

## Killed by plastic

### KILLED BY PLASTIC

Global Ocean is trying to raise awareness about the catastrophic crisis of plastic ending up in the oceans of the world and killing an estimated 100,000 sea animals every year.

- To the people who made this project happen

### THANK YOU

On behalf of Global Ocean and marine life everywhere, i would like to thank all the people below, without whom this project would never have been realised.

In order of appearance:

Norton Figueiredo for his excellent project coordination and team work;

Pedro Almeida for being there at all times and his work behind the scenes;

Leana Mattei and Carolina Camera for their consistent professional support and friendship;

Fabiano Barretto and his wife for their behind the scenes support;

Carlos for ensuring a great working partnership with VEGA and to the guys from EMTURSA for theirs;

Taisa Mendonca for driving us around and for being our translator and negotiator;

Cabelo for trusting us with using and returning his fishing net;

the lads from VEGA - Tadeu, Alan and Fabio for their role in the production and event;

Lazaro from the Amazon for pulling the net so well;

the people of Salvador for being so wellcoming;

the artist, Mark McGowan, for his positive enthusiasm and hard work delivering and documenting this project; and finally, to my family - THANK YOU,

Melanie Salmon

Director, Global Ocean

- SALVADOR PROJECT photos

- PERFORMANCE PART 2

- SALVADOR PROJECT photos

- THE PERFORMANCE

Words cannot explain how wonderful the performance was. People helped us pull the net it was so heavy and we struggled along the route. This video is part 1.. more soon

- NANA BANANA BLOCO

This is the Nana Banana bloco we will be just in front of this doing our performance.

- GLOBAL OCEAN LEADING THE CARNIVAL

Absolutely amazing but Global Ocean and Mark McGowan will be at the very front of the carnival and leading all the blocos around the route. We are all very excited and cant wait to begin. Today we had a press conference at the yacht club and also went back to the dump run by Vega to wrap the net and plastic for transportation down to the beach. Also we will be supported by two workers from Vega. Everyone has been wonderful to us and helped enoumously.

Confira programação para o carnaval de Salvador circuito Barra - Ondina

Horário Entidade Atração

17:00 Performace do Projeto da ONG Fundação Global Ocean Artista inglês Mark Mcgowan

17:30 BABY-TRIBALA Sam Hop (Bambam)

18:00 COCOBAMBU Asa de Aguia

18:30 TRIMIX Trem de Pouso

19:00 ACADEMICAS / NANA BANANA A Zorra

19:30 EU VOU / MULEKERA Negra Cor

20:00 CERVEJA & CIA Ivete Sangalo  
20:30 YES BAHIA CLUBE Banda Cheiro de Amor  
21:00 NU OUTRO Banda Eva  
21:30 FISSURA / VUMBORA Gilmelandia  
22:00 FRENESI / HARÉM Alexandre Peixe  
22:30 BORIMBORA / A BARCA Guig Ghetto  
23:00 ALÔ INTER Psirico  
23:30 OS MASCARADOS Margareth Menezes  
0:00 UNIVERSITARIO VoaDois  
0:30 É MASSA / TRAZ A MASSA / TA RINDO DO Q Kortezia  
1:00 NADANDO EM ÁGUAS A definir  
1:30 AGUA DE COCO A definir  
2:00 SIRI COM TODI Banda Vixie Mainha

- KILLED BY PLASTIC TRAINING

A short video of Mark McGowan training at the Vega waste disposal site for the incredible fishing net filled with plastic attempted 4 kilometre pull at the carnival in Salvador Brazil. Mark is working with Melanie Salmon from Global Ocean who are trying to raise awareness about the catasphropic crisis of plastic ending up in the oceans of the world and killing 100,000 sea animals every year.

- PUTTING THE PLASTIC INTO THE FISHING NETS

Mel and T putting the plastic into the fishing nets at the Vega dump.

- BUYING THE FISHING NET

Mel and T with Cabeza, the fisherman who got us the fishing net

- BUYING THE FISHING NET

Today we went and bought a fishing net from some beautiful fisherman and we are going to fill it with plastic.

- MARK MCGOWAN ARTIST ATTEMPTS TO PULL 1 TON OF PLASTIC RUBBISH 10KM IN BRAZIL

jan 28 2008

i have arrived in Salvador brazil in the middle of the carnival and been looking for a fishing net, we found a wonderful fisherman and been to the local

dump to aquire an enourmous amount of plastic which i am going to drag along the route of the carnival. we are here trying to raise awarness about the levels of plastic in the oceans of the world which is killing over 100,000 sea animals every year.

more soon

- ARTIST TO PULL MASSIVE FISHING NET FILLED WITH PLASTIC WASTE FOR 10KM IN BRAZIL

<http://www.markmcgowan.org/>

January 2008 press release

## KILLED BY PLASTIC

In an extra ordinary art performance artist and enviromentalist Mark McGowan is to attempt to pull an incredible 5 metre high fishing net filled to overflowing with plastic waste for 10 kilometres. The project is to take place in Brazil at Farol da Barra (lighthouse beach), in Salvador, Brazil on the 31st January 2008 and starts at 2.30pm, 2 hours before the official start of the carnival.

And to make it even more difficult McGowan will be coming out of the water pulling the net of plastic waste.

The event is to raise awareness of the catasphropic amounts of plastic waste in the oceans seas and rivers of the world and the affects it is having on sea life with 100,000 of marine mammals being killed every year.

for more info call 07828524056 or mel on

McGowan has previously pulled a red london routemaster bus using just his big toe, pushed a monkey nut along the road with his nose for 7 miles and crawled 55 miles on his hands and knees from london to Canterbury looking for love.

- GREENPEACE ARTICLE

The very thing that makes plastic items useful to consumers, their durability and stability, also makes them a problem in marine environments. Around 100 million tonnes of plastic are produced each year of which about 10 percent ends up in the sea. About 20 percent of this is from ships and platforms, the rest from land.

Take a walk along any beach anywhere in the world and washed ashore will be many polythene plastic bags, bottles and containers, plastic drums, expanded polystyrene packing, polyurethane foam pieces, pieces of polypropylene fishing net and discarded lengths of rope. Together with traffic cones, disposable lighters, vehicle tyres and toothbrushes, these items have been casually thrown away on land and at sea and have been carried ashore by wind and tide.

These larger items are the visible signs of a much larger problem. These big items do not degrade like natural materials. At sea and on shore under the influence of sunlight, wave action and mechanical abrasion they simply break down slowly into ever smaller particles.

A single one litre drinks bottle could break down into enough small fragments to put one on every mile of beach in the entire world. These smaller particles are joined by the small pellets of plastic which are the form in which many new plastics are marketed and which can be lost at sea by the drumload or even a whole container load. These modern day ?marine tumbleweeds? have been thrown into sharp focus, not only by the huge quantities removed from beaches by dedicated volunteers, but by the fact that they have been found to accumulate in sea areas where winds and currents are weak.

The ?Eastern Garbage Patch?

Click to view animation.

The North Pacific sub-tropical gyre covers a large area of the Pacific in which the water circulates clockwise in a slow spiral. Winds are light. The currents tend to force any floating material into the low energy central area of the gyre. There are few islands on which the floating material can beach. So it stays there in the gyre, in astounding quantities estimated at six kilos of plastic for every kilo of naturally occurring plankton. The equivalent of an area the size of Texas swirling slowly around like a clock. This gyre has also been dubbed ?the Asian Trash Trail? the ?Trash Vortex? or the ?Eastern Garbage Patch?.

This perhaps wouldn't be too much of a problem if the plastic had no ill effects. The larger items, however, are consumed by seabirds and other animals which mistake them for prey. Many seabirds and their chicks have been found dead, their stomachs filled with medium sized plastic items such as bottle tops, lighters and balloons. A turtle found dead in Hawaii had over a thousand pieces of plastic in its stomach and intestines. It has been estimated that over a million sea-birds and one hundred thousand marine mammals and sea turtles are killed each year by ingestion of plastics or entanglement.

Animals can become entangled in discarded netting and line. Even tiny jelly-fish like creatures become entangled in lengths of plastic filament, or eat the small plastic particles floating in the water.

Chemical sponge

There is a sinister twist to all this as well. The plastics can act as a sort of ?chemical sponge?. They can concentrate many of the most damaging of the pollutants found in the worlds oceans: the persistent organic pollutants (POPs). So any animal eating these pieces of plastic debris will also be taking in highly toxic pollutants.

The North Pacific gyre is one of five major ocean gyres and it is possible that this Trash Vortex problem is one which is present in other oceans as well. The Sargasso Sea is a well known slow circulation area in the Atlantic, and research there has also demonstrated high concentrations of plastic particles present in the water.

## Ocean hitchhikers

The floating plastics can also affect marine ecosystems in a surprising way, by providing a ready surface for organisms to live on. These plants and animals can then be transported on the plastic far outside their normal habitat. These ocean hitch-hikers can then invade new habitats to become possible nuisance species.

Of course, not all plastic floats. In fact around 70 percent of discarded plastic sinks to the bottom. In the North Sea, Dutch scientists have counted around 110 pieces of litter for every square kilometre of the seabed, a staggering 600,000 tonnes in the North Sea alone. These plastics can smother the sea bottom and kill the marine life which is found there.

The issue of plastic debris is one that needs to be urgently addressed. At the personal level we can all contribute by avoiding plastics in the things we buy and by disposing of our waste responsibly. Obviously though, there is a need to make ship owners and operators, offshore platforms and fishing boat operators more aware of the consequences of irresponsible disposal of plastic items.

- Everyday objects condemn sea life to death

By IAN JOHNSTON

IT IS something most of us hardly think of as we go about our daily lives. Out of sight and out of mind, our waste is largely someone else's problem.

The popularity of recycling may have soared in recent years, but this recent awakening will do little to address the 1,000-year legacy of litter and pollution we have already left for the world's marine life.

That dropped crisp packet, discarded mineral water bottle or escaped plastic bag could be at the start of an epic journey around the world, sailing the Seven Seas for something close to eternity.

Hundreds of thousands of animals are thought to die every year as a result of marine litter, most of it plastic.

Plastic has several qualities that makes it particularly dangerous to sea life:

? it floats, so seabirds will scoop up what they think is a tasty snack, only to fill their stomachs with undigestible toothbrushes and disposable lighters, while filter feeders like basking sharks take in plastic particles, as fine as sand, along with plankton.

? it sinks, so creatures on the seabed are similarly affected - a study of Europe's continental shelf found up to 262,000 piece of plastic per sq mile, most of it plastic bottles and bags.

? in the water, plastic bags and burst balloons look like jellyfish and, when swallowed, can choke animals like whales and turtles or block their gut so they starve to death.

? it lasts for hundreds of years: it is estimated that plastic can survive at sea for between 450 and 1,000 years, but some

forms may never fully degrade. Albatrosses on Hawaii have been found to have eaten plastic from Japanese fighter planes that crashed more than half a century ago.

Few people realise just how much litter there is in the sea, but sailors like Dame Ellen MacArthur see the problem at first hand.

"In the Bay of Biscay and the North Atlantic, when it is flat calm you see so much plastic debris, loads of polystyrene, fishing floats... I've hit a container in the North Atlantic," she said.

"I've been up to the north-west of Scotland and there's a lot of stuff, plastic, bits of rope and net, plastic bottle - there are so many plastic bottles.

"It's horrible, it's bad for wildlife and we don't enjoy it either. You get hugely protective of the ocean. A photographer on board chucked one of those little film cases over the side and I went nuts.

"All the sailors I've sailed with... nothing goes over the side. You do about one binbag every ten days and you store it on the boat."

On a recent visit to South Georgia, Dame Ellen travelled to an uninhabited island with conservationists to record albatross nests. Even in this remote part of the Southern Ocean, they found hooks used by long-line fishing boats - one of the main reasons 19 out of 21 albatross species are endangered.

"It's is incredibly tragic what's going on," she said. "Because the currents travel all over the world, with the sea you cannot separate it in the same way you can with a country. In the sea things can travel for thousands of miles. That is very important."

Adam Walters, a consultant at the Greenpeace research laboratory, took part in an expedition to sail to every sea on the planet and assess just how much litter they contain.

"It's only when you throw a net in the sea that you find it is covered in tiny fragments of plastic. From a ship you don't see anything," he said.

"We were using nets with a 0.3mm mesh size. Drag for a couple of miles and you find hundreds and hundreds of tiny pieces of plastic, like grains of sand."

The analysis is still being carried out, but he said 80 per cent of plastic waste in the sea originated on land, rather than being thrown overboard from boats.

"It is truly shocking. To a greater or lesser extent the entire surface of the ocean is covered in plastic and this stuff is not going to go away," he said.

"Most plastics are recyclable but we haven't got the systems in place to recycle it.

"It is unsustainable. To produce something disposable that will remain in that form for thousands of years is nonsensical."

The international extent of the problem was illustrated when 20 containers carrying bath toys were lost overboard in the Pacific in 1992.

Since then oceanographers, with tip-offs from the public, have monitored a flotilla as it successfully navigated the North-West Passage, entering the Atlantic.

A faded green frog, with the identifying "The First Years" logo, was reportedly discovered in the Hebrides in 2003.

Calum Duncan, the Scottish conservation manager for the Marine Conservation Society, emphasised the very real effect of litter on sealife.

"Globally, it is estimated that 100,000 marine mammals and a million seabirds die annually because of ingesting or entanglement by marine litter," he said.

"It's another motivation for people to think about how they behave when they are at the beach or elsewhere.

"The same applies anywhere, whether you are on the beach or on land: dispose of rubbish properly. There is a real wildlife threat from not doing so."

- PLASTIC IN THE OPEN OCEAN

- "Plastic Debris, Rivers to Sea"

The Algalita Marine Research Foundation chronicles the problem of marine debris in our ecosystem in this video entitled "Plastic Debris, Rivers to Sea". 80% of marine debris is land-based and 90% of floating marine debris is plastics. For more information visit <http://www.algalita.org> and <http://www.cawrecycles.org>. Copyright 2006 Algalita Marine Research Foundation.

- OPERATION PLASTIC

operation plastic a project for Arts Co

## - THE GREAT PACIFIC GARBAGE PATCH

The centre of the North Pacific Gyre is relatively stationary region of the Pacific Ocean (the area it occupies is often referred to as the horse latitudes) and the circular rotation around it draws waste material in. This has led to the accumulation of flotsam and other debris in huge floating 'clouds' of waste which have taken on informal names, the Great Pacific Garbage Patch, the Eastern Garbage Patch or the Pacific Trash Vortex. While historically this debris has biodegraded, the gyre is now accumulating vast quantities of plastic and marine debris. Rather than biodegrading, plastic photodegrades, disintegrating in the ocean into smaller and smaller pieces. These pieces, still polymers, eventually become individual molecules, which are still not easily digested.[1] Some plastics photodegrade into other pollutants. The floating particles also resemble zooplankton, which can lead to them being consumed by jellyfish, thus entering the ocean food chain. In samples taken from the gyre in 2001, the mass of plastic exceeded that of zooplankton (the dominant animal life in the area) by a factor of six. Many of these long-lasting pieces end up in the stomachs of marine birds and animals. [2]

For several years ocean researcher Charles Moore has been investigating a concentration of floating plastic debris in the North Pacific Gyre. He has reported concentrations of plastics on the order of 3,340,000 pieces/km<sup>2</sup> with a mean mass of 5.1kg/km<sup>2</sup> collected using a manta trawl with a rectangular opening of 0.9x0.15m<sup>2</sup> at the surface. Trawls at depths of 10m found less than half, consisting primarily of monofilament line fouled with diatoms and other plankton.[1]

Some sources[2] have incorrectly reported that there is a "floating continent" of debris that is roughly twice the size of Texas, however no scientific investigation, including Moore's, has verified this.

Occasionally, shifts in the ocean currents release flotsam lost from cargo ships into the currents around the North Pacific Gyre, leading to predictable patterns of garbage washing up on the shores around the outskirts of the gyre. The most famous was the loss of approximately 80,000 Nike sneakers and boots from the ship Hansa Carrier in 1990: the currents of the gyre distributed the shoes around the shores of British Columbia, Washington, Oregon, and Hawaii over the following three years. Similar cargo spills have involved tens of thousands of bathtub toys in 1992 and hockey equipment in 1994. These events have become a major source of data on global-scale ocean currents. Various institutions have asked the public to report the landfall locations of the objects (trainers, rubber ducks, etc.) that wash up as a method of tracking surface waters' response to the deeper ocean currents.

## - SALVADOR PROJECT

image from operation plastic a project for Arts Co.

I am on my way to Salvador Brazil for a major new project about the horrors of plastic waste.....more soon. Mark McGowan

## - PLASTICS POISONING WORLD SEAS

By Maggie Ayre

Producer, Costing The Earth

Microscopic particles of plastic could be poisoning the oceans, according to a British team of researchers.

They report that small plastic pellets called "mermaids' tears", which are the result of industry and domestic waste, have spread across the world's seas.

The scientists had previously found the debris on UK beaches and in European waters; now they have replicated the finding on four continents.

Scientists are worried that these fragments can get into the food chain.

Plastic rubbish, from drinks bottles and fishing nets to the ubiquitous carrier bag, ends up in the world's oceans.

Sturdy and durable plastic does not bio-degrade, it only breaks down physically, and so persists in the environment for possibly hundreds of years.

Among clumps of seaweed or flotsam washed up on the shore it is common to find mermaids' tears, small plastic pellets resembling fish eggs.

Some are the raw materials of the plastics industry spilled in transit from processing plants. Others are granules of domestic waste that have fragmented over the years.

Either way, mermaids' tears remain everywhere and are almost impossible to clean up.

#### Raw materials

Dr Richard Thompson at the University of Plymouth is leading research into what happens when plastic breaks down in seawater and what effect it is having on the marine environment.

He and his team set out to find out how small these fragments can get. So far they've identified plastic particles of around 20 microns - thinner than the diameter of a human hair.

In 2004 their groundbreaking study reported finding particles on beaches around the UK. Historical records of samples taken by ships plying routes between Britain and Iceland confirmed that the incidence of the particles had been increasing over the years.

Now the team has extended its sampling elsewhere in Europe, and to the Americas, Australia, Africa and Antarctica.

They found plastic particles smaller than grains of sand. Dr Thompson's findings estimate there are 300,000 items of plastic per sq km of sea surface, and 100,000 per sq km of seabed.

So plastic appears to be everywhere in our seas. The next task was to try and find out what kind of sea creatures might be consuming it and with what consequences.

Thompson and his team conducted experiments on three species of filter feeders in their laboratory. They looked at the barnacle, the lugworm and the common amphipod or sand-hopper, and found that all three readily ingested plastic as they fed along the seabed.

"These creatures are eaten by others along food chain," Dr Thompson explained. "It seems an inevitable consequence that it will pass along the food chain. There is the possibility that chemicals could be transferred from plastics to marine organisms."

#### Other contaminants

There are two ways in which this might happen. Firstly, the Plymouth scientists want to establish whether there is the potential for chemicals to leach out of degraded plastic over a larger area after the plastic has been ground down.

The second aspect of this research is focusing on what happens when plastic absorbs other contaminants.

So-called hydrophobic chemicals such as PCBs and other polymer additives accumulate on the surface of the sea and latch on to plastic debris.

"They can become magnified in concentration," said Richard Thompson, "and maybe in a different chemical environment, perhaps in the guts of organisms, those chemicals might be released."

Whether plastics present a toxic challenge to marine life and subsequently to humans is one of the biggest challenges facing marine scientists today.

The plastics industry's response is that much of the research is speculative at this stage, and that there is very little evidence that this transfer of chemicals is taking place in the wild.

It says it is doing its bit by replacing toxic materials used as stabilisers and flame retardants with less harmful substances.

Whatever the findings eventually show, there is little that can be done now to deal with the vast quantities of plastic already in our oceans. It will be there for decades to come.