

SURVEY OF BEACH LITTER IN THE PROPOSED MARMION
MARINE PARK NEAR PERTH, WESTERN AUSTRALIA

J L Cary¹, J E Robinson¹ and K A Grey²
1: Department of Conservation and Environment,
now Environmental Protection Authority;
2: Centre for Water Research
University of Western Australia, now
with Environmental Protection Authority.

Abstract

The results of a beach litter survey, carried out in July 1985 on eight beaches within the proposed Marmion Marine Park, are given. An average of 274 items, weighing 5.44 kg, were collected per 100 m transect. Sixty-eight percent by weight of the total was found to be generated by the general public and 32% by rock lobster fishermen who were mainly professionals. Litter from the general public consisted mostly of cans, bottles, plastic bags and containers discarded by beach users; whereas rope and plastic bait wrapping were the major components from rock lobster fishing boats. The Ocean Reef boat launching facility beach was found to be the 100 m transect most contaminated by litter.

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1. INTRODUCTION

Frequent complaints by the general public, in local newspapers and to the former Department of Conservation and Environment, of litter contaminating beaches within the proposed Marmion Marine Park lead the M10 study team to undertake a survey of litter. The aim was to determine broadly the quantity, type and origin of the beach litter.

2. METHODS

Beach litter was collected on week days in July 1985 following the closure of the rock lobster fishing season and during a period of low activity by beach users. The litter was collected along a 100 m transect line, parallel to the shoreline, between the waters edge and the vegetation line, at eight beach sites from Trigg to Ocean Reef boat launching facility (Figure 1). Each site was sampled once.

The beach sites sampled were:

- (1) Bennion Street Beach, close to Trigg.
- (2) North Beach, opposite Sorrento Street.
- (3) Marmion, 200 m north of Marmion Angling and Aquatic Club. *WENT N 200M
WALKED SOUTTY
BACK*
- (4) Sorrento, 1 km north of Sorrento Surf Life Saving Club. *HILLARYS STARTY
WELL*
- (5) Mullaloo, 500 m south of Mullaloo Point. *MULLALOO POINT → N*
- (6) Whitford Beach, opposite Whitford Avenue.
- (7) Mullaloo Beach.
- (8) Ocean Reef, inside Ocean Reef boat launching facility (south-east corner).

In the laboratory, litter from each beach site was divided into general litter from beach users, and litter obviously originating from rock lobster fishing activities. Under each of these two categories, litter was again divided into different types of litter (Table 1).

The number of items and total weight (wet) of all items in each litter type, for each transect, were recorded.

3. RESULTS

An average of 274 items and approximately 5.4 kg of beach litter were collected along each 100 m beach transect in the proposed Marmion Marine Park (Table 2).

The total amount of litter collected at each site ranged from 1.00 kg, made up of 145 items at Mullaloo Beach, to 17.47 kg, comprised of 637 items in the south-east corner of Ocean Reef boat launching facility (Table 2).

Litter from beach users was more common, (68% of total litter weight) than from rock lobster fishing activities (32% of total litter weight). The major components of beach litter were cans, bottles, plastic bags and plastic containers.

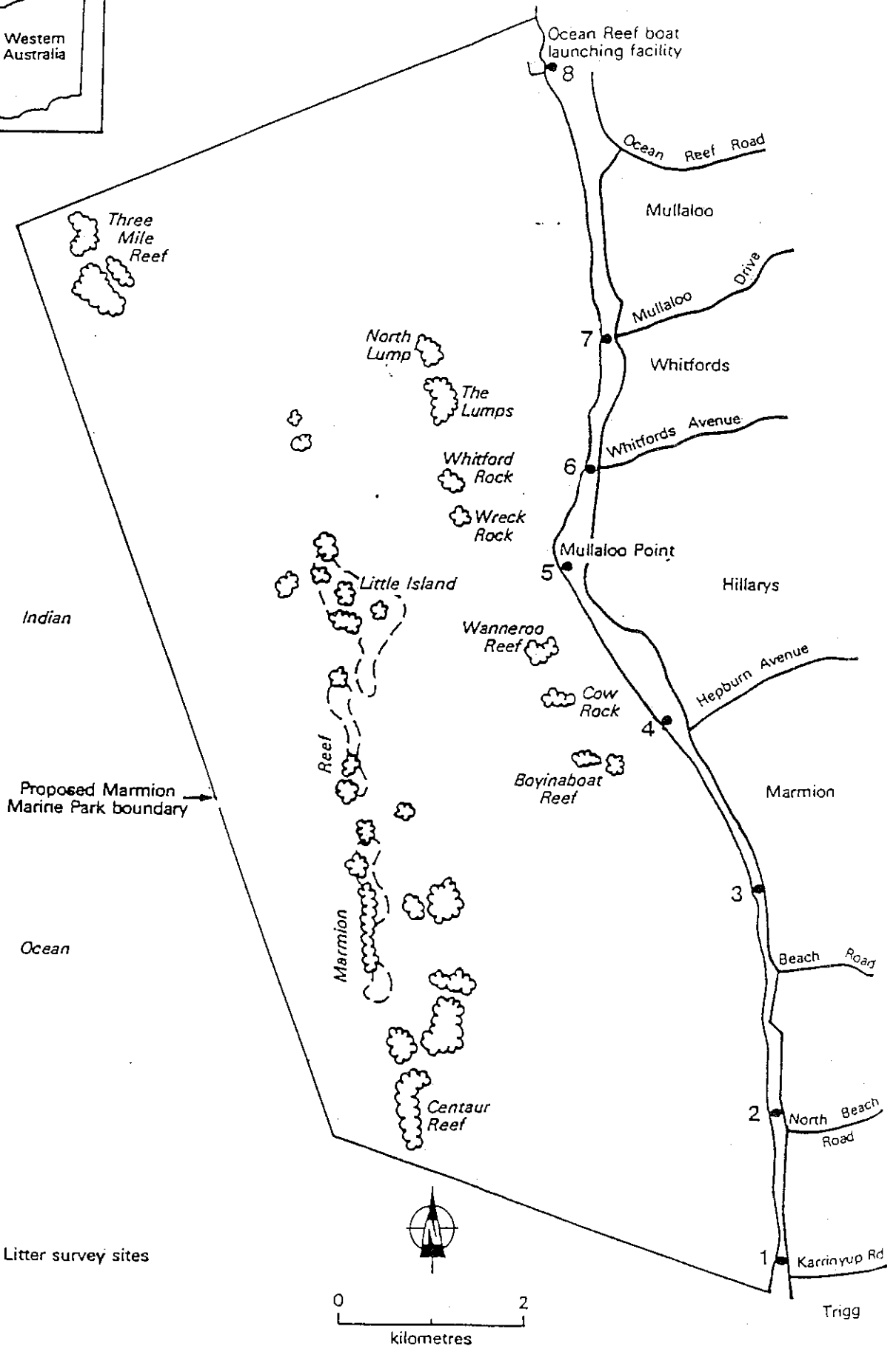
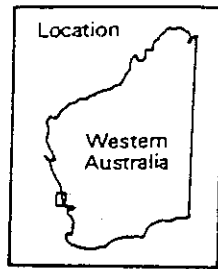


Figure 1. Location of the eight 100 m transects sampled in beach litter survey within the proposed Marmion Marine Park.

Table 1. Types of litter discarded by beach users and professional and amateur rock lobster fishermen.

LITTER FROM BEACH USERS	LITTER FROM ROCK LOBSTER FISHERMEN
cans/bottles	lengths of rope
plastic bags/containers	plastic bait wrapping
wood	plastic catch bags
plastic	miscellaneous plastic
food wrapping	plastic bait straps
paper	bait baskets
rubber	floats or parts of floats
cloth	miscellaneous
glass	
bottle tops	
polystyrene	
fishing line	
metal	
miscellaneous	

Cans and bottles formed the highest proportion of beach user litter at four of the eight sites, ranging from 11.1% of the total litter at Bennion Street Beach to 64.2% of the total litter at the northern end of Sorrento Beach (Table 2). Plastic bags and containers were the major beach user components at two sites, comprising 20.8% of the total litter, 500 m south of Mullaloo Point, and 28.3% of the litter inside Ocean Reef boat launching facility. Broken glass and wood were the major beach user components at the remaining two sites; broken glass comprising 18% of the total litter at North Beach, and wood accounting for 14% of the total litter of Marmion.

Although at six of the eight sites litter from beach users constituted the majority of the litter, at Bennion Street Beach and Mullaloo Beach 63.0% of the total litter weight was from rock lobster activities (Table 2).

The major components of rock lobster litter were rope and plastic bait wrapping. Rope formed the highest proportion of rock lobster litter at six of the eight sites, ranging from 7.1% of the total litter at Marmion to 38.9% of the total litter at Mullaloo Beach. Plastic bait wrapping constituted 9.1% and 10.7% of the total litter at North Beach and Ocean Reef sites, respectively.

The beach with the most litter was inside the Ocean Reef boat launching facility (637 items). Large amounts of litter were found also at Bennion Street Beach near Trigg and Marmion Beach (520 and 308 items, respectively).

4. DISCUSSION

This brief, superficial study provides baseline data on the problem of beach litter in the proposed Marmion Marine Park.

The survey was carried out in winter when beach use by the general public was minimal. Coincidentally, sampling was done immediately following the rock lobster fishing season, and therefore the amount of litter during this

Table 2. Weight, number of items and main litter type collected along 100 m transects at eight beach sites.

TRANSECT NO & SITE	LITTER WEIGHT (kg)			% OF TOTAL LITTER WEIGHT			NO OF ITEMS			LITTER TYPE (% BY WEIGHT)		
	BEACH USERS	ROCK LOBSTER FISHERMEN	TOTAL	BEACH USERS	ROCK LOBSTER FISHERMEN	TOTAL	BEACH USERS	ROCK LOBSTER FISHERMEN	TOTAL	BEACH USERS	ROCK LOBSTER FISHERMEN	TOTAL
	1. Bennion St Beach	3.21	5.46	8.67	37.0	63.0	270	270	250	520	Cans & Bottles 11.1	Rope 22.4
2. North Beach	1.30	0.32	1.62	80.2	19.8	204	204	27	231	Broken Glass 18.0	Plastic Bait Wrap 9.1	
3. Marmion	5.10	1.28	6.38	79.9	20.1	247	247	61	308	Wood 14.0	Rope 7.1	
4. Sorrento	1.70	0.27	1.97	86.3	13.7	68	68	18	86	Cans & Bottles 64.2	Rope 6.9	
5. Mullaloo Point	1.17	0.16	1.33	88.0	12.0	90	90	25	115	Plastic Bags/ Containers 20.8	Rope 7.2	
6. Whitford Beach	4.21	0.89	5.10	82.5	17.5	74	74	73	147	Cans & Bottles 60.8	Rope 7.5	
7. Mullaloo Beach	0.37	0.63	1.00	37.0	63.0	72	72	73	145	Cans & Bottles 12.8	Rope 38.9	
8. Ocean Reef	12.40	5.07	17.47	71.0	29.0	373	373	264	637	Plastic Bags/ Containers 28.3	Plastic Bait Wrap 10.7	
Average per site (x)	3.68	1.76	5.44	67.6	32.4	175	175	99	274	Cans & Bottles	Rope	

period, July 1985, was biased towards litter from the rock lobster fishermen. During summer, litter deposited by beach users would be much more evident on the beaches, both relatively and in absolute terms.

Litter from the rock lobster fishermen was mainly from professionals who used commercial packets of bait, wrapped in distinctive plastic wrapping sealed by equally distinctive blue plastic straps. Discarded fishing gear can result in the entanglement of marine animals such as whales, dolphins, seals, sharks, turtles and seabirds (see reference list).

Although weight and number of items were used as indicators of the extent of the litter problem, litter can also cause aesthetic and health problems which are difficult to quantify. For example, broken glass was uncommon in the litter collected, but during times of peak usage could result in serious injuries on beaches.

Litter from rock lobster fishermen possibly results from their reluctance to carry discarded wrappers and other items to disposal points on shore: it is not clear what further steps could be taken to minimise litter from this source, other than continuing the Fisheries Department effort to educate the fishermen. Litter from recreational beach users might be reduced by the provision of more rubbish bins on beaches, in addition to public education.

5. CONCLUSION

Although sampling was carried out when beach use was minimal, beach litter was prolific: an average of 274 items weighing 5.4 kg on a 100 m transect. Weight of litter, mostly cans, bottles, plastic bags and containers, from beach users (68%) was greater than that from rock lobster fishing activities (32%), which generated mostly rope and plastic bait wrapping. The proportion of litter from the relatively few crayfishing boats is thought to be high when compared with that from the beach users. Most litter was found on the beach inside the Ocean Reef boat launching facility. Bennion Street Beach, near Trigg, and Marmion Beach were also heavily littered.

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