



2011 West Australian Marine Debris Project Technical Report

# **TANGAROA BLUE OCEAN CARE SOCIETY**



## **2011 WEST AUSTRALIAN MARINE DEBRIS PROJECT TECHNICAL REPORT**

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[www.oceancare.org.au](http://www.oceancare.org.au)

Thank you to the following government agencies and organisations for funding and support for the

WA Marine Debris Project.



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## 1. EXECUTIVE SUMMARY

Tangaroa Blue Ocean Care Society's main objective for 2011 has been to consolidate the annual WA Beach Cleanup into a state-wide event. This has been achieved with cleanup activity occurring in each coastal region from the south coast through to the Kimberley coast and out to the Cocos Keeling and Christmas Islands. About 50 organisations and over 1200 volunteers combined their energies to produce this successful outcome.

South West Marine Debris Project monthly monitoring activities have also continued along the Capes coast in 2011 with two additional sites - Yeagarup on the western south coast and Dalyellup Beach near Bunbury being added to the programme. Additional cleanups at Deepdene and Boranup were also funded during the year and valuable data was obtained for these targeted sites.

As part of an ongoing effort to improve the effectiveness of our data collection system a new data sheet has been produced along with a rationalisation for the naming of items found on beaches. The main changes involved grouping items under their material categories and then grouping similar items into item classes. These changes will be reflected in the 3rd edition of our Marine Debris Identification Manual due to be printed in early 2012.

This year's annual WA Beach Cleanup produced 75,832 items of debris. Seventy seven percent of these were plastic and the most numerous item was remnant bits and pieces of plastic. Our revamped cleanup signature shows 47% of items falling into the "remnants and breakage" category, 28% into "packaging" and 13% into "consumer articles". In this report we are introducing a second set of categories which provide an indication of the type of activity which generated the marine debris being found within a site, area or region. By this measure, in this year's cleanup, "*individual consumption*", which includes articles and packaging related to individual consumption of food, drink and cigarettes, generated 34% of the items collected. "*Plastic remnant accumulation*" (the legacy of past activities) also accounted for 34% while "*commercial fishing*" generated 16% and "*recreational fishing*" and "*individual activities*" generated 6% each. Averaged over the whole state our litter and local source index shows 46% of items were from local origins while the remaining 54% had a non local origin such as shipping and oceanic circulation.

Non local sources include debris entering the sea anywhere along the West Australian coast and being transported down the coast (longshore movement). Data gathered in Bunbury during the year by Project Shorelines in conjunction with Tangaroa Blue Ocean Care Society has provided a snapshot of rubbish being generated at local fishing spots. This has been examined together with monthly monitoring data at Dalyellup. Evidence is provided that recreational fishing spots are strong emitters of debris and that this debris not only pollutes locally but is also transported southward to distant parts of the coast.

Plastic resin pellets were collected in the mid west during this year's cleanup extending the identified occurrence of these well north of Perth. During May and June thousands of pellets were also observed on several western south coast beaches. These may have been mobilised out of the coastal system by heavy swells.

Initiatives set in place following the November 2010 meeting of representatives from the Swan River Management Trust, Department of Environment and Conservation, Perth Natural Resource Management (NRM), the Cities of Belmont and Bayswater and Tangaroa Blue Ocean Care Society are



proceeding and include monitoring the output of plastic resin pellets from industrial locations on the Swan River together with an examination of the ability of current policy and regulations to cover the discharge of pellets into the environment. A newsletter focusing on the plastic resin pellet and micro plastic pollution issues is now being produced by Tangaroa Blue Ocean Care Society and this will continue to present developments around these issues in 2012. To subscribe to this newsletter register at [www.oceancare.org.au](http://www.oceancare.org.au).

During November 2011 regulations came into force prohibiting the possession of plastic bait bands (strapping bands) "at sea" in state waters. Tangaroa Blue Ocean Care Society is encouraged by this change in law and will continue to monitor plastic bait bands to record any change in their numbers.

The Tangaroa Blue Ocean Care Society National Marine Debris Database now holds over 1 million pieces of data collected from around the country. This data is being used to find practical solutions to the marine debris issue and holds vital information on what is impacting our marine environment and links to where it is coming from. We look forward to continuing our work with all partners and stakeholders to continue to find ways of stopping the flow of rubbish into our oceans.

We would especially like to thank the thousands of volunteers and supporters for their efforts in this 7<sup>th</sup> year of the WA Marine Debris Project. You have contributed in the removal of over 1 million pieces of debris from the Australian coastline helping to protect our fragile marine ecosystem.

## 2. RECOMMENDATIONS

### Recreational Fishing



Recreational fishing spots such as groynes, jetties and marinas around the state have been shown to be potent sources of litter. A large amount of this litter includes packaging from both bait and other recreational fishing items. Tangaroa Blue Ocean Care Society recommends state government level directives be given to both the managers of these sites and facilities as well as the manufacturers of recreational fishing equipment and bait to institute practices and measures aimed at mitigating the flow of litter from this industry into the marine system. Also recommended is

continued funding and support of initiatives such as Keep Australia Beautiful Council WA's "Clean Marine" programme aimed at raising the awareness of recreational users at these sites.

### Packaging Litter (container deposit scheme)

Drink packaging is an ever present, and numerous component of rubbish collected from beaches. Tangaroa Blue Ocean Care Society strongly recommends the introduction of both state and national container deposit schemes similar to that in operation in South Australia and introduced recently in the Northern Territory. By creating a value to these items, they are less likely to become litter and/or marine debris.





### **Plastic Resin Pellets - Operation Clean Sweep**



Tangaroa Blue Ocean Care Society recommends the implementation of the "Operation Clean Sweep" programme at industry sites in WA where plastic resin pellets are used. This internationally recognised programme is aimed at identifying basic housekeeping practices which prevent pellets being lost into the environment. Research has indicated that plastic resin pellets are in significant numbers around the WA coastline; that local sources are contributing to large numbers found on local beaches; and that the introduction of "best

practices" in this industry would reduce the number of pellets lost into the WA marine environment.

### **Marine Debris Prevention**

Marine debris prevention needs to be part of the planning process at all levels of government and industry. By introducing a basic question such as "will this activity produce marine debris or cause harm to the environment?" into the planning process, preventative measures can then also be incorporated into any given project.



### 3. WEST AUSTRALIAN BEACH CLEANUP 2011

#### CLEANUP SUMMARY - WEST AUSTRALIAN BEACH CLEANUP 2011

**Table 1 - West Australian Beach Cleanup 2011 - Project Cleanup Summary**

	2010	2011	% Increase	Notes
Number of Cleanups	110	120	9%	
Volunteer Occasions	742	1,250	68%	Approximately 1200 Individual Volunteers
Hours Volunteered	1810.75	3112.55	72%	
Number of Items	48,004.03	75,832	58%	Partly due to strong winter pattern
Number of Bags Filled	426	777.75	83%	
Total Weight	3,112.65	8,428.75	171%	Salvage of metal at Busselton Jetty underwater cleanup (approximately 3,000kg)
Combined Length of Sites	193,220m	197,050m	2%	

**Table 2 - Top 10 Sites by Total Number of Items**

Cowaramup Bay	4993	<p><i>Cleanup Notes</i></p> <p>A heavy swell prevented access to a small number of sites and some of these cleanups were cancelled or carried out in November. Also organisational logistics prevented full data collection at three other sites.</p> <p>Underwater cleanups were carried out at Exmouth, Coogee and Busselton.</p> <p>Ten sites accounted for 43% of all the debris collected as shown in the adjoining table.</p>
Binningup Beach	4507	
Gallows Beach	4021	
Twiss Memorial Cocos Keeling Islands	3703	
Buffalo Beach	3315	
Hamelin Bay to Bobs Track	2902	
Deepdene Beach	2459	
3 Bears Beach	2253	
Yanchep beach	2105	
Denmark Lights Beach and Back Beach	2033	
Total	32291	



## LARGE, UNUSUAL AND DANGEROUS ITEMS



This military phosphorous bomb, used in offshore exercises was found at Ocean Beach, Denmark during the cleanup. Authorities were called in to detonate the device.



Several full, leaking tins of marine paint washed ashore near Augusta.



An estimated 500 metres of rope - weighing 160 kg was recovered at Mufflers on the Capes coast.



Our inaugural winner of the most unusual item found during the annual cleanup fronts up with the ice hockey stick he found at Moses Rock on the Capes coast.



Part of the structure of a weather balloon consists of thin foamed plastic material pictured left. Found as marine debris it presents as a thin piece of foam with both sides showing a (once) sticky layer, now discoloured. Having first been identified in Far North Queensland the foam pieces are now being monitored along the WA coast with several pieces recorded during the cleanup. Pictured right are the latex remnants of the actual balloon.



## CLEANUP DATA SUMMARY

**Table 3 - List of Items**

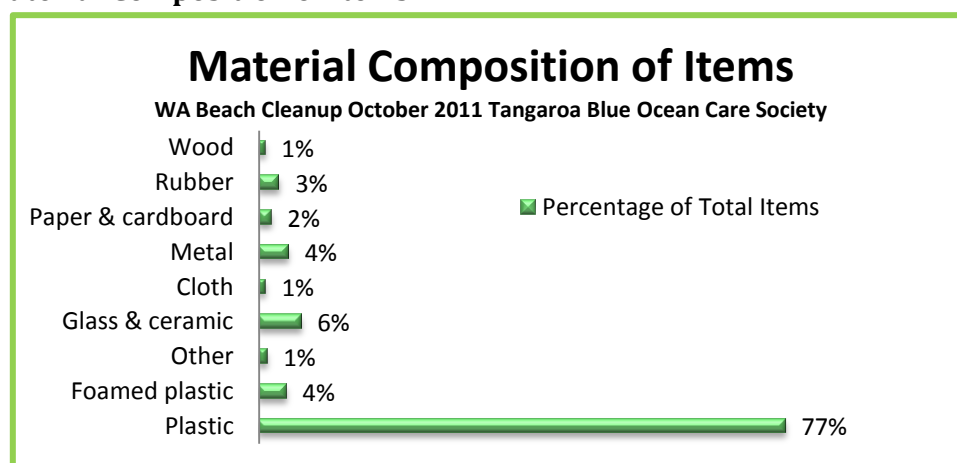
Item Class	Total	Item Class	Total
Plastic bits & pieces hard & solid	20219	Plastic tubes & hoses	42
Plastic film remnants (bits & pieces of plastic film)	5437	Plastic house wares, tablewares, house fittings	40
Rope & net scraps less than 1 metre	4930	Plastic sheeting (tarpaulin, woven bags, pallet wrap)	40
Lids & tops, pump spray, flow restrictor & similar	4106	Plastic oddments	39
Fishing line in metres (recreation)	3434	Recreation & outdoor equipment	35
Cigarettes, butts & filters	2901	Condoms	34
Glass or ceramic broken	2868	Large items	33
Plastic drink bottles (water, juice, milk, soft drink)	2643	Fishing net over 1 metre in metres	33
Foam insulation & packaging (whole and remnants)	2535	Blasting items	32
Rope (estimated length in metres)	2482	Rubber buffers, tyres, seals & similar	29
Straws, confection sticks, cups plates & cutlery	1824	Personal effects (wallets, money, keys, jewellery)	28
Plastic packaging food (wrap, packets, containers)	1792	Drift net floats	24
Aluminium cans	1641	Wire, metal stakes & pipes	24
Commercial fishing remnants (float, pot, crate pieces)	1469	Shotgun cartridges and wadding	23
Rubber footwear & thongs	1382	Brooms, brushes & paint brushes	23
Glass beer stubbies & alco-pop bottles	1292	Plastic bottles, drums, jerry cans & buckets over 4 litres	23
Strapping band scraps	1207	Metal outdoor equipment & implements	21
Plastic bags supermarket, garbage, dog poo, ice	1010	Appliances, electronics & batteries	20
Metal bottle caps, lids & pull tabs	888	Canvas, sailcloth & hessian materials	19
Bait & tackle bags & packaging	618	Plastic pipe PVC, irrigation & reticulation	19
Processed timber, pallets and other wood	588	Occupational health & safety items	18
Rubber remnants	572	Containers content intact & spilt content	15
Sanitary (tissues, nappies, tampons, cotton buds)	550	Foam sponge sheeting (mattress & similar)	14
Cloth, clothing, hats & towels	519	Fibreglass fragments	13
Paper & cardboard packaging	485	Syringes veterinary	11
Newspaper, magazines & brochures	481	Plastic electrical cable, connectors & fittings	11
Cylume glow sticks	474	Plastic vehicle parts	10
Recreational fishing items (lures, floats, rods, reels)	401	Wax (surf wax, candles, paraffin and similar)	9
Plastic containers non food (oil, sealant, chemical)	397	Medical waste	9
Strapping band whole (record as single item)	371	Synthetic cardboard (corflute) signs & packaging	9
Tetra packs & drink cartons	369	Aquaculture items	9
Bait containers & lids, bait savers	319	Childcare items	9
Personal care & pharmaceutical packaging	315	Plastic furniture outdoor & camping	9
Foam cups, food packs & trays	299	Carpet & lino, household, boat deck & padding	9
Foil wrappers, packets, bladders, alfoil, foil balloon	290	Plastic first aid materials & equipment (band aids)	9
Toys, party poppers, ribbons, clips & similar	266	Metal motor vehicle parts & batteries	8
Cigarette lighters	251	Boat pieces	8
Rubber balloons, balls & toys, elastic straps & bands	249	Metal tools	6



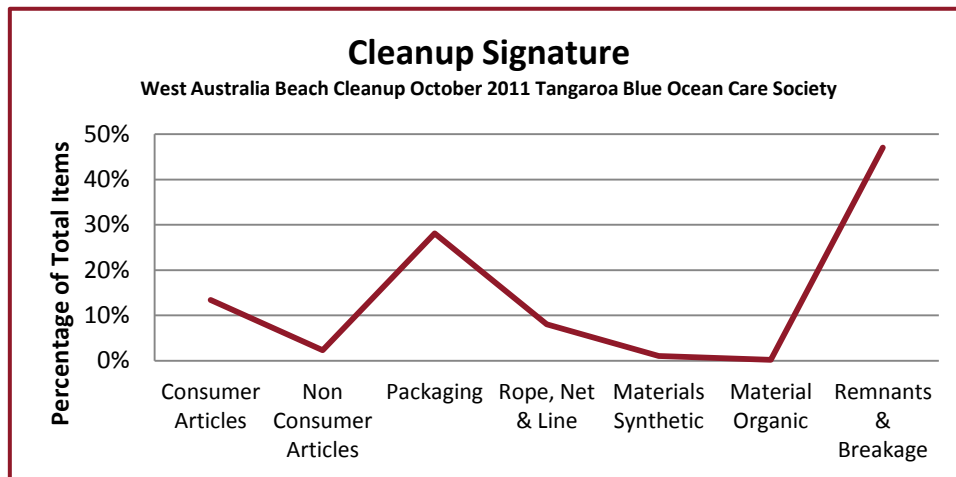


Plastic wrap non food (bubble wrap etc)	226	Metal drums, cans & buckets over 4 litres	4
Toothbrushes, brushes & combs, hair ties etc	224	Plastic gardening items, implements & fittings	4
Binding, thread, string & cord (natural fibre)	221	Drug paraphernalia	4
Glass wine, spirit and similar bottles	217	Weather balloon parts	3
Foam buoys	205	Mesh bags (vegetable, oyster & mussel bags)	3
Bleach & cleaner bottles	182	Glassware & ceramic items	3
Shoes leather & fabric	153	Plastic drink package rings, six pack rings, ring carriers	2
Glass jars & sauce bottles	150	Substances unidentified	2
Metal building & trades materials, fixings & fittings	130	Wooden furniture	2
Pens, markers & other plastic stationary	125	Pets handling & care items	2
Construction material (brick, cement, pipe)	123	Rubber sheeting	2
Wooden confection sticks, pencils, matches etc	122	Plastic ceremonial & festive	2
Fishing line in metres commercial (monofilament)	120	Gas bottles	1
Oil globules & tar-balls	119	Plastic buoys and floats	1
Metal fishing items (sinkers, lures, hooks, traps, pots)	112	Metal signs and sheeting	1
Aerosol cans	83	White goods	1
Municipal activities (tree guard, barrier fence etc)	76	Metal marine engine & boat parts & fittings	1
Miscellaneous paper, labels & tickets	75	Baskets, crates & trays	1
Cable ties & plastic fasteners	72	Small machinery & electric motors	1
Fluorescent light tubes and bulbs	61	Polynet fruit & vegetable bags	1
Metal scrap & remnants	58	Syringes medical	1
Tape adhesive, electrical, duct, hazard marker & rolls	56	Soap, dry lubricant & glue	1
Remnants burnt plastic	54	Dangerous & very hazardous items	1
Packaging accessories (seals, reels, spools, handles)	48	Commercial fishing traps, pots & intact parts	1
Tags	45	Marine safety & survival equipment	1
Food scraps	45	Administration anecdotal data (see item note)	0
Tins under 4 litres (food, drink tins and similar)	43	<b>129</b>	<b>75832</b>

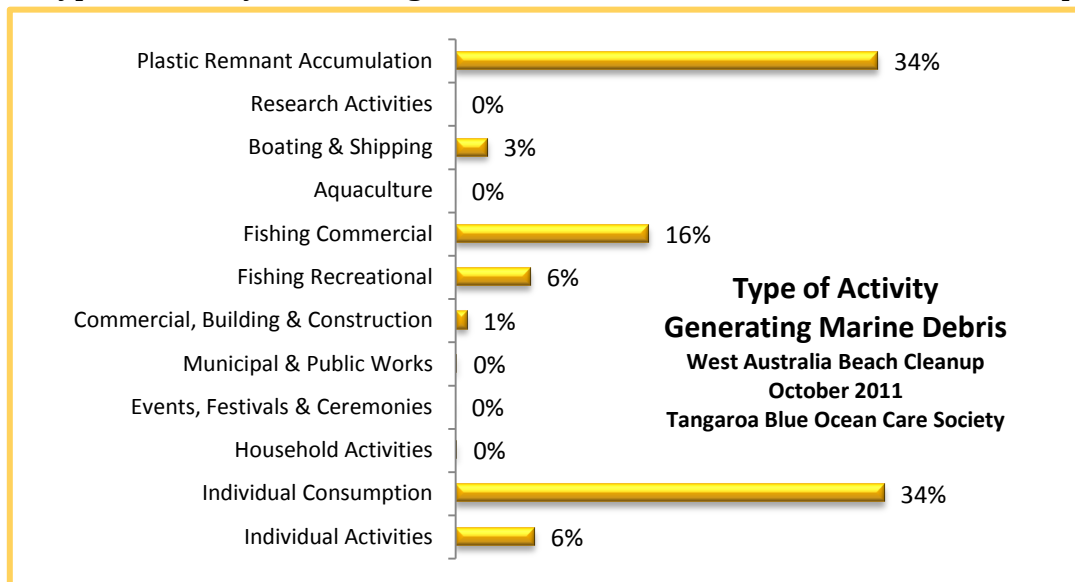
Figure 1 - Material Composition of Items



**Figure 2 - West Australian Beach Cleanup 2011 Cleanup Signature**



**Figure 3 - Type of Activity Generating Marine Debris West Australian Beach Cleanup 2011**



This year's cleanup extended out to the Cocos and Christmas Islands where community members and various island and government agencies and organisations gave it their whole hearted support.



*2011 West Australian Beach Cleanup volunteers at Cocos West Island (left) Cocos Home Island (centre) and Christmas Island Dive Volunteers (right)*



## CLEANUP DATA TABLES BY COASTAL REGION

### *HOW TO INTERPRET THE TABLES*

In the following tables sites are grouped by coastal region. Each cleanup site and accompanying statistics are listed in south to north order. Following the table for each coastal region are two graphs - one for the type of activity generating the marine debris in that coastal region and the other showing the material makeup of the debris. Below are some notes on the types of statistics presented.

### ***Litter & Local Index***

This index is a guide to the proportion of debris coming from littering or other sources at or near the cleanup site. The Non Local Index is the remaining proportion coming from offshore sources including shipping, boating, oceanic and longshore coastal circulation processes. Keep these proportions in mind when interpreting the other statistics and also keep in mind the seasonal context of the cleanup.

### ***Cleanup Signature***

This statistic groups the item classes into very basic categories related to the items form and usage.

**Table 4 - Cleanup Signature Categories**

Form/Usage Category	Example or description
Consumer Articles	E.g. straws, toothbrushes, electronic goods, cigarette butts, clothing
Non Consumer Articles	Any item used in industrial, commercial, fishing or farming operations
Packaging	All packaging
Rope, Net & Line	All rope, net & fishing line over 1 metre (recorded in metres)
Materials Synthetic	All synthetic and or processed materials including processed timber & oil
Materials Organic	E.g. food scraps, animal waste
Remnants & Breakage	E.g. plastic pieces, broken glass, fibreglass pieces, boat parts & wreckage

### ***Type of Activity Generating Marine Debris***

This set of categories groups item classes under the type of human activity which is most likely to have generated the item as marine debris irrespective of where the debris originated.

**Table 5 - Type of Activity Categories**

Individual Activities	Items we use regularly for self care, recreation etc
Individual Consumption	All items and packaging associated with the consumption of food, drink and cigarettes
Household Activities	House ware, tableware, gardening and furniture items
Events, Festivals & Ceremonies	Fireworks, wreaths, plastic flowers
Municipal & Public Works	Tree guard, barrier fence, metal fencing, pine logs
Commercial, Building & Construction	Commercial, building & trade tools, equipment & materials
Fishing Recreational	All identifiable recreational fishing items including fishing line
Fishing Commercial	All identifiable commercial fishing items including commercial fishing line, rope and strapping band (1)
Aquaculture	Oyster spacers, pearl panels
Boating & Shipping	Boat parts, survival equipment, pallets. Items most likely to come from this source based on past evidence. (2)
Research Activities	Weather balloon materials, artificial habitat, research buoys
Plastic Remnant Accumulation	Plastic bits & pieces, plastic film remnants, burnt plastic (3)



(1) A small proportion of rope will come from shipping and recreational boating/fishing and likewise a small amount of strapping band will come from shipping and port areas. Make allowance for these depending on the context of the site.

(2) Some items from boating and shipping are very difficult to pinpoint. Based on 6 years of data it is possible to identify items that are very likely to come from shipping in sites in the vicinity of shipping lanes. Examples include fluorescent light tubes and globes, glass jars & sauce bottles, brooms and paintbrushes. Again - make allowance for these depending on the context of the site.

(3) Plastic remnant accumulation while not an activity is the visible plastic legacy of past activity.

Using the three sets of statistics above should give enough unambiguous information to make some broad assumptions about the debris at a given site or within an area or region.

### Table Highlighting

The following "highlighting rules" apply for the site cleanup statistics in the next section.

#### Example of Highlighting

Two Peoples Bay	110	0.32	0.68	83%	4%	0%	35%	23%	8%	0%	30%
Ellen Cove to Dog Beach	144	0.64	0.36	74%	33%	1%	51%	0%	0%	0%	15%
		A	B	C	D						

**Column A** - Red highlighting - the litter & local index for this site is above its coastal region average.

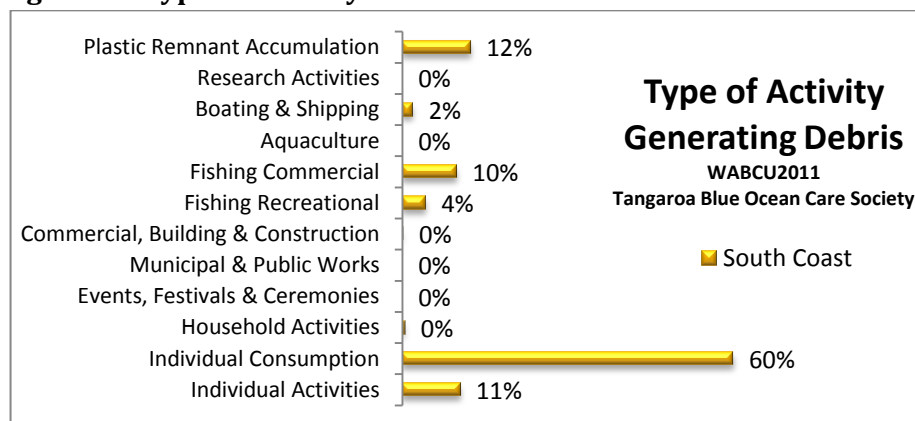
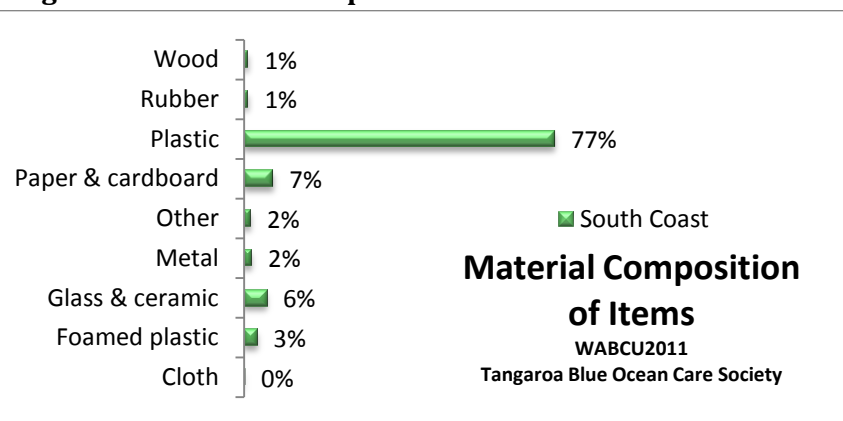
**Column B** - Blue highlighting - the non local index for this site is above its coastal region average.

**Column C** - Green highlighting - the percentage of plastic items for this site is above its coastal region average.

**D** - These columns have a graded colour scale which highlights values from yellow (low values) to dark orange (high values). This is simply an aid to quickly spot the higher values but it also shows which categories the higher values are typically found in for each coastal region. Looking at the colour pattern as a whole for each regions table gives a quick view of that regions overall marine debris situation.

*SITE CLEANUP STATISTICS - SOUTH COAST***Table 6 - South Coast Cleanup Statistics**

	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Cleanup Signature						
					Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
<b>South Coast</b>											
Two Peoples Bay	110	0.32	0.68	83%	4%	0%	35%	23%	8%	0%	30%
Ellen Cove to Dog Beach	144	0.64	0.36	74%	33%	1%	51%	0%	0%	0%	15%
Shoal Bay	383	0.58	0.42	95%	9%	0%	70%	2%	1%	0%	18%
Calimaris to Surf Club	145	0.85	0.15	57%	58%	0%	34%	1%	0%	0%	7%
Goode Beach & Mistaken Island	15	0.04	0.96	100%	7%	7%	80%	0%	0%	0%	7%
Goode Beach Albany	174	0.61	0.39	93%	5%	5%	66%	2%	0%	0%	24%
Frenchman's Bay Beach	49	0.55	0.45	80%	49%	0%	29%	0%	0%	0%	22%
Whalers Cove	75	0.93	0.07	20%	1%	1%	9%	13%	0%	0%	75%
Salmon Holes	167	0.31	0.69	88%	23%	2%	35%	1%	2%	0%	37%
<b>Total/Average</b>	<b>1262</b>	<b>0.54</b>	<b>0.46</b>	<b>77%</b>	<b>21%</b>	<b>2%</b>	<b>46%</b>	<b>5%</b>	<b>1%</b>	<b>0%</b>	<b>26%</b>

**Figure 4 - Type of Activity South Coast****Figure 5 - Material Composition South Coast**





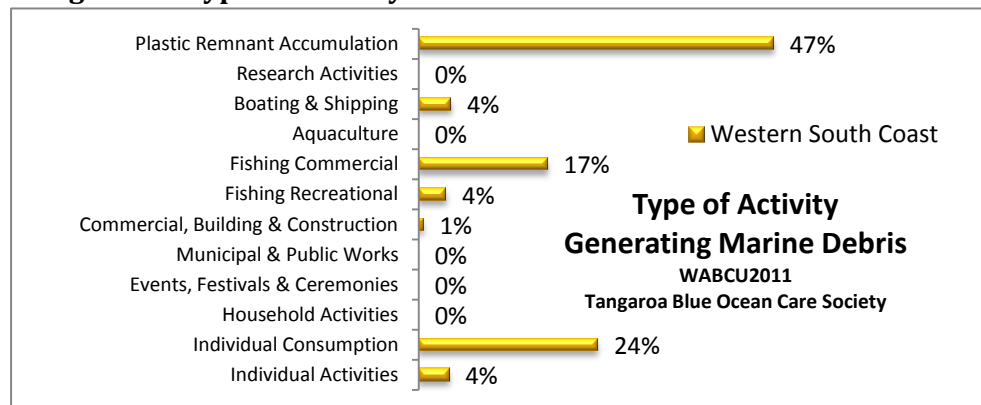
## SITE CLEANUP STATISTICS - WESTERN SOUTH COAST

**Table 7 – Western South Coast Cleanup Statistics**

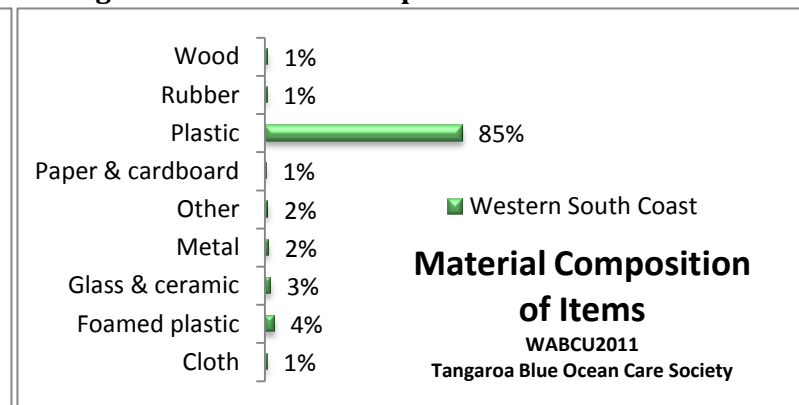
	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Cleanup Signature							
					Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage	
<b>Western South Coast</b>												
Ocean Beach Denmark	518	0.14	0.86	94%	7%	2%	13%	5%	0%	1%	72%	
Denmark Lights Beach and Back Beach	2033	0.02	0.98	92%	6%	3%	20%	1%	2%	2%	65%	
Parry Beach and Green Pool	784	0.04	0.96	94%	2%	1%	33%	2%	1%	0%	61%	
Nornalup Blue Holes Beach	649	0.05	0.95	89%	1%	1%	43%	0%	2%	0%	53%	
Peaceful Bay	120	0.48	0.52	70%	28%	1%	24%	4%	1%	0%	43%	
Mandalay Beach	50	0.05	0.95	94%	6%	8%	14%	0%	0%	0%	72%	
Coodamurru D'Entrecasteaux NP	767	0.04	0.96	87%	7%	3%	26%	8%	3%	0%	53%	
Yeagarup Beach	845	0.15	0.85	87%	7%	3%	29%	21%	1%	0%	39%	
Jays Beach	155	0.15	0.85	90%	6%	3%	26%	0%	3%	0%	63%	
Augusta Flinders Bay to Lookout	106	0.73	0.27	38%	22%	0%	32%	0%	1%	0%	45%	
Augusta Lookout to Lighthouse	123	0.42	0.58	72%	8%	2%	29%	16%	1%	0%	44%	
<b>Total/Average</b>	<b>6150</b>	<b>0.21</b>	<b>0.79</b>	<b>82%</b>	<b>9%</b>	<b>2%</b>	<b>26%</b>	<b>5%</b>	<b>1%</b>	<b>0%</b>	<b>55%</b>	



**Figure 6 - Type of Activity Western South Coast**



**Figure 7 - Material Composition Western South Coast**



*SITE CLEANUP STATISTICS - CAPES COAST*

**Table 8 – Capes Coast Cleanup Statistics**

	Cleanup Signature										
	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
<b>Capes Coast</b>											
Augusta Waterwheel	175	0.17	0.83	81%	11%	2%	31%	0%	1%	0%	55%
Quarry Bay	806	0.07	0.93	96%	5%	1%	17%	4%	0%	0%	72%
Hillview	212	0.01	0.99	98%	4%	3%	22%	0%	0%	0%	70%
Deepdene	2459	0.08	0.92	89%	5%	3%	20%	3%	0%	0%	69%
Foul Bay	974	0.02	0.98	97%	3%	1%	12%	0%	1%	0%	83%
Hamelin Bay to Bobs Track	2902	0.23	0.77	96%	4%	3%	19%	2%	0%	0%	72%
Conto Spring	614	0.34	0.66	65%	4%	4%	29%	0%	0%	0%	64%
Redgate Beach	1284	0.29	0.71	93%	6%	3%	25%	31%	1%	0%	35%
Gas Bay to Gnarabup	1014	0.22	0.78	91%	9%	2%	29%	0%	0%	0%	59%



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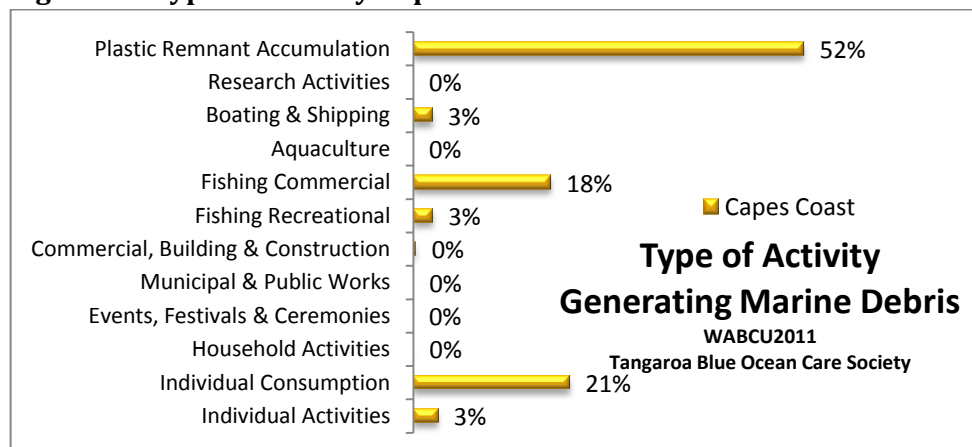
## Cleanup Signature

### Capes Coast Continued

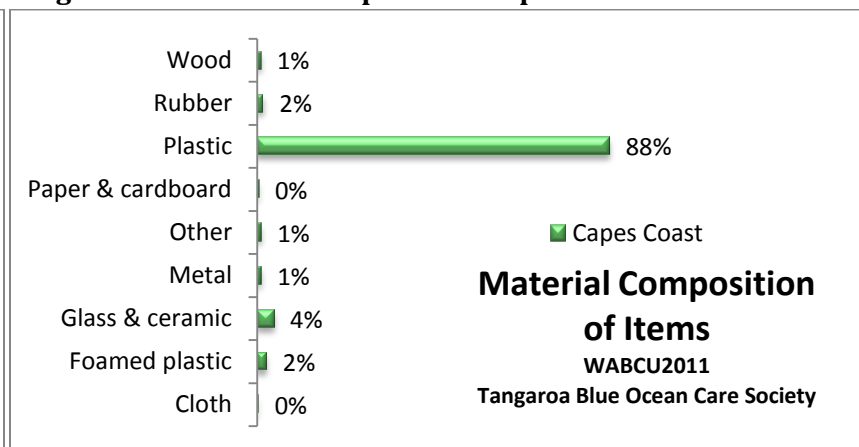
	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
Prevelly (15 October)*	500	0.41	0.59	63%	28%	1%	24%	7%	6%	0%	33%
Prevelly (8 October)*	67	0.41	0.59	53%	12%	1%	16%	0%	1%	0%	70%
Surfers Point to Rivermouth	127	0.29	0.71	92%	20%	0%	24%	0%	2%	0%	54%
Margaret Rivermouth to Joey's Nose	121	0.29	0.71	80%	24%	7%	21%	18%	0%	0%	30%
Joey's Nose to Gnoocardup	1060	0.05	0.95	93%	4%	4%	25%	27%	4%	0%	36%
Gnoocardup Beach (17 October)*	374	0.03	0.97	93%	5%	4%	32%	0%	0%	0%	59%
Gnoocardup Beach (9 October)*	391	0.08	0.92	96%	5%	1%	13%	0%	1%	0%	80%
Ellensbrook South	828	0.04	0.96	96%	4%	2%	20%	3%	0%	0%	70%
Ellensbrook	1526	0.05	0.95	97%	3%	1%	13%	0%	1%	0%	82%
Ellensbrook to Lefties	300	0.06	0.94	90%	10%	6%	28%	3%	0%	0%	53%
Cowaramup Bay	4993	0.35	0.65	81%	8%	2%	16%	8%	1%	0%	65%
Guillotines	101	0.04	0.96	92%	6%	4%	33%	0%	1%	0%	56%
Gallows	4021	0.04	0.96	96%	4%	2%	17%	3%	1%	1%	74%
Willyabrup	322	0.08	0.92	98%	2%	1%	12%	51%	0%	0%	33%
Moses Rock	438	0.09	0.91	90%	4%	4%	16%	1%	3%	0%	71%
Mitchell Rocks to Wyadup	209	0.12	0.88	93%	8%	1%	23%	0%	1%	0%	65%
Smiths Beach	219	0.31	0.69	82%	12%	1%	42%	2%	6%	0%	36%
Yallingup Beach	427	0.22	0.78	91%	12%	0%	24%	3%	0%	0%	61%
3 Bears	2253	0.08	0.92	95%	4%	1%	16%	0%	1%	1%	77%
Sugarloaf Rock	249	0.13	0.87	87%	15%	0%	28%	3%	0%	0%	53%
Windmills	492	0.06	0.94	92%	9%	5%	19%	2%	0%	0%	65%
<b>Total/Average</b>	<b>29458</b>	<b>0.16</b>	<b>0.84</b>	<b>88%</b>	<b>8%</b>	<b>2%</b>	<b>22%</b>	<b>6%</b>	<b>1%</b>	<b>0%</b>	<b>60%</b>



**Figure 8 - Type of Activity Capes Coast**



**Figure 9 - Material Composition Capes Coast**



### *SITE CLEANUP STATISTICS - GEOGRAPHE BAY*

**Table 9 - Geographe Bay Cleanup Statistics**

	Cleanup Signature										
	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
Geographe Bay											
Bunker Bay	257	0.3	0.7	86%	14%	1%	29%	8%	1%	0%	46%
Point Picquet to Gannet Rock	720	0.69	0.31	64%	12%	1%	33%	10%	1%	0%	44%
Meelup Beach	375	0.75	0.25	78%	52%	1%	38%	0%	0%	0%	9%
Castle Bay and Rock	259	0.67	0.33	73%	23%	2%	41%	0%	0%	0%	34%
Dunsborough - Old Dunsborough Boat Ramp	230	0.73	0.27	54%	20%	1%	63%	0%	0%	0%	17%

Cleanup Signature



## Geographe Bay Continued

	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
Geographe Bay											
Dunsborough Professional Boat Ramp	118	0.58	0.42	54%	16%	3%	42%	0%	14%	0%	25%
Busselton Jetty Foreshore	890	0.81	0.19	49%	29%	0%	40%	0%	13%	0%	17%
Busselton Jetty Underwater Cleanup	812	0.96	0.04	85%	4%	4%	5%	81%	0%	0%	7%
Capel Peppermint Grove Beach	530	0.6	0.4	57%	4%	4%	25%	8%	1%	0%	58%
Capel Peppermint Grove Beach North & River	1110	0.27	0.73	83%	14%	2%	24%	1%	1%	0%	59%
Bunbury Rocky Point	448	0.52	0.48	74%	21%	1%	40%	1%	1%	0%	35%
Bunbury Point McKenna	755	0.79	0.21	73%	8%	1%	32%	53%	0%	0%	7%
Bunbury Power Station Beach	224	0.54	0.46	75%	14%	3%	42%	10%	0%	0%	31%
<b>Total/Average</b>	<b>6728</b>	<b>0.63</b>	<b>0.37</b>	<b>70%</b>	<b>18%</b>	<b>2%</b>	<b>35%</b>	<b>13%</b>	<b>3%</b>	<b>0%</b>	<b>30%</b>

Figure 10 - Type of Activity Geographe Bay

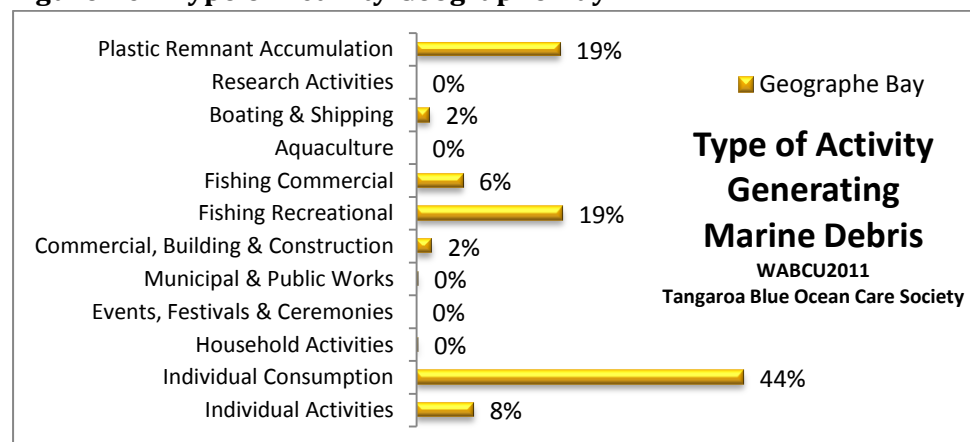
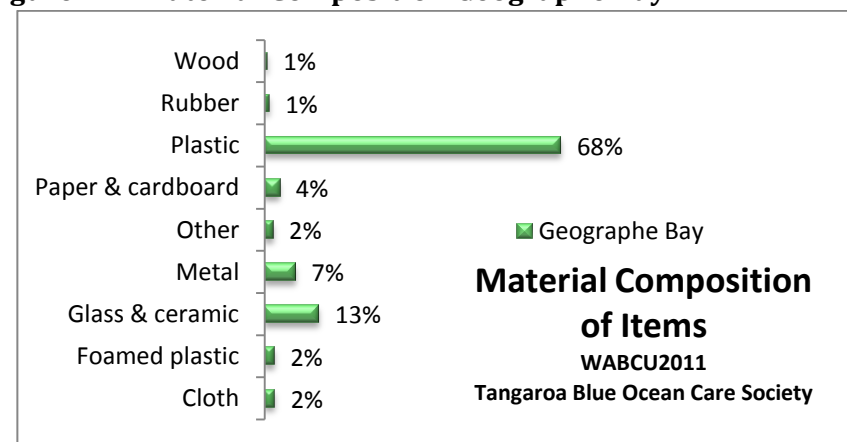


Figure 11 - Material Composition Geographe Bay







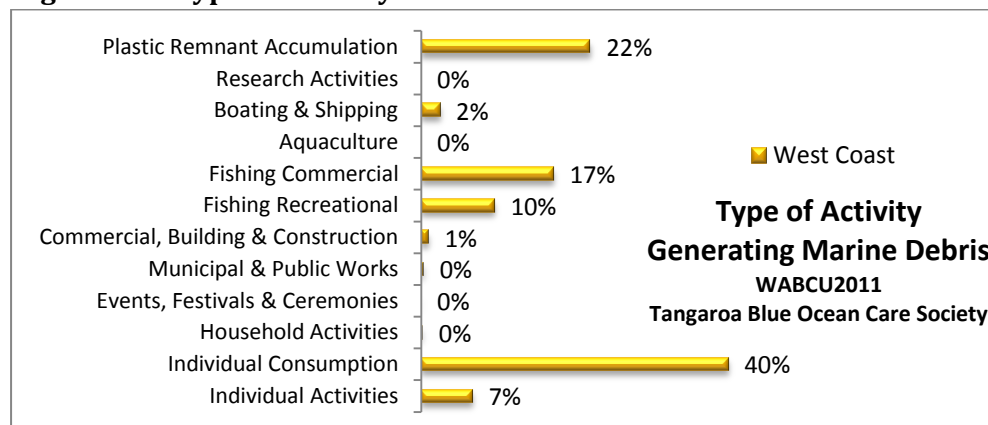
# SITE CLEANUP STATISTICS - WEST COAST

**Table 10 - West Coast Cleanup Statistics**

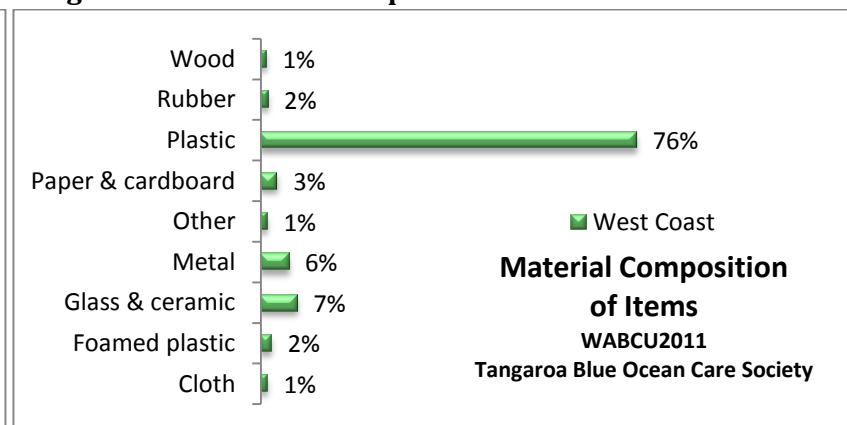
	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Cleanup Signature						
					Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
<b>West Coast</b>											
Buffalo Beach	3315	0.25	0.75	80%	7%	3%	28%	17%	2%	0%	44%
Binningup Beach	4507	0.32	0.68	85%	12%	3%	31%	9%	2%	0%	44%
Point Peron	187	0.72	0.28	37%	9%	0%	14%	0%	3%	0%	75%
Port Kennedy Bridport Point	303	0.72	0.28	78%	44%	4%	32%	3%	0%	0%	17%
Ammunition Jetty Coogee	1615	0.86	0.14	90%	13%	0%	18%	62%	0%	0%	7%
South Beach Fremantle	906	0.75	0.25	58%	61%	0%	27%	0%	0%	0%	12%
Bathers Beach	170	0.61	0.39	87%	46%	14%	18%	4%	1%	0%	18%
Port Beach to Cottesloe Beach	982	0.23	0.77	88%	18%	3%	25%	3%	0%	0%	51%
Leighton Beach	912	0.42	0.58	68%	21%	5%	35%	3%	0%	0%	35%
Perth Cottesloe to Swanbourne	1098	0.44	0.56	74%	28%	4%	37%	2%	0%	0%	29%
Bennion Street	215	0.33	0.67	95%	17%	1%	26%	0%	1%	0%	55%
Mettams Pool to Hammersley Pool	328	0.47	0.53	56%	28%	0%	43%	2%	1%	0%	26%
Sorrento Street	168	0.47	0.53	79%	32%	1%	32%	3%	1%	0%	31%
Marmion Angling and Aquatic Club	151	0.61	0.39	87%	21%	2%	18%	33%	1%	0%	26%
Hillarys	1128	0.37	0.63	94%	39%	2%	26%	9%	1%	0%	23%
Pinnaroo	30	0.42	0.58	87%	37%	7%	23%	3%	3%	0%	27%
Whitfords	24	0.35	0.65	75%	13%	0%	42%	0%	17%	0%	29%
Mullaloo	47	0.39	0.61	55%	17%	0%	38%	0%	4%	0%	40%
Beaumaris Beach	106	0.51	0.49	61%	43%	12%	36%	0%	3%	0%	6%
Burns beach	204	0.35	0.65	83%	7%	10%	19%	16%	7%	0%	41%
Yanchep	2105	0.48	0.52	61%	15%	2%	32%	1%	1%	0%	49%
Rottneest Island Pinky Beach	253	0.65	0.35	48%	15%	1%	75%	0%	0%	0%	9%
<b>Total/Average</b>	<b>18754</b>	<b>0.49</b>	<b>0.51</b>	<b>74%</b>	<b>25%</b>	<b>3%</b>	<b>31%</b>	<b>8%</b>	<b>2%</b>	<b>0%</b>	<b>31%</b>



**Figure 12 - Type of Activity West Coast**



**Figure 13 - Material Composition West Coast**



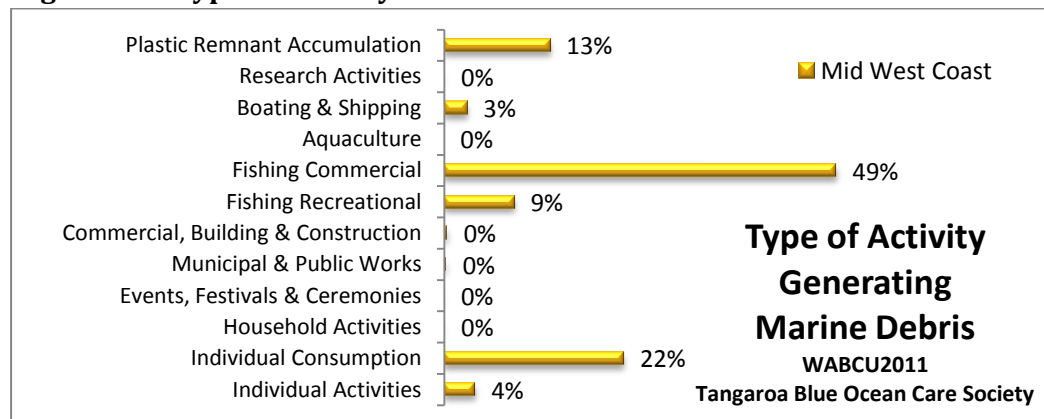
*SITE CLEANUP STATISTICS - MID WEST COAST*

**Table 11- Mid West Coast Cleanup Statistics**

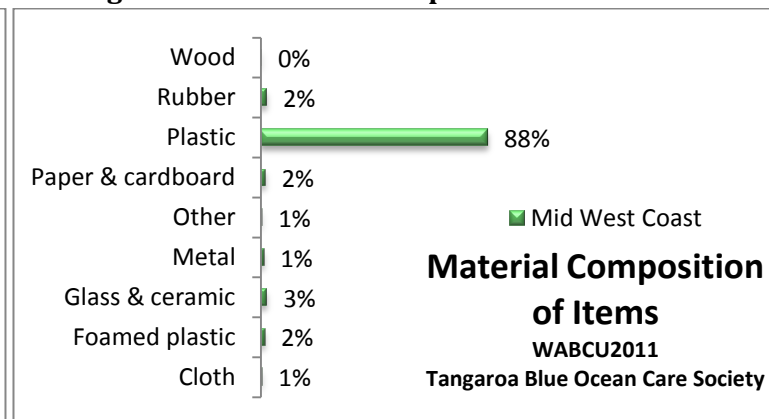
	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Cleanup Signature						
					Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
<b>Mid West Coast</b>											
Ledge Point Beach	297	0.25	0.75	85%	28%	2%	34%	16%	2%	0%	18%
Jurien Bay Marina	580	0.28	0.72	95%	1%	12%	37%	1%	0%	0%	50%
Greys Beach	297	0.46	0.54	98%	2%	1%	11%	43%	1%	0%	42%
Separation Point (6 November)*	131	0.27	0.73	91%	6%	2%	19%	7%	0%	0%	65%
Separation Point (13 November)*	103	0.1	0.9	90%	10%	1%	31%	15%	2%	0%	42%
Separation Point (16 October)*	693	0.12	0.88	85%	5%	1%	17%	0%	5%	5%	68%
Town Beach Geraldton	107	0.55	0.45	77%	37%	7%	50%	0%	0%	0%	7%
Glenfield Beach	187	0.24	0.76	77%	13%	2%	34%	4%	0%	0%	47%
<b>Total/Average</b>	<b>2395</b>	<b>0.28</b>	<b>0.72</b>	<b>87%</b>	<b>13%</b>	<b>3%</b>	<b>29%</b>	<b>11%</b>	<b>1%</b>	<b>1%</b>	<b>42%</b>



**Figure 14 - Type of Activity Mid West Coast**



**Figure 15 - Material Composition Mid West Coast**



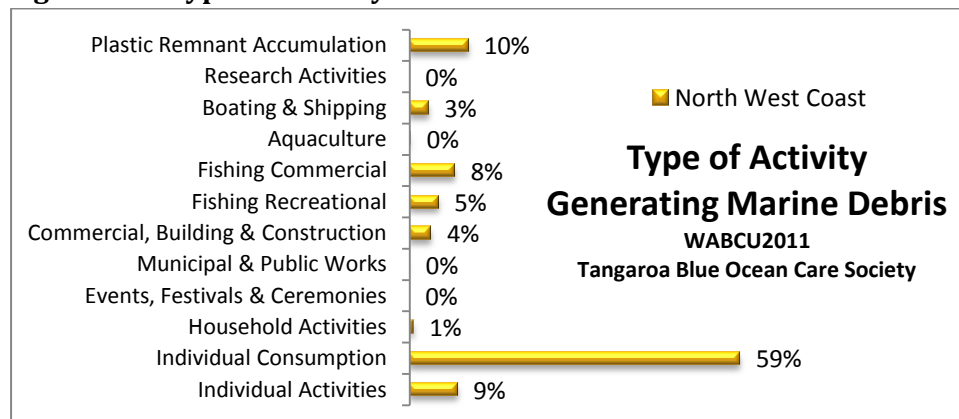
*SITE CLEANUP STATISTICS - NORTH WEST COAST*

**Table 12 - North West Coast Cleanup Statistics**

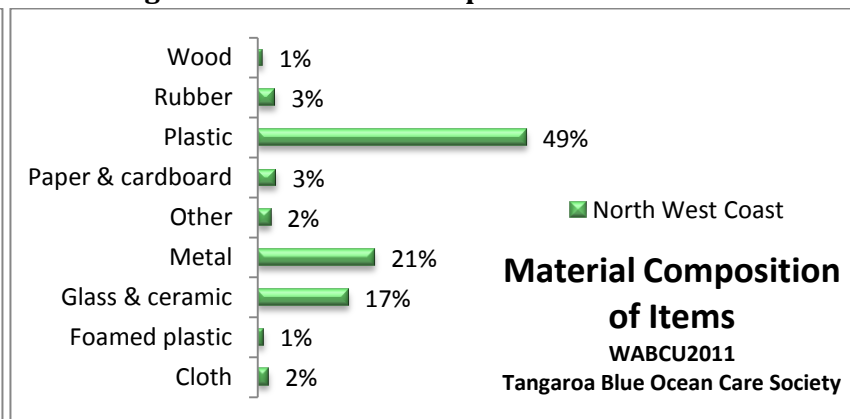
	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Cleanup Signature						
					Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
<b>North West Coast</b>											
Golf Beach Exmouth	821	0.76	0.24	27%	11%	16%	35%	0%	1%	0%	37%
Exmouth Marina	196	0.5	0.5	74%	17%	6%	27%	13%	2%	0%	36%
McLeod's Beach Exmouth	66	0.52	0.48	50%	20%	3%	35%	11%	0%	0%	32%
Kaiser Marina	231	0.7	0.3	42%	0%	7%	68%	12%	2%	0%	11%
Withnell Bay	423	0.8	0.2	40%	20%	5%	48%	21%	0%	0%	7%
Nickol Bay	443	0.62	0.38	43%	15%	1%	78%	2%	0%	0%	3%
Karratha Back Beach	882	0.76	0.24	68%	55%	3%	32%	1%	0%	0%	9%
Dampier Archipelago Islands	250	0.34	0.66	59%	10%	4%	22%	41%	4%	0%	20%
Malus Island	636	0.49	0.51	59%	17%	0%	33%	2%	1%	0%	47%
<b>Total/Average</b>	<b>3948</b>	<b>0.61</b>	<b>0.39</b>	<b>51%</b>	<b>18%</b>	<b>5%</b>	<b>42%</b>	<b>11%</b>	<b>1%</b>	<b>0%</b>	<b>22%</b>



**Figure 16 - Type of Activity North West Coast**



**Figure 17 - Material Composition North West Coast**



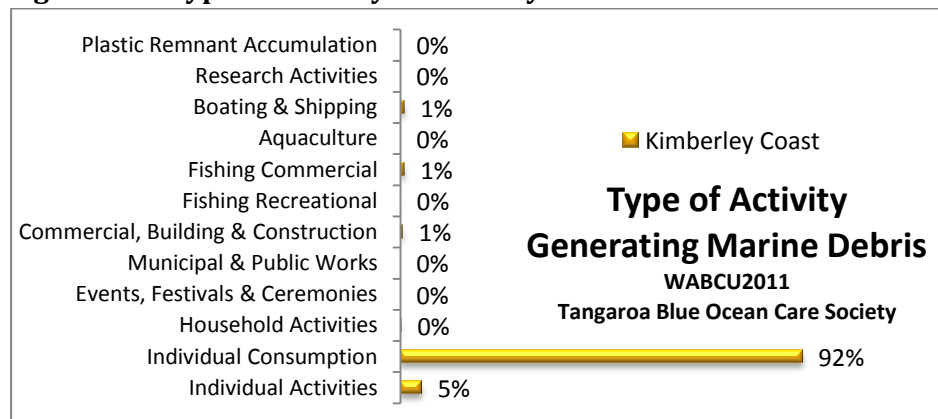
*SITE CLEANUP STATISTICS - KIMBERLEY COAST*

**Table 13 - Kimberley Coast Cleanup Statistics**

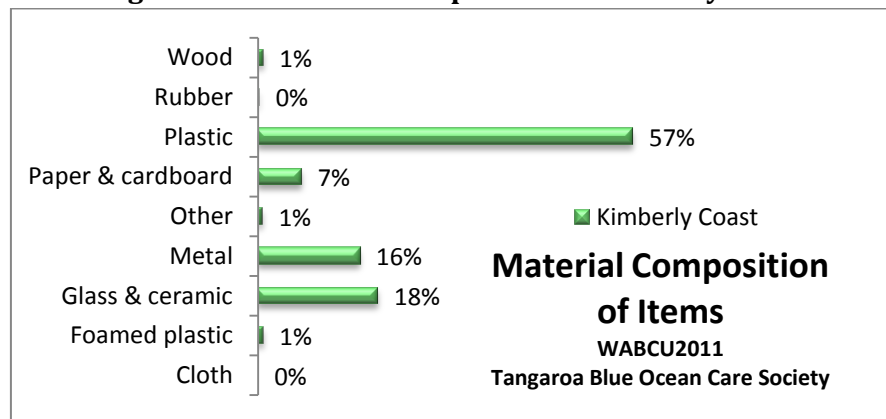
Kimberley /Coast	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Cleanup Signature						
					Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
Broome Town Beach	642	0.88	0.12	48%	35%	0%	44%	0%	0%	0%	21%
Broome Cable Beach	234	0.9	0.1	85%	79%	1%	17%	0%	3%	0%	0%
<b>Total/Average</b>	<b>876</b>	<b>0.89</b>	<b>0.11</b>	<b>0.66</b>	<b>57%</b>	<b>1%</b>	<b>30%</b>	<b>0%</b>	<b>1%</b>	<b>0%</b>	<b>11%</b>



**Figure 18 - Type of Activity Kimberley Coast**



**Figure 19 - Material Composition Kimberley Coast**

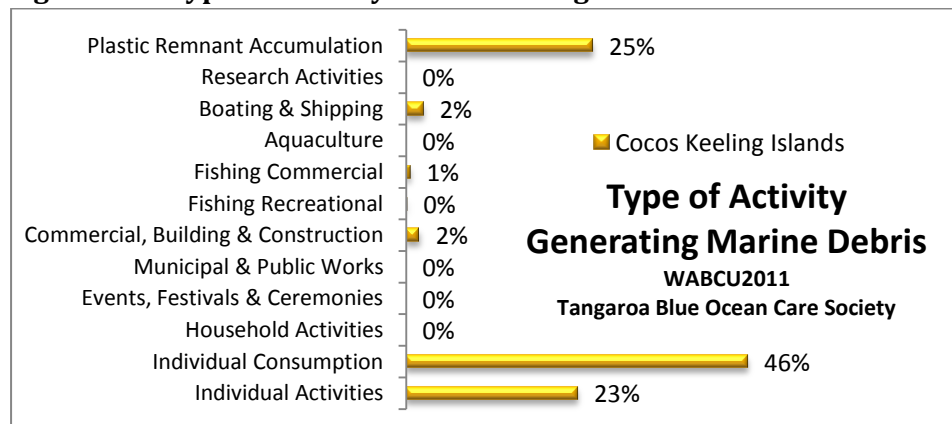
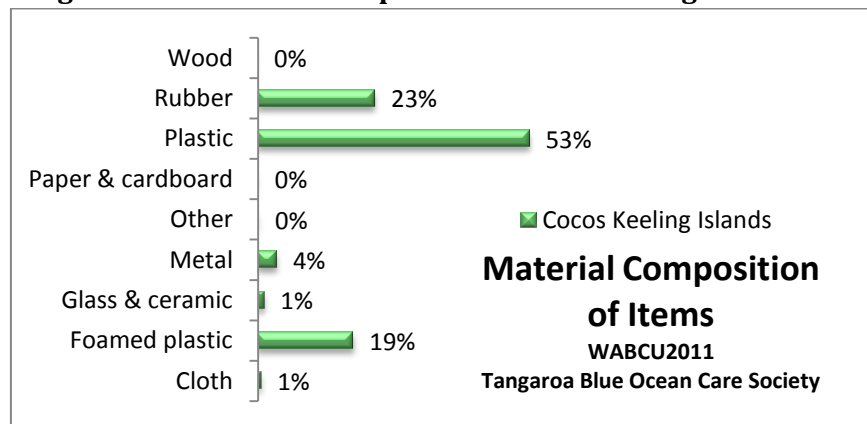
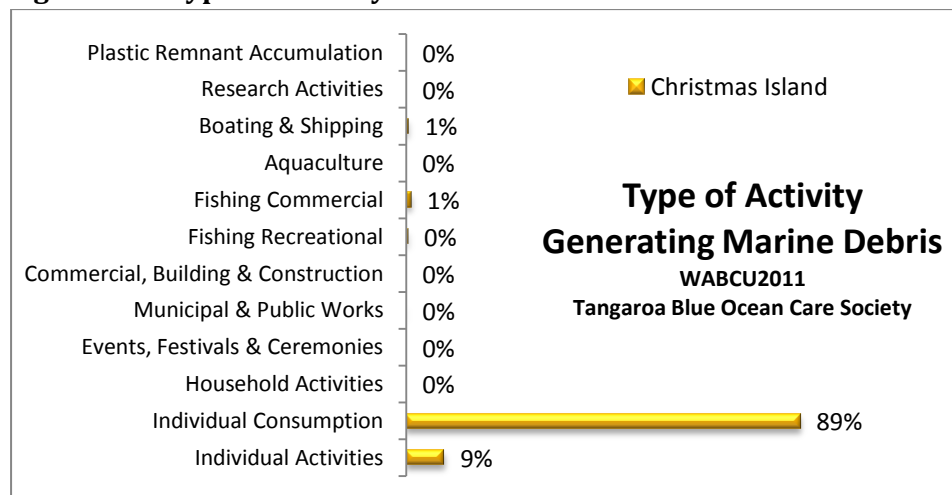
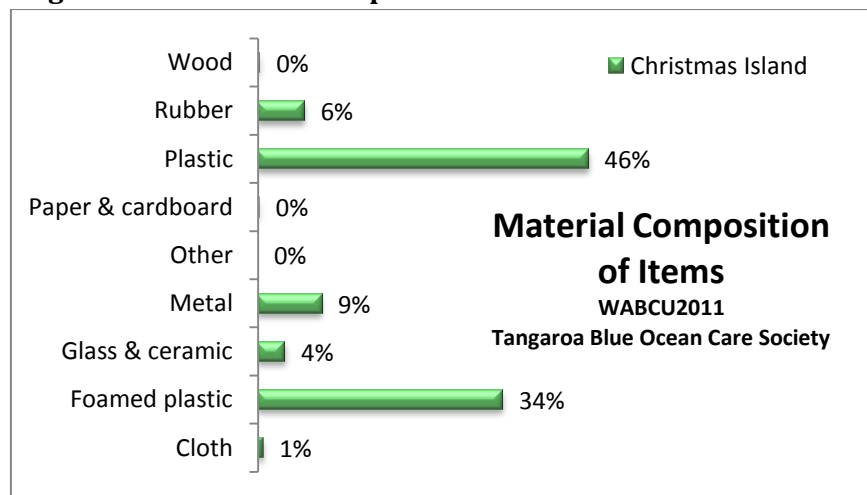


## SITE CLEANUP STATISTICS – INDIAN OCEAN ISLANDS

**Table 14 - Indian Ocean Islands Cleanup Statistics**

	Total Items	Litter & Local Index	Non Local Index	Total Plastic %	Cleanup Signature						
					Consumer Articles	Non Consumer Articles	Packaging	Rope, Net & Line	Materials Synthetic	Material Organic	Remnants & Breakage
Indian Ocean Islands											
Twiss Memorial Cocos Keeling Islands	3703	0.13	0.87	70%	26%	0%	45%	0%	0%	0%	28%
Cocos Home Island Turtle Nest Beach	929	0.24	0.76	78%	30%	1%	48%	1%	0%	0%	20%
Christmas Island Flying Fish Cove	916	0.2	0.8	86%	6%	0%	93%	0%	0%	0%	0%
Christmas Island Ethel Beach	242	0.21	0.79	73%	39%	2%	56%	3%	0%	0%	0%
Christmas Island Lily Beach	470	0.8	0.2	71%	60%	0%	40%	0%	0%	0%	0%
<b>Total/Average</b>	<b>6260</b>	<b>0.32</b>	<b>0.68</b>	<b>0.75</b>	<b>32%</b>	<b>1%</b>	<b>56%</b>	<b>1%</b>	<b>0%</b>	<b>0%</b>	<b>10%</b>



**Figure 20 - Type of Activity Cocos Keeling Islands**

**Figure 21 - Material Composition Cocos Keeling Islands**

**Figure 22 - Type of Activity Christmas Island**

**Figure 23 - Material Composition of Items Christmas Island**


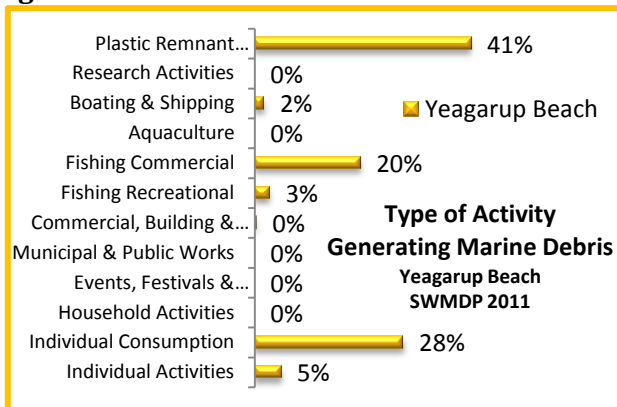
\* Several cleanups at this site involving either different sections of the beach or different cleanup groups.

## 4. SOUTH WEST MARINE DEBRIS PROJECT

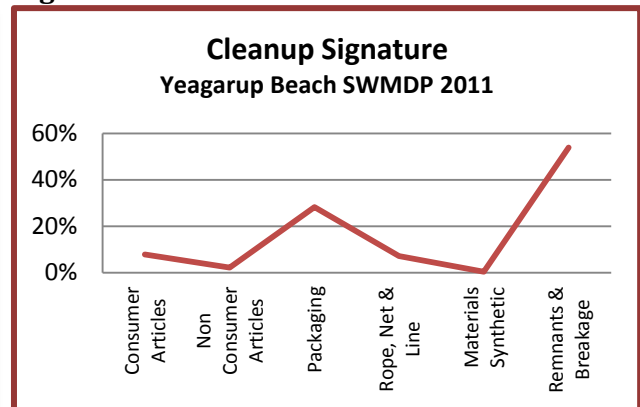
Data collected regularly throughout the year by D'Entrecasteaux Coast Care Group, Project Shorelines Bunbury and Tangaroa Blue Ocean Care Society for the South West Marine Debris Project has allowed for continued and extended monitoring of the south west coast.

A full years monitoring at Yeagarup Beach on the western south coast has provided the first comprehensive view of marine debris processes on a remote south coast beach. Figures show 82% of the debris coming from non local sources and 84% of the items being made of plastic.

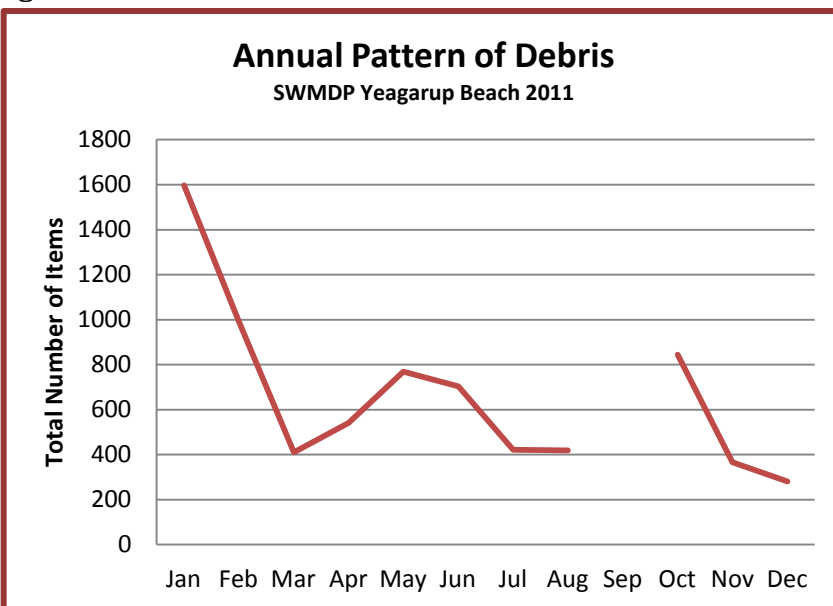
**Figure 24**



**Figure 25**



**Figure 26**



The annual pattern for Yeagarup differs from that of the Capes and west coasts, where there is a distinct onshore - offshore season. On the south coast onshore winds can be experienced year round and this coupled with swell activity suggests a less organised pattern for debris coming ashore. The dynamic environment may also bury and flush out debris more frequently. Heavy swells in September prevented access to the beach.

Monthly monitoring at Dalyellup utilised the existing Project Shorelines system where beach users picked up rubbish and placed it in bags at designated spots along the beach. This beach produces large amounts of debris in the winter months and tails off to small amounts in summer.

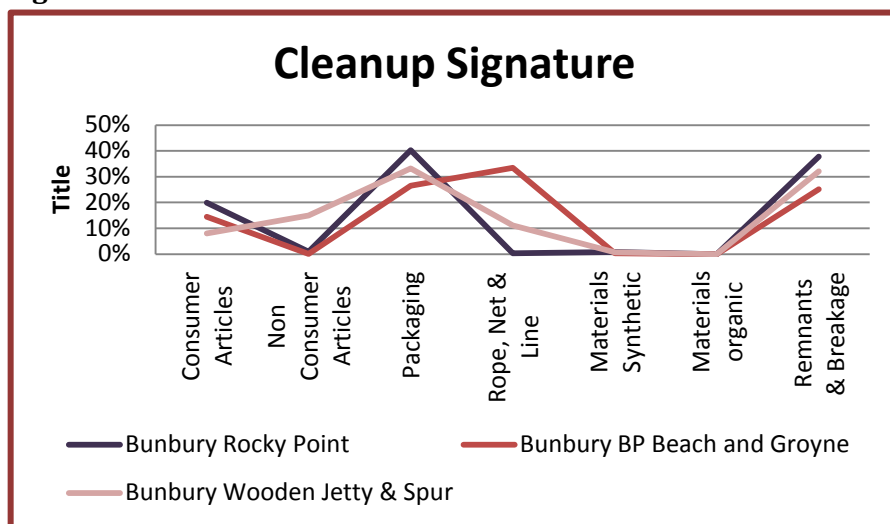
The monthly monitoring programme was supplemented with additional cleanups. In Bunbury, Project Shorelines targeted popular fishing spots and these are examined below.

## 5. RECREATIONAL FISHING LITTER

### RECREATIONAL FISHING LITTER

Three Bunbury fishing sites are examined below. Rocky Point and BP Groyne are on the ocean side of Bunbury while the Wooden Jetty is within Koombana Bay. Litter at BP Groyne comes close to being 100% due to recreational fishing while the other 2 sites receive some input from other sources in addition to a large input from recreational fishing.

**Figure 27**



In Figure 27 the top 3 "consumer items" were newspaper, cigarette butts and plastic straws & utensils.

Table 15 below shows the top 5 "packaging" items.

"Rope, net and line" was almost all fishing line while the main component of remnants and breakage was plastic film remnants and broken glass.

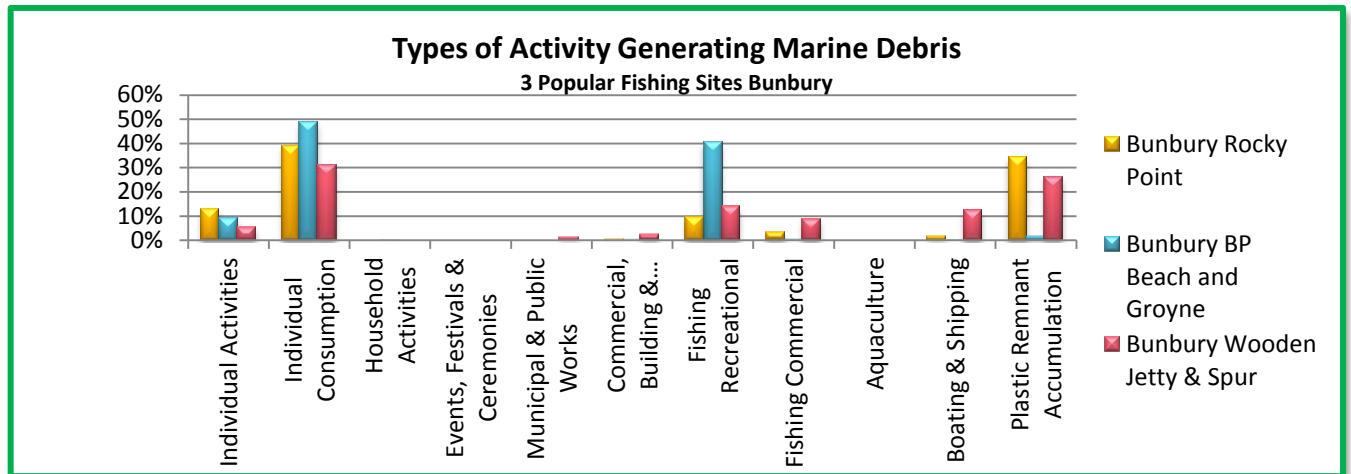
**Table 15 - Packaging Items at 3 Bunbury Fishing Spots**

Bunbury Rocky Point	Total	Bunbury BP Beach and Groyne	Total	Bunbury Wooden Jetty & Spur	Total
Plastic packaging food (wrap, packets, containers)	117	Plastic bags supermarket, garbage, dog poo, ice	137	Plastic bags supermarket, garbage, dog poo, ice	141
Bait & tackle bags & packaging	92	Bait & tackle bags & packaging	117	Plastic packaging food (wrap, packets, containers)	139
Lids & tops, pump spray, flow restrictor & similar	64	Aluminium cans	109	Foam insulation & packaging (whole and remnants)	97
Glass beer stubbies & alco-pop bottles	27	Lids & tops, pump spray, flow restrictor & similar	71	Strapping band scraps	97
Plastic bags supermarket, garbage, dog poo, ice	26	Glass beer stubbies & alco-pop bottles	52	Bait & tackle bags & packaging	90
Plastic drink bottles (water, juice, milk, soft drink)	22	Plastic packaging food (wrap, packets, containers)	48	Aluminium cans	65
Aluminium cans	21	Plastic drink bottles (water, juice, milk, soft drink)	30	Lids & tops, pump spray, flow restrictor & similar	63
Tetra packs & drink cartons	10	Paper & cardboard packaging	11	Plastic drink bottles (water, juice, milk, soft drink)	49
Foam insulation & packaging (whole and remnants)	7	Tetra packs & drink cartons	11	Strapping band whole (record as single item)	22.3
Plastic wrap non food (bubble wrap etc)	6	Foam insulation & packaging (whole and remnants)	2	Glass beer stubbies & alco-pop bottles	22

In Table 15 above the blue shaded headings are the fishing spots on the ocean side while the brown shaded Wooden Jetty & Spur is within Koombana Bay. The pink shaded items in the table are items made up entirely or mostly of plastic film. Plastic supermarket bags are often used to carry bait and given the figures in the above table it is clear that bait packaging is a major component of the plastic film litter at these sites.

Consumption of food and drink at these sites generates more general packaging litter overall as shown in table 28 below.

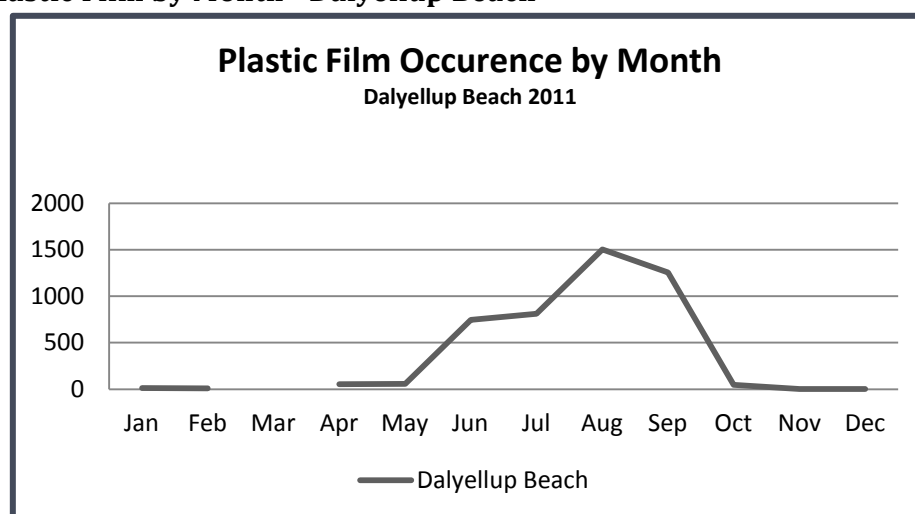
**Figure 28**



Plastic film - plastic bags, wrap and film remnants - is the most numerous material form of packaging litter generated at these fishing sites. When plastic film enters the water it may drift for a short while but will tend to sink. These items then become caught up in seaweed, seagrass or partially trapped on the sea floor. When a strong winter system comes along the plastic film is once again mobilised and comes ashore both in the vicinity of where it was released, or it can be transported in clumps of displaced weed and debris rafts and moved southward.

This seasonal remobilisation of plastic film accounts for the the pattern of plastic film occurrence at Dalyellup, just south of Bunbury. Figure 29 below, shows the film coming ashore very early in the winter. 10% of the plastic film total at Dalyellup is made up of bait and tackle bags while the proportion of the plastic film total to the total amount of debris is 25%.

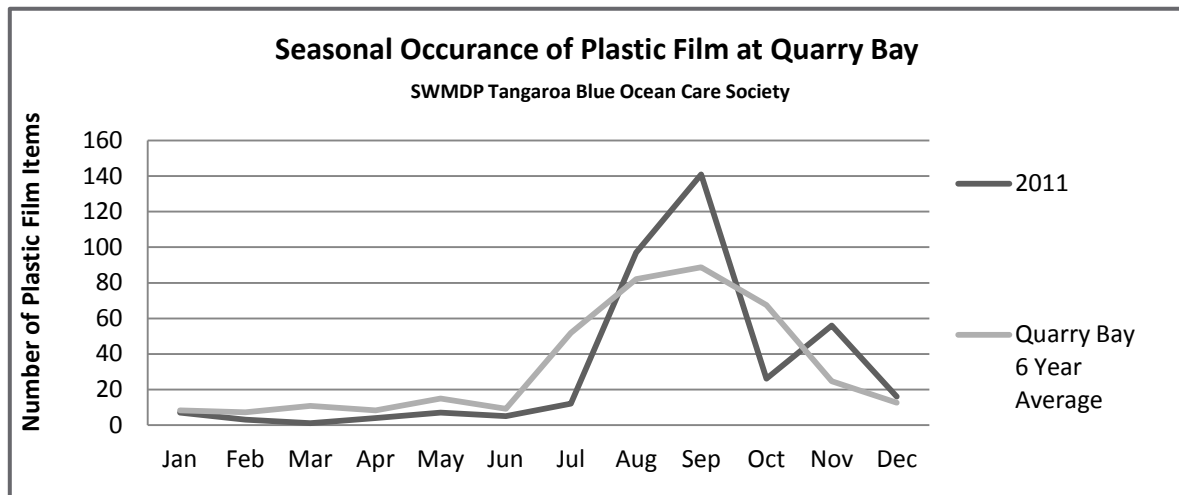
**Figure 29 - Plastic Film by Month - Dalyellup Beach**



The process suggested here is that plastic film items accumulate on the sea floor in the vicinity of fishing spots during summer and remobilise in winter storms. They then come ashore locally and can also be transported downstream along the coast.

If we widen our focus out to consider this process operating at all similar popular fishing sites along the west coast we can reasonably assume a large amount of plastic film being generated, accumulating in the coastal system and dispersing down the coast over time. This film coming from recreational fishing activities together with more general coastal litter sources. The whole process leads to an annual influx of plastic film - especially remnants - onto remote beaches. Figure 30 shows how plastic film spikes in the data from Quarry Bay near Augusta.

**Figure 30**



*Plastic Film Collected from Dalyellup Beach June 2011 (Project Shorelines/SWMDP)*





## 6. VOLUNTEERS AND SUPPORTERS

We would like to make a special thanks to the following people for their ongoing support to Tangaroa Blue's West Australian Marine Debris Project. With their dedication, hundreds of thousands of pieces of debris have been removed from West Australian beaches, helping to protect our precious marine life.

You are making a difference!!

**Renee Mouritz, Liz McGuire, Ron Melville, Alison Dorn, Anita Kelly, Lizzy Pepper, Wendy Eiby, Dave O'Meara, Dave & Marg Leggot, Caroline McCartney**

**To all the individual volunteers, we appreciate your time and efforts in helping us clean up our coastline during the West Australian Beach Clean  
Up we hope to have you back again in 2012!!**

And thank you to the following organisations and agencies and everyone else involved that supported this project through participation, funding, insurance, materials, time, effort and lots of encouragement.  
We look forward to working with you again in 2012!

ACTIV Foundation Albany	Gracetown Progress Association (Inc)
ALCOA	Jurien Bay Coast Care Group
Australian Federal Police	Keep Australia Beautiful Council WA
Baldivis Primary School	Ledge Point Coast Care
Binningup Coast Care	Mitsubishi 4WD Club Perth
Broome Bushrangers	Margaret River Coastal Residents Association
Busselton SLSC	Margaret River Rotary
Cape Conservation Group Exmouth	Perth Region NRM
Cape to Cape Catchments Group	Prevelly Penguins
Cape to Cape Catchments Group Volunteer	Project Shorelines
Caring For Our Country	Quobba Station
CARE (Karratha)	Rottneest Island Authority
Central Institute of Technology	Scuba2
Christian Fellowship Exmouth	Shire of Augusta - Margaret River
Christmas Island District High School	Shire of Busselton
City of Bunbury	Shire of Capel
City of Fremantle	Shire of Gingin
City of Mandurah	Shire of Harvey
Coastwest	Smiths Beach SLSC
Cocos Shire Council	South West Catchments Council
Cocos Youth Council	Surfrider Foundation Margaret River
Conservation Volunteers Australia	Take 3 - Clean Beaches Initiative
CSIRO	The Dive Shed Busselton
Curtin University	Tidy Towns Initiative Walpole



Department of Environment & Conservation  
Decmil Australia  
Denmark Environment Centre  
D'Entrecasteaux Coast Care Group  
Department of Fisheries  
Dunsborough Coast & Land Care (Inc)  
Edith Cowan University Bunbury Campus  
Friends of Marmion Marine Park

Two Hands Project  
Underwater Explorers Club - Perth  
WA Museum Albany  
WA Museum Albany - Young Naturalists Club  
West Australian Underwater Photographic Society  
Wilderness Society

*A DATE FOR YOUR DIARIES!!!*

*2012 WA BEACH CLEAN UP*

*HELP US CLEAN UP ALONG*

*WA'S COASTLINE*

*13<sup>th</sup> & 14<sup>th</sup> OCTOBER 2012*

*To register visit*

[www.oceancare.org.au](http://www.oceancare.org.au)

# ATTACHMENTS

## ATTACHMENT 1 – CLEANUP SITE LOCATION DETAILS

Site	Centre	Latitude	Longitude	NRM
<b>South Coast</b>				
Two Peoples Bay	Albany	34°57'59.95"S	118°10'18.79"E	
Shoal Bay	Albany	35° 4'13.06"S	117°55'41.83"E	
Ellen Cove to Dog Beach	Albany	35° 0'57.37"S	117°55'14.30"E	
Calimaris to Surf Club	Albany	35° 1'19.26"S	117°54'59.41"E	
Goode Beach & Mistaken Island	Albany	35° 3'46.53"S	117°56'20.08"E	
Goode Beach Albany	Albany	35° 4'50.92"S	117°56'10.21"E	
Frenchman's Bay Beach	Albany	35° 5'33.42"S	117°56'51.85"E	
Whalers Cove	Albany	35° 5'41.43"S	117°57'24.98"E	
Salmon Holes	Albany	35° 6'10.62"S	117°58'5.14"E	
<b>Western South Coast</b>				
Ocean Beach Denmark	Denmark	35° 1'40.99"S	117°19'50.62"E	
Denmark Lights Beach and Back Beach	Denmark	35° 1'45.00"S	117°17'39.17"E	
Parry Beach and Green Pool	Denmark	35° 1'3.37"S	117°12'41.25"E	
Nornalup Blue Holes Beach	Walpole	35° 0'58.58"S	116°46'52.07"E	
Peaceful Bay	Denmark	35° 2'31.22"S	116°55'45.59"E	
Mandalay Beach	Walpole	35° 0'20.36"S	116°32'10.04"E	
Coodamurup D'Entrecasteaux NP	D'Entrecasteaux NP	34°52'8.75"S	116°13'42.30"E	
Yeagarup Beach	D'Entrecasteaux NP	34°37'46.98"S	115°51'2.92"E	
Jays Beach	Augusta	34°19'28.24"S	115°10'38.21"E	
Augusta Flinders Bay to Lookout	Augusta	34°21'25.52"S	115°10'1.06"E	
Augusta Lookout to Lighthouse	Augusta	34°22'3.98"S	115° 8'53.74"E	
<b>Capes Coast</b>				
Augusta Waterwheel	Augusta	34°22'7.73"S	115° 8'5.50"E	
Quarry Bay	Augusta	34°21'53.42"S	115° 8'14.63"E	
Hillview	Augusta	34°19'11.61"S	115° 5'28.12"E	
Deepdene Beach	Augusta	34°17'2.14"S	115° 3'30.40"E	
Foul Bay	Hamelin Bay	34°14'57.01"S	115° 1'47.12"E	
Hamelin Bay to Bobs Track	Hamelin Bay	34°12'40.01"S	115° 2'15.85"E	
Conto Spring	Margaret River	34° 4'37.27"S	115° 0'7.50"E	
Redgate Beach	Margaret River	34° 2'34.40"S	115° 0'4.58"E	
Gas Bay to Gnarabup	Margaret River	33°59'50.31"S	114°59'33.33"E	
Prevelly	Margaret River	33°59'17.05"S	114°59'27.76"E	
Prevelly	Margaret River	33°59'17.05"S	114°59'27.76"E	
Surfers Point to Rivermouth	Margaret River	33°58'25.20"S	114°59'11.01"E	
Margaret Rivermouth to Joey's Nose	Margaret River	33°57'33.01"S	114°59'8.64"E	
Joey's Nose to Gnoocardup	Margaret River	33°55'46.96"S	114°59'29.58"E	
Gnoocardup Beach	Margaret River	33°55'46.96"S	114°59'29.58"E	
Gnoocardup Beach	Margaret River	33°55'46.96"S	114°59'29.58"E	
Ellensbrook South	Ellensbrook	33°54'42.62"S	114°59'11.17"E	
Ellensbrook	Ellensbrook	33°54'26.49"S	114°59'17.88"E	
Ellensbrook to Lefties	Ellensbrook	33°53'21.72"S	114°59'4.52"E	



Cowaramup Bay	Gracetown	33°51'45.74"S	114°59'17.42"E	
Guillotines	Gracetown	33°49'38.49"S	114°59'43.55"E	
Gallows	Gracetown	33°49'11.78"S	114°59'52.72"E	
Willyabrup	Willyabrup	33°47'28.28"S	114°59'59.34"E	
Moses Rock	Quinninup	33°45'36.61"S	114°59'23.14"E	
Mufflers	Injidup	33°42'40.17"S	114°58'50.97"E	
Mitchell Rocks to Wyadup	Injidup	33°40'56.58"S	114°59'33.70"E	
Smiths Beach	Yallingup	33°39'29.95"S	33°39'29.95"S	
Yallingup Beach	Yallingup	33°38'11.86"S	115° 1'39.18"E	
3 Bears	Dunsborough	33°34'55.26"S	115° 0'49.89"E	
Sugarloaf Rock	Dunsborough	33°33'37.99"S	115° 0'21.91"E	
Windmills	Dunsborough	33°32'29.43"S	115° 0'30.55"E	
<b>Geographe Bay</b>				
Bunker Bay	Dunsborough	33°32'41.11"S	115° 2'18.05"E	
Point Picquet to Gannet Rock	Dunsborough	33°34'5.02"S	115° 5'7.17"E	
Meelup Beach	Dunsborough	33°34'25.30"S	115° 5'15.19"E	
Castle Bay and Rock	Dunsborough	33°34'54.32"S	115° 5'46.54"E	
Dunsborough - Old Dunsborough Boat Ramp	Dunsborough	33°35'54.03"S	115° 6'14.43"E	
Dunsborough Professional Boat Ramp	Dunsborough	33°37'52.71"S	115° 8'53.54"E	
Busselton Jetty Foreshore	Busselton	33°38'40.32"S	115°20'37.28"E	
Busselton Jetty Underwater Cleanup	Busselton	33°37'59.57"S	115°20'19.88"E	
Capel Peppermint Grove Beach	Capel	33°31'20.71"S	115°30'31.02"E	
Capel Peppermint Grove Beach North & River	Capel	33°30'47.86"S	115°31'1.69"E	
Bunbury Rocky Point	Bunbury	33°19'23.72"S	115°37'48.53"E	
Bunbury Point McKenna	Bunbury	33°18'12.64"S	115°38'44.36"E	
Bunbury Power Station Beach	Bunbury	33°19'2.52"S	115°39'35.12"E	
<b>West Coast</b>				
Buffalo Beach	Australind	33° 12.150'S	115° 40.988'E	
Binningup Beach	Binningup	33° 8'58.24"S	115°41'7.88"E	
Mandurah Pyramids Beach	Mandurah	32°36'13.83"S	115°37'45.18"E	
Point Peron	Kwinana	32°16'21.01"S	115°41'35.74"E	
Port Kennedy Bridport Point	Port Kennedy	32°22'9.82"S	115°43'6.28"E	
Challenger Beach Kwinana	Kwinana	32°11'29.16"S	115°46'30.21"E	
Ammunition Jetty Coogee	Coogee	32° 7'26.33"S	115°45'30.42"E	
South Beach Fremantle	Fremantle	32° 4'42.52"S	115°45'2.71"E	
Bathers Beach	Fremantle	32° 3'24.99"S	115°44'28.00"E	
Port Beach to Cottesloe Beach	Fremantle	32° 1'15.40"S	115°45'3.90"E	
Leighton Beach	Fremantle	32° 1'15.40"S	115°45'3.90"E	
Perth Cottesloe to Swanbourne	Perth Western Suburbs	31°59'8.25"S	115°45'8.71"E	
Bennion Street	Perth Northern Suburbs	31°52'19.37"S	115°45'8.51"E	
Mettams Pool to Hammersley Pool	Perth Northern Suburbs	31°51'57.90"S	115°45'7.48"E	
Sorrento Street	Perth Northern Suburbs	31°51'36.49"S	115°45'7.67"E	
Marmion Angling and Aquatic Club (MAAC)	Perth Northern Suburbs	31°50'16.32"S	115°44'58.06"E	



Hillarys	Perth Northern Suburbs	31°49'6.23"S	115°44'10.16"E	
Pinnaroo	Perth Northern Suburbs	31°48'22.55"S	115°43'40.14"E	
Whitfords	Perth Northern Suburbs	31°47'57.47"S	115°43'51.86"E	
Mullaloo	Perth Northern Suburbs	31°46'32.01"S	115°43'56.28"E	
Beaumaris Beach	Perth Northern Suburbs	31°45'10.44"S	115°43'33.89"E	
Burns Beach	Perth Northern Suburbs	31°43'50.42"S	115°43'7.32"E	
Yanchep	Yanchep	31°32'53.87"S	115°37'22.71"E	
Rottneest Island Pinky Beach	Rottneest Island	31°59'20.96"S	115°32'22.02"E	
<b>Mid West Coast</b>				
Ledge Point Beach	Ledge Point	31° 6'39.35"S	115°22'13.68"E	
Jurien Bay Marina	Jurien Bay	30°17'19.73"S	115° 2'28.51"E	
Separation Point	Geraldton	28°47'28.38"S	114°35'50.61"E	
Separation Point	Geraldton	28°47'28.38"S	114°35'50.61"E	
Greys Beach	Geraldton	28°47'2.99"S	114°35'24.87"E	
Separation Point	Geraldton	28°47'28.38"S	114°35'50.61"E	
Town Beach Geraldton	Geraldton	28°46'18.08"S	114°36'23.03"E	
Glenfield Beach	Geraldton	28°40'57.30"S	114°36'24.69"E	
<b>Gascoyne Coast</b>				
Quobba Station	Carnarvon	24°23'44.42"S	113°24'12.38"E	
<b>North West Coast</b>				
Golf Beach Exmouth	Exmouth	21°55'56.85"S	114° 8'20.65"E	
Exmouth Marina	Exmouth	21°57'23.55"S	114° 8'24.29"E	
McLeod's Beach Exmouth	Exmouth	21°58'1.72"S	114° 8'4.42"E	
Kaiser Marina	Dampier	20°40'23.50"S	116°41'44.01"E	
Withnell Bay	Dampier	20°34'58.11"S	116°47'25.61"E	
Nickol Bay	Dampier	20°39'15.04"S	116°47'54.41"E	
Karratha Back Beach	Dampier	20°43'17.28"S	116°51'56.30"E	
Dampier Archipelago Islands	Dampier	20°33'30.71"S	116°36'41.12"E	
Malus Island	Dampier	20°31'9.25"S	116°39'37.07"E	
<b>Kimberley Coast</b>				
Broome Town Beach	Broome	17°58'15.62"S	122°14'10.97"E	
Broome Cable Beach	Broome	17°55'46.82"S	122°12'35.27"E	
<b>Cocos Keeling Islands</b>				
Twiss Memorial Cocos Keeling Islands	Cocos Keeling Islands	12°12'24.98"S	96°50'43.50"E	
Cocos Home Island Turtle Nest Beach	Cocos Keeling Islands	12° 6'37.49"S	96°53'20.61"E	
<b>Christmas Island</b>				
Christmas Island Flying Fish Cove	Christmas Island	10°25'45.48"S	105°40'12.48"E	
Christmas Island Ethel Beach	Christmas Island	10°27'48.67"S	10°27'48.67"S	
Christmas Island Lily Beach	Christmas Island	10°28'2.59"S	105°42'43.31"E	

	South Coast NRM		Rangelands NRM
	South West Catchments Council		Territory of Cocos (Keeling) Islands
	Perth NRM		Territory of Christmas Island
	Northern Agricultural Catchments Council		