THEME 4

MARINE DEBRIS COLLECTIONS 2024

ANNUAL REPORT

Conducted in collaboration with Kisawa Sanctuary and Universal Plastic.

www.bcssmz.org

Benguerra island, Bazaruto Archipelago National Park, Mozambique

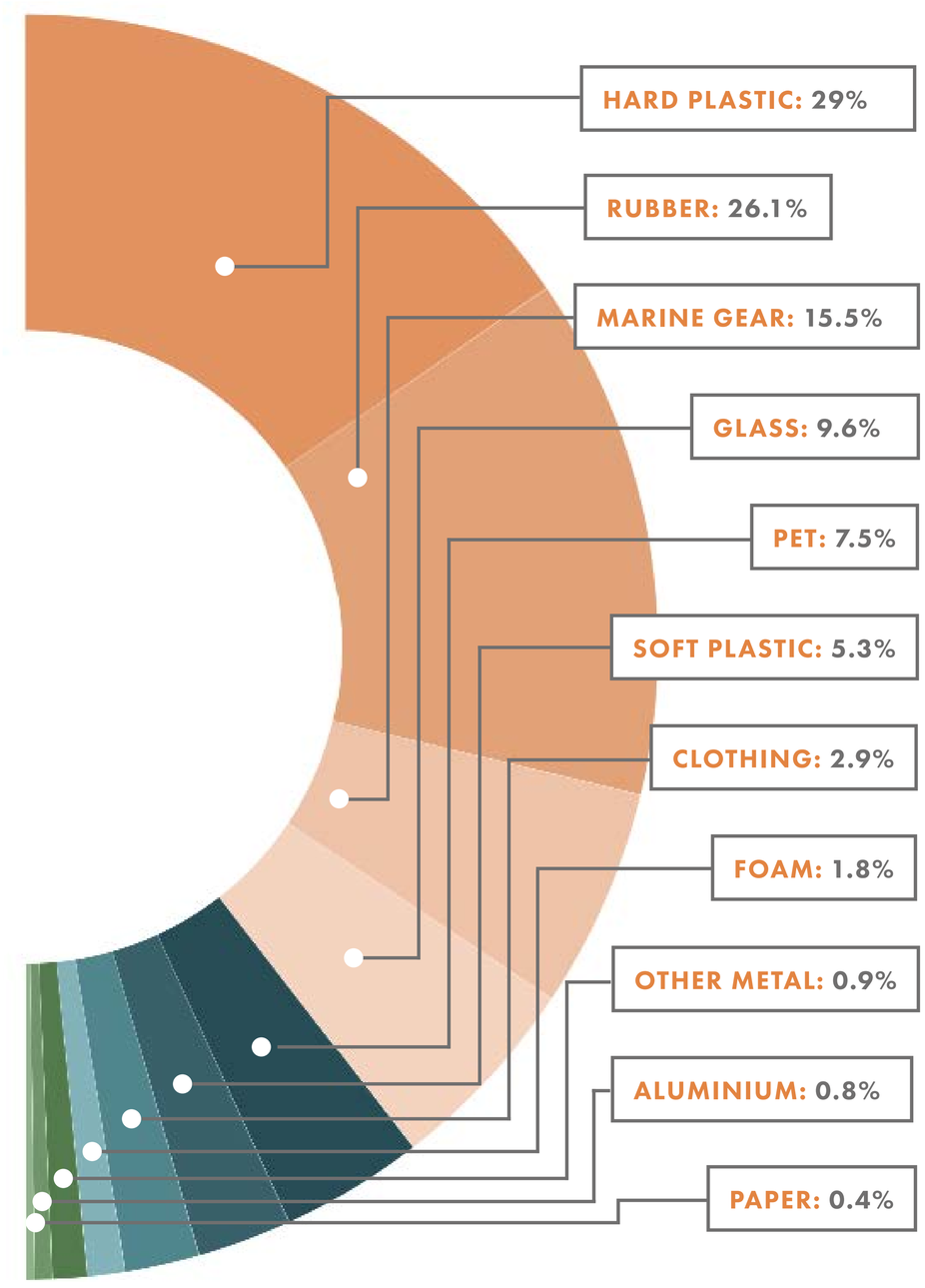
QUICK FACTS

TOTAL WEIGHT	Nº OF COLLECTIONS
2.499 kgs	42
HOURS SPENT	**FISHING NETS**
83 hours	16
SURVEY SITES	**FISHING LINES**
5	17

In 2024, BCSS continued its efforts to manage marine debris by collecting and processing a total of 2,499 kilograms of waste, categorized into **nearly 186 kg of PET, 726 kg of hard plastics, 134 kg of soft plastics, 45 kg of foam, 21 kg of aluminum, 22 kg of other metals, 242 kg of glass, 653 kg of rubber, 11 kg of paper, 73 kg of clothing, and 388 kg of marine gear.**

All debris was transported to the Waste Management Facility at the BCSS station, where it was carefully weighed and sorted into these categories. During sorting, the team gathered data on the type of materials and, when possible, their origin. Once processed, the debris was sent to the recycling facility in the Bazaruto Archipelago National Park on Benguerra Island, where efforts focused on transforming as much plastic as possible into construction materials, supporting both environmental sustainability and local development.

Marine debris (cumulatively)



LOCATIONS

QUICK FACTS

TOTAL WEIGHT

PLASTICS

LOCATIONS BENGUERRA ISLAND

Benguerra Island

As the **second biggest island of the five belonging to the Bazaruto Archipelago**, Benguerra Island covers an area of 55km2. The incredible diversity of the island is characterised by **miles-long beaches, coastal and in-land sand dunes, mangrove forests, freshwater lakes, mudflats and vast wetlands, and hectares of seagrass habitat**. Located on the north coast of the island, BCSS is adjacent to beach and mudflats ecosystems and in proximity of seagrass meadows and mangrove forest.

Frequency of marine debris collections

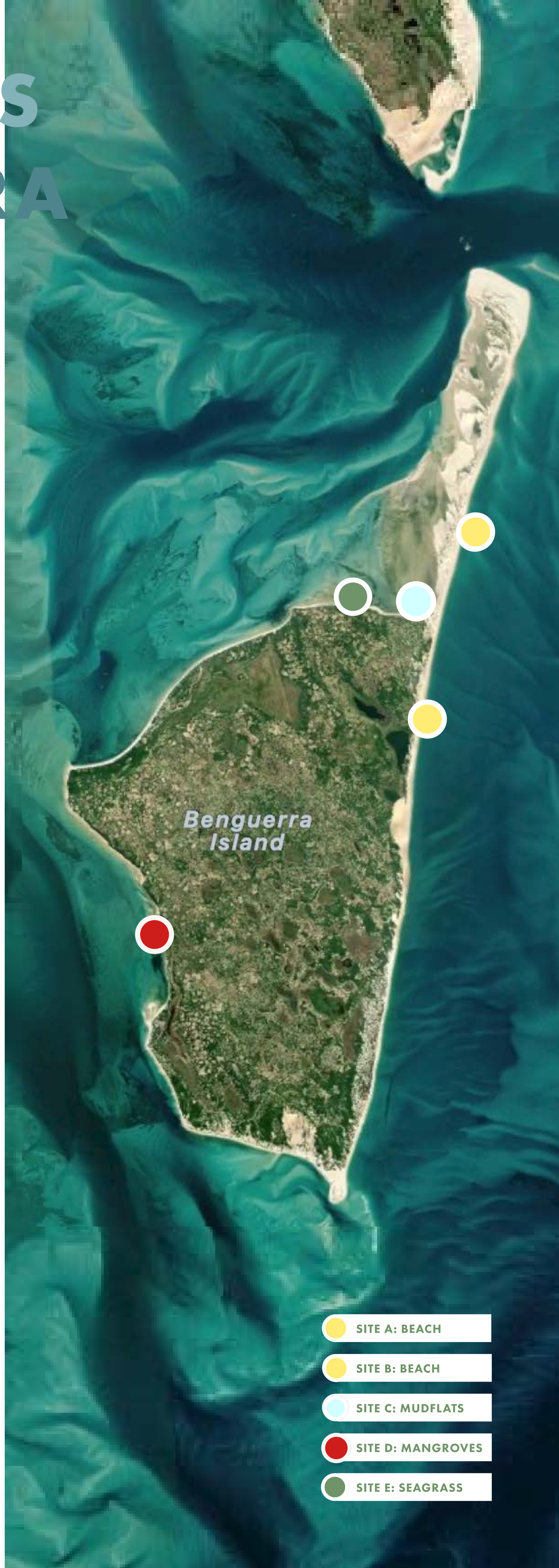
The five marine debris collections sites add up to a total of 45,6 hectares of habitat. In 2024, visited the designated sites 42 times, spending 83 hours collecting debris and removing discarded items and waste from the beaches, mudlfats, mangroves and seagrass meadows. A total of 2,499 kg was collected.

MUDFLATS

MANGROVES

BEACH

SEAGRASS



PARTNERSHIPS

Sustainable Seas Trust

In June 2024, BCSS signed a two-year Memorandum of Understanding (MoU) with the Sustainable Seas Trust (SST), an Africa-based organization dedicated to protecting ocean environments and empowering communities through sustainable waste management. SST focuses on education, research, and partnerships to reduce marine pollution by integrating waste management into value chains. As part of the partnership, BCSS will support SST's efforts by providing detailed marine debris data collected from Benguerra Island's coastal areas. These ecosystems, among Mozambique's most valuable and vulnerable, are increasingly threatened by plastic pollution, which harms both the environment and the wildlife that rely on it.

Universal Plastic

In 2023, BCSS began collaborating with Universal Plastic (UP), an innovative organization focused on enhancing the transparency and traceability of marine debris worldwide through AI algorithms and blockchain technology. This partnership, formalized through a Memorandum of Understanding signed in March 2023, aims to close the plastic waste loop. UP's tracking system uses traced data to reveal the true lifecycle and routes of plastic waste, enabling greater control over its CO_2 footprint. With scientific advisory from BCSS, UP leverages BCSS's data to quantify the environmental and ecological impacts of plastic pollution, particularly on marine ecosystems.

The Universal Plastic application streamlines the process of tracking plastic waste. Using a search radius, the app locates relevant plastic surveys in the area. After signing up, users can document marine debris collections by following step-by-step instructions in the app. By analyzing photos of the debris, the app identifies specific plastic categories using AI calibration. Additionally, the debris is weighed and measured to enhance AI calibration and validate the results. Blockchain technology tracks the entire process, creating a unique CO_2 footprint for the waste and supporting a more comprehensive understanding of plastic pollution's impact.

UNIVERSAL PLASTIC

BCSS
Bazaruto Center for Scientific Studies

LOOKING AHEAD

Coupling data

In parallel to the marine debris data, BCSS gathers weather and ocean-related data. This information is cross-referenced, and the BCSS team is currently looking at external factors and pairing them with the marine debris, aiming to provide more detailed information later this year. BCSS currently has the capability to receive in-situ data via a new set of models and API work to collect up to 500 variables simultaneously. The data is global as it is retrieved via GPS, of which some nearby the BCSS station. Coupling data such as air humidity, cloud coverage, precipitation, wind, swell, waves, tides and currents with marine debris collections can provide unique insights in to the journey of the plastic waste and more. Examples of the 110 mixed models used to obtain these data are radar altimetry, ROMS, Mm-euro1k, Arome and Meteosat.

For precision balance, subsets of the marine debris collections are sent to the BCSS's on-site laboratory to calibrate against the Universal Plastic AI results. The marine debris items are weighted and measured individually.

Prospects

Our prospects are to realise longevity of the current data-sets, processes (through the Waste Management Facility, Universal Plastic application and laboratory work). Through consistent and precise data collections over time, the team hopes that valuable insights into plastic waste will become evident, which in turn may inspire (governmental) conservation strategies to be written to combat the plastic pollution crisis marine environments are coping with.

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