

Eastern Cape York Peninsula Beach Rubbish Assessment, 2007 & 2008

CYMAG Environmental Inc.

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Natural Heritage Trust
Helping Communities Helping Australia



Queensland Government
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Cooktown, Queensland

(CYMAG Environmental is the operational sector of CYMAG - Cape York Marine Advisory Group)

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Cover photo: Accumulated rubbish at a creek mouth, Endeavour River North Shore, Cooktown (photo taken by Peter Pal for CYMAG)



Volunteer Peter Lewis bags rubbish collected at Knob Point

Introduction

Rich in natural and ecological values, the Cape York Peninsula supports a diversity of ecosystems and provides significant habitat for a large number of species, many of which are rare and threatened. Nineteen wetlands of national significance have been recorded, along with 17 species of birds which occur nowhere else in Australia. Among other things, the coast and islands provide important habitat for Estuarine crocodiles, Flatback turtles, Hawksbill turtles and Green turtles. (Reference: Biodiversity Assessment - Cape York Peninsula. www.anra.gov.au)

The problem of terrestrial litter and marine debris on Cape York beaches represents an ongoing threat to marine life and spoils the natural beauty of these remote areas. Animals such as turtles (including the three Vulnerable Species mentioned), whales, seabirds and sharks can ingest or become trapped in marine debris, suffering what is often a slow and painful injury or death. The problem is so serious that 'Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris' is listed as a key threatening process under the Australian Government's Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Harmful marine debris is stated as consisting of plastic garbage washed or blown from land into the sea, fishing gear abandoned by recreational and commercial fishers, and solid non-biodegradable floating materials (such as plastics) disposed of by ships at sea. (Reference: www.environment.gov.au/biodiversity/threatened/publications/marine-debris.html).

While the terrestrial litter is most likely carried along waterways to creek mouths or discarded directly onto the beaches, Cape York's marine debris may have more than one origin. Much of the rubbish on the east coast may come from further south, transported in the Coral Sea Gyre, a current that circles between Australia and Papua New Guinea. Some of the rubbish, particularly that found in the Gulf of Carpentaria, may be originating from further north. A study of Flatback turtles conducted on Crab Island and adjacent mainland beaches in August 2007 included a survey of rubbish along a stretch of beach used by the turtles as a nesting ground. The researchers managed to identify the origin of nearly a quarter of the rubbish. Over 98% of these items were of Indonesian origin, while just over 1% were Australian in origin. According to the researchers, their study showed clear evidence of debris originating from foreign fishing operations either operating within their own waters or within the Australian Fishing Zone. (Reference: Bell, I., Emerick, S. & Leis, B. *Crab Island Scoping Study 9th to 14th August 2007*).

In 2007 and 2008, CYMAG field staff, with logistical support from QPWS/Marine Parks, conducted an assessment and clean-up of rubbish from a number of Eastern Cape York beaches and islands. The purpose of the assessment was to identify the primary sources of rubbish and actions required to reduce rubbish from washing up on these shores. This paper presents the findings and recommendations resulting from this assessment.

Christina Howley surveys rubbish at Three Isles



Methods

During 2007-2008, field staff surveyed rubbish on nine Eastern Cape York beaches; Cape Melville, King Island, Stapleton Island, Lloyd Bay, Coquet Island, Sandbank No.8, Three Isles, Knob Point and Archer Point.

At each locality, the workers marked out a transect selected in an area of concentrated rubbish collection. Transects varied in length from 10m (Knob Point) to 2000m (Three Isles) depending on the density of rubbish and time available.

After recording a series of local observations and drawing a mudmap of the beach/collection area showing concentrations of debris, field staff sorted through all rubbish along the survey transect, noting the numbers and types of rubbish and any labels or other evidence of origin. They then estimated the percentage of rubbish on the beach surveyed.

Each item of rubbish was categorised according to type. Rubbish types were grouped into seven broad categories: Plastics, Rubber, Glass, Metal, Cloth, Timber and Other. Within each broad category, rubbish was broken down further into specific types. The 'Rubber' category, for example, comprised three types of rubbish: Thongs & Footwear, Snorkel/diver gear, and Other. 'Plastics' comprised 23 types. (The CYMAG Rubbish Survey Data Sheet is available on the CYMAG website). The survey methods and data sheets were developed by CYMAG based on the Tangara Blue Ocean Care Society methodology (<http://oceancaresociety.org.au>).



Figure 1: Cape York Peninsula showing survey sites

Findings

'Plastics' made up the overwhelming majority of rubbish recorded on the Cape York beaches surveyed, with plastic bottles representing one of the main culprits. Archer Point fared the worst, with 3321 items of plastic recorded in its collection area (0.9 km), and more than double that number collected from the area but not recorded. Amongst the plastics recorded for Archer Point were 843 fragments of plastic, 829 bottle caps, 673 plastic bottles (304 clear, 369 coloured), 163 ropes, 153 KKK bleach bottles and 141 plastic bags. Of specific concern were the high number of KKK bleach bottles which were found to be of Papua New Guinea origin (more details in Discussion). One of the highest concentrations of rubbish was found at Knob Point, where 649 items of plastic were recorded within a very small distance (10m). During the Knob Point clean-up, 13 large garbage bags containing mostly plastics were removed from the beach; and this was estimated to comprise less than 10% of the rubbish remaining on the small beach.

'Rubber' was found to be the second most prevalent group of rubbish, making up just over 11% of the total rubbish surveyed. The vast majority of rubber items were thongs and other footwear. Rubber items were closely followed by Glass, Metal and Other, while Timber and Cloth items were present in relatively small numbers.

Findings

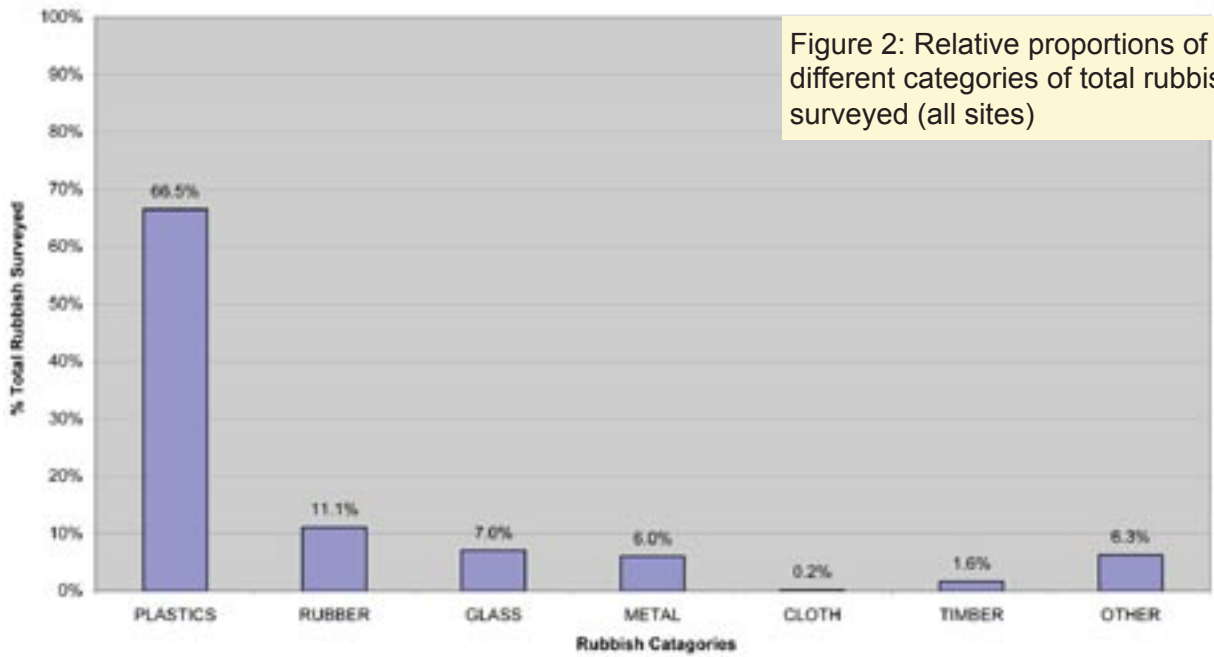


Figure 2: Relative proportions of different categories of total rubbish surveyed (all sites)

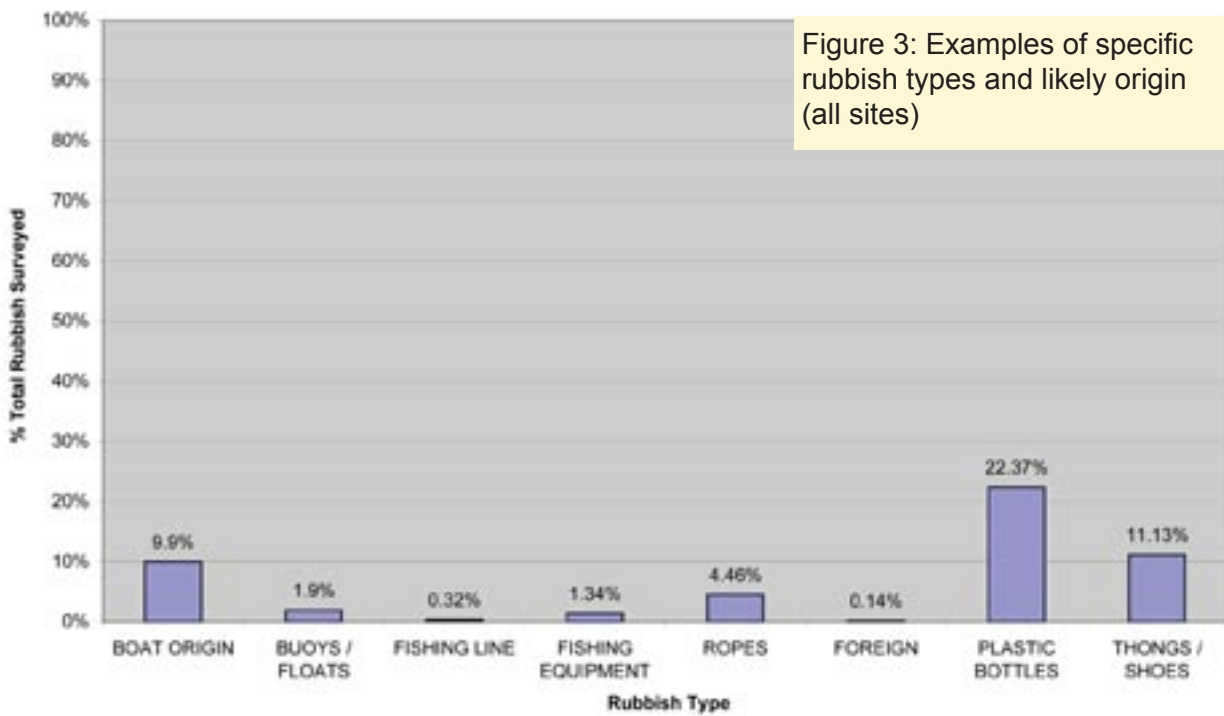


Figure 3: Examples of specific rubbish types and likely origin (all sites)



L-R: Knob Point, disposable camera, fishing net on King Island

Findings

In terms of the overall rubbish (6197 items), Archer Point again fared the worst (3717 items of rubbish recorded for its 900m long survey area). Knob Point (748 items, 10m) and Cape Melville (743 items, 1500m) recorded similar totals, although considering Knob Point's small search area, its density of rubbish was much greater. These totals were followed by King Island (613 items, 640m), Three Isles (139 items, 105m), Lloyd Bay (110 items, 900m), and Stapleton Island (85 items, 270m). These amounts and densities of rubbish were still high enough to detract from the aesthetic beauty of these beaches and potentially contribute to ecological impacts. In comparison, Coquet Island (23 items, 1900m) and Sandbank No.8 (19 items, 1000m) recorded much lower amounts of rubbish.

Determining the origin of much of the rubbish proved difficult, however 9.9% of rubbish was confirmed to be of boat origin and 0.14% confirmed to be from foreign sources (ie floated from overseas). The foreign-sourced rubbish is more likely to make up at least 4 to 10% of the total, based on surveys at Archer's Point where some bottle types, specifically the KKK bleach bottles, were identified as being from Papua New Guinea. These distinct bottles were observed in large quantities at all survey sites, however were not identified or categorised as foreign until several bottles with labels in tact were found at Archer's Point. How these bottles came to be on Cape York beaches is not known, but anecdotal reports from Papua New Guinea tell of these bottles being frequently observed in rivers there, where locals do their washing and then discard of the bottles. It is possible that these bottles, and other plastics, are being washed from PNG into the Coral Sea Gyre (Figure 4), floating south and then back north along the Australian coast.

The majority of rubbish was presumed to have originated from domestic / land sources, most likely transported along creeks and rivers. A small percentage had been directly discarded onto beaches. There is anecdotal evidence of rubbish from as far south as Townsville ending up on southern Cape York beaches after floods.

Figure 3 shows some of the different types of rubbish observed at all sites in relation to one another. Note that percentages for 'Boat Origin' and 'Foreign' are not directly comparable to the other percentages given (ie 'Boat Origin' actually includes the buoys, fishing lines etc). The problem of high numbers of plastic bottles and thongs / shoes is apparent.

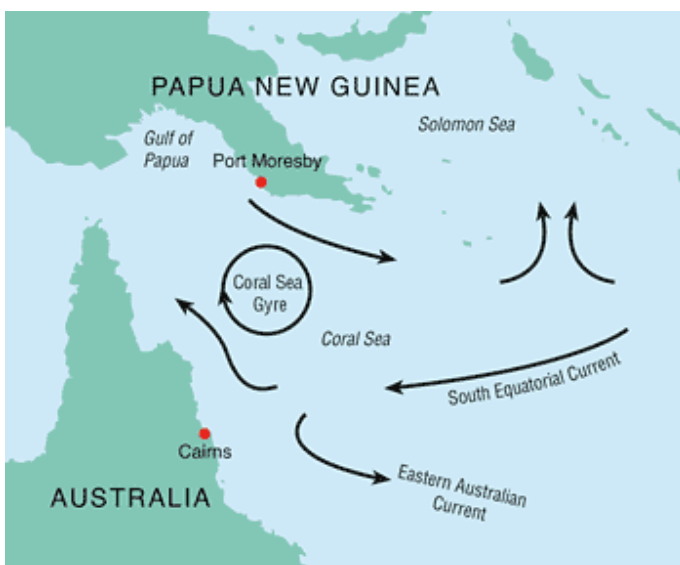


Figure 4: Coral Sea Gyre
(source: CSIRO website
www.cmar.csiro.au/news/media/archive/02releases/9dec02.html)

Loading rubbish for removal from Knob Point



Discussion

Eastern Cape York beaches are suffering a significant rubbish problem as evidenced by the thousands of items of rubbish recorded by field workers during the 2007/2008 survey.

The majority of this rubbish was found to be of the type that will persist in the environment, taking hundreds of years to break down. The prevalence of Plastics, including plastic bottles, bottle caps, ropes and plastic bags (to name a few) is of particular concern. As many people now realise, plastics are not biodegradable. They instead 'photodegrade', breaking into smaller fragments which persist for hundreds of years. Plastics bags last for an estimated 100-400 years and plastic bottles for 450 years. Monofilament fishing net is an even worse offender taking approximately 600 years. (Reference: <http://www.deh.gov.au/plasticdebris> & Coral Reef Alliance Information Sheets).

Because of the daily exchange between land and sea, CYMAG members are concerned that vast amounts of the rubbish cycling onto Cape York's beaches are entering and re-entering the marine environment each year. Coastal watercourses act as collecting points for rubbish during rough seas and heavy wind conditions. This rubbish is then recycled back to sea when these creeks flow after heavy rains. All of the types of "harmful marine debris" as defined by the EPBC Act (see p3) were present in significant numbers. Many Vulnerable Species in the area, including Flatback turtles, Hawksbill turtles and Green turtles, are therefore being exposed to the possibility of slow and painful deaths. This affects species populations as well as individuals.

The Crab Island Scoping Study recorded a number of large nets and other marine debris and in one instance, observed foreign marine debris preventing 81% of turtle hatchlings from one clutch from successfully excavating to the sand surface. Marine mammals are also highly impacted by the floating debris - over 6m of plastic was found in the stomach of a whale which died of unknown causes on a Cape York beach. The full effect of marine debris on populations of turtles, and other marine animals has not been documented.

When it came to identifying the primary sources of rubbish on Cape York beaches (boats vs land-based, foreign sources vs local), field workers faced some difficulties. The origins of most of the plastic bottles, for instance, simply couldn't be determined in the field - the bottles could have come from anywhere. As a result, the Foreign objects percentage calculated (0.14%) may not reflect true numbers. While objects with foreign markings were presumed to have come from overseas (thrown over a boat or floated from overseas), others lacked any identifiers. Many of the theories regarding currents bringing rubbish to Cape York are speculative. Locals believe most of the rubbish comes on the currents from Townsville and Cairns after storms. Another theory suggests rubbish is travelling from Fiji and in the case of ghost nets (in the Gulf of Carpentaria at least), this type of rubbish is probably originating from Indonesia. The prevalence of bleach bottles originating from PNG indicates that plastic objects may be entering the Coral Sea Gyre from PNG and floating south to eventually end up on Cape York beaches. One thing is plainly clear: more detailed investigations into the origins of the rubbish recorded by this survey is warranted.

Recommendations

The surveys and rubbish clean-ups carried out by volunteers to date are considered “just a beginning”. Given that Cape York Peninsula and the far northern Great Barrier Reef are otherwise relatively in tact and in good overall condition compared with many other parts of the continent, CYMAG Environmental believes this issue deserves immediate attention and that great gains can be made from positive intervention. Based on the findings of this report, the group recommends the following actions:

- Conduct a large-scale clean up of Eastern Cape York beaches to remove the majority of rubbish from the system;
 - Carry out follow-up surveys in Northern Cape York Peninsula; and
- Address the sources of the rubbish, beginning with investigations into some of the specific problems identified, eg source of KKK bleach bottles and actions to stop rubbish being disposed of overboard.

Local publicity associated with the CYMAG rubbish surveys has greatly raised public awareness of the problem, and has led to two community based beach clean-ups with several more in the planning stages. However, while community based clean-ups can provide excellent results in accessible areas, there are many areas with high concentrations of rubbish that are not accessible to community groups. For these areas, large-scale government support is required to overcome the logistical difficulties of accessing and removing the rubbish from remote beaches.

Compelled to act on the problem, CYMAG Environmental is optimistic that with enough support, a substantial impact could be made on the present rubbish problem - along the beaches, in the local marine environment and at the source. Because the actions required are clear and achievable, all affected Cape York Beaches should be given a chance to enjoy a rubbish-free future.



Crested terns