



**Marine Habitat Survey**

**Address | 121 Florence Terrace, Scotland Island**

**Client | Scott and Carrie Towers**

**Survey Date | 30 July 2018**

**Report Date | 16 August 2018**

**Job Number 18-046-08**

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# 1. Report Background

## 1.1 Purpose of the Report

Crown Lands require that all proposed waterfront development works involving load-bearing structures located below the Mean High Water Mark be reviewed for compliance with environmental regulations. The aim of these regulations is to protect the marine environment, in particular the local fauna and flora such as seagrasses, mangroves and macroalgae. The body responsible for conducting the assessment during the planning stage of the proposed waterfront development is the NSW Department of Primary Industries (Fisheries).

The purpose of this report is to provide all the necessary data required for an assessment to be done by NSW Fisheries.

## 1.2 Environmental Considerations

In summary, the main environmental considerations that require assessment by NSW Fisheries for waterfront development applications are:

- a) Protection of seagrasses;
- b) Protection of mangroves;
- c) Conservation of the existing ecology; and
- d) Impacts from dredging.

The regulations upon which the environmental considerations are based are discussed below.

The Fisheries Management Act 1994 ("FM Act") applies to habitat and aquatic flora and fauna that have the potential to be affected by a proposed waterfront development. The objectives of the FM Act are to conserve, develop and share the fisheries resources of NSW for the benefits of present and future generations, and in particular to protect key fish habitats and to promote ecologically sustainable development. The FM Act states that *a person must not cut, remove, damage or destroy marine vegetation on public water land, or on the foreshore of any land or lease, except under the authority of a permit issued by the Minister under this Part (205) or of an aquaculture permit.*

Two Fish Habitat Protection Plans have also been developed under the FM Act. The first plan deals broadly with dredging and reclamation activities, fish passage requirements, the protection of marine vegetation (in particular mangroves and seagrasses), and the importance of snags. The second plan is specific to the protection of seagrasses. Scientific research has shown that seagrasses are important to the ecology of shallow estuarine environments as they stabilise sediments and maintain water quality, provide shelter and food critical to the survival of a wide variety of juvenile fishes and mobile invertebrates (many of which are of commercial or recreational importance) and play an important role in the cycling of nutrients within estuaries. Seagrasses are a fragile ecological habitat, with many major estuaries in NSW having lost as much as 85% of their seagrass beds in the past

30 to 40 years. In 2012 the population of *Posidonia australis* seagrass (commonly known as strapweed) was listed as an Endangered Population in the estuaries of Sydney under the Fisheries Management Act (Part 7A).

### 1.3 The Property

The proposed waterfront development of a new skid ramp, slip rails, jetty, ramp, pontoon and berthing area is planned for 121 Florence Terrace, Scotland Island ("The Property").

For details of the existing structures at The Property and the proposed waterfront development refer to Sections 2.1 and 3.1 respectively

### 1.4 On-Site Survey Methodology of The Property

The on-site survey of The Property was conducted at 11:00 on 30 July 2018 by Rick Johnson of Waterfront Surveys Australia. Weather conditions at the time of the survey were sunny with minimal breeze. The water surface was calm and underwater visibility was approximately 4 m. At the time of the survey the tide was dropping, with a tidal height of 1.1 m.

The on-site survey area included the footprint of the proposed structures and extended a further 10 m in all directions from the footprint of the proposed structures. The survey was conducted from the shore and inspection of the seabed was done on snorkel. Unfortunately, due to underwater camera malfunction on the day of the survey, there were no underwater photos taken (only above water photos). A description of each differing habitat, and species list of aquatic flora and fauna observed within the survey area, was recorded. A tape measure was used to obtain the distance of seagrass from structures/shoreline.

Seagrass species were given the following codes:

Hal – *Halophila ovalis* (paddleweed)

Pos – *Posidonia australis* (strapweed)

Zos – *Zostera capricorni* (eelgrass)

The level of patchiness was also estimated using three categories:

A – Individual strands or small clumps (< 2 m diameter);

B – Medium sized patches (2 - 10 m diameter); or

C – Beds of relatively even distribution (> 10 m diameter).

Estimates of seagrass density were made by ranking each observation point using three categories:

1 – Low density (< 15% seabed cover);

2 – Medium density (15% - 50% seabed cover); or

3 – High density (> 50% cover).

Leaf length of seagrass was categorised as follows:

*Halophila* – S (short < 1 cm), M (medium 1 cm – 3 cm), L (long > 3 cm);

*Posidonia* – S (short < 15 cm), M (medium 15 cm – 30 cm), L (long > 30 cm); or

*Zostera* – S (short < 5 cm), M (medium 5 cm – 15 cm), L (long > 15 cm).

These codes provide a description of the seagrasses within an area and are useful in determining the nature and ecological value of any seagrasses likely to be affected by the proposed works. For example, seagrass with shorter leaves and a lower density (e.g. ZosC1S) may have less ecological value compared with seagrass with longer leaves and a higher density (ZosC3L).

## 2. Existing Property Details

### 2.1 Existing Structures at The Property

The Property is located on the south-eastern shoreline of Scotland Island, Pittwater – midway between Carols and Eastern Wharves. The Property faces in a south-easterly direction.

The existing structures (Photos 1 - 4) present at The Property at the time of the on-site survey included:

- a timber jetty (28 x 1.3 m) on the south-western side of The Property, supported on 12 concrete block piers and four outer timber piers;
- three timber berthing piles; and
- a set of slip rails on the north-eastern side of The Property.

### 2.2 Existing Ecology at The Property

#### 2.2.1 Existing Ecology Based on Observations from the On-Site Survey

##### a) Intertidal Ecology

The intertidal zone at The Property consisted of artificial and natural habitats. A sandstone block seawall stretched across the width of The Property (Photo 4), and was fronted by an extensive, gradually sloping area seabed composed of lots of rock and rubble on top of areas of bedrock and sand (Photo 3). The concrete jetty piers provided additional artificial intertidal habitats (Photos 1 - 3).

The seawall and jetty piers were colonised by a low/medium density cover of Sydney rock oysters (*Saccostrea glomerata*) along with low numbers of periwinkles (*Bembicium nanum*). The rocky rubble was colonised by oysters and patches of Neptune's necklace (*Hormosira banksii*).

##### b) Subtidal Ecology

The subtidal zone within the on-site survey area of The Property consisted of a gradually sloping silty sand seabed.

Much of the seabed in the survey area was colonised by the invasive green alga *Caulerpa taxifolia*. It was present as a high density cover on both sides of the existing jetty and offshore of the jetty head. There was a patch of *Zostera* seagrass on each side of the jetty (for more seagrass details, see Section c below). Due to the nature of the business use of the jetty by a mooring contractor, there were several clean, circular concrete mooring blocks sitting on the *Caulerpa taxifolia* seabed off the end of the jetty.

The subtidal sections of the timber berthing piles were colonised by a high density cover of brown filamentous alga, with brown bubbleweed (*Sargassum* sp.) at the base.

Fish observed during the on-site survey were yellowfin bream (*Acanthopagrus australis*).

### c) *Seagrass and Mangroves*

Two patches of medium density, medium leaf length *Zostera* (ZosB2M), mixed with the invasive *Caulerpa taxifolia*, were present off either side of the outer section of the existing jetty (see the seagrass map in Appendix B). Off the south-western side of the jetty, the patch started 1.6 m off the jetty and stretched 6 m near the outer end of the jetty. Off the north-eastern side of the jetty, the patch was smaller and started 1.4 m off the third last pier and stretched 2.5 m.

There was no seagrass in the footprint of the proposed jetty, ramp, pontoon or berthing area. No *Posidonia* was observed in the survey area.

#### 2.2.2 Existing Ecology Based on Government Published Records

NSW Fisheries has done extensive mapping of the aquatic vegetation in Pittwater. The latest aquatic vegetation maps (Creese et al. 2009) indicate the presence of seagrass (*Posidonia*) seaward of The Property and its structures.

## 3. Proposed Waterfront Development

### 3.1 Proposed Structures of the Waterfront Development

The proposed waterfront development at The Property, as per the design by Stephen Crosby & Associates Pty Ltd (Drawing 2128-DA01), consists of the:

- replacement of the existing slip rails with a longer set (approximately 20 m in length) slightly further to the north-east;
- installation of a new skid ramp (6 x 4.3 m) at the centre of The Property;
- replacement of the existing timber jetty with a timber jetty (20.7 x 1.5 m with 10 piers) and a timber ramp (6.0 x 1.5 m) in almost the same footprint (with a slightly more southerly alignment);
- installation of a new longitudinal pontoon (5 x 3 m) off the end of the proposed ramp and the end of the existing jetty, with two stabilising piles on the inshore corners; and
- removal of the two existing timber berthing piles and installation of three new berthing piles further offshore to create a 5 x 9 m berthing area off the front of the new pontoon.

### 3.2 Assessment of Potential Impacts of the Proposed Development to the Existing Ecology of The Property

#### 3.2.1 Summary of Findings

In summary, the potential impacts on the aquatic ecology at The Property from the new skid ramp, slip rails, jetty, ramp, pontoon and berthing area are expected to be minimal, temporary and unlikely to cause significant damage to any marine life.

There was a 1.4 – 1.6 m buffer between the two patches of medium density, medium leaf length *Zostera* (ZosB2M) and any new piling works. The shading footprint of the new jetty would be very similar to that of the existing jetty. The seabed in the location of the proposed new jetty, ramp, pontoon, stabilising piles and berthing area was colonised by the invasive green alga *Caulerpa taxifolia* and not any seagrass.

#### 3.2.2 Detailed Listing of Findings

The potential impacts to the existing ecology of The Property are assessed in detail below in relation to the four main environmental considerations:

- a) Protection of seagrasses;
- b) Protection of mangroves;
- c) Conservation of the existing ecology; and
- d) Impacts from dredging.



a) *Protection of seagrasses*

<i>Development Works</i>	<i>Potential Impact to Seagrasses</i>	
	<i>Summary</i>	<i>Discussion</i>
Replacement of the existing jetty piers and mooring piles	Potential increase in turbidity	The piling works would create a short-term increase in turbidity. Use of a silt curtain during the time of the piling works would mitigate the potential effects on the nearby <i>Zostera</i> seagrass habitats, by containing the suspended sediments within the enclosed silt curtain.
Installation of new jetty and ramp	Potential indirect harm to seagrass from shading	It is predicted that there would be no harm to the seagrass bed from shading as the jetty and ramp would be located in a very similar footprint as the existing jetty

b) *Protection of Mangroves*

No ecological impact from the waterfront development as there were no mangroves present in the survey area.

*Conservation of the Existing Ecology*

<i>Development Works</i>	<i>Potential Impact to Existing Ecology</i>	
	<i>Summary</i>	<i>Discussion</i>
Installation of new pontoon stabilising piles and berthing piles	Minor loss of sandy subtidal habitat	There would be no negative impact to the sandy subtidal habitat in the location of the new piles as the seabed was colonised by the invasive green alga <i>Caulerpa taxifolia</i>
Installation of replacement structures	Provide replacement artificial intertidal and subtidal habitats	The installation of the new jetty piers and slip rails would replace the same artificial habitat lost by the development. The new skid ramp, pontoon stabilising piles and pontoon would provide new artificial habitats not previously present at the site. It is expected that an assemblage of fauna and flora species similar to that colonising the existing and neighbouring structures would colonise these new structures.

c) *Impacts from Dredging*

No ecological impact from the waterfront development as there is no dredging required.

## **Appendix A - On-site Survey Photos**

The following photographs taken by Rick Johnson during the on-site survey conducted at The Property on 30 July 2018 are provided overleaf (note: due to underwater camera malfunction on the day of the survey, there were no underwater photos taken):

- Photos 1 - 4. Existing waterfront structures and intertidal habitats at The Property.

**Photo 1.** The existing timber jetty and berthing piles at The Property.



**Photo 2.** The existing waterfront structures (with slip rails in the foreground) as viewed looking to the south.



**Photo 3.** Intertidal habitats at the site – concrete jetty piers and submerged rocky seabed.



**Photo 4.** The jetty looking inshore to the seawall, slip rails and boatshed.



## **Appendix B - Layout Plan of Waterfront Development and Seagrass Map**

The proposed waterfront development design layout plans (provided by Stephen Crosby & Associates – Drawing 2128-DA01) and mapped seagrass at 121 Florence Terrace, Scotland Island is provided overleaf.

IT T W A T E R

063057

No 121

LOT 58 DP 12744

A N D

SEAWALL

1.80

BH. 1.31AMP  
NATH CONG. 0.00

DECK T. 80AMP

STONE SEAWALL

RETAINING WALL

BOAT SHED  
6x4M

FL. 1.85AMP

SKID RAMP  
6M x 4.3M

EXISTING BOAT SHED  
DOTTED

EXISTING DOTTED

FO CO

EXISTING JETTY  
DOTTED

NEW JETTY  
1.65 AMP

EXISTING SLIPRAIL

NEW SLIPRAIL

ZosB2M

ZosB2M

sandy seabed  
with *Caulerpa taxifolia*

sandy seabed  
with *Caulerpa taxifolia*

LIMIT

4.8M

2.0

2.0

3.0M

4.0

LINE

5.6M

5 BERTHING AREA

9M x 5M

5x3M PONTON

PILES

STABILISING  
PIERS

2.0M

L A T E R A L L I M I T L I N E

20.73

L A T E R A L L I M I T L I N E

## Appendix C - References

Creese, R. G., Glasby, T. M., West, G. and Gallen, C. (2009). *Mapping the habitats of NSW estuaries*. Industry & Investment NSW Fisheries Final Report Series 113. Port Stephens, NSW, Australia. 95pp.