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Marine Habitat Survey: 37 Beaconsfield Street, Newport

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Background

H2O Ecology was engaged by SDG to provide a Marine Habitat Survey of the seabed and surrounding marine habitat at 37 Beaconsfield Street, Newport, NSW. The property adjoins Pittwater and falls within the Local Government Area of Northern Beaches Council.

The purpose of the Marine Habitat Survey is to support a development application for establishment of a berthing area. Under Part 4 of the *Environmental Planning and Assessment Act 1979*, NSW Department of Primary Industries (NSW DPI) is a ‘determining authority’ for integrated developments such as this, where there is potential that marine vegetation may be harmed.

In NSW, the *Fisheries Management Act 1994* (FM Act) provides conservation and protection of fisheries resources, fish habitat and threatened aquatic species in NSW waters. Under the FM Act as well as the New South Wales *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) there are requirements for the protection of estuarine vegetation such as mangroves, saltmarsh and seagrasses.

NSW DPI may make further assessment, evaluations and recommendation that may include stipulating additional mitigation measures as a consent condition for the proposed development after review of this report.

This survey at 37 Beaconsfield Street, Newport has been conducted in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management* (Fairfull 2013).

Objectives

The objectives of this Marine Habitat Survey are to:

- ❖ Provide a clear description of the proposal, marine environment including presence of threatened and/or invasive species and any relevant hydrological features.
- ❖ Where present identify, describe (species & density) and map marine vegetation in the area effected and adjacent areas.
- ❖ Identify potential impacts from the proposed development and where appropriate recommend mitigation measures to ameliorate any environmental effects on the marine environment.

Regional Context

Pittwater Estuary (hereafter Pittwater) is a drowned valley estuary north of Sydney that adjoins Broken Bay at the mouth of the Hawkesbury River. It is approximately 10 km in length and 1 km in width (WBM 2006). The subject site is along the southern shore of a very small inlet in the south-eastern corner of the upper reaches of Pittwater (Figure 1).

The nearest protected aquatic habitat is the Barrenjoey Head Aquatic Reserved located on the southern side of Broken Bay, which is approximately 11 km from the subject site (Figure 1).

There are no aquaculture activities, including priority oyster areas within the vicinity of the subject site (NSW DPI 2014).

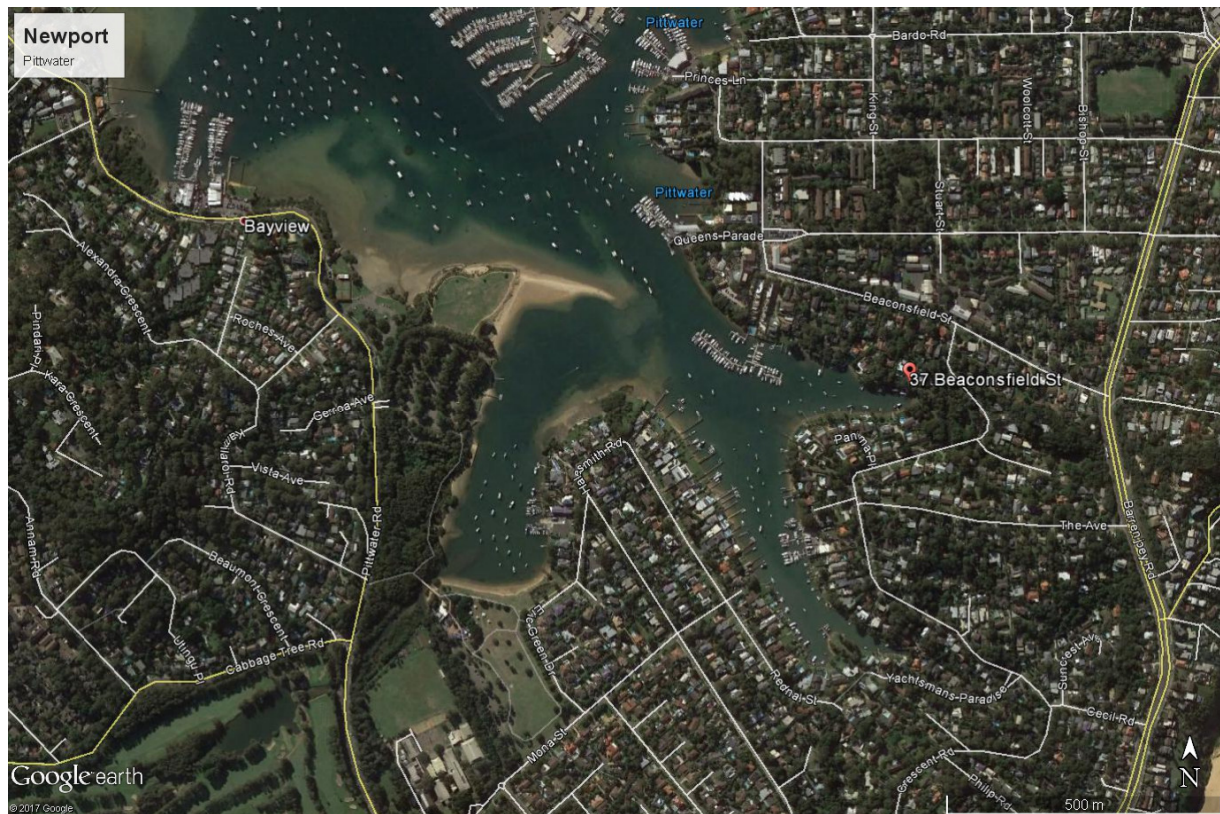


Figure 1: Locality of the proposed development in Pittwater.

Existing Information

Mangroves, saltmarsh and seagrasses are common and important to estuarine productivity and ecological function in Pittwater. Extensive development of the surrounding catchment and accommodation of over 3000 moorings has had a significant impact on aquatic vegetation, especially seagrass beds in Pittwater (WBM 2006). Controlling developments, urban storm water runoff and stream line erosion in the upper catchment remain key management actions in preserving the aquatic environment of Pittwater (Pittwater Council 2005).

NSW DPI habitat maps indicate the common occurrence of seagrasses *Posidonia australis*, *Zostera capricorni* and *Halophila ovalis*, mangroves and saltmarsh communities in Pittwater. In six NSW estuaries including Pittwater (Creese *et al.* 2009), *P. australis* has been listed as an endangered population and added to Threatened Species Schedules under the FM Act (NSW DPI 2012), while more recently *P. australis* seagrass meadows of the Manning-Hawkesbury ecoregion ecological community have been listed as endangered under the EPBC Act. Additionally, Coastal Saltmarsh is listed as an endangered ecological community on the NSW North Coast, Sydney Basin and South East Corner Bioregions under the BC Act, which also corresponds with the listing of Subtropical and Temperate Coastal Saltmarsh as a vulnerable ecological community under the EPBC Act. In the upper south-east reaches of Pittwater isolated stands of mangroves and seagrasses (both *P. australis* and *Z. capricorni*) may occur, however none have been previously mapped in the vicinity of the subject site (Figure 2)

The Pittwater State of the Environment Report (Pittwater Council 2005) indicates the management and control of the spread of the invasive green alga *Caulerpa taxifolia* as a significant ecological issue for aquatic habitats within Pittwater. *Caulerpa taxifolia* is a fast growing alga endemic to tropical waters of Australia that has rapidly colonised areas outside its natural range including within Pittwater. Mapping done in Pittwater by NSW DPI indicates that *C. taxifolia* has not been previously recorded in the vicinity of the subject site (NSW DPI 2015).



Figure 2: Previous mapping of estuarine macrophytes in the south-eastern corner of Pittwater, showing mangroves (green) and seagrasses, *Posidonia australis* (red / pink), and *Zostera capricorni* (blue / pink). Source NSW DPI 2017.

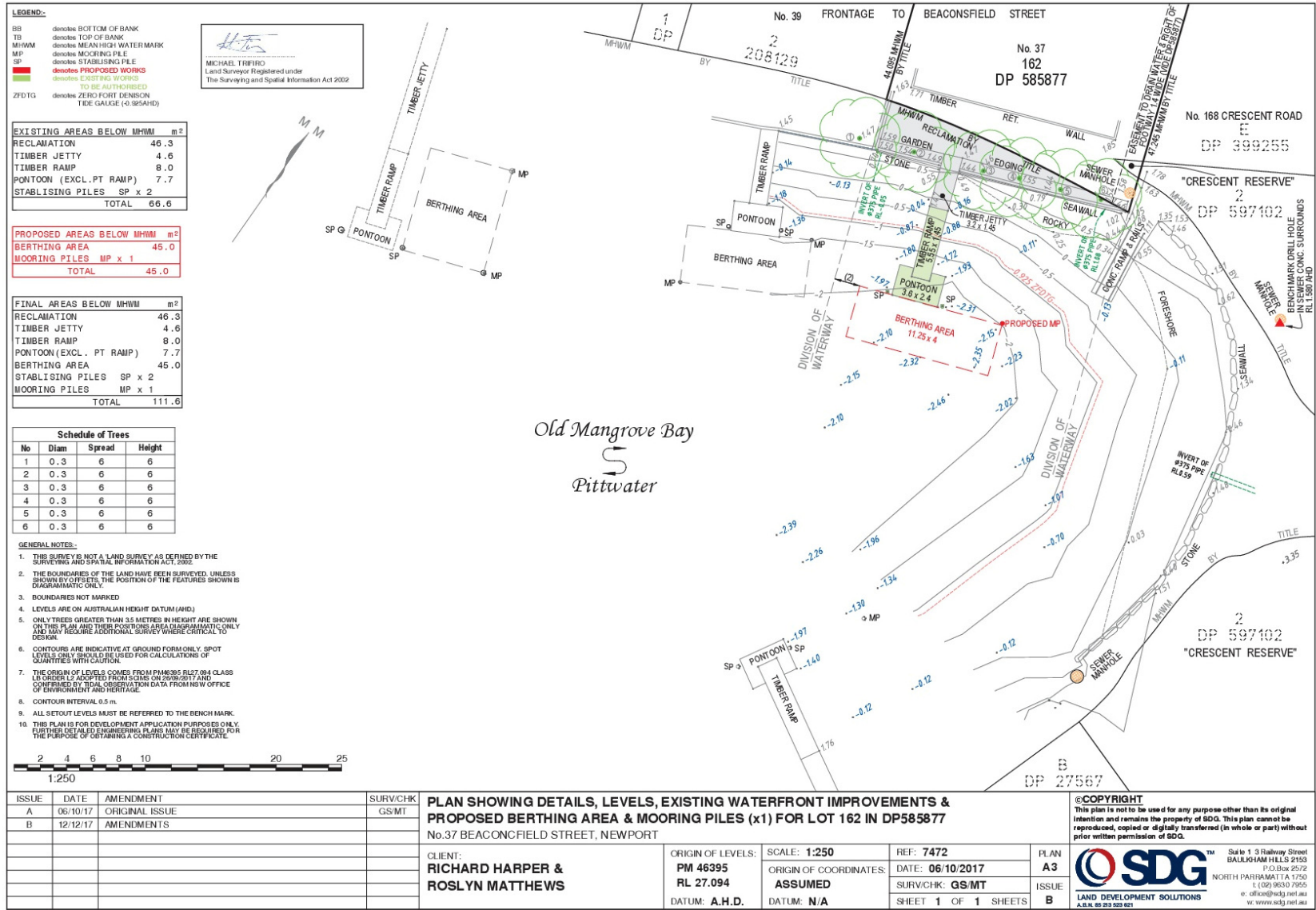
Description of the Proposed Development

The proposed works are for construction of a berthing area (9 x 5 m), requiring one additional pylon. The berthing area is proposed seaward of the existing waterfront jetty, ramp, and pontoon (Figure 3 and 4).



Figure 2: Area proposed for the berthing area.

Figure 3: Plans of the proposed waterfront structures.



Study Methods

The site survey was undertaken between 900-1200hrs on 6th October 2017 at the top of the ebb tide. Tidal predictions for Newport on the day was a 1.7 m high tide at 0928 hrs. Weather conditions were overcast with light south-east winds, while water visibility was good at 2 m.

The survey area was in front and adjacent to the existing waterfront structures at the subject site and extended approximately 20 m from the shore. The area surveyed included all marine habitat within 10 m of the proposed works. The survey was conducted by inspection from the shore and in the water using snorkeling equipment. A combination of GPS positions and measurements taken with a survey tape was used record data on the position of features of interest. Marine habitat and features of interest were photographed using an underwater digital camera. Water depth was recorded using a handheld depth sounder.

Marine habitat was described based on dominant flora and fauna observed. For seagrass habitat, density (abundance) and patchiness (sociability) was estimated using categories for each seagrass species present as per King and Barclay (1986) (See Table 1).

Table 1: Seagrass categories for density and patchiness developed from King and Barclay 1986.

Density	
Low	Sparse growth, up to 15% cover
Medium	Moderate growth 15 – 50% cover
High	Abundant growth greater than 50% cover
Patchiness	
Clumps	Individual strands or clumps (less than 1 m ²)
Patches	Patches of between 1 and 5 m ²
Beds	An area of relatively continuous seagrass greater than 5 m ²

Survey Results

The adjoining shoreline is moderately sloping with a southerly aspect and residential properties. There is a low-lying stone seawall 0.8 m in height near the MHW, which minimises shoreline erosion at the site. The subject site includes an existing jetty, ramp and pontoon, while the property neighbors a bushland park to the east. The neighboring properties to west also include similar waterfront structures to the subject site (Figure 5).

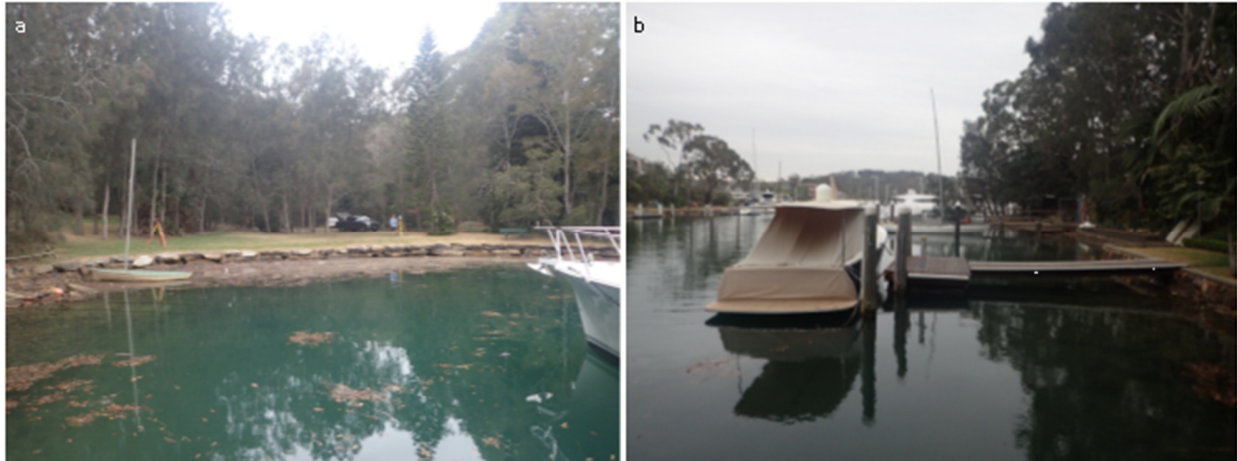


Figure 5: Neighboring waterfront structures to the (a) east, and (b) west of the subject site.

Description of the Marine Habitat

The intertidal habitat along the shoreline was predominantly rubble (Figure 6), with some patches of gravel and the occasional accumulation of silt in lower areas. Artificial substrates provided by the seawall, and footings and pylons associated with the existing structures also provided some additional habitat. The habitat provided by the gravel in lower areas and the existing structures was colonized by Sydney rock oysters (*Saccostrea glomerata*) and the common periwinkle (*Bembicium nannum*). Intertidal vegetation was restricted to turfing algae amongst rubble, no mangroves, saltmarsh plants, or intertidal seagrasses were found.



Figure 6: Intertidal habitat (a) provided by the seawall, and (b) rubble and gravel, in the study area.

The seabed was moderately sloping either side of a silty drop-off approximately 5 m from the shore. Habitats above the drop-off consisted of silty sediments with scattered occurrences of rubble and brown macroalgae and a lot of debris. Below the drop-off the silty sediments continued but appeared much more uniform in nature. Subtidal vegetation was absent; however, areas of turfing brown and green algae were present in places, growing across the surface of the sediment (Figure 6).

During the site survey yellow fin bream (*Acanthopagrus australis*), were commonly observed. While luderick (*Girella tricuspidata*), Australian sawtail (*Prionurus microlepidotus*) sea mullet (*Mugil cephalus*), sand whiting (*Sillago ciliata*), dusky flathead (*Platycephalus fuscus*) and tailor (*Pomatomus saltatrix*) are likely to also utilize the site at times.

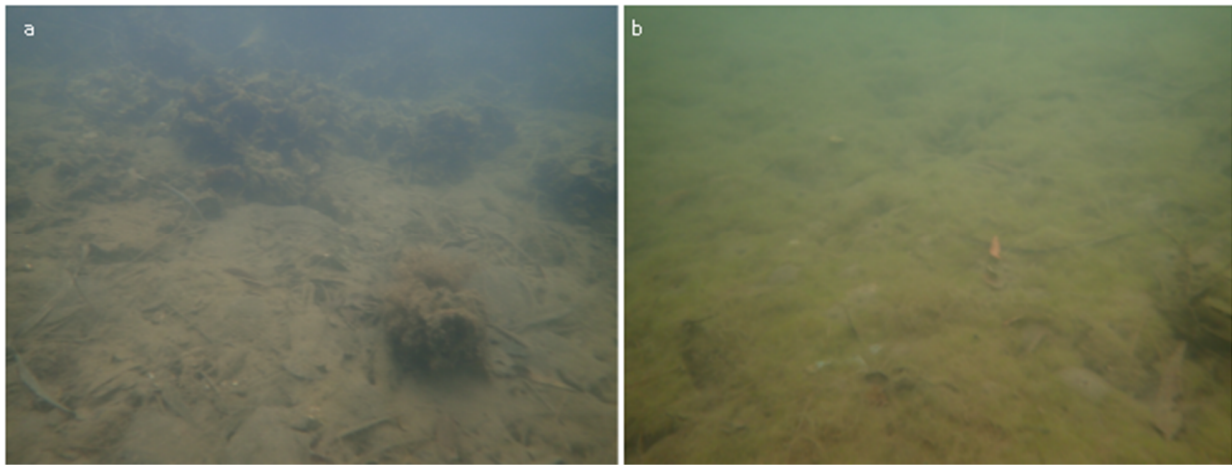


Figure 6: Typical subtidal habitat (a) of rubble and debris above the drop-off, and (b) silty sediments with turfing algae below the drop-off.

Threatened species

No threatened species or communities including the endangered seagrass population *Posidonia australis* or coastal saltmarsh community were found in the vicinity of the subject site.

Introduced Species

No introduced species including the invasive green alga *Caulerpa taxifolia* were observed in the study area.

Conclusions and Recommendations

Effects on the marine environment from the proposed structures are likely to include:

- ❖ Potential for short term increases in turbidity during installation of the pylon. The piling works will be restricted to one pylon and subsequently be minimal. It is likely that any turbidity will dissipate quickly during the normal tidal regime.
- ❖ Some disturbances and possible loss of benthic habitat during driving of the pylon. Only a small amount of habitat that is unvegetated silty sediments will be lost and/or disturbed, of which there is similar habitat in the immediate vicinity.
- ❖ Increased shading of benthic habitat under the berthing area. As no seagrass was observed in the vicinity of the subject site, potential shading impacts on the benthic habitat are of minimal ecological significance.
- ❖ Creation of artificial habitat from the permanent presence of in water structures. This may increase fish presence and provide additional substrate for sessile invertebrates. Given the presence of numerous nearby structures it is expected that these structures would be colonized by biota similar to that found on the nearby structures.

The endangered seagrass *Posidonia australis* was not observed at the subject site, or where any plants aligning with the endangered Coastal Saltmarsh Community. Impacted habitat is confined to silty subtidal areas that do not support seagrasses.

Given no invasive species including the green alga *Caulerpa taxifolia* were observed in the vicinity of the subject site, it is unlikely the proposed works may introduce and/or facilitate the spread of invasive species. Thus, care should still be taken to ensure construction equipment is clean and does not introduce invasive species during mobilisation to the site.

In summary, the proposed development at 160 Crescent Road, Newport is minimal in size and restricted to subtidal areas of silty benthic habitat. Those disturbances that do occur will be minimal and are unlikely to impact negatively on biodiversity at the locality.

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