

BEACH SAND PROFILE AT ROCHES BEACH, TASMANIA



Prepared by Aquenal Pty Ltd
Marine, Estuarine and Coastal Analysts



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1 INTRODUCTION AND PROJECT BRIEF

The proposal for the removal (scraping) of beach sand at Roches Beach for the purpose of nourishing the dunes has the potential to impact macrofaunal communities inhabiting the beach. Sediment profiles of the beach will assist in determining the volume of sand available for removal and aide efforts to minimise the potential impact on macrofaunal communities inhabiting the beach. With this in mind, Clarence City Council commissioned Aquenal Pty Ltd to design a sampling regime to characterise the sediment profile of Roches Beach, in conjunction with a macrobenthic faunal survey.

2 SURVEY METHODS

The sampling design has been developed to provide information about the depth at which coarse shell grit can be found at various locations along the beach. The design consisted of the sampling of ten locations, distributed fairly evenly along the length of Roches Beach (Figure 1). Eight of these locations (R1-R8) correspond to sampling sites in a recent survey characterising the macrofauna at Roches Beach and Cremorne Beach (Aquenal, 2010). Sites were located using a differential GPS, accurate to two metres. At each site, a marker was placed at the base of the sand dunes and a tape measure was run perpendicular to the shore down to the water's edge. The distance to the high water mark was recorded. From the high water mark to the water's edge, depth profile was recorded every five metres. Depth profiles were recorded by digging a hole until coarse shell grit was encountered, then measuring that depth with a 1m ruler (to a maximum depth of 50 cm).

Six locations at Roches Beach were designated as control locations, where it is understood that sand removal will not occur within 100 metres of the profile section. This will provide information on the length of time required for macrofaunal communities to return to background levels, following any removal of sand for the purpose of dune replenishment.

Table 1 Sample locations at Roches Beaches, including location type and geographical coordinates (UTM, WGS 84 Zone 55), and distance from dune base to high water mark (HWM)

Locations	Profile Location	Type	Easting	Northing	Distance to HWM (m)
R1	Long Section 3 - No.122 Bayview Dr.	Control	540589	5248470	2
R2	Long Section 4 - Ralphs Bay Canal	Control	540398	5248902	1
R3	Long Section 5 - No.2 Manata St.	Monitoring	540367	5249273	5
R4	Long Section 6 - No.120 Balook St.	Monitoring	540409	5249615	5.8
R5	Long Section 7 - No. 98 Balook St.	Control	540459	5249814	4.9
R6	Long Section 8 - No. 68 Balook St.	Monitoring	540547	5250094	4.5
R7	Long Section 9 - No 34 Balook St.	Monitoring	540671	5250407	6.2
R8	Long Section 10 - No. 2 Balook St.	Control	540812	5250673	0
R9		Control ?	540881	5250914	8.2
R10		Control ?	540876	5250988	6.5



Figure 1 Sample locations, Roches Beach (R1-R8)

3 RESULTS

Depth profiles were conducted at ten locations along Roches Beach, from high water mark (0 m), every five metres throughout the intertidal zone. In most locations the intertidal zone extended 10 m horizontally from high water mark. At four locations, mostly in the northern end of the beach the intertidal zone extended 20 metres. Data averaged over all locations showed sand depth to be greatest at the high-water mark (0 m), and lowest at 5 m, with depth increasing at 10 m and 15 m.

Data averaged over sites within locations demonstrated no clear patterns with regard to latitude, or expected exposure. The lowest average depth to shell grit was at location R1 (19.33cm) while the greatest occurred at location R6 (45.5cm). The adjacent location R7 also possessed sand to a reasonable depth (39.33cm). All high-water mark sites (0 m) possessed at least 50 cm of sand except location R1 (the southern most location), where the rock retaining wall extends to high-water mark.

Table 2 Depth profile with distance from high water mark at Roches Beach sample sites

Location	Profile depth (cm)			
	0m	5m	10m	15m
R1		50	8	
R2	50	11	18	
R3	50	8	50	
R4	50	13	18	
R5	50	13	16	40
R6	50	50	34	48
R7	50	18	50	
R8	50	4	7	24
R9	50	14	18	48
R10	50	50	36	

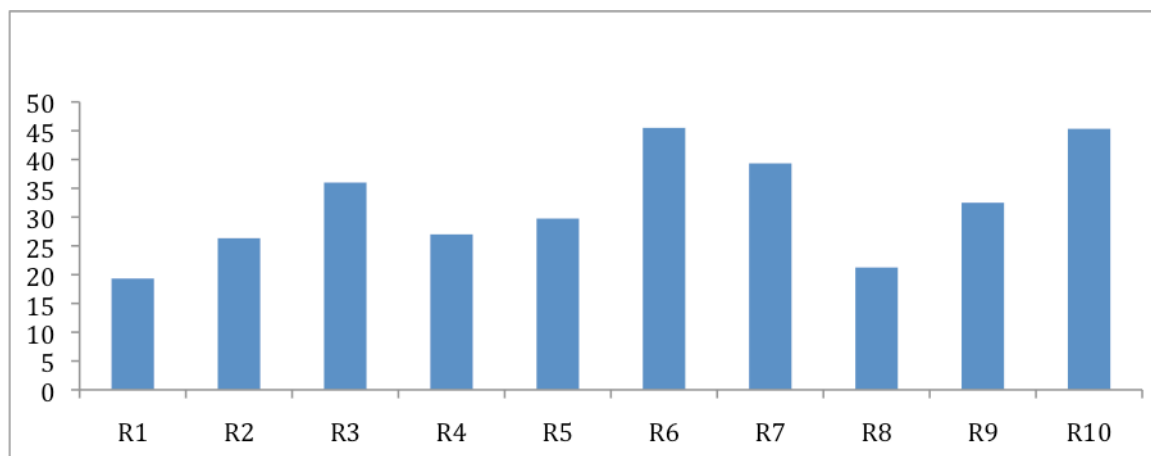


Figure 2 Average depths to shell grit (cm) at Roches Beach

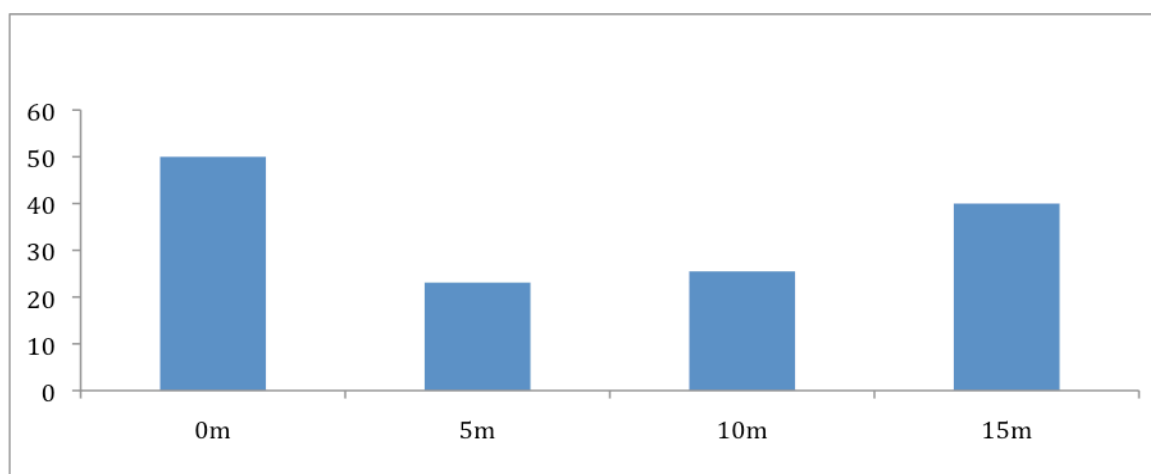


Figure 3 Average depth (cm) with distance from high water mark (m) at Roches Beach

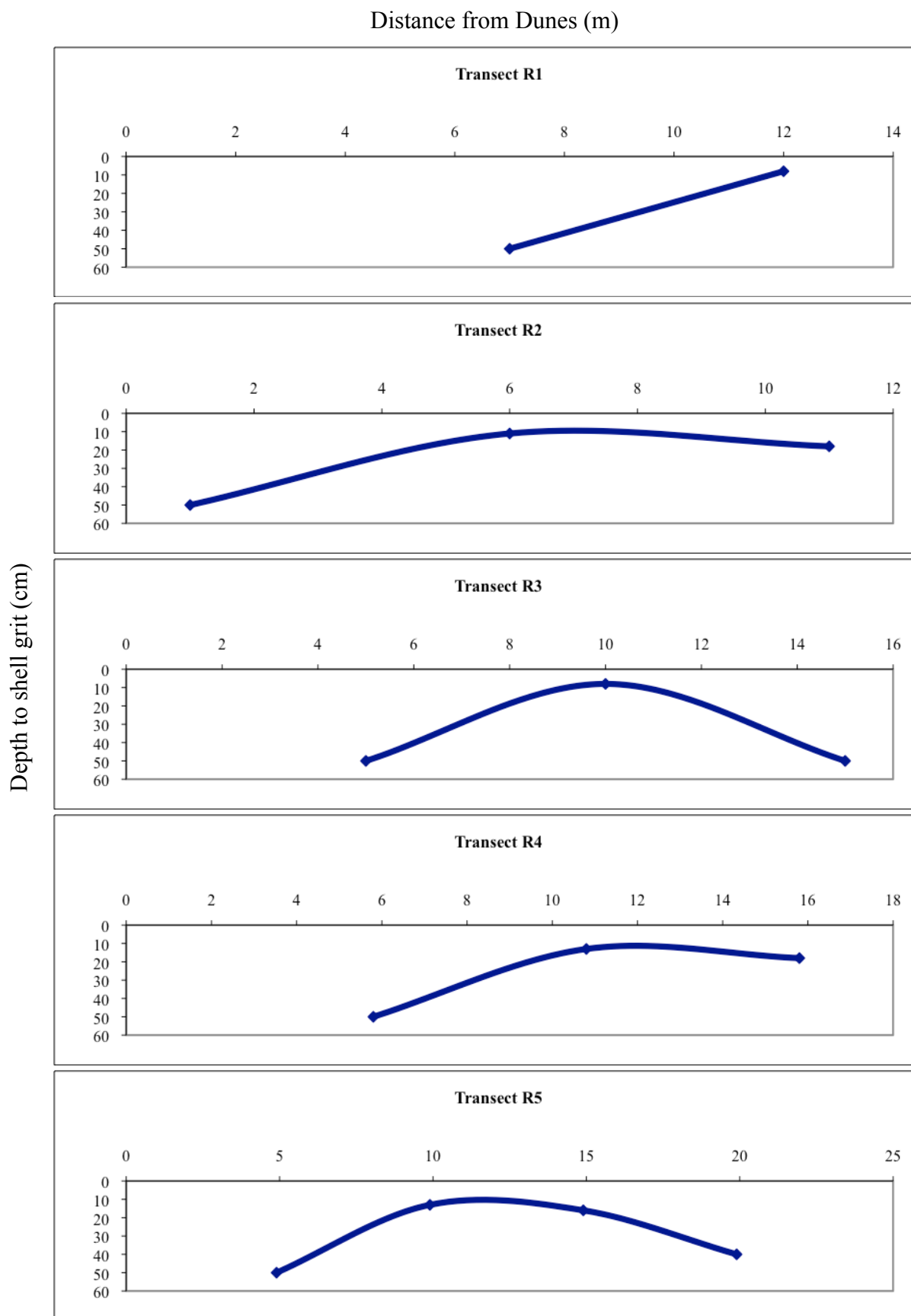


Figure 4 Depth profiles for beach sediments at Roches Beach, sites R1 – R5

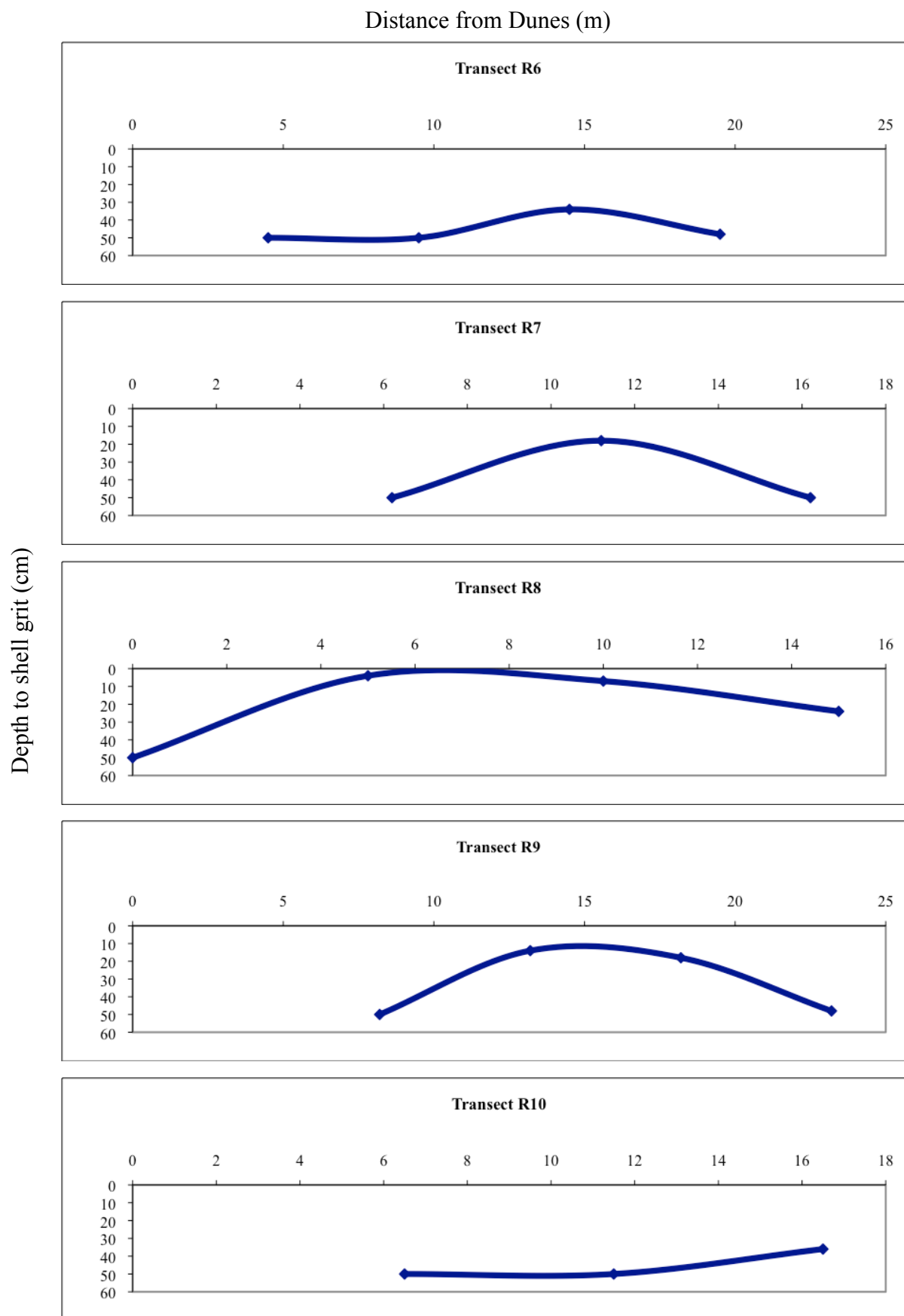


Figure 5 Depth profiles for beach sediments at Roches Beach, sites R6 – R10

4 DISCUSSION AND CONCLUSIONS

The present survey provides information on baseline conditions at Roches Beach, which complements the macrofaunal survey conducted previously (Aquenal 2010). Information provided in this report has been designed to assist decisions in regard to the location and extent of potential sand scraping. The greatest depth of sand occurs at, or near, the high-water mark. This is problematic as it is unlikely that this sand can be utilised for scraping, as replenishment will be occurring in approximately the same location. On average sand depths increased from 5 m (distance from HWM) to 15 m. This suggests that any potential sand scraping should target the lower shore levels. By scraping lower shore levels the impact on the bivalve *Paphies elongata* would also be minimised (see Aquenal 2010). *Paphies elongata* was the most common species both in terms of numbers and biomass encountered during the macrofaunal survey and was almost exclusively found in the upper levels of the intertidal zone.

In the previous survey (Aquenal 2010), it was suggested that one potential monitoring method could involve the scraping of only a small area of the beach. This would be followed by macrofaunal monitoring of the scraped section and an adjacent control section every two to three months. If this method were to be utilised then it is recommended that the area around locations R6 or R7 be considered as a potential monitoring site. Both these locations possessed a reasonable depth of sand at all tidal levels.

5 REFERENCES

Aquenal, 2010) Biological Characterisation of Macrofauna at Roches Beach and Cremorne Beach, Tasmania, Report for Clarence City Council