



Environmental Assessment

Dolans Bay Marina

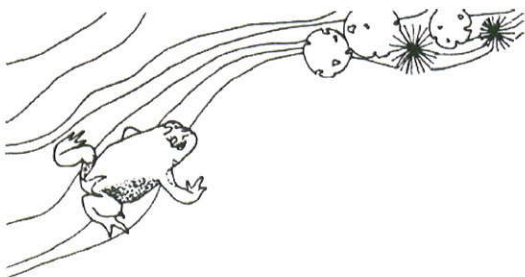
Appendix 5

Flora and Fauna Assessment by Abel Ecology Pty Ltd



APPENDIX 5 – Flora and Fauna Assessment by Abel Ecology Pty Ltd

Abel Ecology



**Flora and fauna assessment report to meet
Director Generals Requirements**

for

72 Parthenia Street, Dolans Bay

Proposed Upgrade of Dolans Bay Marina

Date: 31 August 2010

Prepared for: H and J Standen

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TABLE OF CONTENTS

Introduction	8
1) Policy and Guidelines – Aquatic Habitat Management and Fish Conservation (NSW Fisheries) 1999 Update	8
1.1) Estuarine Habitats (Seagrasses)	8
1.2) Threatened Species Legislation (Part 7A of the Fisheries Management Amendment Act 1997)	8
1.3) Waterfront Developments	9
1.4) Strapweed (<i>Posidonia australis</i>) Seagrass	10
1.5) Protected and Threatened Species	11
1.6) Aquatic Environmental Assessment	11
2) Draft Guidelines for Threatened Species Assessment under part 3A of the <i>Environmental Planning and Assessment Act 1979</i> (DEC) 2005	12
3) Threatened Biodiversity Survey and Assessment: Guidelines for Development and Activities. Working Draft (DEC) 2004	13
4) Threatened Species Assessment Guidelines: The Assessment of Significance (DECC) 2007	13
4.1) Species under Fisheries Management Act 1994 (FM Act)	13
4.2) Species under Threatened Species Conservation Act 1994 (TSC Act)	13
References	16
Appendix 1 Company Profile	17

TABLE OF FIGURES

Figure 1. Seagrass map	3
Figure 2. <i>Caulerpa taxifolia</i> map	4
Figure 3. Depth profile	5
Figure 4. Aerial photograph	6
Figure 5. Threatened fauna map	7

Note regarding maps in this report

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0 250 m 500

Approximate scale

Figure 1. Seagrass mapping of Port Hacking by NSW Industry and Investment indicates that *Posidonia australis* is the dominant seagrass around Dolans Bay. A small amount of Mangrove occurs at the northern end of the mudflat area. (NSW Industry and Investment, 2008). Approximate mudflat area based on site visit by Abel Ecology and aerial photographic interpretation.

Key

- Posidonia australis*
- Mangrove
- Mudflat

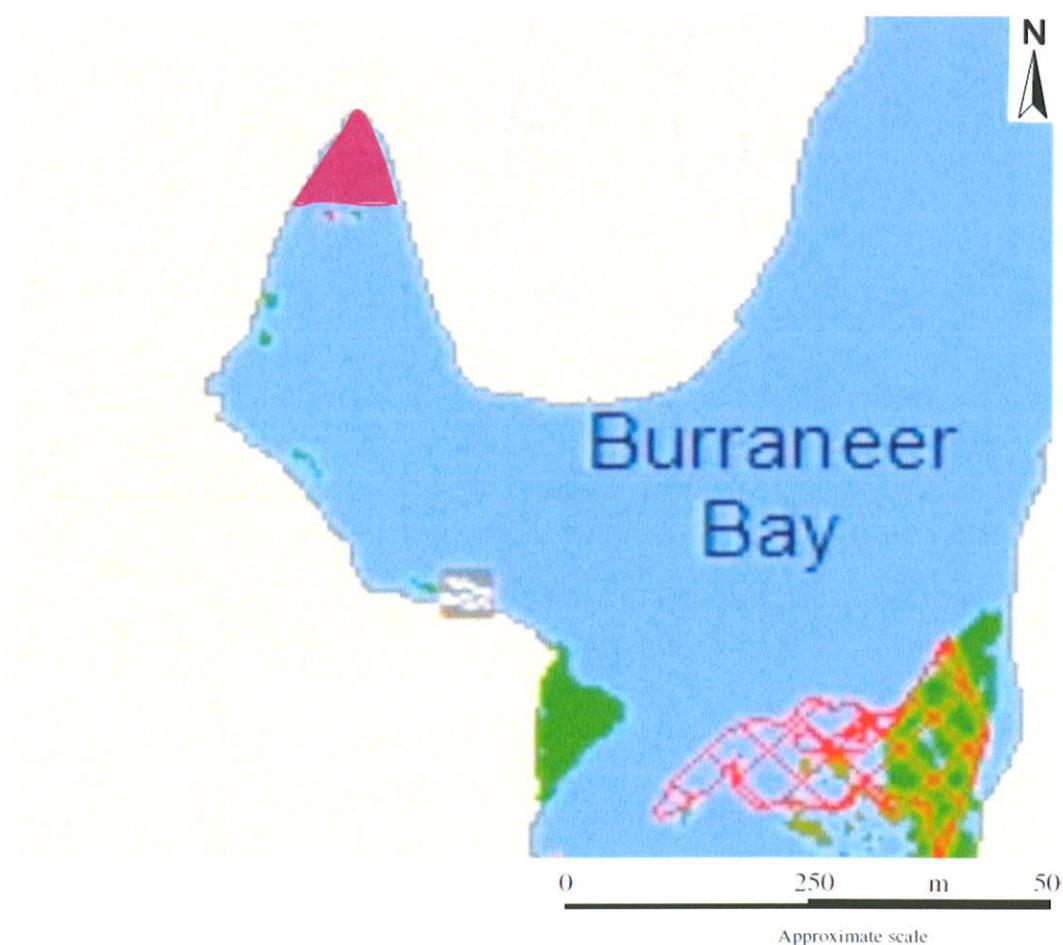
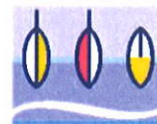


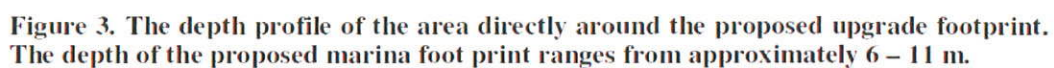
Figure 2. Seagrass mapping of Port hacking by NSW Department of Primary Industries, including the invasive weed *Caulerpa taxifolia* (DPI, July 2007). Approximate mudflat area based on site visit by Abel Ecology and aerial photographic interpretation.

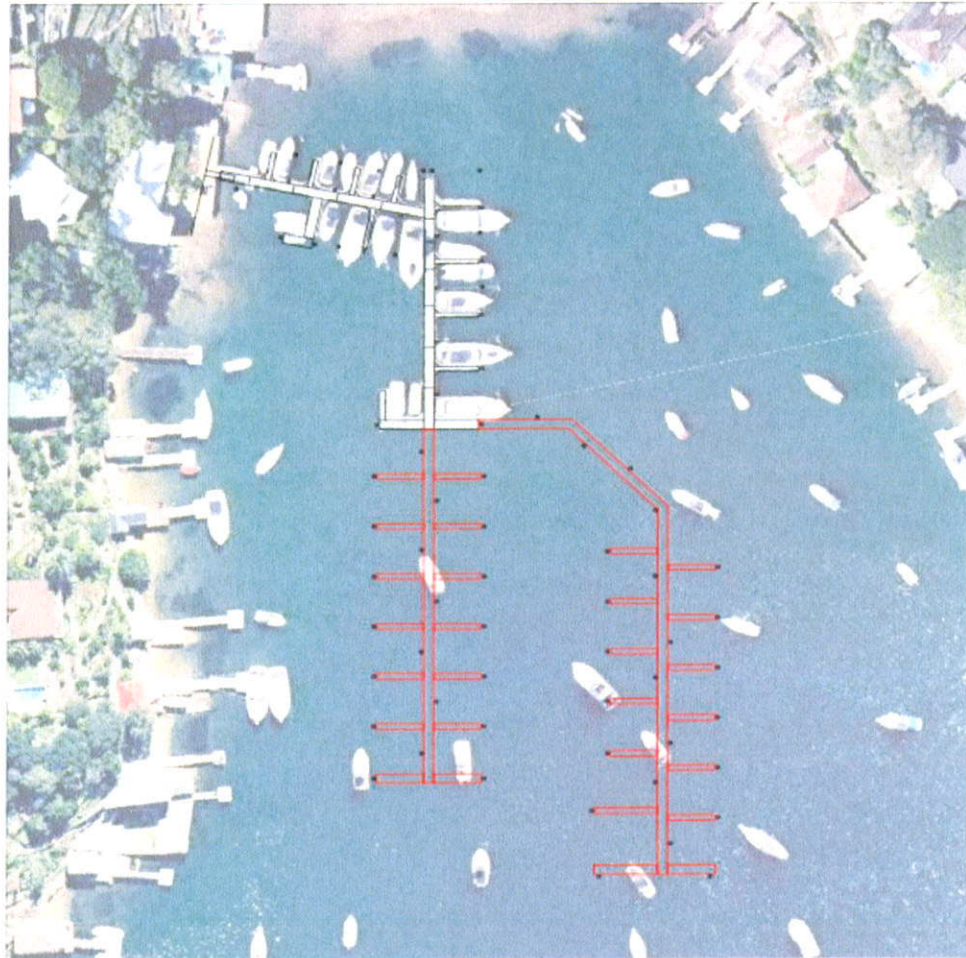
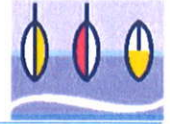
Key

	<i>Caulerpa taxifolia</i>
	<i>Posidonia australis</i>
	Mudflat

Note

Figure 2 does not appear to be as extensive as the mapping shown in Figure 1. The initial field observations by Abel Ecology suggest that Figure 1 is a more accurate representation of the aquatic flora in Dolans Bay.





10 0 10 20 30 40

NOT FOR CONSTRUCTION
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DOLANS BAY MARINA
DOLANS BAY

PROPOSED EXTENSION CONCEPT PLAN

Design: T.F. & A.B. Client Name: Dolans Bay Marina
Datum: AHD Date: 20 AUG 2010
Scale: 1:1000 Sheet 1 of 1
PLAN No. 11A3304/01

Figure 4. Location of the proposed marina upgrade by Toby Fiander & Associates as of 20 August, 2010. Note meadows of *Posidonia australis* seen as dark patches around the edge of the bay.

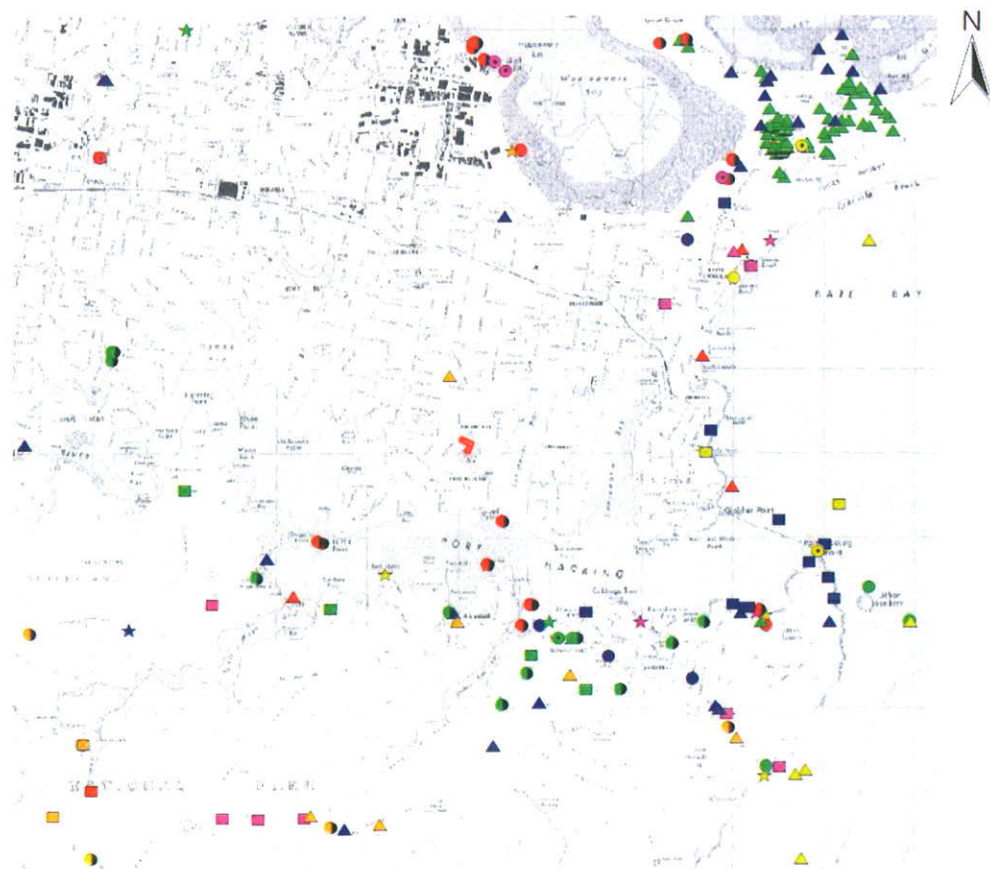
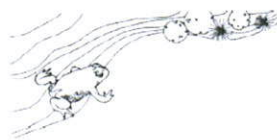


Figure 5. Threatened faunal species records within 5 km of the study site

Key

Scale: grid square = 1 km

- | | |
|---|---|
| <ul style="list-style-type: none"> □ Site location ● Australasian Bittern (V) ● Australian Fur-seal (V) ● Beach Stone-curlew (E4A) ● Black-browed Albatross (V) ● Black-winged Petrel (V) ● Broad-billed Sandpiper (V) ● Broad-headed Snake (E1) ● Bush Stone-curlew (E1) ■ Dugong (E1) ■ Eastern Pygmy-possum (V) ■ Gang-gang Cockatoo (V) ■ Giant Burrowing Frog (V) ▲ Green Turtle (V) ▲ Green and Golden Bell Frog (E1) ▲ Grey-headed Flying-fox (V) ▲ Hooded Plover (E4A) ▲ Humpback Whale (V) ▲ Koala (V) ★ Little Tern (E1) ★ Major Mitchell's Cockatoo (V) | <ul style="list-style-type: none"> ★ Masked Owl (V) ★ New Zealand Fur-seal (V) ★ Osprey (V) ★ Painted Snipe (Australian subspecies) (E1) ● Pied Oystercatcher (V) ● Powerful Owl (V) ● Purple-crowned Lorikeet (V) ● Red-crowned Toadlet (V) ● Regent Honeyeater (E1) ● Rosenberg's Goanna (V) ■ Shy Albatross (V) ■ Sooty Owl (V) ■ Sooty Oystercatcher (V) ■ Sooty Tern (V) ■ Southern Right Whale (V) ■ Speckled Warbler (V) ● Superb Fruit-Dove (V) ● Superb Parrot (V) ● Swift Parrot (E1) ● Terek Sandpiper (V) ● Wandering Albatross (E1) |
|---|---|

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Introduction

Abel Ecology was requested to undertake an assessment of Flora and Fauna in order to meet the Director Generals Requirements (DGRs) for the proposed upgrade to Dolans Bay Marina.

1 Policy and Guidelines – Aquatic Habitat Management and Fish Conservation (NSW Fisheries) 1999 Update

Estuarine Habitats (seagrasses and unvegetated soft substrates)

- 1.1 Seagrasses are found in the inter-tidal and the sub-tidal areas of estuaries. They play an important role in the functioning of marine and estuarine ecosystems. They have a significant influence on the recruitment and establishment of juvenile fish, as well as providing breeding and foraging habitat for other species, including important commercial species.

The dominant seagrass mapped (and observed by Abel Ecology) in Dolans Bay is Strapweed *Posidonia australis* (NSW Industry and Investment, 2008). The *P. australis* is mapped occurring as patchy areas around the perimeter of Dolans Bay. This species of seagrass is slow growing and is unlikely to re-establish naturally in areas where disturbance has occurred (Meehan and West, 2002).

The invasive seagrass *Caulerpa taxifolia* is mapped occurring as several isolated patches within Dolans Bay (NSW DPI, 2007). The current distribution around the bay was not searched for, though its absence directly under the proposed development footprint can be confirmed as no vegetation was found under within the footprint (Aquanaut, 2010).

See **Figure 1** and **2** for distribution of seagrass within Dolans Bay

Unvegetated areas such as mud flats, sand bars and shallows are common in estuaries. These areas provide habitat for a huge diversity of macro and micro invertebrates, and microalgae and cyanobacteria. They play an important role in the function of an estuarine ecosystem, providing a significant food source for many estuarine species.

Dolans Bay has large areas of unvegetated areas with an intertidal mudflat at the northern end of the bay (see **Figure 1** and **2**).

Threatened Species Legislation (Part 7A of the Fisheries Management Amendment Act 1997)

- 1.2 The upgrade of the Cronulla Marina provided an Environmental Assessment report by 'The Ecology Lab' (2008). This report noted that Gunnamatta Bay had potential habitat for three threatened or protected taxa according to Part 7A of the Fisheries Management Amendment Act 1997. These were the Green Sawfish (*Pristis zijsron*), Black Cod (*Epenephelus daemeli*) and Syngnathiformes (seahorses, seadragons, pipefish, pipehorses, ghost pipefishes and sea moths). Gunnamatta Bay is approximately 1 km east of Dolans Bay, and are both part of the Port Hacking estuary. With this information, a site visit, a search on the NSW Fisheries Threatened and Protected Species records viewer, and knowledge of the general area, Abel Ecology has



identified that Dolans Bay is likely to have habitat for the same three threatened species.

The presence of Green sawfish and Black cod at or around the marina for any extended periods of time is considered very unlikely, as the potential habitat is low quality. Conversely, Syngnathiformes are likely to be present in reasonable numbers within the seagrass meadows in and around Dolans Bay. The impact on this taxon is likely to be short term, localised and minimal overall. If disturbances occur from the proposed works, species in this taxon are mobile and will move to an area of less disturbance.

The proposed upgrade is highly unlikely to have an impact on the three identified threatened or protected species.

Waterfront Developments

- 1.3 No seagrass meadows were observed directly within the footprint of the proposed upgrade (Aquanaut, 2010). The exact location of seagrass meadows within a 50m radius is unknown. Should this need to be confirmed, further field work to determine the exact distances can be performed as a 'condition of consent'.

Impact on Aquatic Flora

The removal of swing moorings, and the insertion of pylons for the construction of marinas can result in re-suspension of sediments into the water column. Increased sedimentation can lead to degradation of seagrass meadows through smothering and/or reduced light availability and therefore lowered rates of production (Poiner and Peterken 1995; NSW Fisheries 1999). This damage can be long-term or irreversible due to the poor re-colonizing ability of *P. australis*.

The damage that swing moorings cause on seagrass meadows is well known. Boats attached to swing moorings swing around 360 degrees by tides, currents and winds. This movement causes the anchor chain to scrape across the substrate and scour away sediment and associated flora and fauna living in or on the sediment in the immediate vicinity. This scouring also disturbs sediments at every movement of a moored boat. The area the chain scours can be as high as 314m² (Walker *et al.* 1989). The proposed removal of the swing moorings at Dolans Bay are expected to dislodge a small amount of sediment and re-suspend it back into the water column. The sediment disturbed by one swing mooring (up to 314 m²) in one tide change is likely to be more than the sediment raised by placement of a pylon (say 0.25 m²) into the substrate. Despite probable increase in levels of sediment, and decreased light attenuation, by removal of a swing mooring and installation of a pile, the affects are short term and are likely to only have an effect locally. Therefore, the removal of the swing moorings is removing an immediate threat and will have a long-term gain.

The use of silt curtains, as best-practise, during installation of the pylons will reduce the amount of sediment moving into the water column.

Impact on Aquatic Fauna and Amelioration

The physical structure of the marina provides suitable hard surfaces for invertebrates and algae, as well as habitat and protection for benthic and demersal species. While this