the Fairy Bower Pool and heritage-listed houses at 50 & 52 Bower St. None of these local heritage items will be affected directly or indirectly by the works.

There are no listed Aboriginal Sites in the vicinity where installations are proposed according to AHIMS register however the beach and headland reserve are identified as having 'Extremely High' potential. Our proposed works will be confined to subtidal areas and will not impact these. Any potential heritage artefacts will be reported immediately.

2.4 Description of the Proposed Activity

The proposed activity involves the installation of temporary structures to the rocky reefs to facilitate the restoration of crayweed.

The temporary structures are small plastic mats (0.5 - 2m²), attached to the rocky reefs using flat galvanised metal bars with stainless steel screws (Figure 2.). The sites where we propose to install mats are on bare rocky reefs and does not require the removal of any vegetation.

After installation, reproductively mature crayweed will be collected from the fringes of Sydney where healthy populations still exist, then transported to Cabbage Tree Bay and attached to the mats using customised cable ties that are inconspicuous and enclosed in a rubber tube to ensure the plants are not damaged (Figure 3.). The attached plants will fully cover the mats forming an initial crayweed patch and we anticipate that these will reproduce, slowly forming a self-sustaining crayweed population in Cabbage Tree Bay.

Once significant recruitment of juvenile crayweed occurs, the mats and bolts will be removed, such that no artificial structures remain. This is usually done 6 -18 months from initial attachment of donor plants. The use of stainless-steel bolts allows for easy and complete removal of the

temporary structures. Remaining holes (5-8 mm diameter) are very difficult to identify, as they are rapidly filled by sediment or overgrown by encrusting or turfing algae (Figure 4.)

No removal of material is proposed.



Figure 2. Before (left) and after (right) photos of installation of crayweed. Photos: Georgina Wood

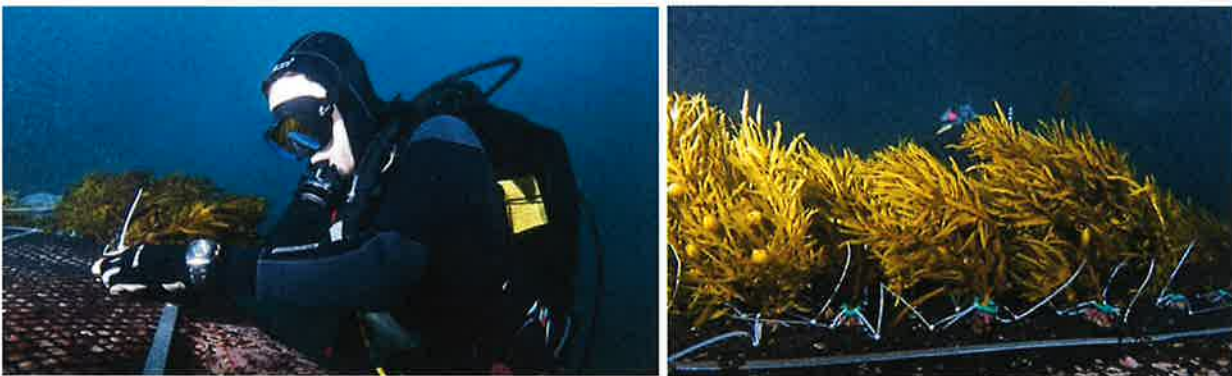


Figure 3. Marine ecologist attaching crayweed to mats. Photos: John Turnbull



Figure 4. Crayweed growing at a restoration site after the removal of plastic mats.

2.5 Justification of the Proposal

Cabbage Tree Bay is an Aquatic Reserve managed by NSW DPI under *Marine Estate Management Regulation 2017* and *Aquatic Reserve Notification 2015*. The objectives of the Aquatic Reserve are:

- Conserve the biodiversity of fish and marine vegetation
- Protect fish habitat
- Facilitate educational activities
- Facilitate scientific research.

The proposed activity is consistent with the objectives of the Aquatic Reserve.

2.6 Consideration of Alternatives

Alternative options include:

Doing nothing

Crayweed has been unable to self re-establish from the Sydney coastline until recent restoration efforts by the Sydney Institute of Marine Science. Without any restoration efforts, a 'do nothing' alternative will see the continued absence of crayweed and its associated, unique diversity from the Cabbage Tree Bay area and will increase the risk of genetic isolation of the northern and southern population of this important habitat forming species.

3. Planning Context & Consultation

3.0 Permissibility

Land Ownership

The study area is zoned W1 Natural Waterways under the provisions of the Manly Local Environment Plan 2013. The area is within a parcel of “land” owned by the Crown which is under the care, control and management of both Northern Beaches Council and NSW DPI (as managers of Cabbage Tree Bay Aquatic Reserve).

A licence to conduct the proposed works was obtained on 18th October 2018, under the *Crown Land Management Act 2016 - Section 2.20*.

Licence: RN 596739

Corporation: SYDNEY INSTITUTE OF MARINE SCIENCE

Authority: Section 127 of the Corporation Act 2001

Name of authorised person: Peter Steinberg

Name of authorised person: Mark Scognamiglio

Environmental Planning and Assessment Act 1979 (EP&A Act)

In New South Wales (NSW) development falls under the provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and subordinate legislation. Before the approval pathway (i.e. assessment under Parts 4 or 5 of the EP&A Act) for a development can be defined, it is necessary to answer two key questions: -

1. Whether development consent is required under a relevant local environmental planning instrument; and
2. Whether the project is likely to have a significant impact on the environment.

Provisions in the State Environmental Planning Policy (Infrastructure) 2007 allow for some activities (by public authorities or **on behalf of public authorities**) to be carried out as “*developments without consent*” (refer below). The intention of the SEPP (Infrastructure) was to allow public authorities (such as Council) carry out low impact activities (such as environmental protection works) that are part of their everyday responsibilities without having to seek formal approvals from other (relevant) public authorities/government agencies.

As development consent under Part 4 is not required the proposed activity may proceed in accordance with Part 5 of the EP&A Act. An environmental assessment is still required as part of Part 5 assessment to ensure that public authorities fully consider environmental issues before they undertake or approve activities that do not require development consent. The proposed activity – experimental restoration of crayweed at Cabbage Tree Bay within the Council LGA – requires an environmental assessment in the form of a Review of Environmental Factors (REF).

This REF has concluded that there is unlikely to be any significant impact on the environment and therefore an Environmental Impact Statement (EIS) under Section 5.7 of the *EP&A Act* is not required.

3.1 Manly Local Environmental Plan 2013

The study area is zoned as W1 Natural Waterways under the Manly LEP 2013 (Figure 5.)

The objectives of Zone W1 Natural Waterways include protection of the ecological and scenic value of the waterway and prevention of development that would have an adverse effect on natural values. As such, the proposed activity (crayweed restoration) is consistent with the objectives of W1 Zoning.

Environmental protection works in W1 Natural Waterways are permitted with consent under the Manly LEP 2013. However, SEPP (Infrastructure) 2007 allows for such activities to be carried out as “developments without consent”. Clause 8 of SEPP (Infrastructure) 2007 and s36 of the EP&A Act 1979 states that “in the event of an inconsistency between environmental planning instruments and unless otherwise provided: there is a general presumption that a State environmental planning policy prevails over a local environmental plan or other instrument made before or after that State Environmental Planning Policy.”

Accordingly, the SEPP Infrastructure is the prevailing instrument for permissibility and the provisions of Manly LEP 2013 are not applicable in this instance.

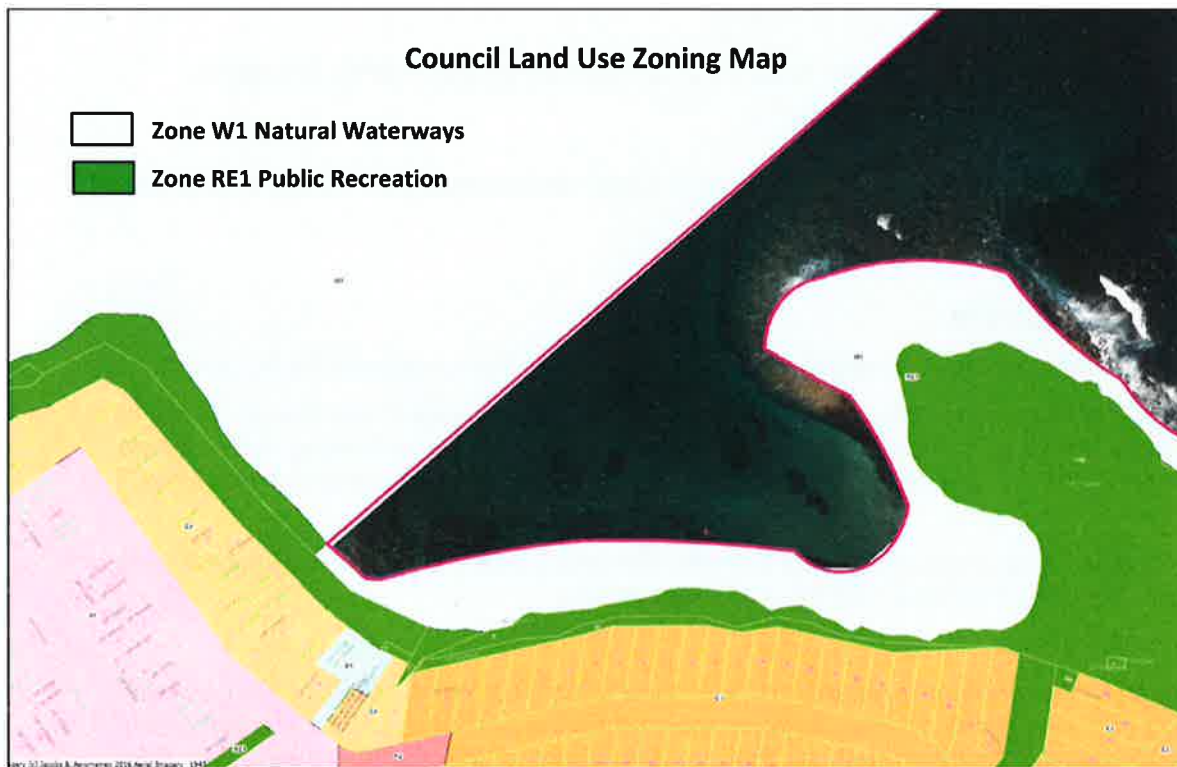


Figure 5. Cabbage Tree Bay, Council land use zoning map.

State Environmental Planning Policy (Infrastructure) 2007

Under SEPP Infrastructure 2007 (Division 25 Waterway or foreshore management activities), which overrides local planning controls, development for “foreshore management” may be carried out by or on behalf of a council without consent on any land.

The relevant portions of Division 25 Waterway or foreshore management activities of the State Environmental Planning Policy (Infrastructure) 2007 states: -

128 Definition. In this Division: waterway or foreshore management activities means:

- (a) riparian corridor and bank management, including erosion control, bank stabilisation, resnagging, weed management, **revegetation** and the creation of foreshore access ways, and
- (b) instream management or dredging to rehabilitate aquatic habitat or to maintain or restore environmental flows or tidal flows for ecological purposes, and
- (c) coastal management and beach nourishment, including erosion control, dune or foreshore stabilisation works, headland management, weed management, **revegetation activities** and

129 Development permitted without consent

- (1) Despite clause 129A, development for the purpose of waterway or foreshore management activities may be carried out by or on behalf of a public authority without consent on any land.
- (2) In this clause, a reference to development for the purpose of waterway or foreshore management activities includes a reference to development for any of the following purposes if the development is in connection with waterway or foreshore management activities:
 - (a) construction works,
 - (b) routine maintenance works,
 - (c) emergency works, including works required as a result of flooding, storms or erosion,
 - (d) **environmental management works.**

The project is considered *environmental management works and revegetation activity* in line with Division 25 SEPP (Infrastructure) 2007.

Coastal Management Act 2016

The works are consistent with the *Coastal Management Act, 2016*. The objects of the Act are to: *manage the coastal environment of New South Wales in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State, and in particular, points 2a and 2b (see below) for Coastal Environment Areas (Part 2 Section 8).*

The works are located in the mapped Coastal Environment and Coastal Use Areas (Figure 6. and 7.). The works are consistent with the objectives of these areas:

8 Coastal environment area

- 1) *The coastal environment area means the land identified by a State environmental planning policy to be the coastal environment area for the purposes of this Act, being land containing coastal features such as the coastal waters of the State, estuaries, coastal lakes, coastal lagoons and land adjoining those features, including headlands and rock platforms.*
- 2) *The management objectives for the coastal environment area are as follows:*
 - a) *to protect and enhance the coastal environmental values and natural processes of coastal waters, estuaries, coastal lakes and coastal lagoons, and enhance natural character, scenic value, biological diversity and ecosystem integrity,*

- b) to reduce threats to and improve the resilience of coastal waters, estuaries, coastal lakes and coastal lagoons, including in response to climate change,*
- c) to maintain and improve water quality and estuary health,*
- d) to support the social and cultural values of coastal waters, estuaries, coastal lakes and coastal lagoons,*
- e) to maintain the presence of beaches, dunes and the natural features of foreshores, taking into account the beach system operating at the relevant place,*
- f) to maintain and, where practicable, improve public access, amenity and use of beaches, foreshores, headlands and rock platforms.*

9 Coastal use area

- 1) The coastal use area means the land identified by a State environmental planning policy to be the coastal use area for the purposes of this Act, being land adjacent to coastal waters, estuaries, coastal lakes and lagoons where development is or may be carried out (at present or in the future).*
- 2) The management objectives for the coastal use area are as follows:*
 - a) to protect and enhance the scenic, social and cultural values of the coast by ensuring that:*
 - i. the type, bulk, scale and size of development is appropriate for the location and natural scenic quality of the coast, and*
 - ii. adverse impacts of development on cultural and built environment heritage are avoided or mitigated, and*
 - iii. urban design, including water sensitive urban design, is supported and incorporated into development activities, and*
 - iv. adequate public open space is provided, including for recreational activities and associated infrastructure, and*
 - v. the use of the surf zone is considered,*
 - b) to accommodate both urbanised and natural stretches of coastline.*



Figure 6. Cabbage Tree Bay, SEPP (Coastal Management) 2018 Map.



Figure 7. Cabbage Tree Bay, SEPP (Coastal environment) 2018 Map.

State Environmental Planning Policy (Coastal Management) 2018

The project is consistent with the aim of this Policy to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area.

As stated above, the Projects falls within both Coastal Environment Area and Coastal Use Area. When this occurs any inconsistency between the management objectives of the two area types is resolved in favour of the Coastal Environmental Area objectives. The maintenance works are consistent with the objectives of Coastal Environment Area.

Biodiversity Conservation Act 2016

The Biodiversity Conservation Act (BC Act) is the chief legislation addressing threatened species and wildlife protection in NSW. The purpose of the Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community consistent with the principles of ecologically sustainable development

A search of the NPWS Wildlife Atlas undertaken on 29 Jan 2019 revealed three records of threatened species and endangered populations occurring within a 500m radius of the study area:

Common name	Scientific name	Status
Long-nosed Bandicoot	<i>Perameles nasuta</i>	Endangered Population
Little Penguin	<i>Eudyptula minor</i>	Endangered Population
Green Turtle	<i>Chelonia mydas</i>	Vulnerable

Long-nosed bandicoot is a terrestrial mammal and therefore unaffected by the project.

The Little Penguin in the Manly Point area is listed as an endangered population under the BC Act. There are no known nesting sites in the study area and the closest critical habitat is located ~ 6km away (via the waterway around North Head) in the north harbour. Cabbage Tree Bay Aquatic Reserve may represent foraging habitat for Little Penguin but as the Project is not expected to have any impact on Little Penguin foraging habitat no formal assessment of significance under the BC Act was considered necessary.

Green turtles have been sighted before in the vicinity of the study area but are not common or resident and spend most of their life history at sea. There are scattered nesting records along the NSW Coast and as adults, feed mainly on marine plants. The proposed works are minor and will not have a significant effect on green turtle habitat or forage (as crayweed will be attached to rocky reef). The plastic mesh that is used to attach crayweed is not the type of plastic debris (e.g. plastic bags) that turtles can mistake for jellyfish and swallow. A formal assessment of significance under the BC Act was considered unnecessary.

Seventeen **endangered ecological communities** were found within a 10km radius using the BioNet search tool.

Common name	Scientific name
Blue Gum High Forest in the Sydney Basin Bioregion	Blue Gum High Forest in the Sydney Basin Bioregion
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Coastal Upland Swamp in the Sydney Basin Bioregion	Coastal Upland Swamp in the Sydney Basin Bioregion
Duffys Forest Ecological Community in the Sydney Basin Bioregion	Duffys Forest Ecological Community in the Sydney Basin Bioregion
Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion	Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions
Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion	Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Shale Sandstone Transition Forest in the Sydney Basin Bioregion	Shale Sandstone Transition Forest in the Sydney Basin Bioregion
Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Sydney Freshwater Wetlands in the Sydney Basin Bioregion	Sydney Freshwater Wetlands in the Sydney Basin Bioregion
Themeda grassland on seacliffs and	Themeda grassland on seacliffs and coastal

coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	Western Sydney Dry Rainforest in the Sydney Basin Bioregion

None of the 17 are found within the study area as all are associated with terrestrial or freshwater habitats. Based on the above assessment, it is considered that the proposed activity is unlikely to have an impact on threatened species or ecological communities as listed under the Biodiversity Conservation Act 2016. Further assessment in the form of a Species Impact Statement is therefore not warranted.

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined in the Act as matters of national environmental significance.

The objectives of the EPBC Act are to:

- provide for the protection of the environment, especially matters of national environmental significance
- conserve Australian biodiversity
- provide a streamlined national environmental assessment and approvals process
- enhance the protection and management of important natural and cultural places
- control the international movement of plants and animals (wildlife), wildlife specimens and products made or derived from wildlife
- promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources

A Protected Matters search undertaken on 29 January 2019 revealed 67 Listed Threatened Species and 5 Listed Threatened Ecological Communities that likely occur – or have habitat likely to occur – within one-kilometre radius of Cabbage Tree Bay. In addition, the search identified 56 Listed Migratory Species, 75 Listed Marine Species and 14 Whales and Other Cetaceans.

While many of these species could potentially occur within 1 km of Cabbage Tree Bay Aquatic Reserve, few have been frequently recorded in the vicinity, are dependent on habitat directly within the study area and / or maintain resident populations directly within the study area. A number are terrestrial and would be unaffected by the works. Similarly, seabirds do not need to be considered as they are transient within the area and would not be directly affected by subtidal works. Strapweed (*Posidonia australis*) is not found within the study area but in Sydney Harbour (within the 1km search radius) and therefore does not need to be considered further. Many of the remaining species do not require further consideration as they have specific habitat requirements not present in the study area, have not been recorded in the study area or are unlikely to maintain sedentary populations in the study area and may only visit the region (1km radius) opportunistically at some point of their life cycle (e.g. during migration).

One group that is likely to reside in the study area are various members of the syngnathiformes (which includes sea dragons, pipefish, pipehorses, seamoths etc.). The proposed works will not reduce or negatively affect habitat of syngnathiformes.

It is considered that the proposed experimental restoration of crayweed to Cabbage Tree Bay Aquatic Reserve will have no negative impact on any species, populations or communities that are listed under the EPBC Act. As such further consideration under the EPBC Act is not required, nor is there a need to conduct an Assessment of Significance.

National Parks and Wildlife Act 1974

The NPW Act regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas of the state. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit is required.

There are no listed Aboriginal Places within the study area. The closest are two Guringai Resting Places – at Quarantine Station and Reef Beach – both are located entirely within the Sydney Harbour National Park. The proposed works will not take place within any national park and as such consultation under CI16 of ISEPP not required.

The foreshore bordering the study area is identified as having high to extremely high potential for Aboriginal Heritage (Figure 8.). However, given the nature of the works and their subtidal location it is considered unlikely that any new artefacts will be uncovered during the project. Any sites or heritage items will be reported immediately, and works will be halted.

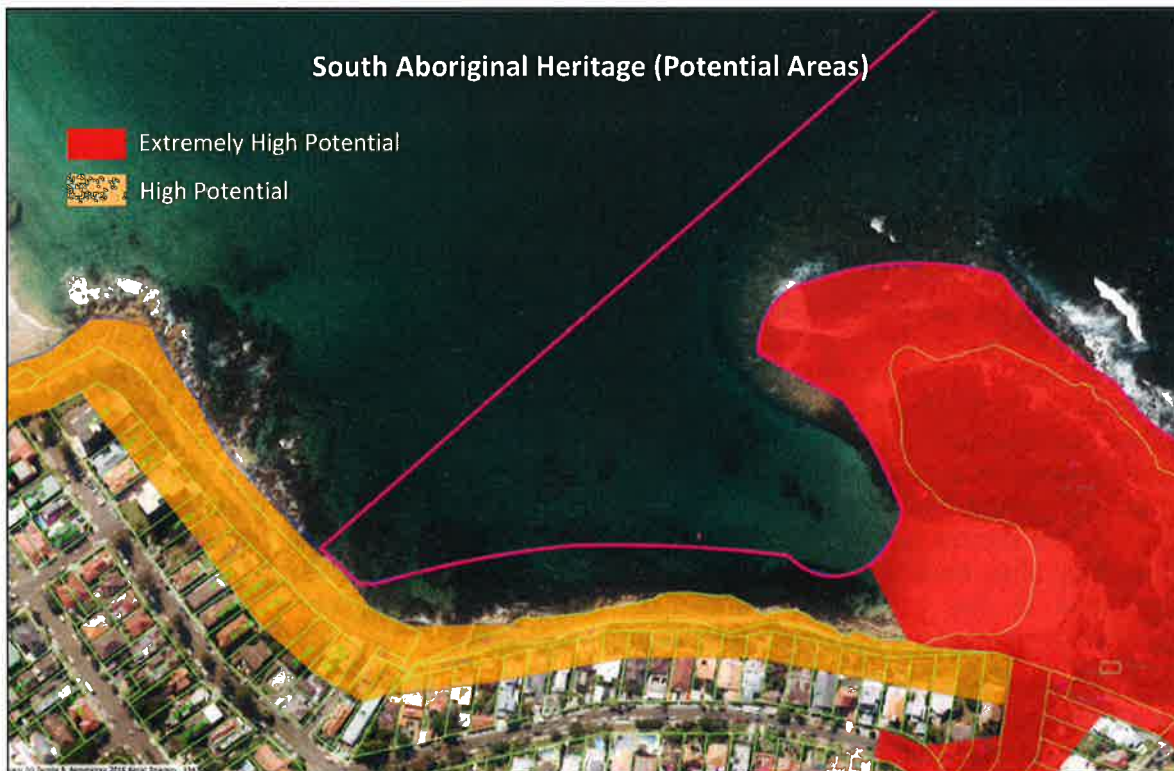


Figure 8. Cabbage Tree Bay, South Aboriginal Heritage map (Potential Areas).

Fisheries Management Act 1994

The FM Act provides for the protection, conservation, and recovery of threatened species defined under the Act. It also makes provision for the management of threats to threatened species, populations, and ecological communities defined under the Act, as well as the protection of fish and fish habitat in general (see NSW Policy and Guidelines for Fish Habitat Conservation and Management 2013). In particular, the FM Act has mechanisms for the protection of mangroves, seagrasses and seaweeds on public water land and foreshores.

As an aquatic reserve, Cabbage Tree Bay is classified as Type 1 Key Fish Habitat: highly sensitive key fish habitat (Figure 9.). One of the key objectives of the FM Act is to conserve Key Fish Habitats.

The proposal to restore crayweed to Cabbage Tree Bay is consistent with the objectives of the FM Act to conserve Key Fish Habitats.



Figure 9. Cabbage Tree Bay, Key fish habitat map (Red Type 1, Highly sensitive key fish habitat)

Cabbage Tree Bay is an Aquatic Reserve managed by NSW DPI under *Marine Estate Management Regulation 2017* and *Aquatic Reserve Notification 2015*. The Objectives of the Aquatic Reserve are:

- Conserve the biodiversity of fish and marine vegetation
- Protect fish habitat
- Facilitate educational activities
- Facilitate scientific research.

The proposed activity is consistent with the Objectives of the Aquatic Reserve. The proponents of the Project, SIMS, have a permit from NSW DPI (Permit No. AR1-2018) to carry out crayweed restoration in the aquatic reserve.

It is an offence to harm marine vegetation without a s205 Harm Marine Vegetation permit from NSW DPI. Cabbage Tree Bay supports numerous species of macroalgae and a significant bed of *H.ovalis* seagrass (Figure 10.) . The proposed works will attach crayweed to bare rocky reef and therefore will not remove existing macroalgae or seagrass and as such a s205 permit is not required.

Syngnathiformes are listed as 'Protected' under the FM Act but a formal assessment of significance is not required. Whilst some taxa of syngnathiformes are likely present with Cabbage Tree Bay Aquatic Reserve the crayweed restoration project is not anticipated to have any significant effect on these species, either directly or indirectly via their habitat.

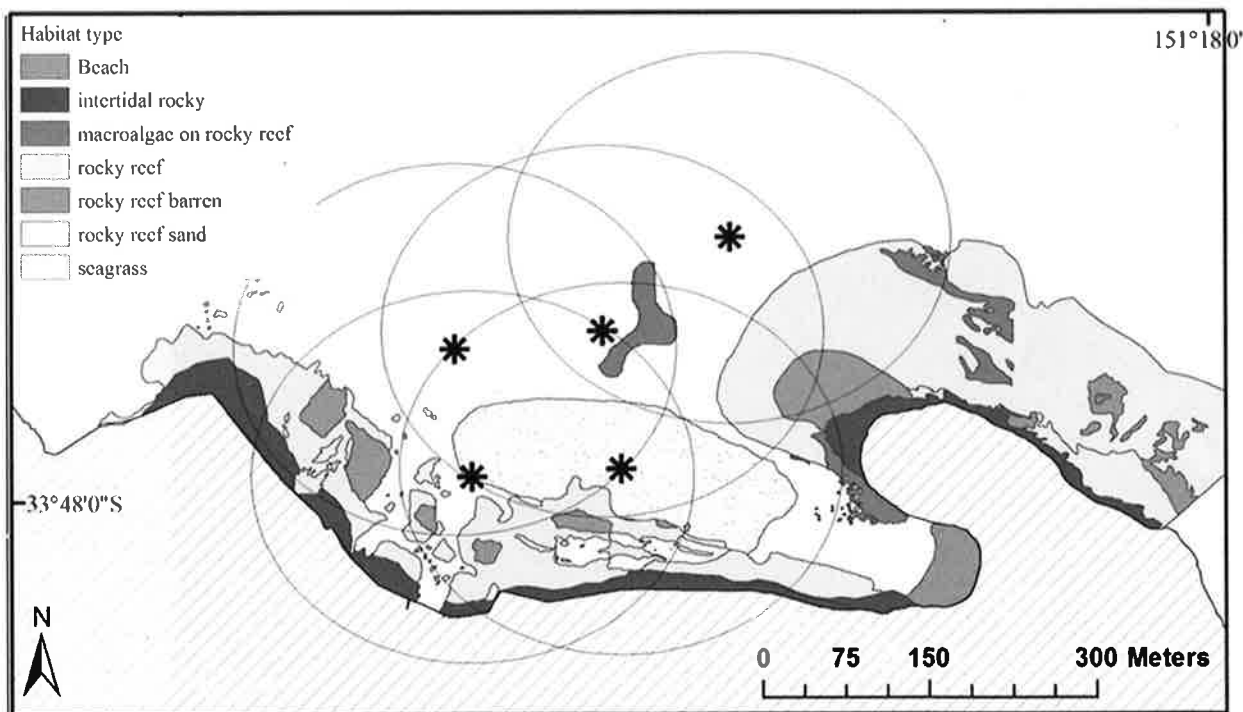


Figure 10. Cabbage Tree Bay Aquatic Habitat Map

Heritage Act 1977

A search of the NSW State Heritage Inventory was undertaken on 29 January 2019.

The study area is situated in subtidal waters at Cabbage Tree Bay Aquatic Reserve, seaward of Marine Parade. There are no listed state heritage items in close vicinity to the study area. The nearest are St Patricks Seminary College and North Head Quarantine Station, approximately 400m and 1km away.

Local Heritage items are listed in the Manly LEP (2013) and include the ocean foreshore (Figure 11.) the Fairy Bower Pool and heritage-listed houses at 50 & 52 Bower St. None of these local heritage items will be affected directly or indirectly by the works.



Figure 11. Cabbage Tree Bay, Local Environmental Plan Heritage Map

Contaminated Land Management Act 1997

The general object of this Act is to establish a process for investigating and (where appropriate) remediation of land where contamination presents a significant risk of harm to human health or some other aspect of the environment Contaminated land has not been identified at the works site.

If previously unidentified contaminated land is uncovered during the works, the Act would be triggered, and works will be halted.

Protection of the Environment Operations Act 1997

This Act regulates environmental protection and environmental pollution across the State. It establishes licensing regime for waste, air, water and land pollution. Scheduled Activities require an Environmental Protection Licence. The proposed activity is not listed as a Scheduled Activity and an Environmental Protection Licence is not required.

3.2 Summary of Licences/Permits Required

Act	Authority	Type	Licence Required?
<i>Crown Land Management Act 2016</i>	NSW Dept. Industry	Section 2.20 – Short term licences over dedicated or reserved Crown land.	Yes
<i>Biodiversity Conservation Act</i>	Office of Environment & Heritage	Section 91 - Licence to pick or harm threatened species, populations or ecological communities or damage habitat	No
<i>Marine Estate Management Act 2014</i>	NSW DPI (Fisheries)	Aquatic Reserve Permit (Marine Estate Management Regulation 2017 & Aquatic Reserve Notification 2015)	Yes
<i>Fisheries Management Act 1994</i>	NSW DPI (Fisheries)	Section 199 - Circumstances in which a public authority (other than local authority) may carry out dredging or reclamation	No
		Section 200 - Circumstances in which a local government authority may carry out dredging or reclamation	No
		Section 205 - Marine vegetation —regulation of harm	No
		Section 219 - Passage of fish not to be blocked	No

Review of Environmental Factors – Temporary structure to the subtidal rock reef at Cabbage Tree Bay

		Section 220ZW - Licence to harm threatened species, population or ecological community or damage habitat	No
<i>Heritage Act 1977</i>	Office of Environment & Heritage	Section 60 - Approval within reserved land to carry out activities to an item listed on the State Heritage register or to which an interim heritage order applies	No
		Section 141 - Excavation permit within reserved land	No
<i>National Parks and Wildlife Act 1974</i>	Office of Environment & Heritage	Section 90 - Aboriginal heritage impact permits	No
		Section 132C - Scientific licences	No
<i>Water Management Act 2000</i>	NSW Office of Water	Section 89 - Water use approvals	No
		Section 90 - Water management work approvals	No
		Section 91 - Activity approvals	No
<i>Water Act 1912</i>	NSW Office of Water	Section 112 – Bore to be licensed.	No

3.3 Stakeholder Consultation

The Operation Crayweed Team has been exceptionally engaging in stakeholder consultation and outreach components ranging from citizen science, educational programs, to a prominent exhibition on crayweed restoration at 2016's Sculpture by the Sea in Sydney (Figure 12.).



Figure 12. Sculptures by the Sea – Operation Crayweed.

There has also been extensive media outreach, including articles in popular science magazines (Ecological Society of Australia bulletin and Wildlife Australia) and newspapers (Sydney Morning Herald) and interviews on radio and television (e.g. see Channel 9 News, ABC News, Network Ten's Kid's Science TV show SCOPE and the BBC), reaching an audience of over a million people

Operation Crayweed have developed an informative website (www.operationcrayweed.com) and attracted a large following on social media <https://www.facebook.com/Operation-Crayweed-552478078213597/>. Operation Crayweed has also captured the attention from different social and recreational clubs. Several clubs requested talks by the Operation Crayweed team and have been involved in the project since. For example, Tamarama Rotary club assisted with a 'hands on' experience at a restoration site at Bondi.

Cabbage Tree Bay consultation

More recently, the Operation Crayweed team (SIMS) have focused and engaged with various local community and stakeholder groups of Cabbage Tree Bay since early 2018. The Cabbage Tree Bay crayweed restoration proposal has been discussed at the following meetings.

7th February 2018

Northern Beaches Council (meeting, no presentation)

People in attendance:

SIMS researchers: Prof. Peter Steinberg, A/Prof. Adriana Vergés, Dr. Ezequiel Marzinelli, A/Prof. Melanie Bishop and SIMS development manager Kate Parsons.

Philanthropic supporters: Mr Dorset Sutton and Mrs Jenny Lim Sutton.

Council: Jodie Crawford, Senior Coastal Management Officer plus Manager Coast and Catchment, Manager Greener Communities and Penguin Biodiversity Officer.

Agenda:

SIMS Overview: eco-restoration initiatives (Peter).

Lim-Sutton Initiative: intro (Kate), supporter perspective (Dorset/Jenny), crayweed (Adriana/Ziggy).

Council (Jodie): how Council and SIMS can work together (Jodie).

Questions/discussion and next steps.

8th February 2018

Friends of Cabbage Tree Bay Volunteer Group (presentation at Northern Beaches Town Hall, Manly HQ)

People in attendance:

SIMS researchers: Prof. Peter Steinberg, A/Prof. Adriana Vergés, Dr. Ezequiel Marzinelli, and SIMS development manager Kate Parsons.

Council: Robynne Millward, Projects Officer, Manly Environment Centre and Founding Manager of Friends of Cabbage Tree Bay (FOCTB).

Philanthropic supporters: Mr Dorset Sutton and Mrs Jenny Lim Sutton.

Community: ~ 40 Friends of Cabbage Tree Bay volunteers.

Agenda:

SIMS Overview: eco-restoration initiatives (Peter).

Lim-Sutton Initiative: intro (Kate), supporter perspective (Dorset/Jenny), crayweed (Adriana/Ziggy).

Presentation: 10 min PowerPoint

Council (Jodie): how FOCTB and SIMS can work together (Robynne).

Questions/discussion and next steps.

13th February 2018

Bold and Beautiful Swim Squad (presentation at Bluewater Restaurant, South Steyne)

People in attendance:

SIMS researchers: Prof. Peter Steinberg, A/Prof. Adriana Vergés, Dr. Ezequiel Marzinelli, and SIMS development manager Kate Parsons.

Philanthropic supporters: Mr Dorset Sutton and Mrs Jenny Lim Sutton

Community: Ian Forster and over 100 CTB ocean swimmers.

Agenda:

SIMS Overview: eco-restoration initiatives (Peter)

Lim-Sutton Initiative: intro (Kate), supporter perspective (Dorset/Jenny), crayweed (Adriana/Ziggy)

Presentation: 10 min PowerPoint.

Questions/discussion and next steps.

19th February 2018

Manly Community Forum (presentation at Manly Yacht Club)

People in attendance:

SIMS researchers: Prof. Peter Steinberg, A/Prof. Adriana Vergés, Dr. Ezequiel Marzinelli, A/Prof. Melanie Bishop and SIMS development manager Kate Parsons.

Philanthropic supporters: Mr Dorset Sutton and Mrs Jenny Lim Sutton

Community: ~ 60 representatives from key Manly community groups

Agenda:

SIMS Overview: eco-restoration initiatives (Peter). Lim-Sutton Initiative: intro (Kate), supporter perspective (Dorset/Jenny), crayweed (Adriana/Ziggy). Council (Robynne).

Presentation: 10 min PowerPoint.

Questions/discussion and next steps.

Outcomes

The response from the community groups was overwhelmingly positive. High levels of interest were expressed by potential citizen science volunteers and more than 170 signatures of support were obtained and used as part of the permit application to NSW DPI.

Some general concerns raised by members of the community are addressed below:

Plastic waste – concerns about storms dislodging mesh and other materials used to attach crayweed

Installations will also be monitored and maintained on a regular basis to ensure they do not become dislodged or hazardous. Volunteers from the Bold and Beautiful Swim Squad have also agreed to regularly monitor the installations and notify SIMS if immediate maintenance is required.

To restore crayweed underwater forests, the scientific team attaches adult plants to polyethylene mesh plots that are temporarily attached to underwater boulders via steel screws and washers and nylon cable-ties. This plastic is recycled, durable and resistant to degradation by sunlight and waterflow, and it is removed once the established crayweed has reproduced and self-propagated.

In consultation with Dr Mark Anthony Browne's 'Benign by Design Programme', the team trialled several non-plastic alternative materials (i.e. coconut fibre, starch and metal mesh), however, plastic produced the best results. Dr Browne, a world expert on impacts of plastic debris on biota based at UNSW, commented "the team's materials and methods are currently the most effective at improving biodiversity whilst minimising emissions of microdebris to the environment".

Concerns that crayweed will: "overtaken the bay", "reduce the snorkelling experience", "reduce fish balling"

Crayweed is not exotic to Cabbage Tree Bay, the project objective is simply to re-establish the species to areas where it used to be naturally present before the 1980's. We anticipate that with restoration efforts, a self-sustaining crayweed population will form in Cabbage Tree Bay. In NSW, ecological constraints limit crayweed to shallow subtidal reef habitats, and there is no evidence of crayweed extending beyond these habitats at successful restoration sites (Bondi, Long Bay and Little Bay).

Crayweed restoration will enhance underwater aesthetics for the enjoyment of swimmers, snorkellers and scuba divers. The large seaweed is aesthetically pleasing and has a beautiful golden colour, specific to only this species. Moreover, the barren habitat the crayweed replaces is often perceived as ugly and unwanted, as urchin barrens in and around Sydney are an increasing problem.

Crayweed also promotes biodiversity by creating habitat for important species such as the eastern rock lobster and abalone. Crayweed also contributes to detritus in soft sediment habitats, an important food source that underpins food webs of key fish species including mullet and bream.

Recent engagement

January 2019

The Operation Crayweed team sent email notifications to the community groups Bold and Beautiful Swim Squad and Friends of Cabbage Tree Bay to maintain expressions of interest for this project. The response was very positive and to date, we have engaged 28 citizen scientist volunteers from these groups that will assist in this project.

In addition, our Operation Crayweed social media sites (Facebook and Twitter) have received high traffic and levels of engagement, including comments and re-posts from Manly-based organisation like the Bold and Beautiful Swim Squad. Support from the community is also evident with direct donations from Manly residents to the restoration project via the Operation Crayweed website (five individual donations in the last 12 months). Communication will be continued throughout the project life via print, social media and newsletters. Signage will also be installed at Cabbage Tree Bay including communication contacts.

4 Impact Assessment

Impacts are discussed in Section 4 below. Further detail can be found in Table 1 which also details impacts, mitigation and management measures.

4.0 Soils and Erosion

The site is surrounded by an area classed as a Class 5 Acid Sulphate Soils locality (refer **Error! Reference source not found.**12).

This project will not involve disturbance of soil, erosion causing activities, dredging or jetting.

The installation of the temporary structure to the ocean floor will involve drilling into subtidal sandstone and will have no effect on the surrounding terrestrial area.



Figure 12: Cabbage Tree Bay, Acid Sulphate Soils map (Class 5 yellow).

4.0.1 Mitigation Measure

Drilling will only occur on subtidal rocky reefs.

4.1 Water

The proposed work would have a neutral impact on water quality or movement. There will be no pollutants or barriers used during the installation works. Drilling into the sandstone rocky reefs will temporarily increase turbidity in a highly localised area and will dissipate once drilling is ceased.

Some equipment used in the installation may require maintenance involving lubricants or other materials. If used, a fuel powered vessel will present a low risk of a fuel or lubricant spill.

4.1.1 Mitigation Measures

Works are very small scale and will be confined to subtidal, sandstone rocky reefs and it is extremely unlikely that activities associated with the proposed works will negatively affect the waters of Cabbage Tree Bay or surrounding areas.

Any maintenance of equipment which may result in the spillage of a fuel or lubricant is to be undertaken away from any location where there is a chance to drain directly into the waterway.

If relevant, spill kits will be held on site and used for equipment breakdown or spills (where necessary). In the event of any spillages Council will be contacted immediately. Pollutants would be contained immediately, removed and disposed of satisfactorily according to EPA regulations.

4.2 Flood Affected Land

The area is not on flood prone land or likely to be affected by flooding.

4.2.1 Mitigation measures

Nil

4.3 Coastal Land

The sites are adjacent to land subject to coastal processes and coastal hazards.

4.3.1 Mitigation measures

Works will only be undertaken when tides are favourable and ocean conditions are calm.

4.4 Chemical and Waste

Works do not involve the use, storage or transport of hazardous substances or the use or generation of chemicals which may build up residues in the environment. There is a low risk of material from the installations entering the marine environment.

Some equipment used in the installation may require maintenance involving lubricants or other materials. If used, a fuel powered vessel will present a low risk of a fuel or lubricant spill.

4.4.1 Mitigation measures

Installations will be regularly monitored for wear and maintenance to ensure that the materials used remain intact. Volunteers from the Bold and Beautiful Swim Squad have also agreed to regularly monitor the installations and notify SIMS if immediate maintenance is required

Any maintenance of equipment which may result in the spillage of a fuel or lubricant is to be undertaken away from any location where there is a chance to drain directly into the waterway.

If relevant, spill kits will be held on site and used for equipment breakdown or spills (where necessary). In the event of any spillages Council will be contacted immediately. Pollutants would be contained immediately, removed and disposed of satisfactorily according to EPA regulations.

4.5 Dust, odours, noise, vibration

Drills used during the installation process will cause brief noise, vibration, and increase turbidity.

If used, fuel powered vessel will result in minor exhaust and noise emissions

4.5.1 Mitigation measures

Equipment will have been serviced to ensure that they do not emit excessive noise

Noise, vibration and increased turbidity from drilling will only occur for brief periods of time in a highly localised area. These effects will be unnoticeable from above the water. Drilling will be limited to only what is necessary. Should turbidity levels become too high, drilling will be undertaken in short sessions with breaks in between sessions to allow for turbidity to dissipate. In addition, works will be confined to hours 0700-1700, Monday to Friday. Equipment will have been

serviced to ensure that they do not emit excessive noise. If used, vessel will be anchored away from busy areas to reduce impact.

4.6 Flora and fauna

Terrestrial vegetation in surrounding areas include Endangered Ecological Communities. No terrestrial vegetation will be affected or disturbed during the course of this project.

Cabbage Tree Bay, and surrounding waters, are classified as Key Fish Habitat under the *Fisheries Management Act 1994*. Cabbage Tree Bay Aquatic Reserve is home to diverse flora and fauna, some of which has been classified as vulnerable, endangered, or critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999*. These include;

Little Penguin (*Eudyptula minor*) - The proposed sites are located within Cabbage Tree Bay, and not at or near any known nesting area of the Endangered Manly Point Little Penguin population.

Green Turtle (*Chelonia mydas*) – Green Turtles, listed as vulnerable, have been sighted in Cabbage Tree Bay.

Grey Nurse Shark (*Carcharias Taurus*) – Grey Nurse Shark are listed as critically endangered. Whilst Cabbage Tree Bay is not listed as critical Grey Nurse Shark habitat, sightings have occurred.

Halophila spp. are present in Cabbage Tree Bay. All seagrasses are protected under *NSW Fisheries Management Act 1994*.

4.6.1 Mitigation measures

In the case of disturbance to the listed protected fauna, or other protected fauna, sightings will be reported, and work will cease in order to prevent disturbance if necessary. All divers or other workers involved in this project will be educated regarding recognising these species.

Only experienced divers trained in correct buoyancy control will undertake works to reduce the risk of damage to the existing marine flora and fauna of Cabbage Tree Bay.

Seagrass will not be disturbed or removed during this project. If used, vessel will be anchored away from seagrass habitat. The proposed installation sites are on rocky reefs barren of vegetation and works comply with the Aquatic Reserves Notice (2015) as it does not take, gather, destroy, injure or interfere with any fish or marine vegetation.

4.7 Impact on the community

Most impacts on the community will be positive. The installation will facilitate community engagement and education, consistent with the *Marine Estate Management Act (2014)* in 'facilitating social and recreational use, as well as education'. The promotion of the biodiversity of Cabbage Tree Bay will generate interest and subsequent support for the aquatic reserve.

Some minor impacts may occur during and after installation. During installation works, access to small sections of Cabbage Tree Bay may be restricted (albeit minimal) due to the presence of, scientists, volunteers and equipment. After installation, mats may become damaged posing a hazard to the public. Uninformed members of the public may also be concerned with the installations.

4.7.1 Mitigation measures

Restriction of access to areas of Cabbage Tree Bay due to presence of scientists and volunteers will be minimised by working outside peak weekend and holiday periods. Restoration works will be confined to hours 0700-1700, Monday to Friday.

Installations will be monitored and maintained on a regular basis to ensure they do not become hazardous. Volunteers from the Bold and Beautiful Swim Squad have also agreed to regularly monitor the installations and notify SIMS if immediate maintenance is required.

Consultation has focused and engaged with various local community and stakeholder groups of Cabbage Tree Bay since early 2018. Communication will be continued throughout the project life via print, social media and newsletters. Signage will also be installed at Cabbage Tree Bay including communication contacts.

4.8 Visual Assessment and Recreation Values

All installations are subtidal and will not be visible from the land. Preliminary consultations proposed two restoration sites within Cabbage Tree Bay, however, three sites are now proposed to maximise the restoration potential of the project. The installations may be visually unappealing to underwater users initially, although as the project progresses the visual impact of the structures will be reduced as they are covered overgrown by encrusting or turfing algae.

Crayweed restoration will enhance underwater aesthetics for the enjoyment of swimmers, snorkellers and scuba divers. The large seaweed is aesthetically pleasing and has a beautiful golden colour, specific to only this species. Moreover, the barren habitat the crayweed replaces is often perceived as ugly and unwanted, as urchin barrens in and around Sydney are an increasing problem. Community engagement, volunteer and educational opportunities will enhance the experience of swimming and diving at Cabbage Tree Bay. As crayweed establishes, the increased biodiversity will further enhance these recreational activities.

4.8.1 Mitigation Measures

Print and social media will also be utilised to promote the project, further educating community members. Consultation has focused and engaged with various local community and stakeholder groups of Cabbage Tree Bay since early 2018. Communication will be continued throughout the project life via print, social media and newsletters. Signage will also be installed at Cabbage Tree Bay including communication contacts.

To reduce the visual impact, installations will be interspersed within the restoration sites. Further, it is expected that only two sites will be initially used, and the third site retained as a reserve

4.9 Natural resource

The project will involve reproductively mature crayweed collected from the fringes of Sydney where healthy populations still exist. No flora or fauna will be collected within Cabbage Tree Bay.

The proposed works involve attaching crayweed to bare rocky reef and will promote biodiversity by creating habitat for important species. There is a low risk of divers damaging existing marine flora and fauna within Cabbage Tree Bay.

4.9.1 Mitigation measures

Installations will only occur on bare rocky reef.

Only experienced divers trained in correct buoyancy control will undertake works to reduce the risk of damage to the existing marine flora and fauna of Cabbage Tree Bay.

4.10 Aboriginal heritage

There are no listed Aboriginal Places within the study area. The foreshore bordering the study area is identified as having high to extremely high potential for Aboriginal Heritage. The proposed works are subtidal location it is unlikely that any new artefacts will be discovered during the project.

4.10.1 Mitigation measures

Any aboriginal heritage items will be reported immediately, and works will be halted.

4.11 Other Cultural heritage

There are no listed state heritage items in close vicinity to the study area. The nearest are St Patricks Seminary College and North Head Quarantine Station, approximately 400m and 1km away.

Local Heritage items are listed in the Manly LEP (2013) and include the ocean foreshore (Figure 11.) the Fairy Bower Pool and heritage-listed houses at 50 & 52 Bower St. None of these local heritage items will be affected directly or indirectly by the works.

4.11.1 Mitigation Measures

When moving through Landscape Heritage area, care will be taken to ensure no damage occurs. The nearest State Heritage item is not located within the area of impact of this project.

Any cultural heritage items will be reported immediately, and works will be halted.

4.12 Cumulative environmental impacts

There are no cumulative negative environmental impacts anticipated from this project and restoration works will have a positive environmental impact by promoting local marine biodiversity.

Table 1 Environmental Impacts and Management
 This section analyses a range of possible impacts from the proposed activity and a description of proposed mitigation measures.

Physical and chemical impacts during construction and operation				
	Impact level (negligible, low, medium, high; or N/A)	Reasons (describe the type, nature and extent of impact, taking into account the receiving environment & proposed safeguards which will limit the impact)	Safeguards/Mitigation Measures	
1. Is the proposal likely to impact on soil quality or land stability?	Negligible	<p>This project will not involve disturbance of soil, erosion causing activities, dredging or jetting.</p> <p>The installation of the temporary structure to the ocean floor will involve drilling into subtidal sandstone and will have no effect on the surrounding terrestrial area.</p>	Drilling will only occur on subtidal rocky reef sites and will have no effect on the surrounding terrestrial area.	
2. Is the activity likely to affect a waterbody, watercourse, wetland or natural drainage system?	Low	<p>The proposed work would have a neutral impact on water quality or movement. There will be no pollutants or barriers used during the installation works. Drilling into the sandstone rocky reefs will temporarily increase turbidity in a highly localised area and will dissipate once drilling is ceased.</p> <p>Some equipment used in the installation may require maintenance involving lubricants or other materials. If used, a fuel powered vessel will present a low risk of a fuel or lubricant spill.</p>	<p>Works will be confined to subtidal, sandstone rocky reefs and it is extremely unlikely that activities associated with the proposed works will negatively affect the waters of Cabbage Tree Bay or surrounding areas.</p> <p>Any maintenance of equipment which may result in the spillage of a fuel or lubricant is to be undertaken away from any location where there is a chance to drain directly into the waterway.</p>	

Review of Environmental Factors – Temporary structure to the subtidal rock reef at Cabbage Tree Bay

				<p>If relevant, spill kits will be held on site and used for equipment breakdown or spills (where necessary). In the event of any spillages Council will be contacted immediately. Pollutants would be contained immediately, removed and disposed of satisfactorily according to EPA regulations.</p>
<p>3. Is the activity likely to change flood or tidal regimes, or be affected by flooding?</p>	<p><input type="checkbox"/></p>	<p>N/A</p>	<p>N/A</p>	<p>Works will have no effect on flood or tidal regimes and will not be affected by flooding.</p>
<p>4. Does the activity involve the use, storage, or transport of hazardous substances or the use or generation of chemicals, which may build up residues in the environment?</p>	<p><input checked="" type="checkbox"/></p>	<p>Low</p>	<p>Works do not involve the use, storage or transport of hazardous substances or the use or generation of chemicals which may build up residues in the environment. There is a low risk of material from the installations entering the marine environment.</p> <p>Some equipment used in the installation may require maintenance involving lubricants or other materials. If used, a fuel powered vessel will present a low risk of a fuel or lubricant spill.</p>	<p>Installations will be regularly monitored for wear and maintenance to ensure that the materials used remain intact.</p> <p>Any maintenance of equipment which may result in the spillage of a fuel or lubricant is to be undertaken away from any location where there is a chance to drain directly into the waterway.</p> <p>If relevant, spill kits will be held on site and used for equipment breakdown or spills (where necessary). In the event of any spillages Council will be contacted immediately. Pollutants would be contained immediately, removed and disposed of satisfactorily according to EPA regulations.</p>
<p>5. Does the activity involve the generation or disposal of gaseous,</p>	<p><input checked="" type="checkbox"/></p>	<p>Low</p>	<p>If used, a fuel-powered vessel will create minor exhaust emissions.</p>	<p>Work will be carried out between 7am and 5pm Monday to Friday. Vessel will not be operated in close vicinity to public.</p>