

## Marine litter in the Wider Caribbean Regional overview and proposed Action Plan

### Introduction



The Wider Caribbean Region (WCR) is defined as the area delineated by the UNEP Regional Seas Programme and includes insular and coastal States and Territories with coasts on the Caribbean Sea and Gulf of Mexico as well as waters of the Atlantic Ocean adjacent to these States and Territories. The area covers 28 island and continental States, plus several islands which are dependent territories. Four States (France, The Netherlands, United Kingdom, and the United States) also participate in the Caribbean Environment Programme with their dependent territories or associated states within the region. There are 13 dependent territories, all islands (except for French Guiana), grouped by their respective metropolitan countries as follows: five overseas territories of the United Kingdom (Anguilla, British Virgin Islands, Cayman Islands, Montserrat, and Turks and Caicos); three French overseas regions or departments (Guadeloupe, Martinique and French Guiana, including two French overseas collectivities (St. Barthélemy and St. Martin), two self-governing units of the Netherlands (Aruba and the Netherlands Antilles), an organized, unincorporated U.S. territory (U.S. Virgin Islands), and a U.S. territory with Commonwealth status (Puerto Rico). Taking the 28 states together with their 13 dependent territories, 41 political units participate in the Caribbean Environment Programme of UNEP Regional Seas. The surface area of the WCR is about 3.3 million km<sup>2</sup>,

with an average depth of 2,200 m and coastal length of 55,383 km. Some 41 million people live within 10 km of the coastline.

The Caribbean Environment Programme (CEP) was established in 1976 and is one of the UNEP – administered Regional Seas Programmes (RSPs). The CEP is managed by and for the countries of the WCR through the Caribbean Action Plan (1981) outlining regional environmental challenges. The Action Plan led to the 1983 adoption of the Convention for the Protection and Development of the Marine Environment of the WCR (Cartagena Convention), which provides the legal framework. The Convention, which entered into force in 1986, has been supplemented by three protocols addressing specific environmental issues: oil spills; specially protected areas and wildlife; and pollution from land-based sources and activities. The CEP provides the programmatic framework for the Convention. The Caribbean Regional Co-ordinating Unit (CAR/RCU) located in Kingston, Jamaica (created in 1986) serves as Secretariat to the CEP.

Marine litter (ML) is a significant pollution issue for the Caribbean region, damaging valuable natural resources including wildlife and sensitive aquatic and coastal habitats, affecting the quality of life of local inhabitants and visitors, and impacting the base economies and sustainability of the entire region. The ubiquitous presence of marine litter, coupled with its physical, ecological, cultural, and socio-economic complexities, poses one of the most severe threats to the sustainability of the Caribbean's natural resources – its sensitive habitats, wildlife and people.

UNEP CAR/RCU with support from UNEP's RSP conducted a pilot project on the development of a "*Regional Action Plan on the Sustainable Management of Marine Litter in the Wider Caribbean*" (RAPMaLi), with the objective to assist in the environmental protection and sustainable development of the WCR. As part of this project, a review document ("*Marine Litter in the Wider Caribbean: A Regional Overview*") was prepared on the existing status of marine litter issues and programmes and reviewed at a workshop in Aruba (February 2007) jointly with International Maritime Organization/Regional Marine Pollution Emergency, Information and Training Centre. Information for this assessment was obtained by UNEP's Caribbean regional consultant for marine litter, through background research and interactions with various participating States in the compilation of surveys and interviews with government representatives, as well as UNEP Focal Points and appointed national consultants. The development of the draft RAPMaLi involved a host of international, regional and national experts who work on marine litter and other related conservation issues in the WCR. The RAPMaLi is a work in progress and is being integrated into national and regional programmes as appropriate and implemented as funding becomes available.

This chapter presents a summary of both the Regional Assessment document and the RAPMaLi. Full copies of these documents are posted on the UNEP-CAR/RCU website for public review ([www.cep.unep.org/operational-components/amep/marine-litter](http://www.cep.unep.org/operational-components/amep/marine-litter)).



**BEACH LITTER IN THE CARIBBEAN.**

## **Assessment of the status of marine litter**

### **Overview**

Marine litter is more than an unsightly inconvenience for beach-bound vacationers or pleasure boaters; it's one of the world's most pervasive pollution problems affecting our oceans and inland waterways. It affects the economies and inhabitants of coastal and waterside communities worldwide. Over the past 40 years, organic materials (once the most common forms of litter) have yielded to synthetic elements as one of the more abundant components of solid waste. Durable and slow to degrade, plastic materials that are used in the production of packaging for beverages, food and a host of other products, made into packing straps and tarps, and synthetic nylon materials used in fishing line and gear can all become marine debris if they are discarded improperly into the marine environment. In addition, many of these items are highly buoyant, allowing them to be carried in currents for thousands of miles, endangering sensitive marine ecosystems and wildlife along the way. Cigarette filters and cigar tips, fishing line, rope and gear, baby diapers and nappies, six-pack rings, beverage bottles and cans, disposable syringes, batteries, tires – the litany of litter is as varied as the products available in the global marketplace, but it all shares a common origin. At a critical decision point, someone, somewhere, mishandled it, either thoughtlessly or deliberately while on land or on the water.

Marine litter is a significant pollution issue for the Caribbean region damaging valuable natural resources of wildlife and sensitive aquatic and coastal habitats, affecting the quality of life of local inhabitants and visitors, and impacting the base economies and sustainability of the entire region. Analysis of the available ML data collected in the Caribbean region through various beach and underwater cleanup activities conducted by local community groups and government agencies indicates that the dominant source of marine litter is land-based (Coe and Rogers, 1997, UNEP, 2006 and Ivar do Sul and Costas, 2007). The ubiquitous presence of marine litter, coupled with its physical, ecological, cultural, and socio-economic complexities, poses one of the most severe threats to the sustainability of the natural resources of sensitive habitats and wildlife and people of the region, and indeed the world as a whole.

Much of the debris reaches the ocean after being dumped along roadsides or into creeks, rivers, storm drains and sewers. It is then is carried into ocean areas by beach visitors when they neglect to take their "picnic" trash and litter home when they leave the beach, or it is passed from landfills (waste dumps) due to storms and coastal flooding. Other marine litter comes from activities on the water, including vessels (from

small power boats, sailboats and yachts, to subsistence and commercial fishing vessels and large transport ships carrying human cargoes and commercial goods), fishing piers and marinas.

One of the most significant features of the Caribbean region is related to its hydrography and its relationship to the transboundary effects of marine litter throughout the region. The Caribbean Sea is dominated by the flows of the North Equatorial Current and, to a lesser degree, the South Equatorial Current which filters westward through the Lesser Antilles near Trinidad and Tobago (UNEP, 1984).

The hydrography of the Gulf of Mexico is more complex. The Caribbean Current enters the Gulf via the Yucatan Channel and exits to the east through the Straits of Florida as the Gulf Stream. In between, the Gulf Loop Current may take a variety of routes (Van Vleet *et al*, 1983).

Circulation in the western Gulf of Mexico is less understood. The main body of the western Gulf is dominated by an anti-cyclonic gyre off Louisiana, Texas, and northern Mexico. Although eddies from the Loop Current occasionally pinch off and enter the western Gulf, there seems to be little exchange between the two areas, especially for the western to the eastern Gulf (Van Vleet *et al*, 1983 and Atwood *et al*, 1987).

Watershed dynamics related to freshwater entry from rivers and canals into the ocean are also important within the region as they relate to land-based sources of marine litter. The flow of these currents as they shift seasonally has a direct effect on the presence and deposition of marine litter in the region.



NO CAPTION NEEDED? WHAT KIND OF TURTLE IS THIS?

### **Marine litter data summary (1989-2005)**

Winds, waves, currents, and regional land-use activities along with seasonal climatic variations can influence marine litter patterns and trends in deposition. Seasonality in debris patterns and trends should be considered when assessing the types, amount and sources. In the Caribbean region, which has weather patterns that can vary from island to island, but are dominated by a tropical climate with classic wet and dry seasons, the weather is conducive to year-round beach and other water-related activities thus resulting in a more regular influx of marine litter and other pollutants.

Many organizations are engaged throughout the year in a variety of debris removal activities from beaches, mangroves and other sensitive coastal habitats, including coral reef areas. However, the most consistent activity for marine litter monitoring in the Caribbean region is associated with the annual efforts conducted through the global beach cleanup event known as the International Coastal Cleanup, which is coordinated by the Ocean Conservancy – a U.S. marine conservation and advocacy organization. Data from the International Coastal Cleanup (ICC) is recorded by category related to most dominant sources and documented activities that have been shown to generate various forms of litter ([www.oceanconservancy.org/icc](http://www.oceanconservancy.org/icc)).

During the period of 1989-2005, marine litter data was documented during the annual ICC in 28 countries of the Caribbean region where a total of 6,781,537 debris items were removed from shoreline areas and

WIDER CARIBBEAN

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underwater sites covering 12,139.5 miles by 440,544 volunteers and supporters. The following table summarizes the debris item counts per source category:

<b>Caribbean ICC Debris Items</b>	<b>Total Counts (1989-2005)</b>
<b>Shoreline &amp; Recreational Activities</b>	
Bags	716,182
Balloons	23,333
Beverage Bottles (Glass)	467,801
Beverage Bottles (Plastic) 2 liters or less	716,070
Beverage Cans	289,825
Caps, Lids	805,165
Clothing, Shoes	211,548
Cups, Plates, Forks, Knives, Spoons	768,745
Food Wrappers/Containers	514,281
Pull Tabs	129,019
Shotgun Shells/Wadding	7,125
Six-Pack Holders	127,066
Straws, Stirrers	327,278
Toys	52,463
<b>Ocean/Waterway Activities</b>	
Bait Containers/Packaging	10,394
Bleach/Cleaner Bottles	140,924
Buoys/Floats	43,974
Crab/Lobster/Fish Traps	18,309
Crates	14,516
Fishing Line	32,648
Fishing Lures/Light Sticks	41,001
Fishing Nets	30,931
Light Bulbs/Tubes	47,914
Oil/Lube Bottles	140,359
Pallets	50,865
Plastic Sheeting/Tarps	61,493
Rope	84,753
Strapping Bands	22,350
<b>Smoking - Related Activities</b>	
Cigar Tips	26,257
Cigarette Lighters	35,185
Cigarettes/Cigarette Filters	427,933
Tobacco Packaging/Wrappers	29,683
<b>Dumping Activities</b>	
55-Gallon Drums	27,341
Appliances (refrigerators, washers, etc.)	3,544
Batteries	7,481
Building Materials	141,688
Cars/Car Parts	11,505
Tires	28,223
<b>Medical/Personal Hygiene</b>	
Condoms	22,269
Diapers	74,311
Syringes	23,056
Tampons/Tampon Applicators	26,729
<b>DEBRIS TOTALS</b>	<b>6,781,537</b>

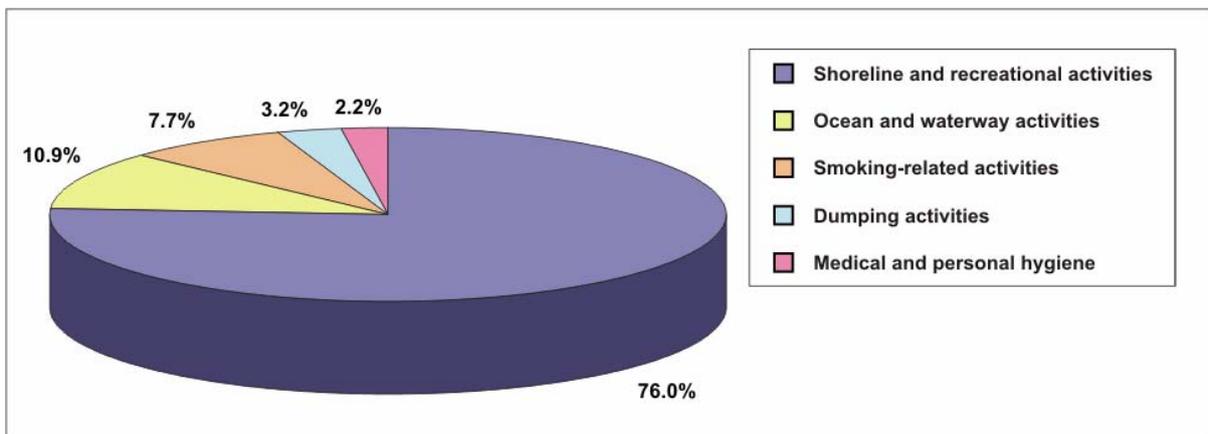
**Marine litter source categories and indicators**

The following are the types of debris generally associated with activities and sources that have been documented by researchers and assessed from data collected during the annual ICC and used in the Caribbean region for select monitoring and outreach efforts:

Debris sources & activities	Marine litter indicators
Shoreline & recreational: indiscriminate and intentional littering by beachgoers, picnickers, participants at waterside sports and festival events, washing down creeks and rivers, and litter carried from streets, drains, gutters and culverts.	Bags, balloons, beverage bottles (plastic) 2 liters or less, beverage bottles (glass), cups/plates/forks/ knives/spoons, food wrappers/containers, pull tabs, 6-pack rings/holders, shotgun shells/wadding, straws/stirrers, children’s toys
Ocean/waterway: improper handling of solid wastes from recreational fishing/boating, subsistence/commercial fishing and shipping, military ships, cruise ships, and oil and gas offshore rigs.	Bait containers/packaging, bleach/cleaner bottles, buoys/floats, crab/lobster/fish traps, crates, fishing line, fishing lures/light sticks, fishing nets, light bulbs/tubes, oil/lube bottles, pallets, plastic sheeting/tarps, rope, strapping bands for packaging/cargo
Smoking: improper disposal and littering of smoking-related materials and packaging by smokers.	Cigarettes/cigarette filters, cigarette lighters, cigar tips, tobacco packaging/wrappers
Dumping: improper disposal of building and construction materials, drums, tires, cars/car parts, household trash and appliances.	Appliances, car/marine batteries, building materials, cars/car parts; 5 to 55-gallon drums, tires
Medical/personal hygiene: discarded materials into sewer systems, dumped into storm drains (along roadways and culverts), toilets, and litter left by beachgoers.	Condoms, diapers, syringes, tampons/tampon applicators passed from sewage systems NOTE: Discarded medical supplies and expired medicines are also a potential hazardous debris/litter source.

**Marine litter sources in the Caribbean (1989-2005)**

The dominant source of marine litter documented in the historical ICC data from the Caribbean region is attributed to land-based-sources (LBS) at 89.1 percent, with 10.9 percent attributable to ocean-based sources (OBS). Land-based sources of debris are reported to have a profound impact on tourism (and other economic sectors), as well as human health and safety. Ocean-based debris forms (e.g. fishing nets, gear and supplies, rope, fish traps, sheeting/tarps, and strapping bands) can also be very harmful to wildlife (entanglement and ingestion) and damaging to sensitive aquatic habitats, including coral reefs and sea grass beds. All of these can have monumental impacts on the region, its resources and its people.



Shoreline/Recreational Activities (LBS), Ocean/Waterway Activities (OBS), Smoking Activities (LBS), Dumping Activities (LBS), Medical/Personal Hygiene (LBS).

\*Source: Ocean Conservancy, ICC Data Reports. [www.oceanconservancy.org/ICC](http://www.oceanconservancy.org/ICC)

### **Dominant marine litter forms**

When the Caribbean ML data is reviewed according to the count (number of pieces) collected during the annual ICC events, the composition of debris is dominated by the presence of remnants of convenience containers, packaging for food and beverages and smoking materials. This can be translated into a behavioural pattern exhibited by the public, wherever the caps of their favourite beverages litter the ground and their utensils and containers from consuming fast-foods end up somewhere other than an appropriate trash receptacle. Discarded beverage containers can be listed in a hierarchy from plastic to glass to metal, corresponding to apparent regional recycling efforts: metal cans are recycled more than glass, and glass more than plastic. Discarded cigarette filters are ubiquitous, a testament to poor smoker waste handling.

The following “Top Ten” listing of the debris collected in the Caribbean region from 1989-2005 provides a “roadmap” as to what people are doing to create the litter problem. The leading debris forms are associated with packaging and containers, smoking materials, and abandoned clothing left at the beach and are land-based sources:

<b>“Top 10” marine litter types collected in the Caribbean region in the ICC 1989 – 2005</b>	
<b>1. Caps &amp; lids</b>	<b>11.9%</b>
<b>2. Cups, plates, forks, knives, &amp; spoons</b>	<b>11.3%</b>
<b>3. Bags</b>	<b>10.6%</b>
<b>4. Beverage bottles (plastic – 2 liters or less)</b>	<b>10.6%</b>
<b>5. Food wrappers &amp; containers</b>	<b>7.6%</b>
<b>6. Beverage bottles (glass)</b>	<b>6.9%</b>
<b>7. Cigarettes &amp; cigarette filters</b>	<b>6.3%</b>
<b>8. Straws &amp; stirrers</b>	<b>4.8%</b>
<b>9. Beverage cans</b>	<b>4.3%</b>
<b>10. Clothing &amp; shoes</b>	<b>3.1%</b>
<b>Total</b>	<b>77.4%</b>

Source: Ocean Conservancy, ICC Data Reports. [www.oceanconservancy.org/ICC](http://www.oceanconservancy.org/ICC)

Comparing the “Top 10” during the past five years provides a bit of different view on the habits of the citizens in and visitors to the region. Beverage containers (plastic), along with their caps and other disposable materials, top the list and are followed closely by an increased level in cigarette-related litter and glass beverage containers. Food and metal beverage container wastes round out the list, again ending with abandoned clothing left, no doubt, at the beach after a long day of fishing, swimming and sunbathing.

When examining the ML data, abundance is not the only criteria for consideration. Some debris forms have the potential to be more harmful than others. For example, the potential impact to the environment and wildlife of 10 abandoned fishing nets or a bundle of discarded monofilament line could be far greater than 10,000 bottle caps or 1,000 cigarette filters. The types of debris must also be evaluated.

A comprehensive report, *Marine Litter in the Caribbean*, including detailed country reports on marine litter composition and analysis, is available in PDF format and is posted on the UNEP CEP website (<http://www.cep.unep.org/operational-components/amep/marine-litter>).

### **Problems and impacts associated with marine litter in the Caribbean region**

**Economy/aesthetics:** Marine litter that collects along the beautiful beaches and waterways in the Caribbean detracts from the aesthetic beauty and enjoyment of those areas. It also impairs the enjoyment of these resources by locals, and negatively affects tourism. The result is extensive expenditures by both the private and public sectors of valuable and very limited financial resources and manpower to maintain these areas.

**Human health and safety:** Litter can also be a human health and safety hazard. Discarded fishing line, rope and plastic bags can wrap around and damage boat propellers, or be sucked into boat engines. Medical wastes and drug paraphernalia lying on beaches can carry diseases, and broken glass and other sharp objects lie in wait for a child's bare foot.

**Habitat destruction:** Marine litter can also result in habitat destruction by affecting water quality and causing physical damage to sensitive ecosystems. The coral reefs in the Caribbean are very susceptible to the impacts of marine litter as well as sea grass beds and bottom-dwelling species occupying these underwater habitats.

**Wildlife:** Aquatic (and also many shore-based) wildlife can often have lethal encounters with marine litter. Many species, including sea turtles, seabirds, and other wildlife in the Caribbean, accidentally ingest trash, mistaking it for their food. Abandoned fishing nets and gear, discarded fishing line and other forms of debris can become entangled on coral reefs damaging them extensively and pose a hazard to other marine wildlife.

### ***Sources of marine litter***

Determining where all of the marine litter originates is no easy task since trash and litter can travel long distances before being deposited on our shorelines or settling on the bottom of the ocean, bay, or riverbed. Marine litter sources are generally classified as either land-based or ocean/waterway-based, depending on how the debris enters the water. Other factors such as ocean current patterns, climate and tides, and proximity to urban centres, industrial and recreational areas, shipping lanes, and fishing grounds influence the types and amount of debris that are found on the open ocean or collected along beaches and waterways or under water.

Marine litter from land-based sources blows, washes, or is discharged into the water from adjacent land areas. Sources include beachgoers; fishermen; materials manufacturers, processors, and transporters; shore-based solid waste disposal and waste processing facilities; sewage treatment and combined sewer overflows; inappropriate or illegal dumping; and general public littering.

Both legal and illegal waste handling practices contribute to marine litter. These include the inadvertent release of trash from coastal landfills and garbage illegally dumped from water transports; recreational beach and roadside litter; and the illegal dumping of domestic and industrial garbage into coastal and marine waters.

People also generate marine litter when at sea. Ocean/waterway-based contributors include subsistence and commercial fishing boats/vessels; merchant, military, and research vessels; recreational boats and yachts; cargo and cruise ships; and offshore petroleum platforms and associated supply vessels. Litter can end up in the water through accidental loss or system failure; antiquated waste management practices; or illegal disposal and indiscriminate littering and dumping.

## **Legislation, policies and institutional arrangements**

### ***Legislation***

When confronted with the harmful effects of marine litter on sensitive ocean and vulnerable coastal habitats, most people's first reaction is, "There ought to be a law against this!" In fact, many such laws do exist. After years of irresponsible dumping practices, there are now laws regulating at sea and shore-side dumping. Unfortunately, the widespread nature of marine litter, its ability to traverse territorial borders, and the difficulties in identifying the sources have made effective laws difficult to draft and even harder to enforce. In the Caribbean region there are various examples of laws and policies related to solid waste and littering that have been developed and which form a substantial foundation for a strategy to address the broad-based issue of marine litter.

The types of regulations that currently exist in the Caribbean region related to marine litter include legislation that focuses on public health and sanitation, watershed management, sewerage and wastewater management, solid waste management, coastal zone management, resource management efforts (including fisheries, habitat conservation/protection, and species protection), shipping and port regulations, recycling of (beverage) containers and other materials, dumping regulations, and general anti-littering laws. A listing of the various laws and policies that are currently in operation in select countries of the region are

described in the report “*Marine Litter in the Wider Caribbean: A Regional Overview*” posted on the UNEP CAR/RCU website: (<http://www.cep.unep.org/operational-components/amep-resources/marine-litter>)

Regionally there are no specific laws that address marine litter, except for the United States with the “Marine Debris Research, Prevention and Reduction Act” which establishes a program to identify, assess, reduce and prevent marine debris and its effects on the marine environment. This was ratified in December 2006 and is currently being implemented into key federal programmes. For more information, visit: [www.ocean.us/node/524](http://www.ocean.us/node/524) or [www.commerce.senate.gov/pdf/marinedebris\\_mark.pdf](http://www.commerce.senate.gov/pdf/marinedebris_mark.pdf).

### ***International and regional treaties and conventions***

While there are laws regulating the dumping of trash at sea and on shore, the global nature of marine litter, its inability to be confined within territorial boundaries, and the complexity of identifying litter sources have made effective laws difficult to draft and even harder to enforce. There are several existing regional and international treaties and conventions that address the jurisdiction and handling of marine litter from land-based and ocean-based sources in the Caribbean region and across the globe.

The international and regional treaties and conventions that address various aspects of marine litter relative to the Caribbean region include:

- Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (London Convention), 1972
- International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), Annex V and “Special Area” designation
- United Nations Convention on the Law of the Sea (UNCLOS), 1982
- Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (Cartagena Convention, 1996) and Protocol on Marine Pollution from Land-based Sources and Activities (signed in 1999)
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
- FAO Code of Conduct for Responsible Fishing
- Fish Stocks Agreement (UNFSA)
- Regional Fishery Management Organizations (RFMOs)

### ***Institutional arrangements***

An extensive regional network exists in the Caribbean, which brings together numerous agencies, organizations and associations involved in the management of ML – its creation, handling, abatement, and prevention. It includes health, environmental, conservation, education, tourism, and waste management bodies. Which, through their regional and local programmes and initiatives for solid waste and natural resource management and other related activities, form a powerful base for regional interaction and collaboration in dealing with the marine litter problems that plague the region.

Several international organizations are positioned to address marine litter problems in the Caribbean region through their programming and institutional collaborations. Some have been doing so for some time. These are: International Maritime Organization (IMO), United Nations Educational, Scientific, and Cultural Organization (UNESCO), Intergovernmental Oceanographic Commission (IOC) and the Sub-Commission for the Caribbean and Adjacent Regions of the Intergovernmental Oceanographic Commission of UNESCO (IOCARIBE), and the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (UNEP/GPA).

Other regional organizations have also supported activities related to marine litter and form a solid foundation for a regional initiative. The leading regional coordinating group is the United National Environment Programme/Caribbean Environment Programme (UNEP-CEP), which is the Secretariat for the Land-Based Sources (LBS) of Marine Pollution Protocol. Projects are implemented through: (1) the Caribbean Action Plan and (2) the Assessment and Management of Environmental Pollution (AMEP) Programme while also supporting Global Programmes such as implementation of the Programme of Action for the Small Islands Developing States (SIDS) of the Eastern Caribbean and the SIDS Mauritius Strategy. (<http://www.cep.unep.org/>)

Other regional organizations with programmatic interests in marine litter reduction and prevention including the Organisation of Eastern Caribbean States, Caribbean Environmental Health Institute, Caribbean Network for Integrated Rural Development and Caribbean Shipping Association. Numerous conservation

organizations have taken the lead on addressing marine litter issues in their community-based programming, lead by the Caribbean Conservation Association and the Caribbean Youth Environmental Network.

With tourism representing such a substantial component of the economy in the Caribbean, several tourism-related organizations have been involved in various aspects of the marine litter issue including: Caribbean Shipping Association, Caribbean Hotel Association, Caribbean Alliance for Sustainable Tourism, Caribbean Tourism Organization, the International Council of Cruise Lines and the Florida-Caribbean Cruise Association.

Because marine litter problems have long been recognised as a problem by Caribbean governments, numerous national institutional arrangements have been developed to address this environmental problem. These include solid waste management agencies, environmental and natural resource agency conservation and management programmes, port authority operations, tourism board programmes, and maritime activities including fishing, boating, and other vessel operations.

In any effective pollution prevention initiative, successful partnerships between public and private sectors play a critical role in the success and sustainability of the effort. While the governments are typically charged with protecting the land and its people, they cannot and should not do this alone. Collaboration between these groups results in more efficient uses of resources and builds linkages between the government and its people. The establishment of a stewardship ethic among the people is essential in addressing pollution problems and their solutions.

### **Programmes and initiatives**

Few formal marine litter monitoring programmes currently exist within the Caribbean region. However, over the years various programmes have been conducted by groups of States. Numerous community clean-up programmes exist, but do not usually include the compilation of data on the types and amounts of marine litter for programme analysis. The leading effort to assess marine debris is conducted annually through the International Coastal Cleanup, which is held in most countries in the region.

National programme activities include beach cleanups and adopt-a-beach efforts, public awareness campaigns for litter prevention and solid waste management, education projects conducted by the local schools for conservation, programmes for nature and wildlife reserves on marine litter, monitoring activities for water quality and coral reefs that include marine litter components, and yachting and boating programmes for environmentally safe boating.

The International Coastal Cleanup (ICC), which is coordinated globally by Ocean Conservancy, is an annual campaign that consists of a vast grouping of partners and participating countries that focus on public awareness of the marine debris issue and the collection of data on debris amounts, types and sources. One of the ICC's primary goals is to trace pollution to its source and work to prevent it from occurring. Volunteers record marine debris information on data cards that identify the types, sources, and activities that produce the debris found along beaches and waterways. Information on the data card is grouped by the behaviour associated with the debris, including recreational, beach-going activities, smoking-related activities, ocean and waterway activities, activities associated with legal or illegal dumping, or activities resulting from improper disposal or handling of medical or personal hygiene materials. Data from the Cleanup provides the framework for government action to limit marine debris and to educate the public about litter and pollution prevention. Since 1989, as many as 28 countries in the Caribbean region have participated in the annual ICC event.

### **Strengths, gaps and needs**

Successful management of the problem of marine litter requires a comprehensive understanding of this issue including identifying the dominant forms of marine litter, their abundance and potential sources, and most importantly, the human behaviours and activities producing it. Conducting effective documentation and monitoring activities to assess the types and amounts of marine litter, coordinated public education programmes and waste management strategies, implementing effective policies supported by regional and international treaties and conventions, enforcement and compliance with national and local legislation and regulations, and governmental and private sector support can form the foundation for successful marine pollution prevention interventions that will ultimately lead to the reduction and abatement of the marine litter problems impacting the continental coastal regions and small islands of the Caribbean region (Sheavly, 2005).

Through surveys conducted by the UNEP CAR/RCU Marine Litter Project with select national consultants, National and Marine Litter Focal Points, and other research, the following gaps and needs related to marine litter management were identified:

- **National monitoring programmes.** The need for establishment of national marine litter monitoring programmes was expressed so that information could be collected on a regular basis and used for programme development and assessment of interventions and reduction strategies. A regional database needs to be established so that this information is accessible throughout the region.
- **Assessment of impacts of marine litter.** Research needs to be conducted to determine the various impacts of marine litter on wildlife and habitats and other indicators (e.g. invasive species transport and toxicity due to ingestion of materials). In addition, the economic impacts of marine litter need to be assessed to help prioritize and quantify the economic impact of this issue within government programmes, business and industry groups, and the public.
- **Education campaigns.** A comprehensive strategy needs to be developed and implemented for an education campaign series that can be accessed by government agencies and other organizations that includes radio and television advertisements, printed educational materials (brochures, posters) that can be used by government agencies, NGOs, business and industry groups, and educational components (curriculum aids/activity sheets) for use by educators in the integration of this issue into the school curriculum.
- **Effective legislation and enforcement.** Existing waste management legislation needs to be evaluated for its effectiveness and whether or not it is being enforced. In most cases, substantial legislation and regulations exist, but are poorly enforced due to a variety of reasons. MARPOL Annex V needs to be assessed to determine if it is functioning effectively in terms of reduction/prevention of ocean-based sources of marine litter.
- **Establish responsible government authority.** The authority for management of the marine litter issue in a country is spread among several agencies or not identified specifically. This line of responsibility and authority needs to be restructured to be more effective. Many agencies have partial responsibility for select components which leads to a division of resources and ineffectiveness in overall management of this issue. Collaborations between NGOs and government agencies where authority is defined and authorized between these groups could strengthen management and control efforts.



LOADING COLLECTED LITTER FOR DISPOSAL.

## Recommendations for improvement

Despite knowing the causes of marine debris and how it enters the environment, we continue to facilitate its deposition. Alternative materials that are less invasive or harmful to the environment exist, but they have not been successfully integrated into the economic mainstream. Lack of enforcement and inadequate compliance with existing laws that seek to control and prohibit marine litter make those laws ineffectual.

To fight these developments, we must create national strategies and opportunities that encourage people to reduce and eliminate marine litter. We must continue with current efforts by governments and the private sector to increase awareness, establish debris abatement programs, and change behaviours that ultimately lead to marine litter impacting our ocean. Successful management of the problem requires a comprehensive understanding of both marine litter and human behaviour. Education and outreach programs, strong laws and policies, and governmental and private enforcement are the building blocks for successful marine pollution prevention initiatives.

## Proposed Regional Action Plan for Marine Litter (RAPMaLi) Management in the Wider Caribbean

The following recommendations are presented as a regional framework for marine litter management in the Caribbean region. Most of the proposed actions will need to be implemented at the national level, with a select group applicable on the regional level. These actions incorporate a prevention and/or responsive approach to addressing marine litter issues plaguing the Caribbean. UNEP-CAR/RCU will function as a coordinator of information and facilitator of new strategies and initiatives, as appropriate, for addressing marine litter issues in the region and ensuring synergies with other regional strategies and initiatives for pollution prevention, reduction and control and an integrated approach to solid waste management in the region.

Development of the draft “Regional Action Plan” has involved a host of international, regional and national experts who work on marine litter and other related conservation issues in the Wider Caribbean Region. These experts included key UNEP staff, an international marine litter consultant, various government representatives associated with coastal zone management, environmental protection, fisheries, solid waste management, and tourism. Representatives from regional and national conservation NGOs that manage marine litter programmes and activities and conduct annual beach cleanups were also engaged as national consultants for marine litter.

## Legislation, policies and enforcement

Numerous laws regulate litter and debris on both land and sea. Unfortunately, laws do not guarantee compliance. In addition to enforcement and penalties, a sense of environmental stewardship among ocean users is essential for laws to be effective. There are a host of national regulations and policies that are country-specific addressing solid waste management and other pollution concerns. However, specific marine litter legislation is very rare or not existent. Even when legislation exists, enforcement and compliance is often lacking.

An extensive array of national, regional and international policies currently exists in the Caribbean that forms a strong basis for dealing with marine litter problems. However, compliance issues exist in this region as they do in every other part of the world. In discussions with law enforcement representatives, who are besieged with a plethora of more serious, life threatening issues on a daily basis, the idea of processing tickets for littering violations or other waste management infractions were viewed as an impracticality. The importance of litter prevention and abatement must be elevated as a priority for coastal management.

**ACTION 1:** Evaluate existing legislation, regulations and enforcement practices that deal with marine litter and strengthen or enact new legislation/regulations as appropriate.

**ACTION 2:** Establish and/or enhance government sponsored “litter wardens or patrols” in coordination/collaboration with municipal police/security forces and establish the infrastructure for compliance.

**ACTION 3:** Participate in the review of MARPOL Annex V and implementation of Annex V Special Area status for the Caribbean region.

**ACTION 4:** Expand ratification and promote effective implementation of MARPOL Annex V and the LBS Protocol of the Cartagena Convention by all Caribbean States.

ACTION 5: Ensure that debris and ecosystem health issues are integrated into emergency management plans and procedures.

ACTION 6: Establish a clearinghouse of information on effective strategies and practices for enforcement of waste management practices.

ACTION 7: Mobilize resources for improving enforcement capacity for integrated waste management.

### **Institutional frameworks and stakeholder involvement**

Government management of the marine litter issue in most states is dispersed among multiple agencies or not specifically identified. Many agencies have partial responsibility for select components, which leads to a division of resources and ineffectiveness in overall management of marine litter-related issues. It has been suggested that there needs to be reduced fragmentation and identification of clear lines of responsibility and authority in order to be more effective. Collaborations between NGOs and government agencies where authority is defined and authorized between these groups could strengthen management and control efforts.

ACTION 1: Develop and implement a model of a national management plan for marine litter.

- Establish country-specific, integrated waste management programmes and projects that are within the context of a National Waste Management Strategy.
- Encourage the development of industry guidelines that could be included in National Management Plans
- Identify the key lead/responsible agency.
- Engage key stakeholders where a national agency is designated as the lead for this national effort.
- Establish or strengthen existing National Committees to ensure representation of all stakeholders and to identify clear roles and responsibilities.
- Conduct research and analyses related to marine litter that will be used to guide future policy decisions.
- Develop and implement an incentives programme to reduce marine litter.
- Develop economic instruments to provide opportunities for marine litter initiatives, such as recycling and reuse programmes.

ACTION 2: Establish the infrastructure for compliance with existing marine litter management legislation at the national and community levels.

ACTION 3: Establish a Caribbean Marine Litter Regional Working Group to coordinate and advise on appropriate actions for marine litter management.

ACTION 4: Provide training for judiciary/magistrates/enforcement officers and sensitization for politicians on marine litter issues.

ACTION 5: Present information on the marine litter issue at key environmental meetings and conferences in the region.

### **Monitoring programmes and research**

A national marine litter monitoring programme can support an expanded understanding of the problem and function as an ongoing component of management strategies that deal with this pollution issue. Monitoring can be used to clarify the problem of marine litter – e.g., what are the types, what are the sources, how widespread is the problem. Data and research on marine litter can be used to help formulate management solutions – which must in turn be implemented by management agencies with support from private sector. Objectives for monitoring must be clearly delineated. Policy could be developed through monitoring efforts to produce legislation or funding for source-reduction programmes, to assess trends, to identify pathways by which debris gains access to the water, to assess wildlife and habitat impacts, to identify point sources, to quantify economic impacts and to help enforce regulations (Farris and Hart, 1995; Coe & Rodgers, 1997; and Sheavly, 2005).

ACTION 1: Design and implement a strategy to develop national marine litter monitoring pilot projects in the Caribbean region, that are aligned with the UNEP Regional Seas Global Marine Litter Monitoring guidelines, including standardized methods for data collection and reporting.

ACTION 2: Develop a regional, web-based database as a clearinghouse for marine litter information and research.

ACTION 3: Engage all stakeholders at community, national and regional levels in monitoring and research efforts.

ACTION 4: Solicit information/research from fisheries, wildlife, and other resource management agencies and programmes throughout the region on the impacts of marine litter on wildlife and ecosystems.

ACTION 5: Utilizing the Marine Litter Economic Guidelines developed by UNEP-Regional Seas, UNEP-CAR/RCU will field test an assessment of the economic impacts of marine litter, including costs for cleanup efforts, maintenance of recreational beach areas, costs for lost or abandoned fishing gear, and the costs associated with the loss of recreational uses of coastal areas through a phased assessment.

ACTION 6: Conduct a GAP analysis of overlap of high density ML areas with areas of high sensitivity (endangered species, key habitats, etc) in order to prioritize clean-up and mitigation efforts.

ACTION 7: Review and disseminate research and information on the identification, removal and disposal of marine litter to enable more effective recovery efforts and disposal of marine litter.

### **Education and outreach**

A regional strategy needs to be developed for a marine litter education campaign that can be accessed by government agencies, NGOs and other related organizations in the Caribbean. This campaign would incorporate an expansion in promotion and participation in the annual International Coastal Cleanup (ICC) and be implemented through a variety of venues, including radio and television advertisements (PSAs), web-accessible materials, and printed educational materials (brochures, posters) that can be used by government agencies, NGOs, and business and industry groups. In addition, specialized educational components (curriculum aids/activity sheets) are needed for use by traditional educators to support the integration of this issue into the general school curriculum.

ACTION 1: Develop and implement community-based public education campaigns for marine litter prevention, including specialized marine litter prevention programmes for key user-groups and stakeholders.

ACTION 2: Develop a regional campaign for the International Coastal Cleanup (ICC). Since 1989, 28 countries in the Wider Caribbean have participated on various levels in the ICC.

ACTION 3. Incorporate cultural issues, including popular culture icons in outreach programming to promote behavioural change.

ACTION 4. Incorporate ML issues into other community calendars and environmental events.

ACTION 5. Explore opportunities for integrating issues on marine litter into formal education curricula and programming.

ACTION 6. Collate best management practices, case studies and lessons learned on marine litter management at the community and national levels and communicate these with UNEP-CAR/RCU for regional compilation and dissemination.

### **Solid waste management strategies**

Marine litter management is a significant component of solid waste management efforts in the Caribbean region. However, many national solid waste management strategies do not include specific activities relating to marine litter management. It is critical that there be an integration of marine litter management strategies with solid waste management strategies. An effort to coordinate programme activities, waste management strategies, and resources would prove beneficial for the people and environment of the Wider Caribbean Region.

ACTION 1. Maintain/develop specialized marine litter waste management strategies for public events – either as a separate strategy or part of an existing waste management strategy.

ACTION 2. Research hotel, restaurant and the marine transport industry BMP's for waste management practices and strengthen collaboration with the tourism sector for sharing of best practices and lessons learned.

ACTION 3. Develop and promote activities for national/regional recycling, reuse and waste diversion.

ACTION 4. Identify/promote international environmental certification programmes which include waste management and minimization.

ACTION 5. Maintain/develop specialized waste management strategies for marine litter problems associated with seasonal and/or weather-related events.

ACTION 6. Improve port reception facilities to effectively manage ship generated wastes.

Implementation of the Regional Action Plan for Marine Litter Management will be coordinated by the UNEP-CAR/RCU and will include the development of a process for assessment and evaluation of the plan through the identification of targets, milestones and indicators. In addition, efforts to identify funding resources will be spearheaded by UNEP-CAR/RCU with support from member States. Leveraging of resources will be explored for existing sources as well as the cultivation of new funding sources to support regional efforts for addressing marine litter.

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