LITTER CATCH UP
MARINE LITTER MONITORING PROJECT NEWSLETTER

December 2019
Standing Stock Survey

A standing stock survey was conducted at Mkomani beach in November, 2019. 3224 litter items were collected dominated by foam, plastic caps/ lids and food wrappers.

Accumulation Survey

The accumulation surveys were carried out between October and November, 2019 in Kwale County (Trade winds beach) and Mombasa County (Jomo Kenyatta beach). These are public beaches and therefore mostly receive high numbers of visitors during the holiday seasons (April, August and December). The surveys involved participation of the local community and project stakeholders- Kenya Wildlife Service (KWS) and KMFRI. 2,990 and 27,656 litter items were collected at Jomo Kenyatta beach and Tradewinds beach respectively.
Street Survey Ukunda

A street survey was carried out in Ukunda within the south of Coastal Kenya from 21st to 28th October 2019. The aim of the survey was to determine the relationship between the types of plastic bottles found on the streets and the plastic litter collected at the beach.

The sites involved were Ukunda road, Diani road, Airstrip road and Diani junction. Majority of the water bottles were locally manufactured in Ukunda and Mombasa followed by bottles from Tanzania.

Surface Trawl Survey

A surface trawl survey was carried out in October, 2019 in South Coast Kenya (Diani Mwakamba, Waa, Kinondo and Ndomeni). Four litter categories were identified- foam, hard plastic, fiber and soft plastic.
The Beginning of Madagascar’s Sampling!

It is the first time for Madagascar to characterise marine litter on the coastline. CETAMADA (Malagasy association) and CEDTM (French association, Reunion island) ran the marine litter monitoring project in Madagascar.

Sampling Site

To better understand the problem, two sites have been chosen on the east coast and on the west coast:

1: Nosy Be
2: Toliara
3: Fort Dauphin
4: Sainte Marie

For each site, two beach stations have been chosen:

1: Inhabited
2: Uninhabited
Accumulation Survey

October- Madagascar’s sampling has started! The 20 days have passed and 28 307 marine litter items were collected at the four sites with 2 stations each. Microplastics sampling took place only in Sainte Marie. All debris were collected thanks to 12 volunteers (students) and 4 environmental clubs.

Team Nosy Be

Team Toliara

Team Sainte Marie

Macro- litter

For Sainte Marie, 15 666 (446.74 kg) marine litter items were collected. Categories most represented were hard plastic, specifically fragments (2.5 cm -10 cm) on the uninhabited station and soft plastics, specifically packaging, on the inhabited station.

For Nosy Be, it was the same. 6 224 (277 kg) marine litter items were collected, and hard plastic and soft plastic were most represented.

For Fort Dauphin, among 4 005 (183 kg) marine litter items collected, categories most represented were hard plastic, specifically fragments for the uninhabited station and soft plastic, specifically packaging for the inhabited beach.

For Toliara, 2 412 (327 kg) marine litter items were collected. Soft plastic, specifically food packaging and fishing litter, specifically fishing nets were most represented.
**Meso-litter**

In Sainte Marie, 671 meso hard plastics were collected at the uninhabited station and only 3 glass fragments at the inhabited station.

In Nosy Be, only meso hard plastics were observed- 12 hard plastic fragments at the uninhabited station and 46 hard plastic fragments at the inhabited station. Regarding Fort Dauphin and Toliara, meso-litter was found and collected only at the inhabited station. For Fort Dauphin, 4 hard plastic fragments and 2 glass fragments were collected, and in Toliara, 5 meso-plastic fragments were collected.

**Micro-litter**

Micro-litter sampling was done on Sainte Marie island, in front of each station thanks to a plankton net loaned by University of Reunion Island. Three samples were collected for each station and will be analyzed in Reunion Island.

**Branding audit**

Malagasy production was the major source of litter collected on the inhabited station, which consisted of food/drink and textile products.

Asian waste was dominant for the uninhabited beach of Sainte Marie and Fort Dauphin, specifically drink products.

**Sensitisation**

Consumers as well as producers have been made aware of marine litter. In total, 105 students, 3 producers and distributor companies and 5 hotel were made aware. In Nosy Be with the regional tourist office, we ran a weekly radio show weekly waste problems. All our results were presented to a workshop which gathered all waste actors in Madagascar and the public of Nosy Be.
Beach Surveys for Macro-litter

Macro-litter surveys were conducted during the month of October in Vamizi Island, Mozambique and Maputo Bay (Northern and Southern Mozambique).

The surveys in Vamizi Island were conducted with five people, 500 meters of beach length and 43 meters wide at the lighthouse beach located at the south part of the island.

The results Stock survey in Vamizi were:

<table>
<thead>
<tr>
<th>Survey area</th>
<th>Total count</th>
<th>Total weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet</td>
<td>849</td>
<td>9.109</td>
</tr>
<tr>
<td>Dry</td>
<td>6051</td>
<td>48.328</td>
</tr>
</tbody>
</table>

The results for the accumulation survey were:

<table>
<thead>
<tr>
<th>Survey area</th>
<th>Total count</th>
<th>Total weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet</td>
<td>314</td>
<td>8.583</td>
</tr>
<tr>
<td>Dry</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

In Maputo Bay, for the second synchronized marine litter monitoring programme, beside “Ka Elisa” Beach, “Hospital” beach was added for macro litter sampling. The lengths of beaches were 600m for Ka Elisa (same length as previous) and 400m for Hospital, considering that 100m was the buffer zone for Ka Elisa and Hospital. The sampling took place during 12 days: 2 days for stock surveys and 10 days for accumulation surveys. It was not possible to mobilize volunteers for the first clean up as other activities were taking place in the same period (students were attending exams; resident people were engaged in cultural activities). So, only IIP staff participated in the cleaning activities during the whole period.
River Sampling for Maco-litter

The first river sampling took place in Matola river in Maputo province for 5 days. Sampling was done using the STOP net technique developed and provided by SST in combination with the RIMMEL application technique. The data is still being processed.
Surveys Conducted in November

The month of November was an exciting time for The Ocean Project Seychelles as the team conducted macro-litter beach surveys on three different sites on Seychelles’ main and most populated island, Mahe. The sites are located in the south, south-east and north-west of the island, enabling TOP to investigate the influence of seasonal changes on the accumulation of macro-litter for the next three years.

Seychelles can be divided into the north-west monsoon from December to March and the south-east monsoon from May to October separated by two relatively short inter-monsoon periods in April and November. Each site was also chosen based on their proximity to human development, in order to compare the influence of human development on the presence of beach litter amongst beaches with high and low exposure to human activity and infrastructure.

After the previous trial in August, further changes were made to the datasheets and the methodology was refined. Conducting the survey at different times of the year with different groups of people allows for further amendments and improvements to be made.

Our Surveyors

Each site, namely Beau Vallon, Anse Royale and Grand Police beach, held a group of research assistants varying between 2 – 5 surveyors who collected, sorted and weighed the litter on a daily basis. The surveyors consisted of mainly young Seychellois, including students and full-time employed youths, eager to learn more about the issues of marine litter in Seychelles and to actively participate in solving this global issue. Other surveyors also included non-Seychellois that feel very strongly about the issues of marine litter. TOP aims to not only continue recruiting surveyors with an interest in the project but to make people more aware of the pressing issues of plastic pollution through the process of collecting and sorting the litter.
Three Sites, Three Brand Audits

On the first day of the survey, Day Zero, each team conducted a brand audit on all the branded litter collected. This consists of a major clean-up covering the whole study site. Teams of sorters and recorders collected information on the type of branded items (i.e. material, utility), brand name, the manufacturing country and the buoyancy of certain items.Attributing buoyancy to items allow for Surface Currents from Diagnostics (SCUD) model to track the pathway of the debris according to their windage and to determine their potential origin. Because liquids inside items can alter their buoyancy, the windage of sealed bottles was recorded on site according to their content.

It was observed that a lot more food (e.g. wrappers & containers) and drink items (e.g. bottle caps, plastic & glass bottles) were present on the sites closest to human development, namely Beau Vallon and Anse Royale. Based on the brand names known locally and the physical state of the items, we know that the majority of the litter at these sites originate from Seychelles and most likely from direct acts of littering. These touristic sites are popular among locals, forming social hotspots where drinks, food and other picnic items are brought to the beach.

Exploring Marine Litter on Farquhar Atoll

The next set of surveys will be taking place in February during the north-west monsoon. TOP will be conducting the survey on one of the outer islands, Farquhar atoll, for the first time since the launch of the study. Farquhar is situated 770 km South West of Mahé, consisting of 10 islands and 2 sand banks. With the help of the Island Conservation Society (ICS) and Island Development Company (IDC), TOP will be trialing the macro-litter beach survey on the atoll.
Local products were found to make up the majority of branded litter items on two Port Elizabeth beaches in October. Brand audits on standing-stocks of beach litter revealed that 93% and 95% of branded litter at Cape Recife and Bluewater Bay beaches originates from South Africa (as opposed to foreign countries).

These brand audits, which were conducted on Day Zero of the quarterly macro-litter accumulation surveys, also revealed that food packaging was the most abundant type of product found, while multi-layered plastic was the most common type of packaging found. Food packaging made up 93% of litter at Cape Recife beach and 83% of litter at Bluewater Bay beach. At Cape Recife beach, 47% of litter was multi-layered plastic compared to 37% at Bluewater Bay beach (Figure 1).

These results indicate that local interventions are essential to reduce litter loads on beaches. Additionally, large portions of beach litter consist of recyclable material such as PET and PP bottle caps. Promotion of recycling may thus play a key role in the reduction of beach litter in Port Elizabeth going forward.

Figure 1: Main types of packaging found on two Port Elizabeth beaches. ML = Multi-layered packaging, PP = Polypropylene, PET = Polyethylene terephthalate, SL = Single-layered packaging.
Spring Tides Bring Waves of Litter onto Beaches

Port Elizabeth, South Africa experienced an unusually strong spring tide on the last days of the most recent macro-litter accumulation beach survey in October. In addition to creating interesting and difficult sampling conditions (Figure 2), the tide also provided researchers with a unique opportunity to show how spring tides may influence litter loads on beaches. During spring tides, buried beach litter is more likely to be exhumed than during usual tides, potentially biasing estimates of litter washing up daily from the ocean. Evidence of this was found on Cape Recife and Bluewater Bay beaches where substantially more litter was found during days coinciding with the spring tide compared to other days of sampling (Figure 3).

Including data collected over spring tides may therefore overestimate daily accumulation rates of litter from the ocean. This emphasises the need to avoid sampling during spring tides, as recommended in the Litter Monitoring Manual in production at the Sustainable Seas Trust.

![Sampling during spring tides.](image1)

![Estimates of daily accumulation by count (left) and weight (right) for Cape Recife when including and excluding data collected during a spring tide.](image2)

Figure 2: Sampling during spring tides.

Figure 3: Estimates of daily accumulation by count (left) and weight (right) for Cape Recife when including and excluding data collected during a spring tide.
Decades-old Litter is Washing up on Beaches in Port Elizabeth

It is widely known that plastic and other litter items may take decades or even centuries to biodegrade in a natural environment. Our researcher found evidence of this during a recent macro-litter accumulation survey in October. An old chocolate wrapper and aluminium toothpaste tube was found on Cape Recife beach in Port Elizabeth (Figure 4). Based on our research, which included contacting the manufacturers, we estimate a minimum age of 15 years for the chocolate wrapper and an approximate age of 49 years for the toothpaste tube. The good condition of these items – with print still legible, illustrates how long litter items can persist in the marine environment. In addition to providing essential litter data, beach surveys aid in removing litter that may have been in the marine environment for decades, while also providing an interesting glimpse into the past.

Figure 4: A ~15-year-old chocolate wrapper (left) and 49-year old aluminium toothpaste tube (right) washed up on Cape Recife beach during a recent beach survey in Port Elizabeth.