

THE OCEAN AND THE PLASTIC PROBLEM

EDUCATION TOOL



PREFACE

The Surfrider Foundation Europe is an environmental association founded in 1990 in Biarritz, France by triple world surfing champion, *Tom Curren*. Our mission is to defend, protect and sustainably manage the ocean, its coastline and its inhabitants. With over 120,000 supporters, 12,000 members and 36 chapters, we are present in 9 European countries.

As part of our mission we have developed various educational tools, such as the online platform oceancampus.eu. This unique online educational platform offers a wide range of useful information. This pack, '*The Ocean and the plastic problem*', was created to inform and educate a wide audience on the issue of plastic pollution. It's free and easy to access.



SUMMARY

INTRODUCTION: MARINE DEBRIS AND THE PLASTIC PROBLEM	P 4
1. HOW MARINE DEBRIS IS CREATED.....	P 5
2. THE MOVEMENT OF MARINE DEBRIS IN THE OCEAN.....	P 9
3. THE IMPACT OF MARINE DEBRIS ON SEA LIFE	P 13
CONCLUSION.....	P 16

INTRODUCTION : MARINE DEBRIS AND THE PLASTIC PROBLEM

Of all the marine debris present in our oceans, plastic is the most common¹. Every year, eight million tonnes of plastic waste flow from land to sea². In certain parts of the globe, plastic represents up to 95% of the total marine debris³.

This omnipresence of plastic in our oceans is due to constantly increasing industrial production. In 1950, world plastic production stood at 1.5 million tonnes. In 2015, it was 322 million⁴.

This increase in production is due to plastic being so cheap, resistant and easy to produce. Plastic lives on long after it has been thrown away and a large part of all plastic produced is designed for single use. A minute portion of plastic is recycled. The rest ends up either in landfill or in our environment.

Plastic never fully degrades. Instead, it becomes fragmented into tiny particles, barely visible to the naked eye. These 'microplastics' are difficult to detect and impossible to remove completely from the environment.

« 200 TIMES MORE
PLASTIC PRODUCED IN
2015 THAN IN 1950 »



FIND THE VIDEO « MARINE LITTER, TOP PREDATOR OF THE OCEAN » ON OCEAN CAMPUS

1 HOW MARINE DEBRIS IS CREATED

WHAT IS MARINE DEBRIS ?

Be it plastic, glass, fabric or metal, all litter is created by human activity. Marine litter is defined as: 'any object or material produced by man which, directly or indirectly, ends up in the ocean ⁵. Marine debris is solid and resistant, be it floating, stranded or submerged. It's classified according to its size and can be 'macro-waste' (>5mm) or 'micro-waste' (<5mm) ⁶.



MARINE DEBRIS - WHERE DOES IT COME FROM ?

The debris mainly comes from inland regions. It's transported by wind, rain and waterways to the ocean. Between 1.15 and 2.41 millions of tonnes of plastic flow from rivers into the ocean every year⁷.

During storms or heavy rains, water levels rise, sweeping away litter from the shore. As they travel through agricultural, industrial and urban areas, waterways pick up a multitude of litter (food packaging, tin cans, cigarette butts, etc...).

In towns and cities, water treatment infrastructure can become overloaded, meaning untreated waste water ends up in the local ecosystem. Fish farming, fishing and maritime transport also contribute to the waste abandoned on beaches or out at sea.

BETWEEN 1.15 AND 2.41
MILLIONS OF TONNES

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RIVERS INTO THE OCEAN
EVERY YEAR.



WATERWAYS ARE THE MAIN CARRIERS OF WASTE FROM INLAND
AREAS TO THE SEA.



THE RIVERINE INPUT PROJECT



The *'Riverine Input'* project has been run by *Surfrider Foundation Europe* since 2014. Its objective is 'to reduce marine plastic pollution by studying waterway inflow and proposing solutions to local elected representatives'.

In partnership with local associations, readings are regularly taken from six Spanish and French rivers (the Aa, the Adour, the Liane, the Var, the Slack and the Deba). Litter is identified and counted.

The information collected allows us to identify which waste items are most present in our waterways. We can then propose concrete measures to stop the pollution at its source.



FIND THE INFOGRAPHIC « LITTER IN RIVERS » ON OCEAN CAMPUS

2

THE MOVEMENT OF MARINE DEBRIS IN THE OCEAN

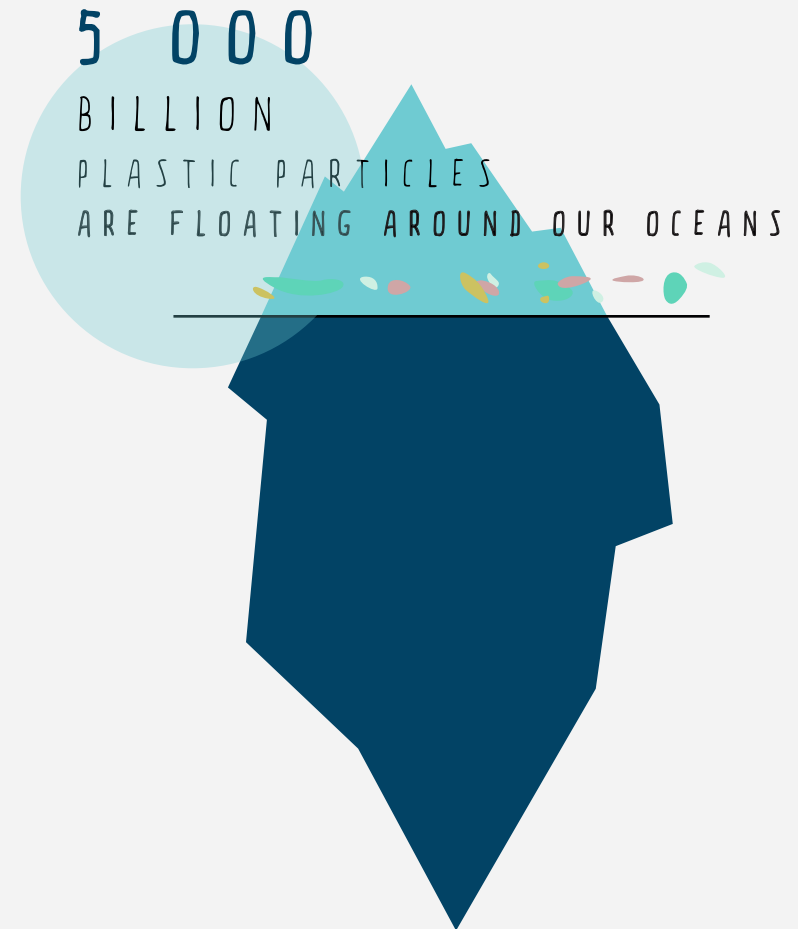
WHAT HAPPENS TO LITTER ONCE IT'S IN THE OCEAN ?

Litter transported by wind, rain and waterways finds its way into the ocean. A tiny part of this waste drifts onto our beaches, but the majority of it sinks to the bottom of the ocean ⁸.

Floating debris can be carried by ocean currents across sometimes remarkable distances. Of all this debris, plastic is the most problematic for the environment. It becomes fragmented into micro particles by the UV effect and micro bacteria ⁹.

Today there are over 5000 billion plastic particles floating in our oceans.¹⁰ Marine currents play a crucial role in the transport and distribution of ocean waste on a global scale. This is why certain waste products can be found in areas with little or no human activity.

Large quantities of plastic debris can be found in the Arctic, for example. Ocean currents are essentially highways for litter.



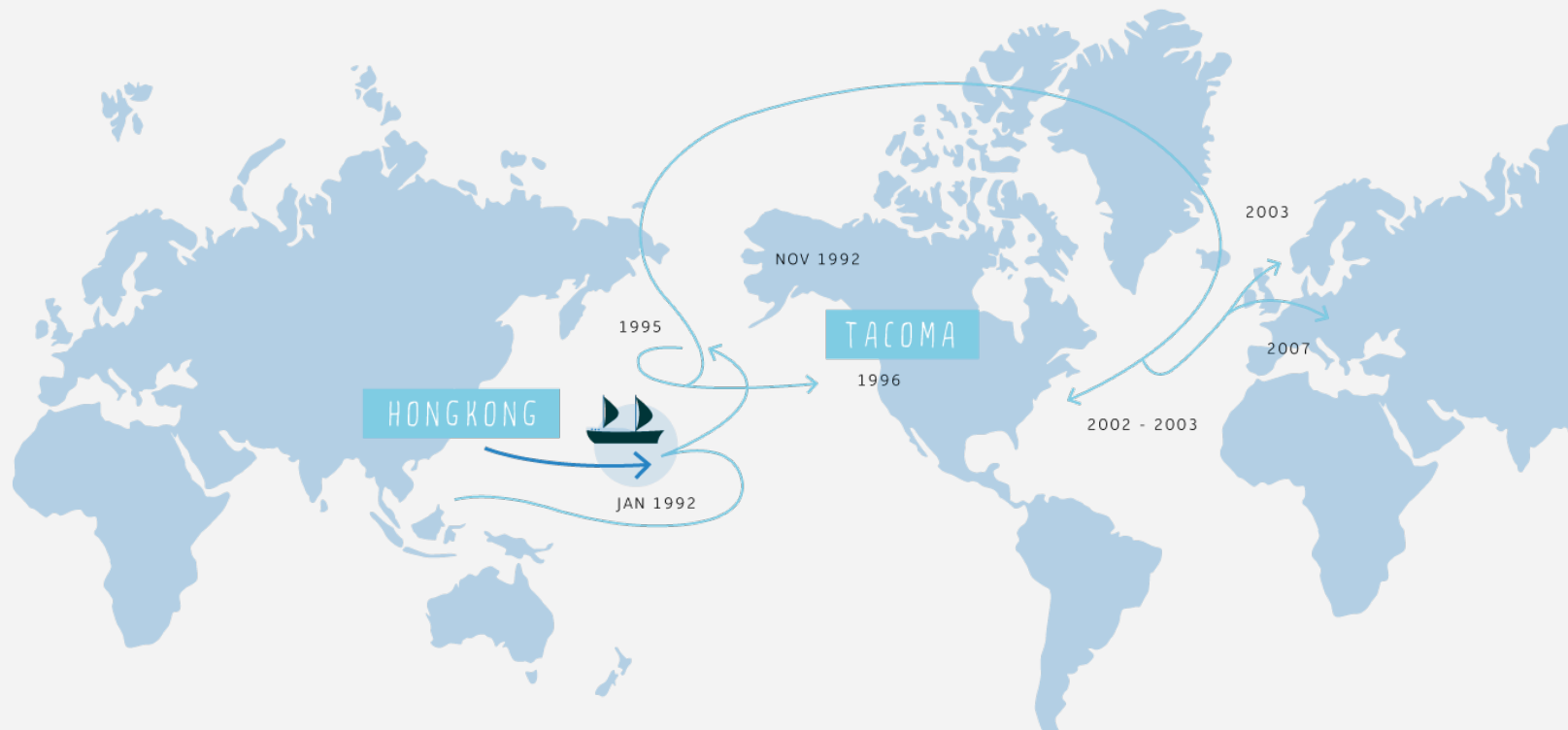
OCEAN CURRENTS ARE ESSENTIALLY HIGHWAYS FOR LITTER.



THE CURIOUS JOURNEY OF PLASTIC DUCKS

In January 1992, an ocean liner connecting China to the US lost 12 containers off the coast of Russia in a storm. Thousands of plastic ducks poured into the ocean. Ten months later, numerous ducks were found on the coast of Alaska. American oceanographer, *Curtis Ebbesmeyer*, decided to follow the ducks around the world and to map their journey along the ocean's currents.

The map below follows the duck's route between 1992 and 2007 (Tacoma 1996-2007). This study has allowed us to better understand the movement of waste in the ocean and to determine its impact on the environment.





A SEVENTH CONTINENT OF WASTE

The *Seventh Continent*, also called the *Great Pacific Garbage Patch*, is a zone where floating debris converges, situated in the North Pacific between California and Japan. There are 5 such meeting points or 'gyres' on earth.

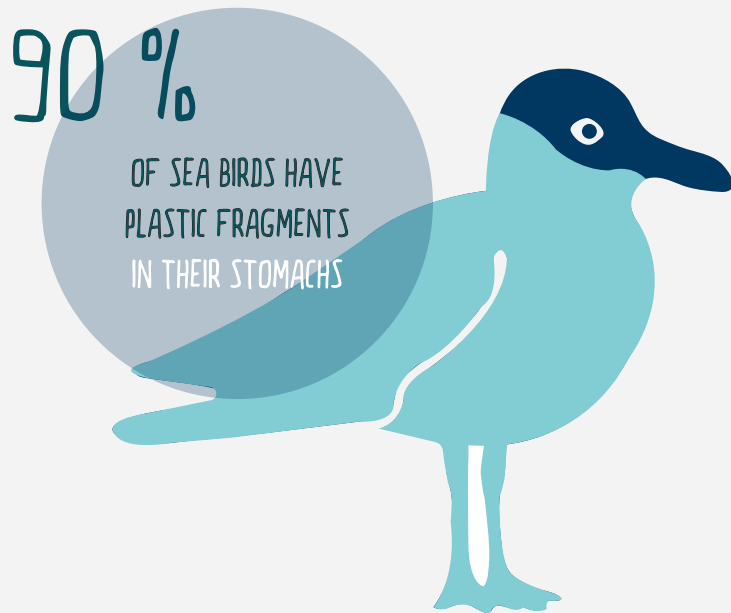
Taking the form of a plastic soup, these gyres are essentially made up of plastic particles smaller than 5mm. It is estimated that the *Great Pacific Garbage Patch* or *Seventh Continent* could contain between 45 and 129 thousand tonnes of waste¹¹.



FIND THE INFOGRAPHIC « THE GREAT PACIFIC GARBAGE PATCH » ON OCEAN CAMPUS

3

THE IMPACT OF MARINE DEBRIS ON SEA LIFE



« 693 MARINE SPECIES ARE
DIRECTLY THREATENED
BY PLASTIC POLLUTION »

WHAT IS THE IMPACT ON SEA LIFE ?

Floating on the surface, lining the ocean floor or washed up on the beach, marine debris threatens aquatic ecosystems.

It can injure many marine species by hindering their mobility. Marine debris can also transport invasive species or harbour numerous contaminants.

This pollution of the seas and oceans has a profound impact on all sea life. Today there are 693 marine species directly threatened by plastic pollution¹².

Marine debris can work as a lure for ocean fauna, who confuse it with their usual prey. Certain turtles, for example, mistake plastic bags for jellyfish and can choke on them if swallowed. Many sea birds confuse plastic with food. It is estimated that 90% of sea birds have plastic fragments in their stomachs. By 2050, this could reach 99% if effective measures are not taken to reduce the flow of plastic entering the ocean.¹³



INGESTION, ENTANGLEMENT AND INJURIES

Marine fauna (birds, fish...) become entangled in different types of debris, causing injury, drowning and immobilisation. This can impede the animal from feeding itself or breathing and cause its death. Abandoned or lost fishing nets, for example, continue to trap thousands of fish, turtles, birds and marine mammals. This phenomenon is called '*phantom fishing*'. It's estimated that abandoned or lost fishing material amounts to 640,000 tonnes of waste¹⁴ .



TRANSPORTING INVASIVE SPECIES

Floating waste which drifts along ocean currents helps transport invasive species.

These are generally molluscs or algae but can also be microbes that attach themselves to the litter. They can sometimes find themselves thousands of kilometres from where they started out. This phenomenon deeply disrupts local ecosystems.



CONCENTRATION OF CONTAMINANTS

Microplastics, found in great number at sea, accumulate a range of contaminants.

These contaminants can prove toxic for the marine animals who ingest them.



CONCLUSION

Plastic waste, now everywhere in our environment, stems from human activity that has been steadily increasing since 1950. Today, we produce 200 times more plastic than we did 70 years ago. That's 8 million tonnes of waste poured into the sea every year.

This pollution is having a substantial impact on biodiversity. This influx of plastic puts all marine life in danger. There are 693 marine species directly threatened by plastic pollution. According to a recent Australian study, 9 out of 10 birds have plastic in their stomach.

WHAT ARE THE SOLUTIONS TO REDUCE THESE STATISTICS ?

There are many possible solutions to the issue. Acting directly at the source of the pollution is still the most effective method. Reducing our daily consumption of plastic is something everyone can do individually. Discover our educational pack [here](#) to help you limit your plastic consumption and protect the ocean.



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