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Cape York Clean-up Report 2015-2016

Tangaroa Blue Foundation

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Proudly supported by

Everyone's Environment grants conservation

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Contents

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Cover Photo: 2015 Chilli Beach Clean-up event / Christian Miller

1.0 Description of Cape York

Cape York is a large and diverse area, with very few roads. Access is limited by seasonal weather patterns, and in many areas, is restricted to boat or air access only.

Debris in Cape York tends to be primarily sea-based in origin, and the ocean currents of the Coral Sea, Torres Strait, and Gulf of Carpentaria deposit large amounts of debris on the shores of Cape York. The region is recognised as a marine debris "hotspot," and there are many areas on the peninsula where debris accumulates. Much of this debris is foreign in origin, and travels from nearby Papua New Guinea, Indonesia, or other countries in Southeast Asia. The debris may originate from land-based sources or discarded from international fishing or cargo vessels.

Cape York is also home to a small number of isolated communities, many of which have inadequate solid waste management systems. Additionally, some areas are subject to high litter loads. In these areas, debris tends to be land-based as opposed to ocean based.

Tangaroa Blue Foundation has been conducting clean-ups and surveys throughout Cape York since 2011. We rely on volunteers that are recruited from both Australia and internationally, and who travel to the region to assist local community volunteers and partners. Here we report on the clean-ups that have been conducted throughout Cape York over the 2015-2016 time frame (Map 1).

For the purposes of reporting, we have divided the peninsula into 5 separate regions, as follows:

- Torres Strait islands (TI) (populated)
- Great Barrier Reef Islands (GBRI)
- Eastern Cape York (ECY) (predominately unpopulated)
- Western Cape York (WCY) (predominately unpopulated)
- Populated Cape York areas (CY pop)

Each of the regions contains a varying number of sites and clean-ups (Appendix B), but they share similar geographic and social characteristics. A synopsis of the regional clean-ups follows an overall picture of the clean-up data from Cape York.

1.1 Cape York clean-up overview

A total of 60 clean-ups were conducted between 2015-2016, involving over 800 volunteers and removing a total of over 31 tonnes of debris (Table 1.1). It is important to note that the mean, or average number of items found per m2 of beach (0.3206) is considerably higher than the median number (0.0770). Median values indicate the middle value in a list of all values. When the mean value is much higher than the median, it means that there are one or a few events, with numbers considerably higher than average. In this instance, the mean is heavily influenced by one particular event, the Horn Island clean-up in Torres Strait. This clean-up was small in area (50 m2), but had

very concentrated debris levels (over 5 items per square meter). It is also worth noting that the overall mean items per m2 declined between 2015-2016, but this decline was not statistically significant, given the large variability between sites. We address the question of change over time in section 3.0.

Map 1: Cape York clean-up sites 2015-2016

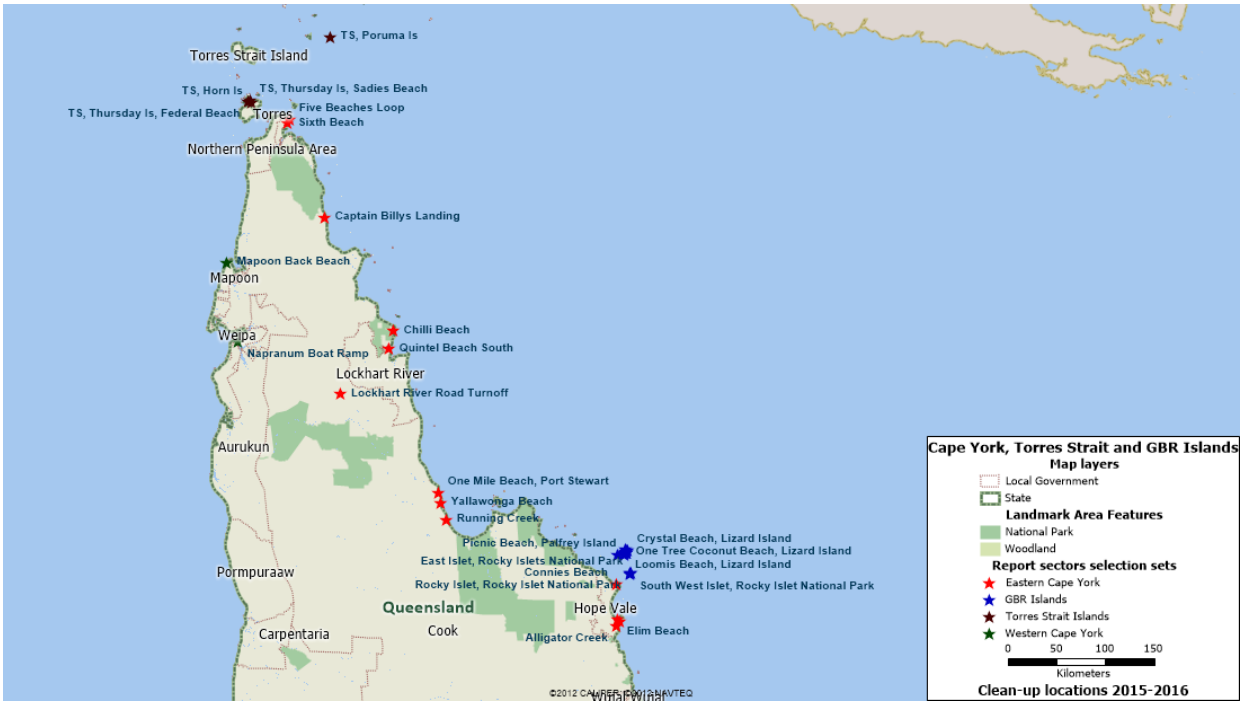
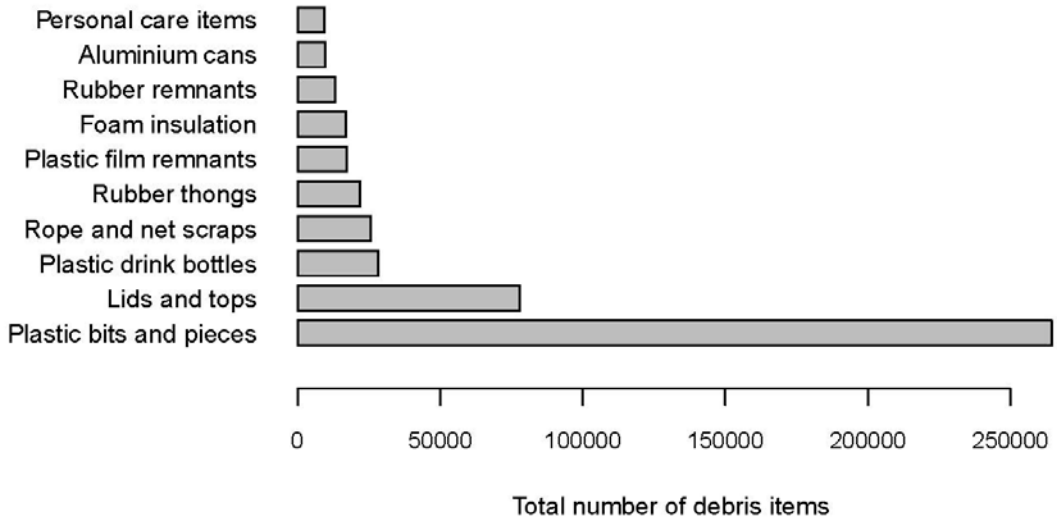


Table 1.1 Summary statistics for clean-ups across Cape York in 2015 and 2016.

Year	Sites	Clean-ups	Items	Total weight (kg)	Area cleaned (m^2)	Mean items per m^2 (± s.e.)
2015	19	26	342,342	16,583.3	2,403,540	0.329 ± 0.125
2016	30	34	249,254	15,359.61	2,363,952	0.314 ± 0.159
Total	**35**	**60**	**591,596**	**31,942.91**	**4,767,492**	**0.321 ± 0.104**

We present two different ways of assessing the most common items found in clean-ups. First, we calculated the top 10 most common items by number, amalgamating all clean-ups across the two-year time frame and among all sites (Figure 1.1). Here we see that hard plastic bits and pieces are by far the most common item, followed by plastic lids and bottle tops, and then an assortment of other items. This provides a snapshot of all of the items that have been removed from Cape York. However, it does not provide an accurate statistical representation of the most common debris items in the region. This analysis can vary depending on the sites selected, and the number of clean-ups done at each site. For example, if one site has an abundance of a rare item, but clean-ups are done more frequently than elsewhere, the item might appear to be more prevalent than it actually is. Additionally, it gives no indication of the variability in the items present.

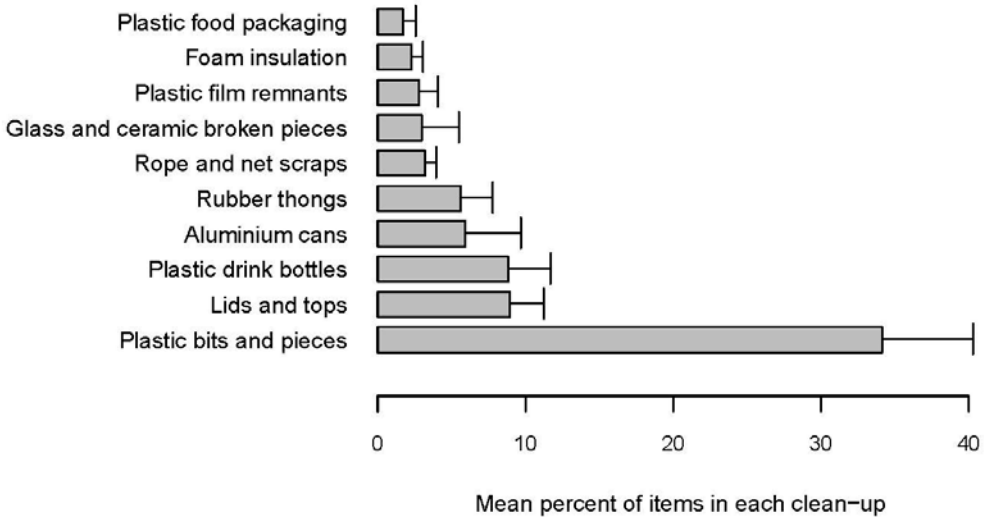
Figure 1.1 Top 10 most common items in Cape York (by count)



Therefore, we analysed each clean-up individually and calculated the percentage of each item type within each clean-up. Then we calculated the mean (average) and 95% confidence interval for the top 10 most common items (Figure 1.2). The confidence interval is a measure of the variability of the data. When an average value is calculated from a series of numbers that are quite close together, the variability will be small and so will the confidence interval. With a greater range of values, we are less sure of the accuracy of the mean value. When confidence intervals of two mean values overlap, we cannot be certain that the mean of the two datasets is equal.

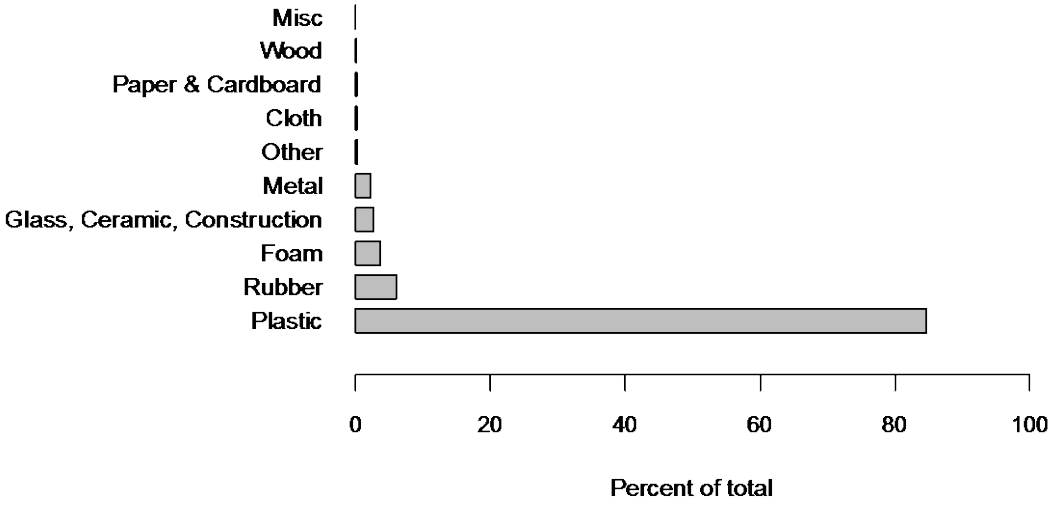
The top two items (hard plastic bits and pieces, and plastic lids and tops) are the same as in the previous graph, but the other items do differ slightly. With error bars plotted we can also see that the abundance of many of the items does not differ significantly.

Figure 1.2 Top 10 most common items per clean-up (by percent) across Cape York clean-ups, 2015-2016.



We also investigated the material types removed from Cape York during 2015-2016. The vast majority, 84.6%, is plastic (Figure 1.3).

Figure 1.3. Material types (percent of total) for all Cape York clean-ups



2.0 Regional comparisons

The clean-up effort was not split evenly between each of the regions. ECY and GBRI had the greatest total number of clean-ups (and sites) during the time period, but despite the fact that there was only one site in WCY (Mapoon Back Beach), the area cleaned in Western Cape York far exceeded that of most other areas. This is likely because the beach at Mapoon in WCY is between 100-150m wide, and since much of the debris tends to accumulate at the high tide line, the density of debris in Mapoon is much lower than in ECY, so volunteers can cover more area in a given time period. Volunteer effort in ECY was higher than all of the other sites by an order of magnitude, as was the resulting weight and number of items removed. ECY had a significantly higher number of items per m2 than any other site, followed by CY pop areas.

Table 2.1 Summary statistics for items in each region of Cape York

Region	Sites	Clean-ups	Items	Weight	Area cleaned (m^2)	Mean items per m^2 (± s.e.)
TI	4	7	2154	195.1	211,650	0.807 ± 0.772
GBRI	16	24	12842	1158.51	227,322	0.135 ± 0.0490
ECY	12	25	480,760	25,804.8	2,200,220	0.400 ± 0.125
WCY	1	2	88,982	4599.6	2,080,000	0.0428 ± 0.000680
CY pop	2	2	6858	184.9	48,300	0.122 ± 0.0326

For each of the regional areas, we calculated the mean (plus 95% confidence interval) percent of each clean-up for the top 10 most commonly found items. We also calculated the Marine Debris Source Index (MDSI). The MDSI calculates the likely source of each debris item based on the characteristics of the item (e.g. fishing lures are classified as recreational fishing gear; boat remains are shipping sources. Some of the items are unable to be allocated into a category; these are then split between local litter and garbage washed ashore based on the Land Sea Source Index (LSSI) for the region in question. The LSSI is based on the physical properties of each item (e.g. buoyancy, volume, material, etc.), and estimates the likelihood that each item would be from a local source versus washed ashore.

2.1 Torres Strait islands (populated)

The three islands represented in the Torres Strait clean-ups (Horn Island, Poruma Island and Thursday Island) all have small communities on them, with Thursday Island the largest in all of the Torres Strait islands. While the mean amount of litter per m2 (0.807) is considerably higher here than in any other region (Table 1), this is driven primarily by a single clean-up on Horn Island. Removing that event, the mean number of items drops to 0.0344, the second lowest of any region.

Figure 2.1: Top 10 items (by proportion of each clean-up) in Torres Strait

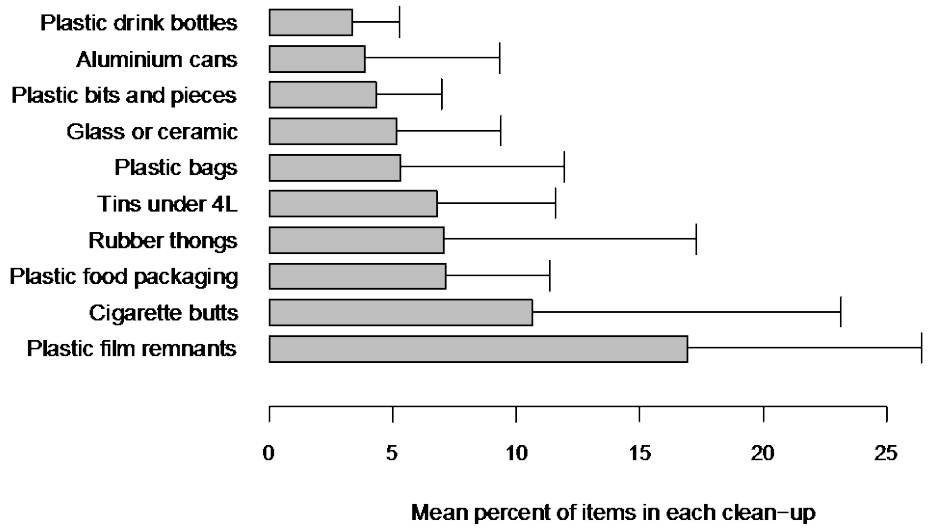
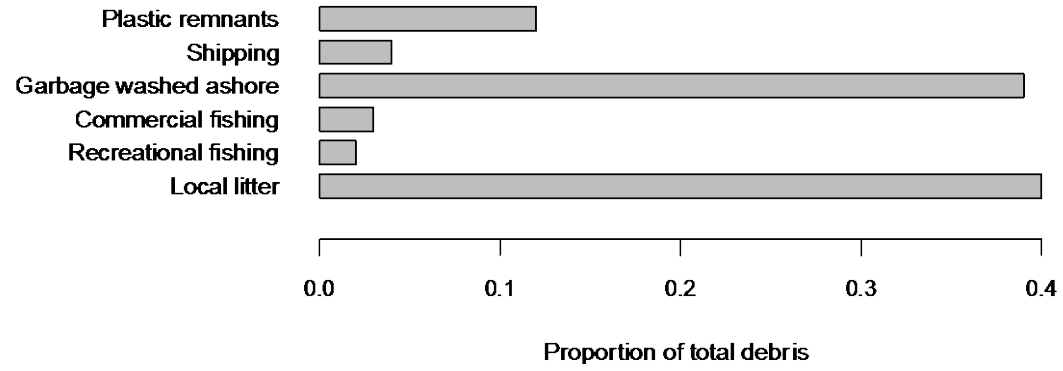


Figure 2.2 MDSI for debris found in Torres Strait islands



While there is significant variability in the data, it is clear that the top 10 items found in clean-ups are significantly more diverse than in unpopulated areas. A substantial amount of the debris found is washed ashore, but an equal proportion likely comes from local litter. The types of debris commonly found (aluminium cans, cigarette butts, food packaging, plastic drink bottles) indicate that locally-based waste management solutions (potentially including enhanced education and litter control measures) could be effective at reducing debris levels.

2.2 GBR islands

The GBR island group consists of Lizard Island (11 sites, 19 clean-ups) as well as nearby unpopulated islands Eagle Isle, Palfrey Island, and 3 sites in the Rocky Islet group. There are several sites on Lizard where repeated clean-ups have been completed over the two year time frame, while each of the sites in the Rocky Islands have been visited once in 2016.

Figure 2.3 Top 10 items (by proportion of each clean-up) in GBR Island surveys

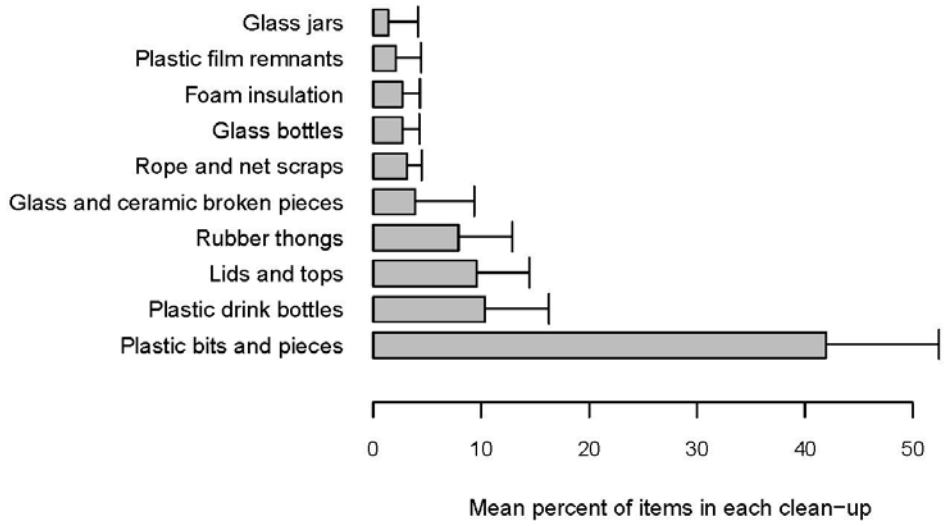
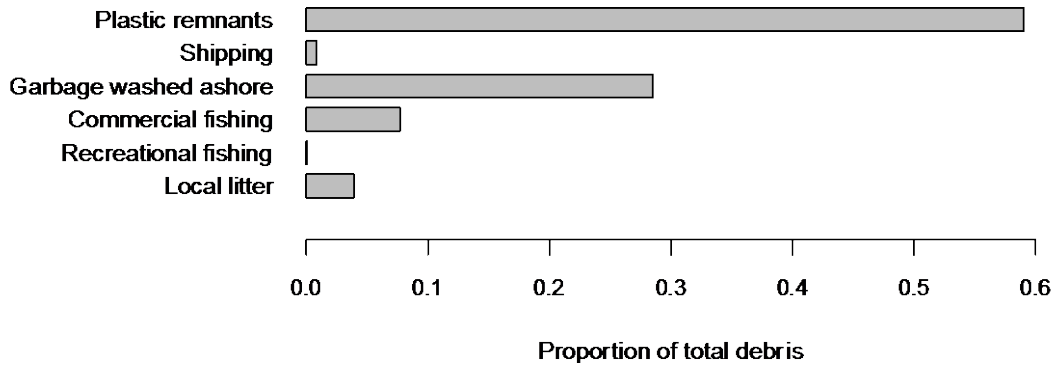


Figure 2.4 MDSI for debris found in GBR islands



The majority of debris from the Great Barrier Reef islands is hard plastic bits and pieces not generated locally. Mitigation actions here should continue to focus on clean-up efforts and national source reduction policies.

2.3 Eastern Cape York unpopulated areas

The Eastern Cape York region has the most extensive coverage of clean-ups of all the regions in this report, both in terms of number of sites and temporal range of clean-ups. Sites are all unpopulated, but while litter is at a minimum, the number of items per m2 is among the highest of any region.

Figure 2.5 Top 10 items (by proportion of each clean-up) for ECY sites.

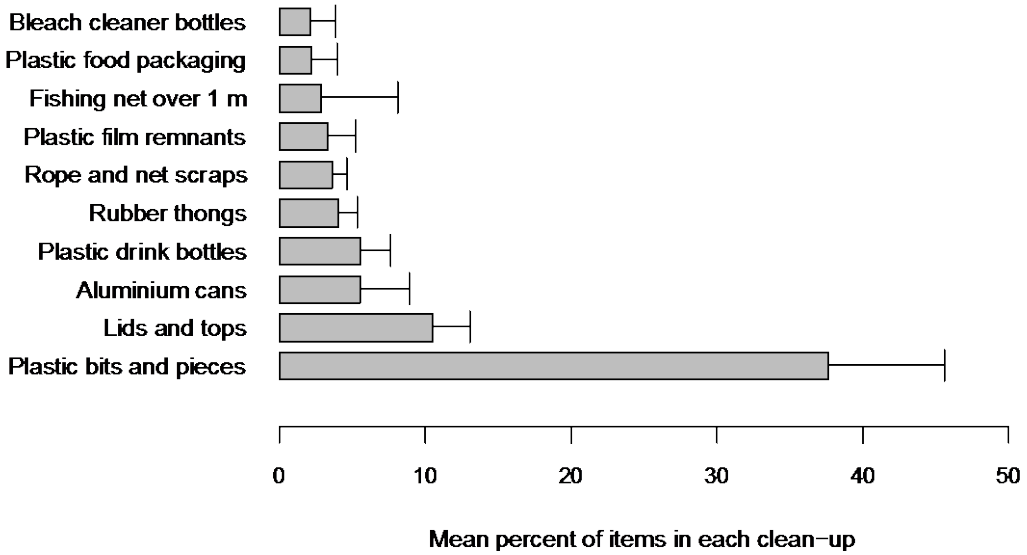
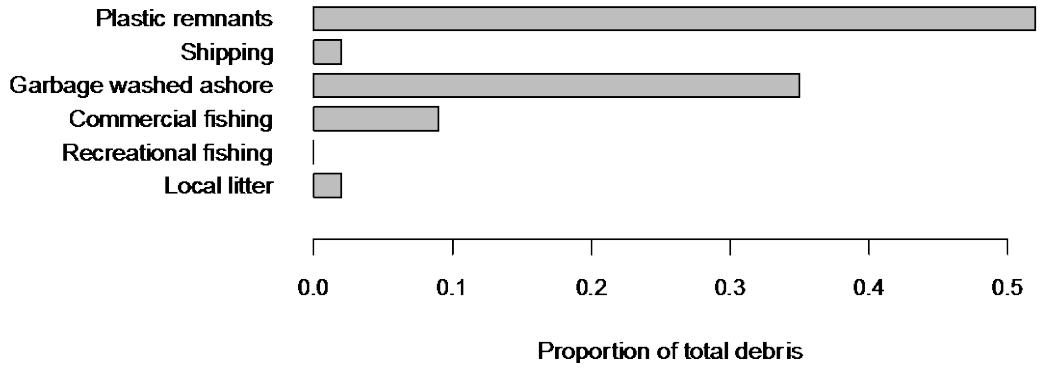


Figure 2.6 MDSI for debris found in East Cape York clean-ups



Similar to the GBR islands, the high levels of debris in the East Cape are driven primarily by hard plastic bits and pieces which have been washed ashore. There is some commercial fishing input, but here again, mitigation will probably be most successful if directed at national and international sources of debris.

2.4 Western Cape

The Western Cape region is the least well-surveyed region in Cape York, with only one site (Mapoon) and 2 clean-up events represented here. As such, the statistical results may not adequately represent debris in this region. Mapoon Back Beach is extremely wide, and only fully inundated during king tides and cyclones or big weather events. Therefore, although it is the largest area surveyed, the density of debris is not nearly as dense as in areas in ECY.

Figure 2.7 Top 10 items (by proportion of each clean-up) for the Western Cape York region.

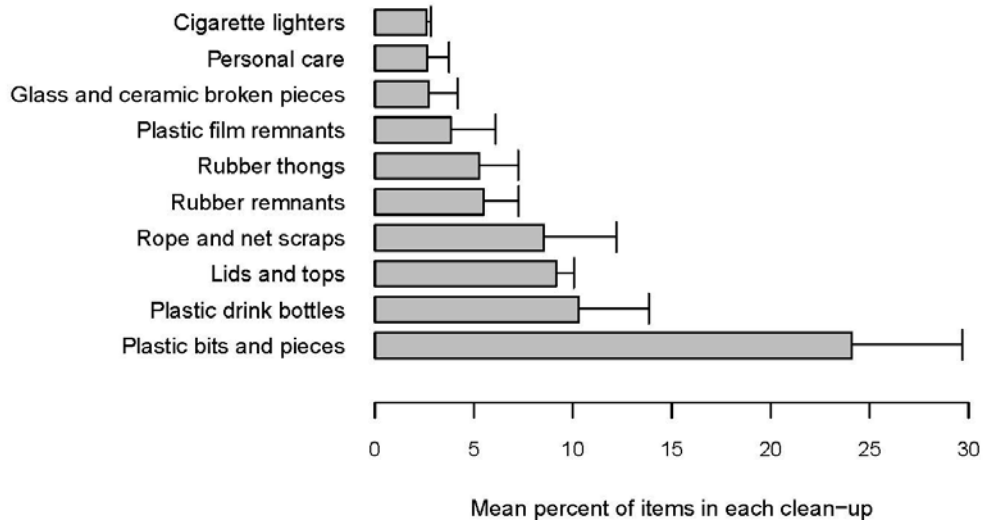
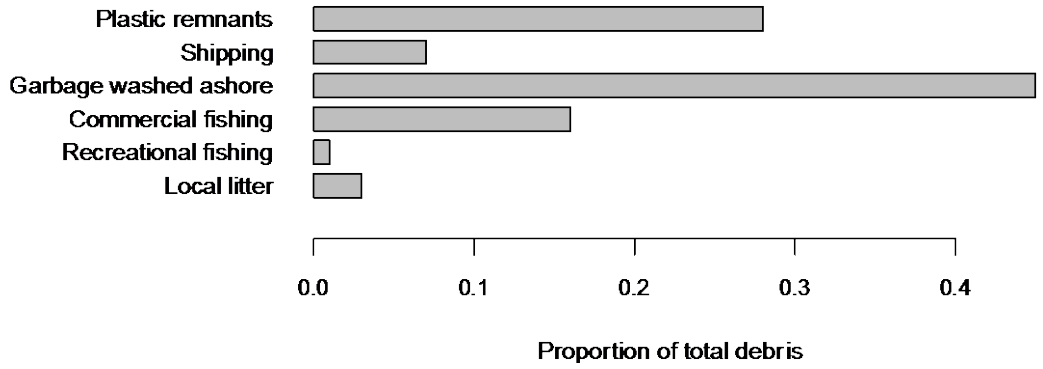


Figure 2.8 MDSI for debris found in Western Cape York unpopulated only

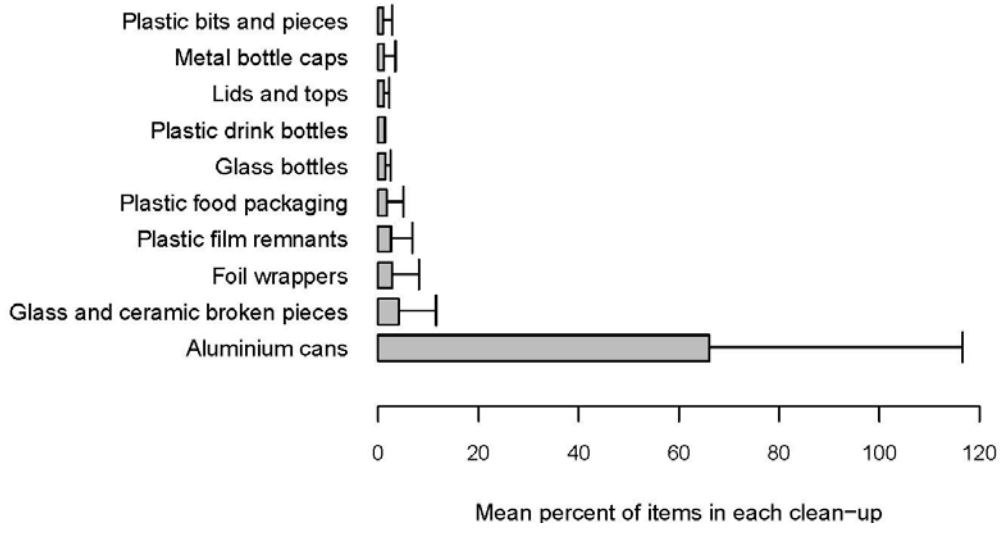


Similar to other unpopulated areas, the debris in Mapoon tends to be primarily hard plastic bits and pieces. Here there is a much higher percentage of debris that comes from offshore activities such as commercial fishing and shipping, so enhanced waste management legislation in these industries, as well as enforcement of existing legislation through increased compliance effort may yield positive results.

2.5 Populated Cape York Areas

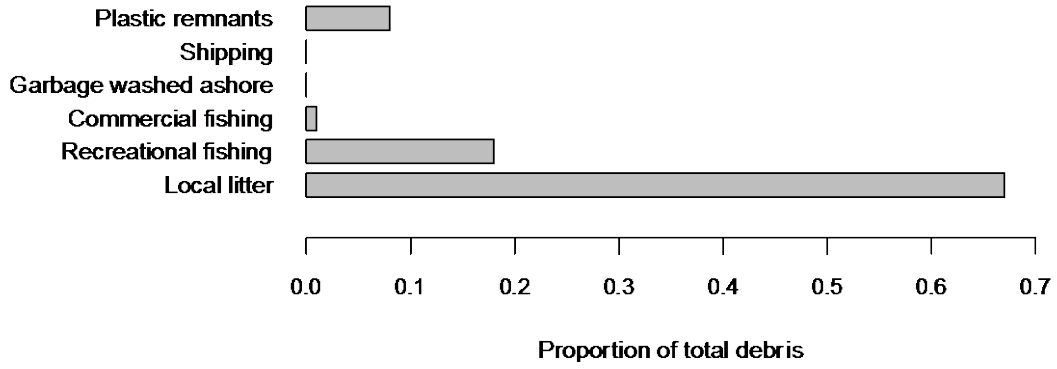
There are two sites (Napranum boat ramp and Lockhart River Road turnoff, one clean-up each) that are extremely dissimilar to the rest of Cape York clean-ups. The Lockhart River Road turnoff is not a coastal area, and is characterised by a high amount of traffic. Napranum boat ramp is also quite populated, and is an area where locals appear to socialise. Subsequently the debris in this area is 100% local litter.

Figure 2.9 Top 10 items (by proportion of each clean-up) found in the populated Cape York areas.



The Marine Debris Source Index was designed for coastal areas, and as such, is not yet applicable to the Lockhart River Road turnoff, however the debris removed can be recorded as 100% local litter. Below is the MDSI for Napranum boat ramp (one clean-up).

Figure 2.10 MDSI for debris found at the Napranum boat ramp site.



Mitigation in these areas will have to be focused on local sources. The first step is determining whether littering is based on behavioural cues or is due to lack of appropriate waste management infrastructure. Educational campaigns and improved access to waste management may assist in mitigating litter here.

3.0 Change over time

Anecdotally, there have been noticeable changes in the type and quantity of debris found at some of the Cape York sites. Over the past two years, for example, the amount of debris at Chilli Beach decreased from 3.1 tonnes in 2015 to 2.3 tonnes in 2016, and the effort required to clean the same area dropped significantly from 1547 hours to 715 hours. Similarly, in Mapoon, average debris levels have declined from just over 1 piece per m2 in 2012, to around 0.04 pieces in 2016. This has contributed to much of the “old” debris that has potentially been in situ for decades being removed, and only new items entering the local system being found on the beach. This is particularly encouraging, because older pieces of debris that have been exposed to weather have a tendency to disintegrate into large amounts of micro-plastics, which are much harder and time consuming to remove.

In order to determine whether there has been a statistically significant change in the amount of debris, we chose five sites for which we had a minimum of three years worth of data at each site. We therefore calculated the number of items collected per m2 (Figure 3.1), and the weight of debris per m2 (Figure 3.2) at each survey site, and fit a simple linear model to the data, incorporating both year and site as dependent variables. While there was a downward trend in both the number of thongs and the weight of debris collected each year, the difference was not statistically significant overall. However, when looking at individual sites, both Chilli Beach ($p=0.0058$) and Mapoon Back Beach ($p=0.014$) showed a statistically significant decrease in the

weight of debris collected each year.

Figure 3.1 Number of thongs per m2 for beach clean-up sites in Cape York for which there are at least three years worth of data. For sites with more than one survey in a given year, values reported are the average for the year.

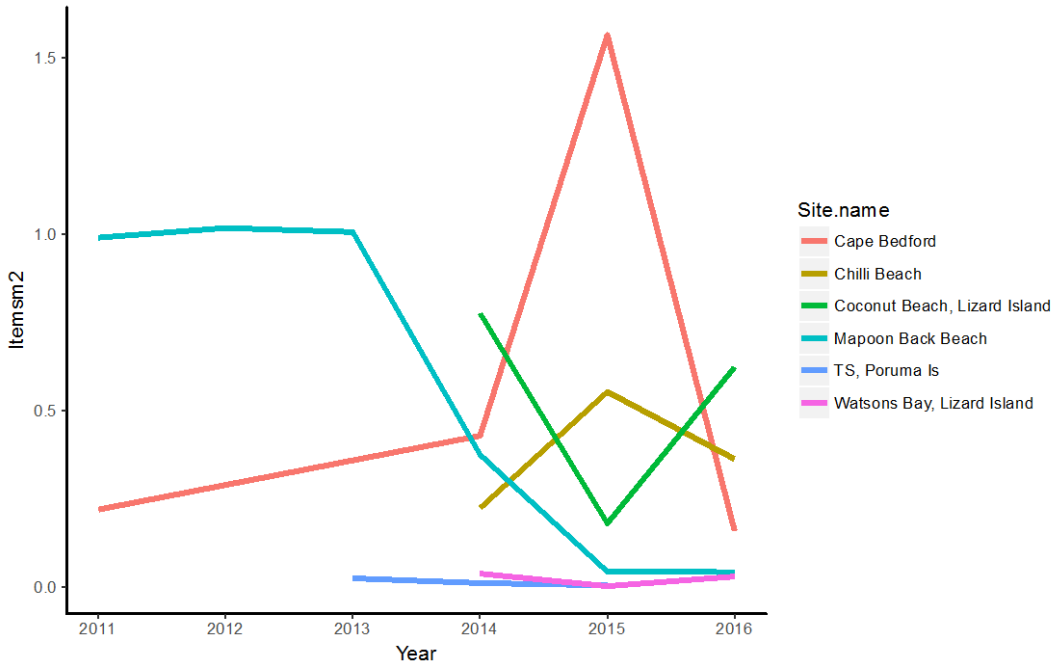
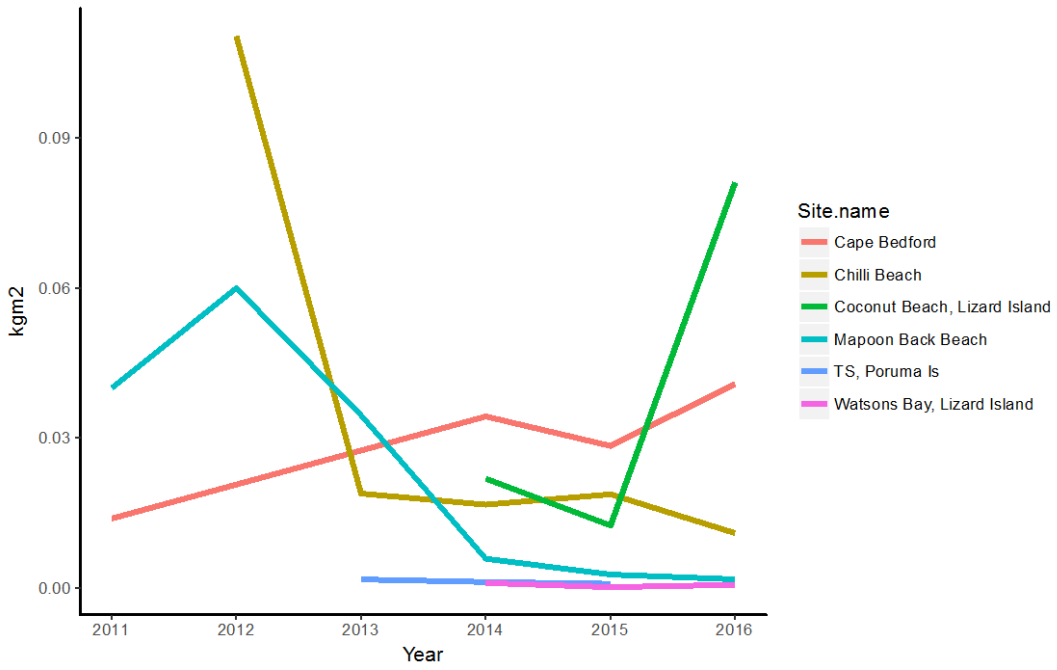


Figure 3.2 Kilograms per m2 for beach clean-up sites in Cape York for which there are at least three years worth of data. For sites with more than one survey in a given year, values reported are the average for the year.



There are a few reasons that a statistically significant change was not recorded in the number of items of debris. First, in areas where multiple surveys have been conducted in one year, there is high variability. This variability may be due to different weather patterns at different points of the year, or different patterns in human usage of the areas. Second, while clean-up efforts have removed much of the large older debris, human behaviour patterns suggest that if there are no large pieces of debris, beach surveyors will start to look for smaller items. While the weight and size of the debris may have decreased, the number of items may stay relatively constant as more and more smaller pieces are removed. Additionally, point source events such as cyclones may cause dramatic increases in debris accumulation. For example, Cyclone Nathan caused a large increase in the amount of debris in Cape Bedford area at the beginning of 2015.

Critically, as the larger, older, persistent debris is removed, volunteer hours are freed up to clean ever larger areas of the beach. Because the vast majority of the expense in conducting clean-ups in Cape York is in transporting volunteers and the debris that has been removed, regular clean-ups will result in increasing efficiency for each dollar spent (see Table 3.1).

Current effort required to remove debris

Over the two-year time frame, 818 people contributed 8,208 hours towards the Cape York clean-ups. The vast majority of the effort went into sites in Eastern Cape York. While many of the people represented in Table 3.1 are volunteers, Tangaroa Blue Foundation has also had constant and growing support from local indigenous community partners, some of which are volunteers and others that are part of the local Indigenous Ranger programs. Tangaroa Blue Foundation supports the local effort by increasing capacity for clean sweeps that the local community wouldn't be able to do alone. We are building skills and knowledge of the issue among communities, which will assist in keeping debris off the beaches and out of the ocean into the future.

Table 3.1. Clean-up effort (number of people contributing to clean-up and hours) expended in Cape York clean-ups between 2015-2016.

Site	People	People-Hours
Cape York		
2015	448	4347
2016	370	3861
Regional		
TI	58	51
GBRI	29	87
ECY	652	7146
WCY	39	850
CY pop	40	74
Total	**818**	**8208**

4.0 Potential impacts of and problems arising from the debris

The work our organisation is doing in Cape York is of the utmost importance. The negative effects from marine debris are well documented, and affect not just wildlife, but also humans. Floating debris causes substantial economic costs to the marine industry, both directly though at-sea encounters with nets, containers, or other debris; but also to the fisheries industry through by-catch and habitat damage. Tourism also suffers through decreased visitation to debris littered beaches, and there are even potential human health impacts from discarded sharps, and from exposure to toxins from eating fish that have ingested debris. Additional research suggests that even mental health is impacted by the cleanliness of the environment.

The impacts to wildlife from marine debris are even greater, from both ingestion and entanglement in marine debris. This is particularly relevant to the Cape York area as turtles, an important local food source, are among the taxa most impacted by marine debris.

Plastics are persistent and pervasive in the environment, and have been shown to harbour invasive species, transporting them far greater distances than on the biodegradable products that plastics have replaced. Tangaroa Blue Foundation has signed an official Memorandum of Understanding with the Department of Agriculture and the Northern Australian Quarantine Service to assist in the identification and reporting of biosecurity risks and their management.

5.0 Prospects of mitigation actions

Container Refund Scheme legislation

In June of 2016, the Queensland government announced that a Container Refund Scheme (CRS) will take effect in 2018. The CRS is based on a similar scheme which has been in place in South Australia since 1975, and one which is scheduled to be rolled out in NSW in 2017. Drink bottles between 150ml – 3L (with the exception of milk, pure juice, and wine) will attract a 10-cent refund when returned to appropriate waste collection facilities.

41,383 items, or 7% of the debris collected across Cape York during 2015-2016 fall within the categories of items eligible for the CRS. However, some of the items that wash up on CY beaches are of foreign origin, meaning that they would not qualify for refunds.

Typically, aluminium cans and glass beverage bottles are discarded without lids (as the lids are typically not reusable). If they reach the ocean they

rapidly fill up with water and therefore are unlikely to travel far distances over sea. When found in Cape York, therefore, we can presume that these items are predominately local in origin and would likely be eligible for a Queensland refund.

Plastic beverage bottles, on the other hand, are often discarded after replacing the lids. Their light weight, buoyancy, and longevity mean that they can travel long distances on ocean currents. We therefore collected preliminary data on the percentage of plastic drink bottles that are of foreign origin. These data are based on one survey at Chilli Beach and one at Mapoon in winter 2016. Approximately 39% of bottles at Chilli beach and 56% of bottles at Mapoon are foreign source; the rest are undetermined, so potentially could be up to 100% foreign source.

The foreign source data are only based on two surveys, one on the east coast of Cape York, and one on the west coast. There is likely to be a high variability in the number of items that come from foreign sources based on currents and weather patterns. However, if we conservatively estimate that approximately 80% of plastic bottles and 5% of aluminium cans are foreign origin, then we can roughly calculate that 3% of the total debris (by count) found in Cape York would be eligible for a container deposit scheme refund. Between 2015-2016 this would equate to approximately 18,000 items. This does not, of course, include fragments of glass or plastic CRS items, which will also presumably be reduced when the CRS is implemented.

It is unlikely that 100% of CRS eligible items would be removed completely from the waste stream, so while the CRS has been shown to significantly reduce waste in South Australia, the gains in Cape York may be restricted primarily to areas such as Napranum and Lockhart River Road Turnoff, where there is a high percentage of locally generated litter.

Plastic bag legislation

With the legislation for banning single use plastic shopping bags in Queensland scheduled to begin in 2018, what effect can this be expected to have in Cape York? This, too, is a difficult question to answer, because the thin plastic bags that will be affected by the ban deteriorate quite quickly into small fragments that are harder to identify. 2015-2016 data from Cape York identified 1447 bags, or about 0.2% of the total debris, while more than 10 times that amount (17141, 2.9%) of fragments were collected. Although it is likely that most of these bags are not of foreign origin, it is very difficult to tell what percentage of the fragments would be taken out of the waste stream when the bag ban is implemented.

6.0 Challenges identified to date in sustaining a CY marine debris program

To date, Tangaroa Blue Foundation has been active in applying for funding to conduct clean-ups throughout the region. Since 2011 we have assisted in between 20-55 clean-ups per year, and the number of sites we have cleaned increased from 16 in 2011 to 39 in 2014. However, Cape York is a very challenging place to work.

Accessing remote locations

Many areas of Cape York are extremely remote, and are difficult and expensive to access. Certain areas are only accessible by sea, and then only when it is calm; or by helicopter, which is prohibitively expensive, and restricts the amount of debris that can be removed. We have had some success in collaborating with government departments with assets in the region, so that we can access extremely remote areas. For example, through the Federal Government's Reef Trust program, the Great Barrier Reef Marine Park Authority funded a helicopter survey to assess debris along the entire coastline of Cape York, in order to best direct clean-up efforts. In other areas, we have collaborated with the Australian Navy to remove heavy and unwieldy debris items. We would like to continue these collaborations and increase cooperation between agencies so that we can access additional logistical difficult areas into the future.

Lack of waste management infrastructure

A significant portion of the land-based debris that we have removed from Cape York is generated because there is a substantial lack of adequate waste management infrastructure throughout the region. Most communities have only a small local landfill which is burnt or buried once full, both of which impact the health of the local environment. There is currently extremely limited access to recycling programs so zero resource recovery to reduce waste loads going to landfill. With significant sections of the Peninsula Development Road expected to be completely sealed in the coming years, the number of people accessing this region, and needing to dispose of their waste will increase significantly compounding this problem and its results.

Aftermath of clean-ups

Conducting a large scale clean-up in Cape York is not only expensive and logistically challenging to organise and carry out, but carries additional burdens with respect to disposing of the debris that is picked up. Not wanting to overload local landfill sites with collected debris, all recyclable materials are currently trucked from CY to Lakeland for baling, and further to Cairns and Brisbane for recycling. While we have received support from Hawkins Transport, Sea Swift and the Cook Shire in the past, long-term transportation arrangements are required to make recycling possible for this region. It is important to note that there is quarantine border at Coen, preventing any plant/soil/food materials from travelling south. This needs to be considered when bringing recyclables south from northern Cape York.

Timeliness of funding

Marine debris accumulation in Cape York happens throughout the year and impacted by onshore trade winds and king tides depositing the majority of the debris. However, events such as cyclones can deposit significant quantities of debris at a single point in time. Responding to these events within a timely fashion can mean the difference between removing the bulk of the debris or allowing it to return to the ocean following the next large storm. As an example, after Cyclone Nathan in March, 2015, emergency funding was provided for a team of volunteers to clean Alligator Creek, in Hopevale. 1.3 tonnes and 20,362 items of debris were removed from the beach. 11months later, during the regular annual clean-up, the same section of the beach only had 226.2kg and 7,529 items of debris on it. Debris is continuously deposited and some items are re-suspended, so ensuring prompt action following large debris events is critical.

Photo: Alligator Creek/Cape Bedford, Hopevale shortly after Cyclone Nathan hit in March, 2015.

Appendix A: List of organisations that have contributed to the AMDI clean-ups in Cape York 2015 - 2016

This work would not have been successful without the participation and assistance of the following organisations, so we gratefully recognise their input. Acknowledgement also goes to the hundreds of volunteers who give their time to help protect this beautiful part of Australia from marine debris and plastic pollution.

Australian Maritime Safety Authority (AMSA)
Clean Coast Collective
Conservation Volunteers Australia QLD (CVA)
Cook Shire
Department of Agriculture, Northern Australian Quarantine Strategy
Djunbunji Ltd Land and Sea Program
Great Barrier Reef Marine Park Authority (GBRMPA)
Green Army QLD
Hawkins Transport
Hopevale Aboriginal Council
Hopevale Congress Rangers
Hopevale My Pathways
Hopevale State School
Lama Lama Aboriginal Rangers
Lizard Island Research Station
Lizard Island Resort
Lizard Island Social Club
Lockhart River State School
Mapoon Aboriginal Shire Council
Mapoon Land and Sea Rangers
Mapoon My Pathways
MV Aroona
MV Bahama
Nanum Wungthim Napranum Rangers
Napranum Aboriginal Shire Council
Northern Kuuku Ya'u Land and Sea Rangers
Northern Peninsula Aboriginal Regional Council
Northern Peninsula Area State College
NPARC Apudthama Rangers
Parley for the Oceans
Poruma Island Land & Sea Rangers
Poruma School Campus
Queensland Government's Everyone's Environment Grant
Queensland Parks & Wildlife Service (QPWS)
Remote Youth Justice, Queensland
Reef Trust

Sea Swift
Tangaroa Blue Foundation
Thamarrurr Rangers
Torres Strait Regional Authority Land and Sea Rangers
Uncle Eddie's Camp Ground – Elim Beach
University of Colorado Boulder
Yintjingga Aboriginal Corporation

Appendix B: Table of regions and associated clean-ups

Site name	Date	# of Vols	Items	Weight (kg)	Area (m2)
Torres Strait Islands					
Horn Is	5/12/2016	2	272	10	50
Poruma Is	15/01/2015	3	143	16.1	28500
Poruma Is	24/02/2015	1	145	35	29000
Poruma Is	27/04/2015	8	382	78	75000
Poruma Is	8/07/2015	1	307	30.5	69300
Thursday Is, Federal Beach	17/08/2016	40	564	14	4700
Thursday Is, Sadies Beach	18/08/2016	3	341	11.5	5100
Great Barrier Reef Islands					
Bommie Bay, lizard Island	29/10/2016	1	3	0.2	1000
Casuarina Beach, Lizard Island	26/10/2016	1	42	16.3	8152
Coconut Beach, Lizard Island	19/04/2015	1	72	5	400
Coconut Beach, Lizard Island	27/10/2016	1	3140	408.9	5040
Crystal Beach, Lizard Island	14/11/2016	1	3111	110.7	3000
Eagle Isle	17/05/2016	2	1142	38.5	46400
East Islet, Rocky Islets National Park	29/10/2016	1	0	0	200
Loomis Beach, Lizard Island	19/11/2016	1	438	116.3	5000
Mangrove Beach, Lizard Island	11/04/2015	1	1378	29	24000
Mangrove Beach, Lizard Island	31/05/2015	1	176	3.2	12000
Mangrove Beach, Lizard Island	10/11/2016	1	28	2.3	3250
Mermaid Cove, Lizard Island	30/07/2015	3	66	5	10000
Mermaid Cove, Lizard Island	20/10/2016	1	293	4.39	2100
One Tree Coconut Beach, Lizard Island	19/11/2016	1	447	97	1450
Palfrey Island, North Side	4/11/2016	1	3	0.5	200
Picnic Beach, Palfrey Island	4/11/2016	1	514	118.2	1850
Rocky Islet, Rocky Islet National Park	12/11/2016	1	598	134.9	11330
SW Islet, Rocky Islet National Park	12/11/2016	1	20	0.5	500
Trawler Beach, Lizard Island	10/05/2015	1	216	4	9000
Trawler Beach, Lizard Island	27/05/2015	1	162	6.5	9000

Trawler Beach, Lizard Island	2/05/2016	3	329	4.5	6000
Trawler Beach, Lizard Island	27/10/2016	1	349	40.3	1450
Watsons Bay, Lizard Island	6/04/2015	1	136	8.5	60000
Watsons Bay, Lizard Island	21/10/2016	1	179	3.82	6000
Eastern Cape York					
Captain Billys Landing	12/06/2015	21	41974	2309.6	297540
Captain Billys Landing	2/06/2016	18	29942	1642	384000
Chilli Beach	17/07/2015	81	93695	3173.4	169375
Chilli Beach	10/06/2016	80	73962	2234.7	204000
One Mile Beach, Port Stewart	25/08/2015	35	3373	212.8	64000
One Mile Beach, Port Stewart	26/09/2016	25	1271	64.7	28500
Running Creek	10/07/2015	55	1747	209.5	60000
Yallawonga Beach	27/06/2015	55	5554	377.7	73125
Yallawonga Beach	27/09/2016	33	2904	103.3	36200
Alligator Creek	26/05/2015	36	20362	1303.2	11400
Alligator Creek	17/08/2015	9	23818	1054.6	81600
Alligator Creek	18/04/2016	11	7529	226.2	26400
Alligator Creek	19/04/2016	10	5606	742.4	15000
Alligator Creek	30/10/2016	2	121	5	1500
Cape Bedford	24/05/2015	20	18275	285	7200
Cape Bedford	28/05/2015	8	32582	954.2	55200
Cape Bedford	15/04/2016	11	11437	2783.5	90000
Cape Bedford	26/05/2016	18	10236	2714.8	53520
Connies Beach	8/04/2015	10	149	138	100
Elim Beach	28/05/2015	7	1725	185.3	90000
Elim Beach	29/05/2016	14	623	74.5	23100
Quintel Beach South	9/11/2015	16	342	205.7	12700
Five Beaches Loop	14/09/2015	23	49126	3096.9	96000
Five Beaches Loop	10/06/2016	34	36961	1299.1	246560
Sixth Beach	13/06/2016	20	7446	408.7	73200
Western Cape York					
Mapoon Back Beach	31/08/2015	23	45626	2820.6	1050000
Mapoon Back Beach	23/07/2016	16	43356	1779	1030000
Cape York populated sites					
Lockhart River Road Turnoff	16/07/2015	27	811	36	9100
Napranum Boat Ramp	30/09/2016	13	6047	148.9	39200