WWF

REPORT

2018



OUT OF THE PLASTIC TRAP

SAVING THE MEDITERRANEAN FROM PLASTIC POLLUTION

Front cover
A loggerhead sea turtle swims entangled in abandoned fishing gear, off the coast of Tenerife, Canary Islands.
World Press Photo 2017.
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Lead author: Eva Alessi (WWF)
Co-author: Giuseppe Di Carlo (WWF)

Communications: Stefania Campogianni (WWF)

Translation: Eda Başgül Di Carlo

Editing: Barney Jeffries

Design/Layout/Infographics: Bianco Tangerine Snc
(Erika Vicaretti, Maria Isabella Reggio)

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CONTENTS

EXECUTIVE SUMMARY 3

1. PLASTICS IN EUROPE 5

2. DISTRESS SIGNALS FROM THE SEA 6

A GLOBAL EMERGENCY 6
THE MEDITERRANEAN "PLASTIC TRAP" 10
Plastics used and recycled in Mediterranean countries 12

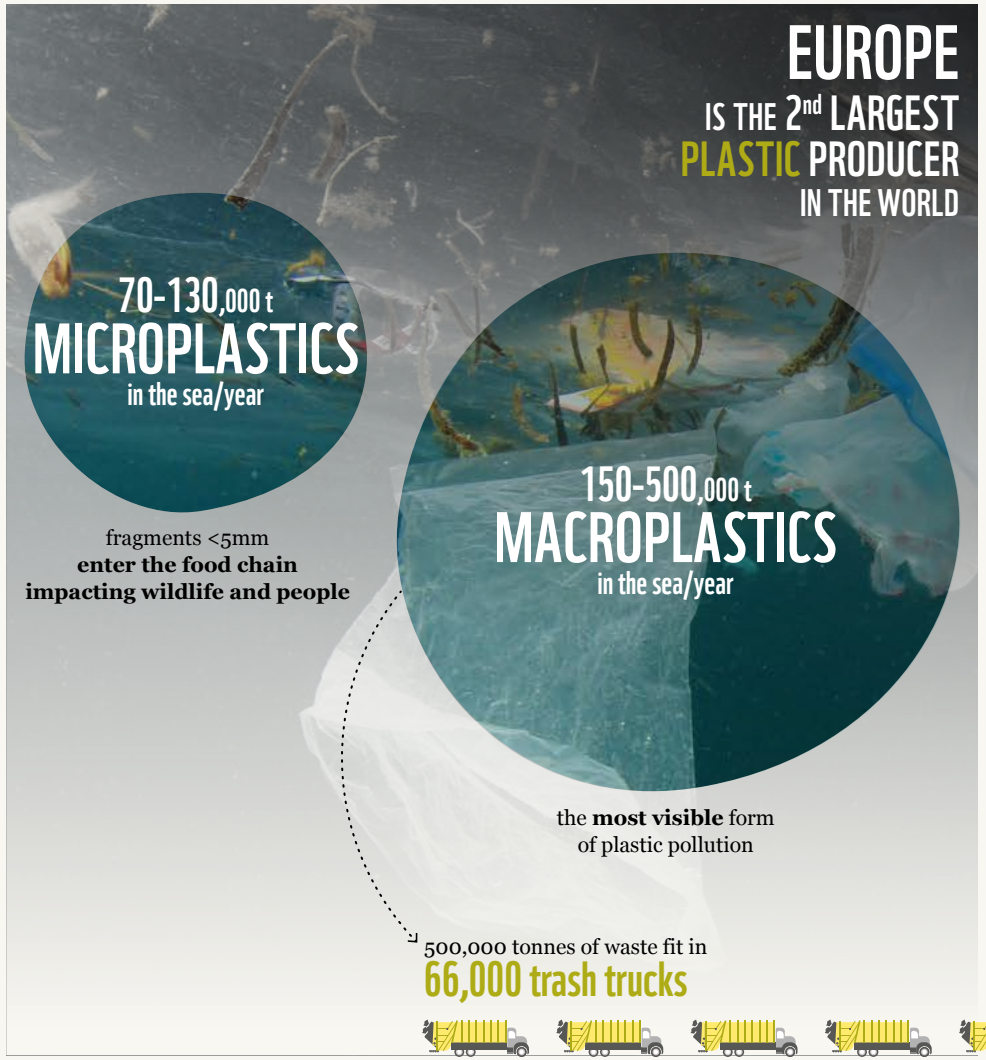
3. RISKS FOR WILDLIFE 14

DEADLY TRAPS 14
JUNK FOOD 15
Why do animals mistake plastic for food? 17
Microplastics alert in the Pelagos sanctuary 18
SILENT POISONING 19
THE PLASTI-SPHERE 20

RECOMMENDATIONS FOR A PLASTIC-FREE MEDITERRANEAN 21

REFERENCES 25

EXECUTIVE SUMMARY



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The Mediterranean Sea, cradle of civilization and centre of extraordinary environmental heritage, is **today one of the seas with the highest levels of plastic pollution in the world**.

Plastics account for 95% of the waste in the open sea, on the seabed and on beaches across the Mediterranean. This waste comes mainly from Turkey and Spain, followed by Italy, Egypt and France.

Europe is the second largest plastics producer in the world, after China, dumping 150,000-500,000 tonnes of macroplastics and 70,000-130,000 tonnes of microplastics in the sea every year. The majority of these plastics enter the Mediterranean Sea, posing a major threat to marine life.

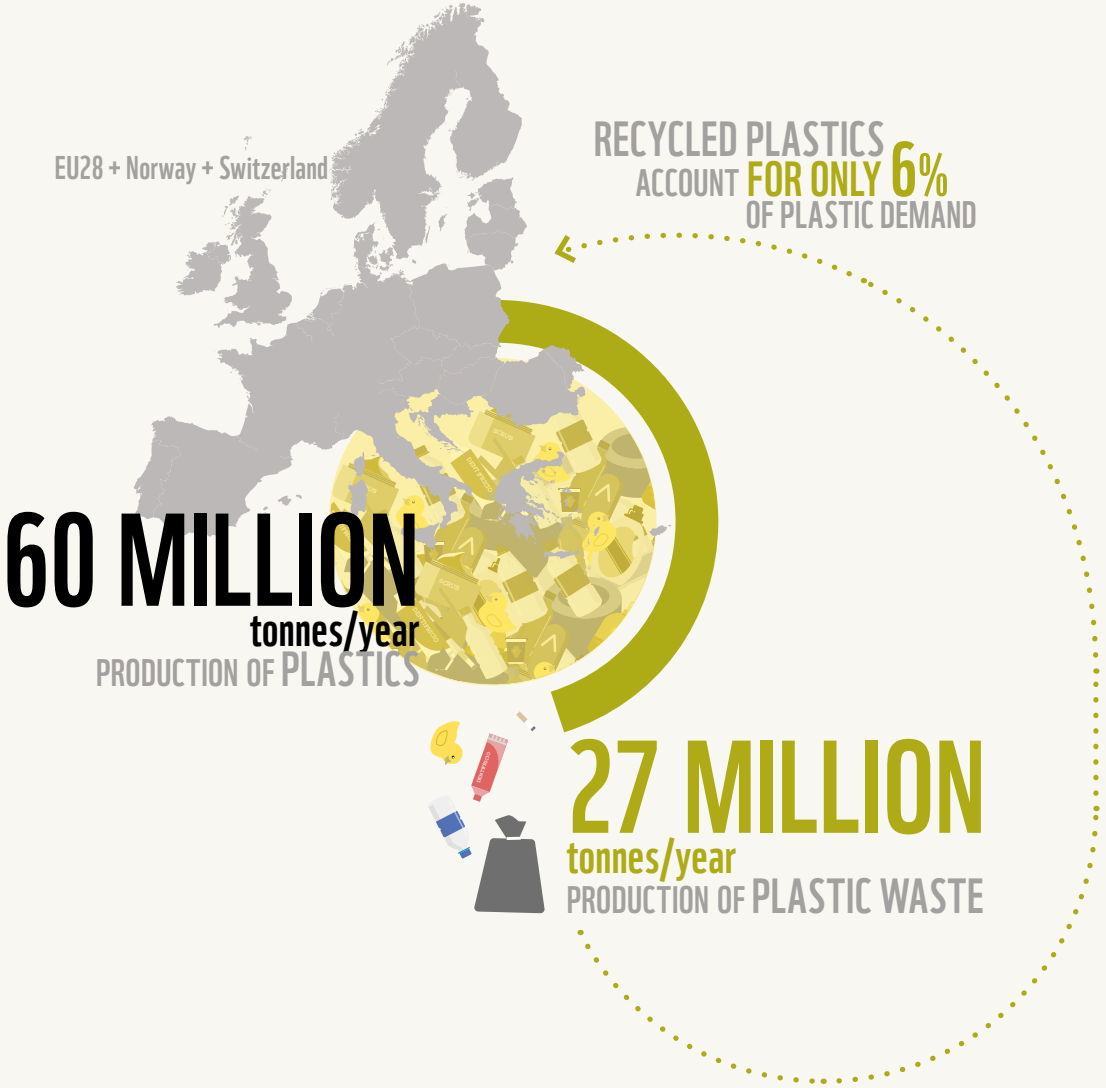
Large plastic pieces injure, suffocate and often kill marine animals, including protected and endangered species, such as sea turtles. But **it is the microplastics, smaller and more insidious fragments that reach record levels in the Mediterranean Sea**: the concentration of microplastics is almost four times higher than in the "plastic island" found in the North Pacific Ocean. By entering the food chain, these fragments threaten an increasing number of animal species as well as human health.

Plastics are synthetic compounds made from carbon-based materials; most plastic is derived from oil and other fossil materials, though it can also be made from other sources like cellulose and corn starch. Plastic is widely used because of its durability, but this also makes it dangerous: most plastics are not biodegradable and remain in the environment for hundreds of years.

The root cause of plastic pollution is found in the delays and gaps in plastic waste management in most Mediterranean countries. Out of the 27 million tonnes of plastic waste produced each year in Europe, only a third is recycled[1]; half of all plastic waste in Italy, France and Spain ends up in landfills[2]. Recycled plastics currently account for only 6% of plastics demand in Europe[3].

Key economic sectors in the Mediterranean, especially fisheries and tourism, are negatively impacted by plastic pollution. Marine litter is estimated to cause an annual economic loss of € 61.7 million to the EU fishing fleet because of reduced catch and damage to vessels, while polluted beaches can discourage tourists with consequent job losses in the sector.

The good news is that it is possible to clean up and protect the Mediterranean Sea from plastics. But this requires the commitment and collaboration of all: governments, businesses and individuals. In this report, WWF proposes a series of recommendations for actions that institutions, industry and individuals can take to create a plastic-free Mediterranean.



1. PLASTICS IN EUROPE

Plastic has been around for more than 100 years, and one of its peculiar characteristics is its durability.

Plastic production – still almost entirely (90%) dependent on fossil fuels – uses 4 to 6% of all the oil and gas used in Europe[4]. There are also additives in plastics, such as pigments, flame-retardants, antioxidants or antistatic agents[5].

Seven types of plastic materials cover 85% of total demand at global level[6].

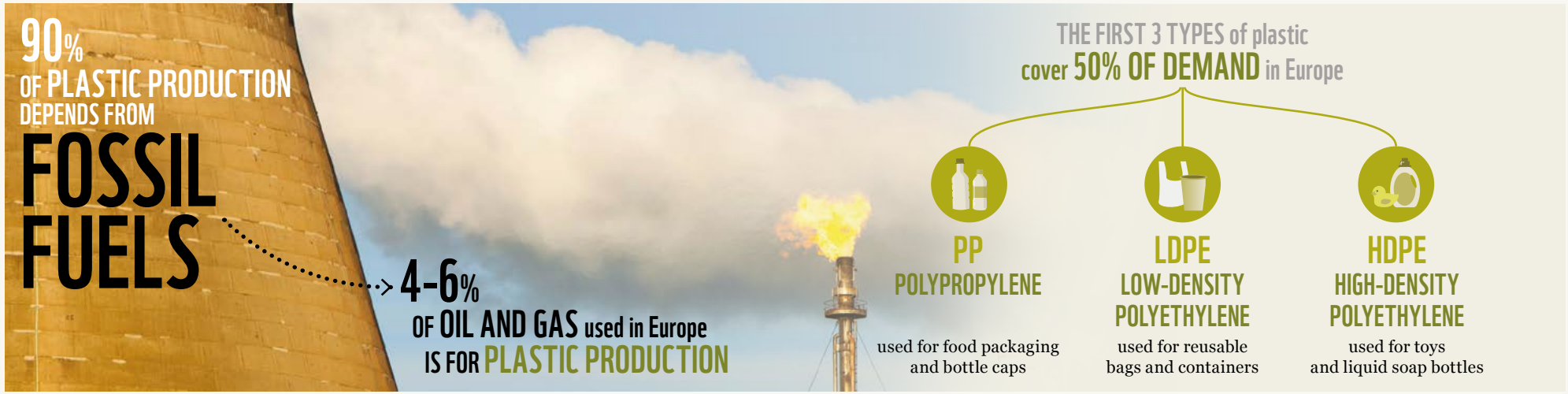
The first three types of plastic cover almost 50% of the demand in Europe[7].

Europe is the world's second largest plastic producer after China. In 2016, the EU-28, Norway and Switzerland produced 60 million tonnes of plastics, and generated 27 million tonnes of plastic waste. Only 31% of this waste was sent for recycling, while 27% ended up in landfills; the rest was burnt for energy[8].

40% of European plastics are used for packaging, creating 16.7 million tonnes of waste[9].

Although the situation is improving, the **use of landfill** (without going through any type of recycling) **still remains the first or second option for many European countries**: it is the main practice in the Balkan countries and in some areas of Eastern Europe. In Italy, France and Spain, 50% of waste ends up in landfill[10].

To date, recycled plastics account for only 6% of plastics demand in Europe[11].



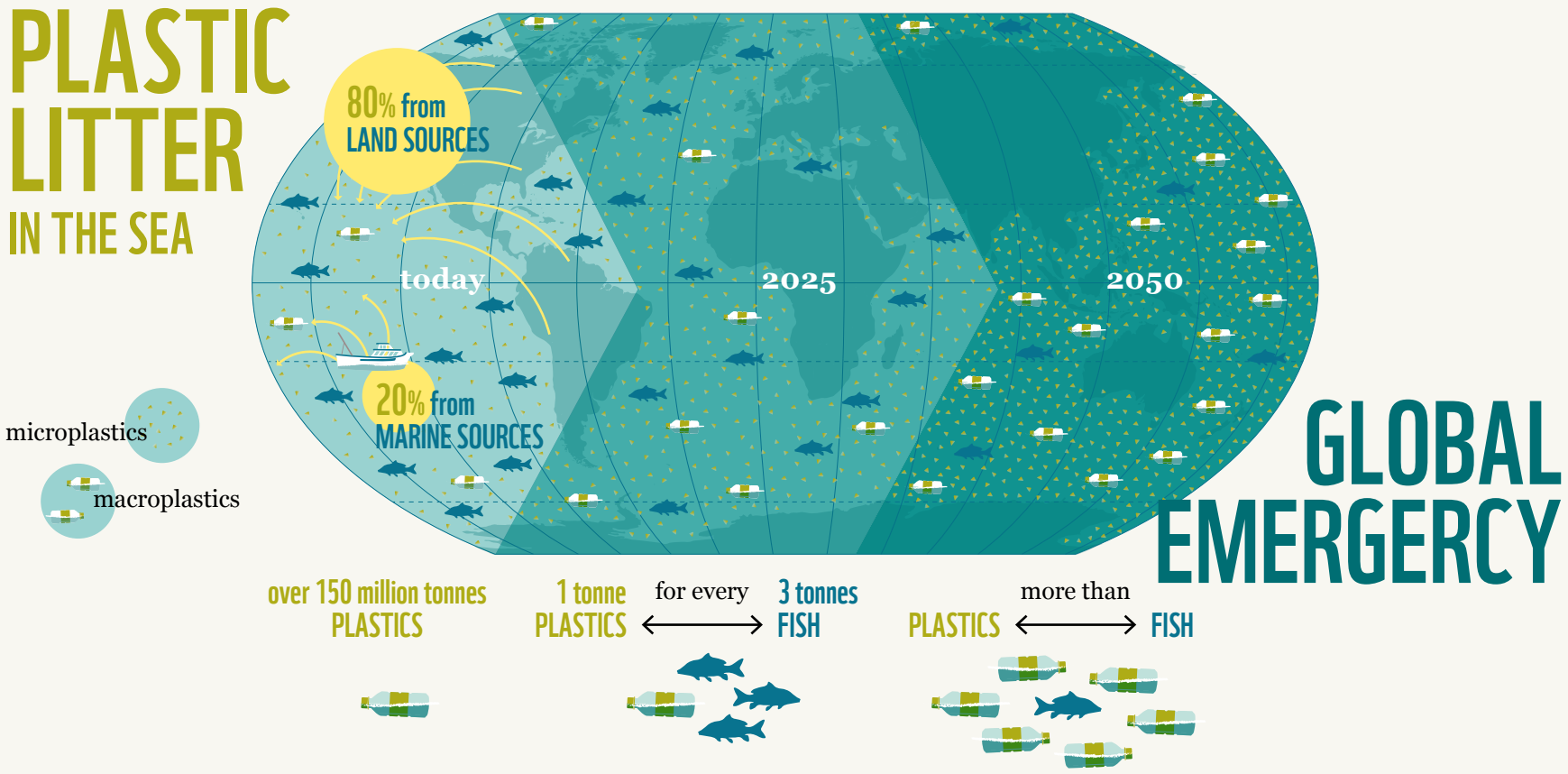
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2. DISTRESS SIGNALS FROM THE SEA

A GLOBAL EMERGENCY

Current estimates report that there are over 150 million tonnes of plastics in the ocean today. In a business-as-usual scenario, the ocean will contain 1 tonne of plastic for every 3 tonnes of fish by 2025, and by 2050, the oceans may have more plastics than fish (by weight)[12].

The fight against marine pollution – of which plastic waste is among the main causes – is one of the focus areas of Sustainable Development Goal 14 "Life below water". In 2018, the UN Environment placed the issue of ocean plastics among the six most serious environmental emergencies,





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(along with others such as climate change, ocean acidification and biodiversity loss).

Plastics represent most of the waste (60-95%) found in seas around the world and the main type of waste found on beaches[13] and marine sediments[14]. Of this, 80% comes from land sources and 20% from marine sources (such as fishing, aquaculture and maritime transport)[15].

Since most plastics are not biodegradable, all the plastics present in the environment will remain there for hundreds or thousands of years[16]. Used on average for four years – but often just once – plastics remain in the sea for periods ranging from five years for a cigarette filter, 20 years for a bag, 50 years for a plastic cup and up to 600 years for a fishing line[17].

Macroplastics – larger waste items such as **bags, cigarette filters, balloons, bottles, caps, or straws**[18] – are the most visible form of plastic pollution. But it is **microplastics**, fragments of less than 5mm that have **the greatest impact on marine life**.

Some microplastics are formed directly at sea, as larger plastic debris breaks down due to wind, waves or ultraviolet light. Others are intentionally manufactured as nurdles (tiny pellets used in plastic production) or exfoliating agents and additives for soaps, creams, gels and toothpastes, or are accidentally generated, for instance from tyre dust or from the use and washing of synthetic clothing fibres.

The impact of microplastics goes beyond the marine environment, contaminating even air, both tap[19] and bottled[20] water –and food and drinks, including salt, honey[21] and beer.

The global economic cost of the 10 to 20 million tonnes of plastic ending up in the world's oceans each year is estimated at approximately US$13 billion per year in environmental damage to marine ecosystems. This includes financial losses incurred by fisheries and tourism as well as time spent cleaning up beaches[22].



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THE MEDITERRANEAN "PLASTIC TRAP"

The Mediterranean basin is home to **150 million people**, who produce among the largest quantities of solid urban waste per capita, at **208-760kg per year**[23]. The over **200 million tourists**[24] **visiting the Mediterranean each year generate a 40% increase in marine litter during summer**[25]. Plastic flows depend on the proximity of urban activities, shore and coastal uses, wind and currents. Debris is also carried to the sea by rivers, primarily the Nile, the Ebro, the Rhone, the Po, and the Ceyhan and Seyhan rivers in Turkey which flow into the sea after passing through densely populated areas.

This semi-enclosed sea, surrounded by three continents and with intense human activity, works as a trap for plastics. Plastics accumulate in great quantity in the sea and remain there for a long time, breaking down into smaller and smaller parts[26]. Today, plastics account for 95% of the waste in the open sea, on the seabed and on beaches across the Mediterranean[27].

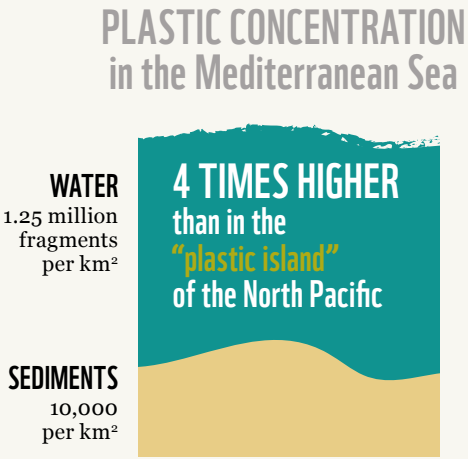
Every year **150,000-500,000 tonnes** of macroplastics and **70,000-130,000 tonnes** of microplastics enter European seas[28]. **The vast majority of these plastics end up in the Mediterranean Sea**[29].

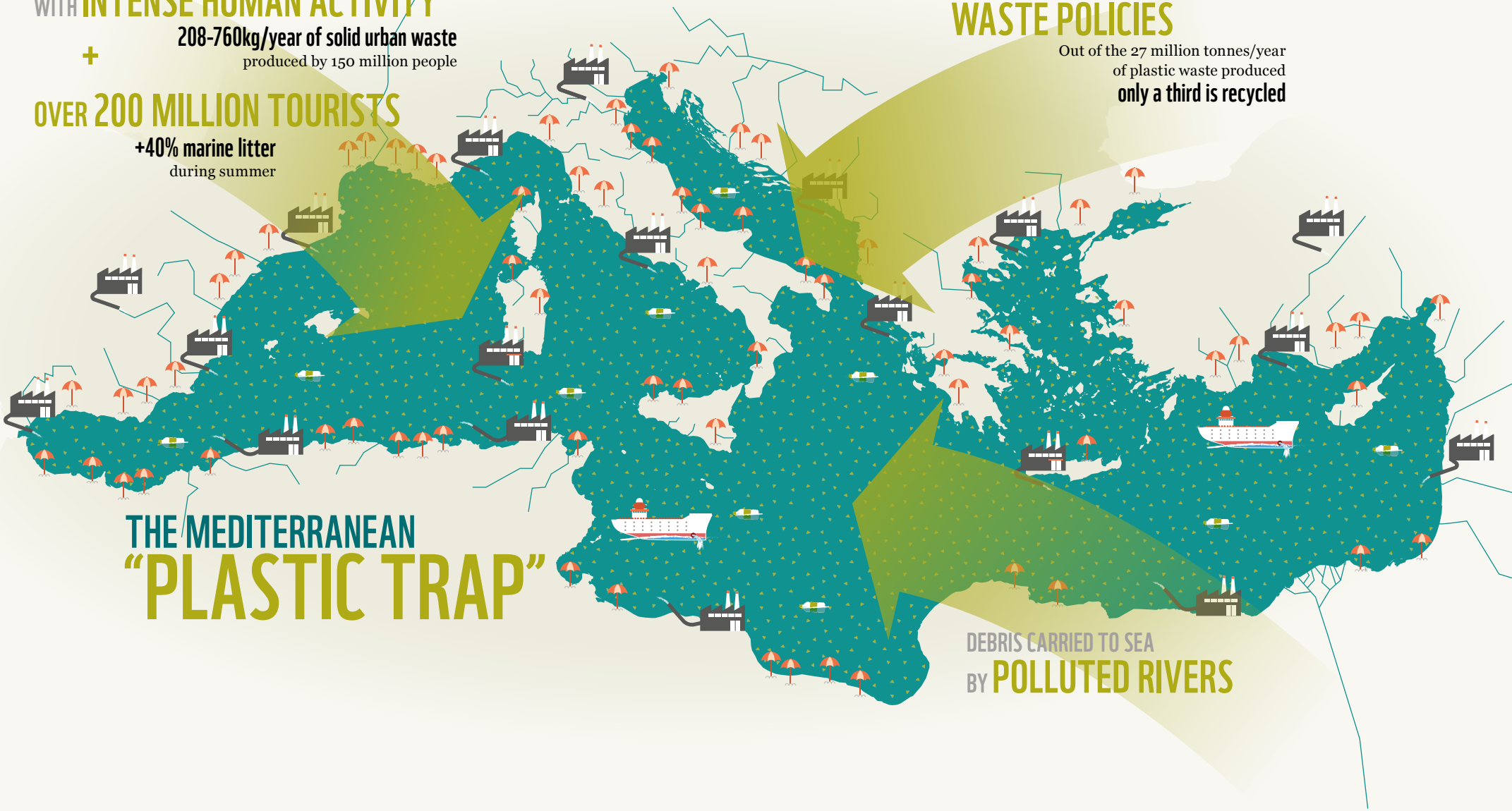
There are five oceanic "plastic islands" where the majority of plastic waste accumulates: two in the Pacific Ocean, two in the Atlantic and one in the Indian Ocean. The Mediterranean is considered the sixth greatest accumulation zone for marine litter: this sea holds only 1% of the world's waters, but concentrates **7% of all global microplastics**[30].

In the Mediterranean, microplastics reach record levels of concentration: 1.25 million fragments per km², almost four times the level of one of the five "plastic islands"[31]. Even ocean sediments are affected, with concentrations of plastic fragments among the highest in the world at 10,000 per km²[32].

The countries that dump most plastics into the Mediterranean Sea are Turkey (144 tonnes/day), Spain (126), Italy (90), Egypt (77) and France (66)[33].

Plastic pollution can impact key economic sectors in the Mediterranean, especially fisheries and tourism. Marine litter is estimated to cost the EU fishing fleet € 61.7 million every year, due to reduction in fish catch, damage to vessels or reduced seafood demand due to concern about fish quality. Polluted beaches can also discourage visitors, leading to reduced jobs and revenues and increased costs for beach and harbour clean ups. The town of Nice for example spends about € 2 million every year to ensure that beaches remain clean[34].




DENSELY POPULATED AREA
WITH INTENSE HUMAN ACTIVITY
208-760kg/year of solid urban waste
produced by 150 million people
+
OVER 200 MILLION TOURISTS
+40% marine litter
during summer
INADEQUATE
WASTE POLICIES
Out of the 27 million tonnes/year
of plastic waste produced
only a third is recycled
THE MEDITERRANEAN
"PLASTIC TRAP"
DEBRIS CARRIED TO SEA
BY POLLUTED RIVERS

PLASTICS USED AND RECYCLED IN MEDITERRANEAN COUNTRIES[35]



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ITALY

Italians consume about 2.1 million tonnes of plastics each year, the second biggest users after Germans. Recycling is still limited to packaging and only to 41% of it.

Every day 32 million plastic bottles are used in Italy. With about 178 l per person/year, Italians are the greatest consumers of bottled water in Europe (and globally), with 65% of this water in plastic bottles[36].

Italy has a target of 26% for plastic separate waste collection and, following an EU Directive, it has imposed limited levels of bisphenol A in polycarbonate baby bottles. A ban on single use plastic bags in supermarkets is in place, and it was recently extended to small bags for fruits and baked goods. On 1 January 2020 the production and marketing of microplastic in cosmetics and plastic cotton swabs will be banned.

2.1 MILLION tonnes of plastic CONSUMED EVERY YEAR

SPAIN

Spain consumes about 3.84 million tonnes of plastics per year and around 38% is recycled.

Spanish people consume 10% of Europe's single use plastics. This includes 3,500 million plastic drink bottles, 1,500 million plastic coffee cups, 50,000 million cigarette butts, 207 million disposable containers and 5000 million plastic straws[37]. In some coastal areas like Almeria and Granada, there is a very significant presence of greenhouse plastics used for agriculture.

Spain has no landfill restrictions, and has a law on waste and packaging in line with the EU Waste Directive. A ban for single-use plastic is under discussion in the Balearic Islands.

10% of Europe's SINGLE USE PLASTICS

FRANCE

Between 2 and 4 million tonnes of plastics are consumed in France per year[38]. France recycles only 22% of its plastics, among the worst record in Europe[39]. A 2018 survey showed that only one quarter of plastic packaging is recycled[40].

French people are Europe's top 3 consumers of bottled water (plastic bottles included) and top 10 worldwide. Cotton swabs are the 2nd most common plastic item (Surfrider).

Plastic bags are banned in supermarkets, while cotton swabs will be banned in 2020. France has launched a new roadmap to achieve 100% recycled plastics by 2025. Additional legislation on water and waste management will impact plastic waste management.

ONLY 22% of PLASTIC IS RECYCLED

GREECE

Greece consumes about 0,6 million tonnes of plastics per year and recycles 20% of this.

A clean-up survey of 80 beaches in Greece showed that the most abundant litter material was plastic (43–51%), followed by paper (13–18%) and aluminium (7–12%)[41]. Top items found in Greek beaches are cigarette butts, bottle caps, straws and stirrers, plastic bottles, food wrappers and plastic bags[42].

Plastic waste management and recycling are included in the National Solid Waste Strategy and the National Strategic Solid Waste Prevention Programme. Greece has a target of 65% plastic packaging recycling by 2020, but it is far from reaching it. The current solid waste management system is inefficient and non-transparent, and lacks ambition on plastics waste prevention and reuse.

65% of PLASTIC PACKAGING RECYCLED BY 2020

TURKEY

On average 1.24 million tonnes of plastic are consumed per year (2015), about 40% is said to be recycled.

Fragments from transparent items are the most frequent type of plastics found on Turkish coasts[43].

According to the 2017 Packaging Waste Control Regulation, plastic manufacturers and industrial users have to recycle 54% of their production (56% after 2020). Turkey aims at reducing plastic bag use to 90 bags per person by 2019, and 40 by 2025. From 1 January 2019 Turkish people will start paying for plastic bags.

WWF-Turkey is working on the national zero waste programme organized under the auspices of the Turkish President and announced by the First Lady in 2017.

TARGET: 90 PLASTIC BAGS/PERSON BY 2019

CROATIA

54,744 tonnes of plastic packaging were used in Croatia in 2016 and less than half were reused or recycled[44].

Small plastic and polystyrene pieces are among the most common items found in Croatia's seas followed by cotton buds, plastic caps and lids from drink bottles and other items.

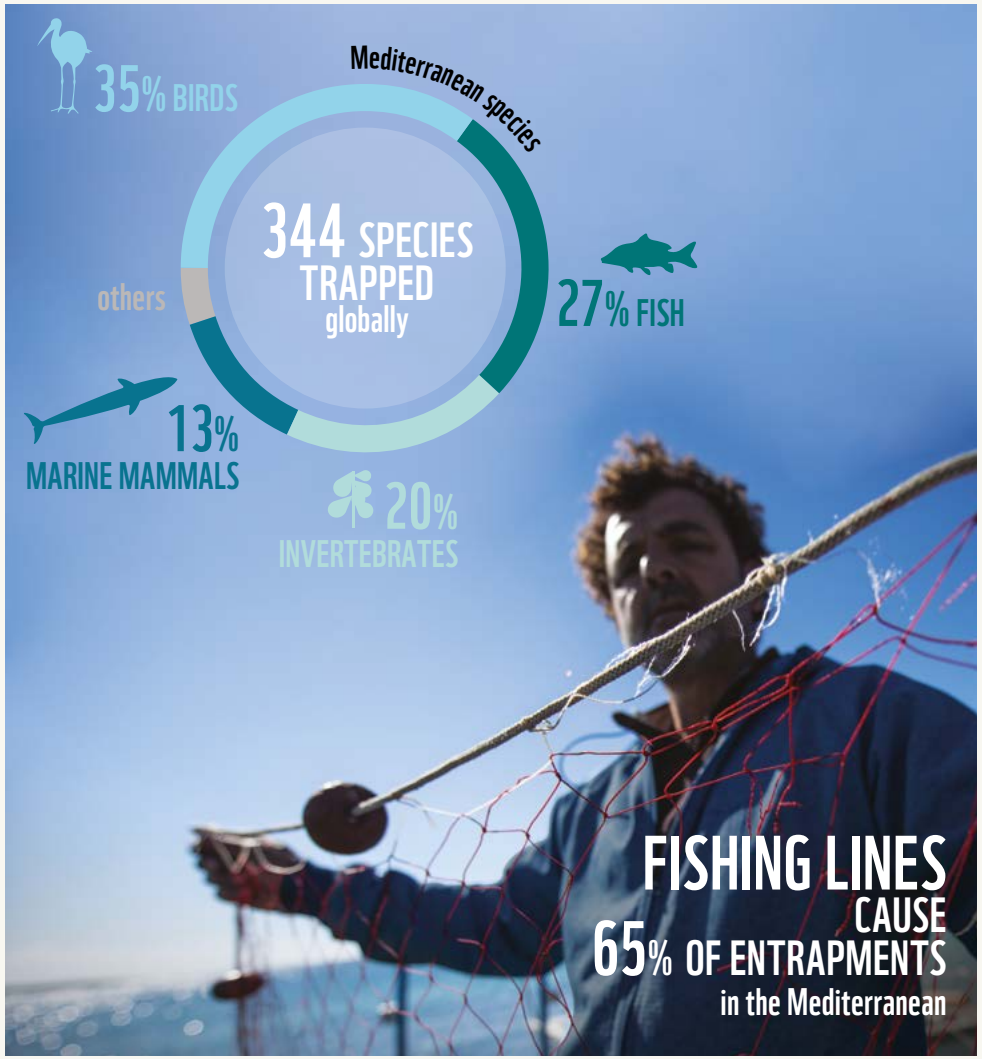
Several pieces of legislation, like the Marine and Coastal Management Strategy, address marine litter in the country. Improved waste management and collecting litter in the sea by diving action and trawling, are included. Companies are required by law to produce packaging that can be reused, recovered and/or recycled in accordance with the best available technologies to minimize the environmental impact. Croatia has a goal to set a marine waste management system by 2022.

SMALL PLASTIC AND POLYSTYRENE ARE MAINLY FOUND IN THE SEA

3. RISKS FOR WILDLIFE

Over 90% of the damage caused to marine wildlife by human waste is due to plastics[45]. Globally, there are about 700 marine species threatened by plastics, of which 17% are listed by IUCN as “threatened” or “critically endangered”, including the Hawaiian monk seal, the loggerhead turtle and sooty shearwater[46]. Entrapment, ingestion and contamination, as well as the transport of alien species, are the main ways plastics put marine wildlife at risk[47].

700 MARINE SPECIES THREATENED BY PLASTICS
in the world



© CLAUDIA AMICO / WWF

DEADLY TRAPS

Abandoned fishing lines and nets, but also six-pack bottle rings and packaging, entangle and trap animals, in some cases constraining parts of their body.

Globally 344 species have been found trapped in plastics[48]. In the Mediterranean, the main victims are birds (35%), fish (27%), invertebrates (20%), marine mammals (13%) and sea turtles[49].

Plastics can cause injuries, lesions and deformities (including during growth), and prevent animals from being able to move in order to escape predators, swim and feed, with almost always fatal consequences: the animals die from hunger, drowning or because they become easy prey[50].

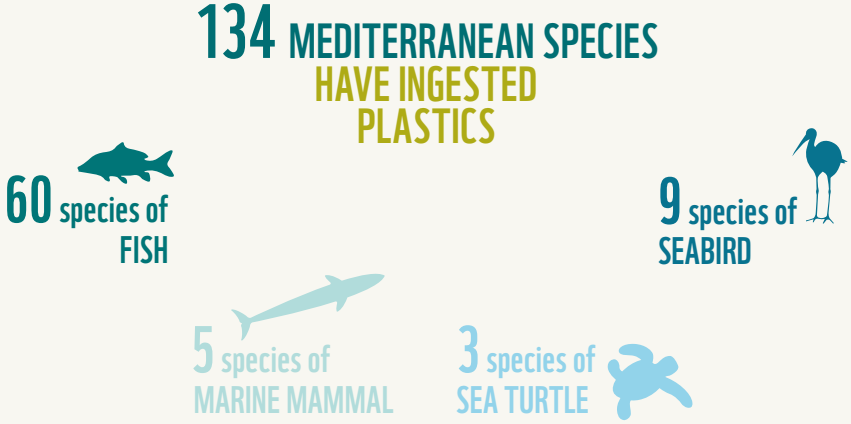
In general, all the fishing gear that is abandoned, lost or discarded at sea (lines, nets, traps) causes damage to wildlife, trapping and killing fish and other marine animals – a phenomenon known as “ghost fishing”. Even the very rare monk seal is one of the victims of ghost nets[51].

JUNK FOOD

Marine species ingest plastics intentionally, accidentally, or indirectly by feeding on prey that has already eaten plastics.

In the Mediterranean Sea, 134 species are victims of plastics ingestion[52], including 60 species of fish, all 3 species of sea turtle, 9 species of seabird and 5 species of marine mammal (sperm whales, fin whales, bottlenose dolphins, Risso's dolphins and striped dolphins). Today, **90% of the world's seabirds have fragments of plastic in their stomach** (in 1960 it was 5%); by 2050 this number may rise to 99% if action is not taken to reduce the flow of plastics into the sea[53].

Fibres and microplastics have been found in oysters and mussels, while crisp packets and cigarettes have been found in large pelagic fish[54]. The most extreme case was when 9m of fishing line, 4.5m of flexible hose, 2 flower pots and several plastic tarps were found in the stomach of a washed-up sperm whale[55].



Plastic ingestion, especially of large pieces, has a range of consequences. It can reduce the stomach capacity, which reduces the sense of hunger and subsequent fat accumulation (essential for all animals that undergo long migration), and cause intestinal blockage, ulcers, necrosis (death of cells), perforations and wounds. All these impacts almost always lead to the death of the animal.

All the sea turtle species living in the Mediterranean have been found to ingest plastics[56]. A 10-year study on the loggerhead turtle showed that 35% of the specimens analysed had ingested debris, which were almost all plastic[57]. Up to 150 plastic fragments have been found in some specimens.

In addition, **18% of tuna and swordfish have plastic debris in the stomach**[58] – mostly cellophane and PET[59] – as do 17% of blackmouth catsharks in the Balearic Islands.



Even smaller animals, such as mussels, common crabs, red mullet and sole that feed on the seabed can be important accumulators of microplastics[60]. A study of microplastics in mussels and oysters – cultivated for human consumption – estimated that an average European shellfish consumer could ingest up to 11,000 pieces of microplastic per year. However, the effects of microplastics on human health are still unknown[61].

Plastics have also infiltrated the world of the microscopic. Zooplankton (the small organisms at the base of the marine food chain) involuntarily feed on plastic fragments smaller than 1mm. These fragments can contain toxic substances: by ingesting them the zooplankton transmit them up the food chain, all the way to humans.



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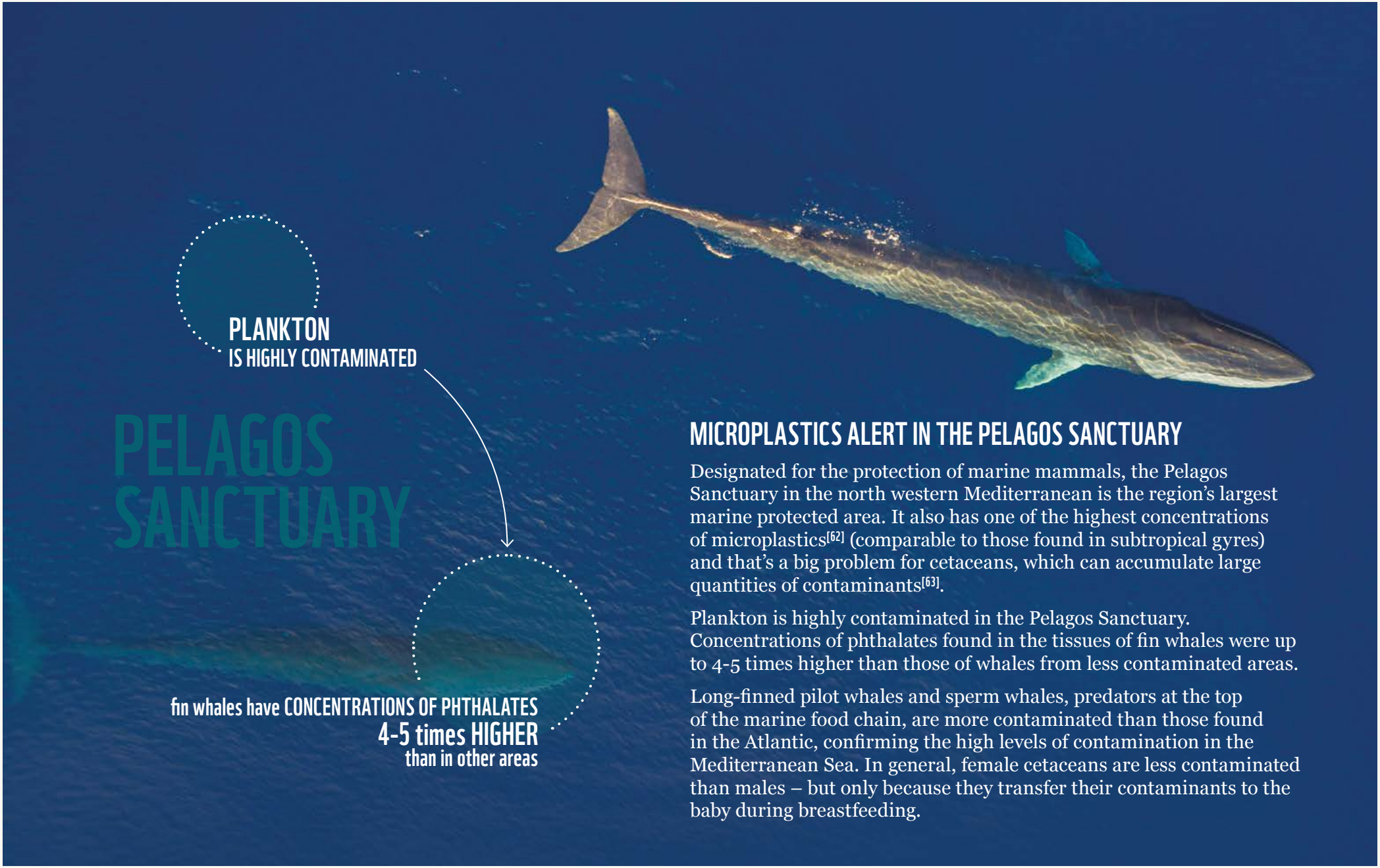
WHY DO ANIMALS MISTAKE PLASTIC FOR FOOD?

Seabirds choose food through smell. Plastic can be mistaken for food because of the algae and bacteria that colonize it emitting a strong smell of sulphur. Seabirds associate this smell with food, so fall into "olfactory traps" that lead them to eat plastics instead of their prey.

The smell of plastics also misleads fish: some schools of anchovies have remained indifferent to fragments of clean plastics, but have been attracted by microplastics that smell similar to the krill they eat.

Sea turtles, meanwhile, choose their prey by sight – and jellyfish, plastic bags and balloons all look like food. Most young sea turtles spend a long period of life in the open sea, within the great systems of currents where dangerous ocean plastics are also concentrated. Today, half of all sea turtles have ingested some form of plastic.

© DENIS ODY / WWF



MICROPLASTICS ALERT IN THE PELAGOS SANCTUARY

Designated for the protection of marine mammals, the Pelagos Sanctuary in the north western Mediterranean is the region's largest marine protected area. It also has one of the highest concentrations of microplastics[62] (comparable to those found in subtropical gyres) and that's a big problem for cetaceans, which can accumulate large quantities of contaminants[63].

Plankton is highly contaminated in the Pelagos Sanctuary. Concentrations of phthalates found in the tissues of fin whales were up to 4-5 times higher than those of whales from less contaminated areas.

Long-finned pilot whales and sperm whales, predators at the top of the marine food chain, are more contaminated than those found in the Atlantic, confirming the high levels of contamination in the Mediterranean Sea. In general, female cetaceans are less contaminated than males – but only because they transfer their contaminants to the baby during breastfeeding.



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SILENT POISONING

A silent poisoning caused by chemical contaminants looms over the oceans today.

Plastic debris in the marine environment, including resin pellets, fragments and microscopic plastic fragments, contain organic contaminants, such as pesticides, phthalates, PCBs and bisphenol A. Some of these compounds are added during plastics manufacture, while others are absorbed from the surrounding seawater[64]. Of the contaminants that adhere to plastic in the sea, 78% are toxic (i.e. have harmful impacts on the organisms they come into contact with), persistent (i.e. are resistant to degradation processes, remaining unaltered for a long time) and accumulate in the tissue of living organisms[65].

Plastics can contain concentrated toxic compounds up to a million times higher than those naturally found in sea water[66][67].

Polyethylene (PE), used for plastic bottles and bags, accumulates more organic contaminants than other types of plastic. This capacity to absorb toxic substances also increases over time, making plastics more and more dangerous for those that ingest them[68].

The negative effects of these contaminants also depends on the rate at which they are released in the body: **plastic releases up to 30 times more contaminants when it is present in body tissue (i.e. the intestines) than in sea water**[69][70]. Once plastic contaminants enter the body, they interfere with important biological processes, causing liver damage or altering hormones. This in turn can influence mobility, reproduction and growth, and cause the development of cancer[71]. The substances absorbed and released by plastics can also alter the DNA, causing adverse health effects.

THE PLASTI-SPHERE

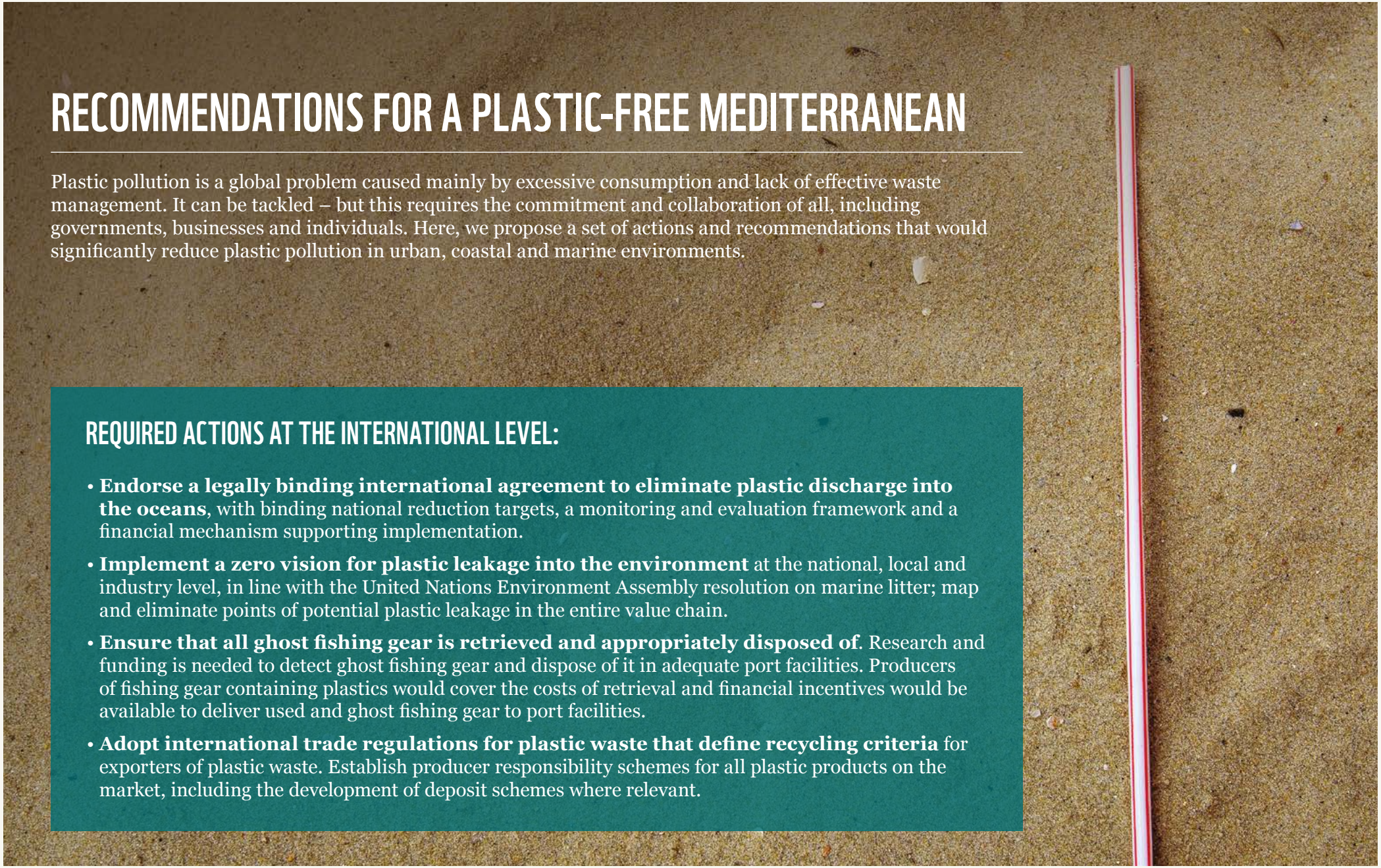
Besides contaminants, plastics also accumulate and self-select organisms, building new communities that are different from those that live in the water... a real “Plasti-sphere”!

Different types of plastics accommodate different inhabitants: there are about 1,000 types of micro-organisms that inhabit the plastisphere, including those that cause diseases in humans and animals, such as vibrios[72].

Plastic objects or fragments begin their journey floating in a “clean” state, but then get colonized by various organisms. Over 335 groups of different organisms have been recorded on marine plastics, including bacteria, algae and sponges, but also insects, crustaceans and molluscs. **The plastics found in the Mediterranean carry among the highest concentrations of different organisms ever recorded**[73]. This can cause serious impacts on the marine habitats with which they come into contact.



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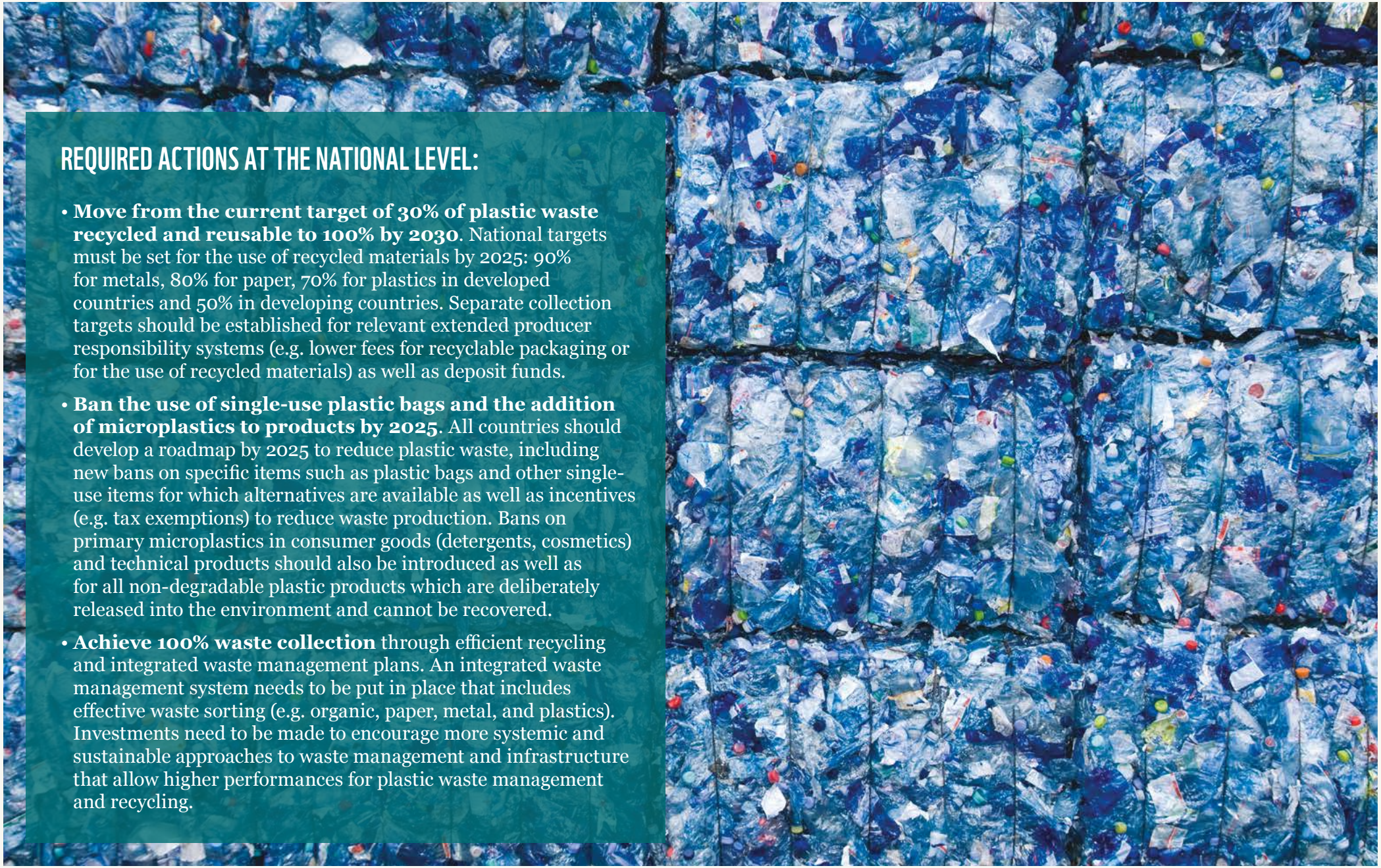
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RECOMMENDATIONS FOR A PLASTIC-FREE MEDITERRANEAN

Plastic pollution is a global problem caused mainly by excessive consumption and lack of effective waste management. It can be tackled – but this requires the commitment and collaboration of all, including governments, businesses and individuals. Here, we propose a set of actions and recommendations that would significantly reduce plastic pollution in urban, coastal and marine environments.

REQUIRED ACTIONS AT THE INTERNATIONAL LEVEL:

- **Endorse a legally binding international agreement to eliminate plastic discharge into the oceans**, with binding national reduction targets, a monitoring and evaluation framework and a financial mechanism supporting implementation.
- **Implement a zero vision for plastic leakage into the environment** at the national, local and industry level, in line with the United Nations Environment Assembly resolution on marine litter; map and eliminate points of potential plastic leakage in the entire value chain.
- **Ensure that all ghost fishing gear is retrieved and appropriately disposed of**. Research and funding is needed to detect ghost fishing gear and dispose of it in adequate port facilities. Producers of fishing gear containing plastics would cover the costs of retrieval and financial incentives would be available to deliver used and ghost fishing gear to port facilities.
- **Adopt international trade regulations for plastic waste that define recycling criteria** for exporters of plastic waste. Establish producer responsibility schemes for all plastic products on the market, including the development of deposit schemes where relevant.



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REQUIRED ACTIONS AT THE NATIONAL LEVEL:

- **Move from the current target of 30% of plastic waste recycled and reusable to 100% by 2030**. National targets must be set for the use of recycled materials by 2025: 90% for metals, 80% for paper, 70% for plastics in developed countries and 50% in developing countries. Separate collection targets should be established for relevant extended producer responsibility systems (e.g. lower fees for recyclable packaging or for the use of recycled materials) as well as deposit funds.
- **Ban the use of single-use plastic bags and the addition of microplastics to products by 2025**. All countries should develop a roadmap by 2025 to reduce plastic waste, including new bans on specific items such as plastic bags and other single-use items for which alternatives are available as well as incentives (e.g. tax exemptions) to reduce waste production. Bans on primary microplastics in consumer goods (detergents, cosmetics) and technical products should also be introduced as well as for all non-degradable plastic products which are deliberately released into the environment and cannot be recovered.
- **Achieve 100% waste collection** through efficient recycling and integrated waste management plans. An integrated waste management system needs to be put in place that includes effective waste sorting (e.g. organic, paper, metal, and plastics). Investments need to be made to encourage more systemic and sustainable approaches to waste management and infrastructure that allow higher performances for plastic waste management and recycling.



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REQUIRED ACTIONS BY INDUSTRY:

- **Invest in innovation for recyclable or sustainable alternatives** to tackle the 30% of plastic packaging that is currently unrecyclable. **Decouple plastics from fossil sources and adopt renewably sourced** feedstocks.
- **Redesign infrastructure for production processes and supply chains** that allow the use of recycled material and alternatives to plastic. Develop solutions to avoid the release of microplastic fibers as a result of washing processes.
- **Adopt a zero waste business and office policy to halt single use plastic products** and promote a plastic-free working environment.
- **Reduce plastic use** starting with all unnecessary small plastic items and packaging. Focus on redesigning multi-material packaging and adopting alternatives already available on the market.
- The **tourism industry**, including hospitality and maritime operators, should avoid the use of all single use plastic items such as bags, bottles, caps, or straws and put in place effective systems of waste collection and recycling.

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REQUIRED ACTIONS BY CITIZENS:

- **Choose, when possible, products made of biodegradable or recycled materials instead of plastics**: biodegradable dental floss rather than nylon; wooden hair combs or clothes pegs; sponges made of cellulose; ceramic plates, bowls and cups; glass bottles; cotton napkins; bamboo fibre yoga mats.
- **Avoid disposable products**: prefer, for example, toothbrushes or razors with replaceable heads; don't use plastic straws, shopping bags, water bottles, crockery and cutlery, cotton buds, pens and lighters.
- **Store food without plastic containers**: replace plastic films, bags and containers with glass, an inert material that, unlike plastic, does not release any contaminants.
- **Avoid soaps and cosmetic products that contain microplastics**: check the ingredients for polyethylene, polypropylene or polyvinyl chloride – these are all plastics.
- **Buy unpackaged products**: buy fruit, vegetables, cheese, meat, fish and other food products which are sold loose/by weight, and "on tap" detergents in order to minimize the packaging.
- **Pay attention to the waste and recycling procedures in your city or community** and recycle as much as possible.
- **Engage** with shops and supermarkets and your municipality to urgently reduce unnecessary plastics, promote sustainable alternatives, improve waste management and invest in recycling.
- **Be a responsible citizen** avoiding single-use plastic items and disposing of all waste items (cigarette butts, packaging and plastic toys) in a proper way to avoid polluting beaches, and the environment.

REFERENCES

[1] Europe here refers to the EU-28, Norway and Switzerland. Plastic Europe. 2017. Plastic - the facts 2017.

[2] Ibid.

[3] European Commission. 2018. A European Strategy for Plastics in a Circular Economy.

[4] see Ref. [1]

[5] World Economic Forum. 2016. The New Plastic Economy: Rethinking the future of plastics.

[6] American Chemistry Council. 2015. 2015 Resin Review. Washington, DC: American Chemistry Council.

[7] see Ref. [1].

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] see Ref. [3]

[12] Ellen MacArthur Foundation and New Plastic Economy, 2017, The new plastics economy: rethinking the future of plastics & catalysing action.

[13] Ocean Conservancy. 2014. Turning the Tide on Trash. Washington, DC: Ocean Conservancy.

[14] Galgani F. *et al.* 2000. Litter on the sea floor along European coasts. *Mar. Pollut. Bull.*, 40, 516-527.

[15] Andrady A.L. 2011. Microplastics in the marine environment. *Mar. Pollut. Bull.*, 62, 1596-1605.

[16] Geyer R. *et al.* 2017. Production, use, and fate of all plastics ever made. *Sci. Adv.*, 3(7), e1700782.

[17] see Ref. [13]

[18] UNEP/MAP. 2015. Marine Litter assessment in the Mediterranean.

[19] Orb Media. 2017.

[20] Orb Media. 2018.

[21] EFSA. 2016. Presence of microplastics and nanoplastics in food, with particular focus on seafood. *EFSA Journal*.

[22] UNEP. 2014. Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry.

[23] Ibid.

[24] Coll M. *et al.* 2010. The Biodiversity of the Mediterranean Sea: Estimates, Patterns, and Threats. *PLOS One*, 5(8) e11842.

[25] Galgani F. *et al.* 2014. In: CIESM 2014. Marine litter in the Mediterranean and Black Seas. CIESM Workshop Monograph n° 46 [F. Briand, ed.], 180 p., CIESM Publisher, Monaco.

[26] Ibid.

[27] see Ref. [18]

[28] see Ref. [3]

[29] Ibid.

[30] Suaria G. *et al.* 2016. The Mediterranean Plastic Soup: synthetic polymers in Mediterranean surface waters. *Sci. Rep.*, 6, 37551.

[31] Ibid.

[32] see Ref. [14]

[33] see Ref. [18]

[34] ten Brink P. *et al.* 2016. Plastics Marine Litter and the Circular Economy. A briefing by IEEP for the MAVA Foundation.

[35] Most data related to the consumption of plastics in Europe are based on: Eurostat 2015 and Plastic Europe 2017.

[36] Censis. 2015. Un mare di plastica.

[37] Seas at Risk. 2017. Single use plastic and the marine environment, 2017.

[38] https://myboocompany.fr/constat-du-plastique

[39] See also article Science et Avenir.

[40] See article.

[41] Kordella S. *et al.* 2013. Litter composition and source contribution for 80 beaches in Greece, Eastern Mediterranean: A nationwide voluntary clean-up campaign, *Aquat. Ecosyst. Health & Manag.*, 16(1), 111-118.

[42] MAP 2015 – Marine Litter Assessment in the Mediterranean 2015, ISBN No. 978-92-807-3564-2.

[43] Gündoğdu S. *et al.* 2017. Micro- and mesoplastics in Northeast Levantine coast of Turkey: The preliminary results from surface samples, *Mar. Pollut. Bull.*, 118(1-2), 341-347.

[44] Croatia's National Waste management plan, 2017-2022.

[45] Law K.L. 2017. Plastics in the Marine Environment. *Annu. Rev. Mar. Sci.*, 9, 205-229.

[46] Gall S.C. and Thompson R.C. 2015. The impact of debris on marine life. *Mar. Pollut. Bull.*, 92(1-2), 170-179.

[47] see Ref. [45]

[48] Ibid.

[49] see Ref. [18]

[50] see Ref. [45]

[51] Cebrian D. 2008. Seals-fisheries interactions in the Mediterranean monk seal (*Monachus monachus*): related mortality, mitigating measures and comparison to dolphin-fisheries interactions. *SCMEE/ SCSA Transversal Working Group on by catch/incidental catches FAO Headquarters, Rome (Italy)*.

[52] Deudero S. and Alomar C. 2015. Mediterranean marine biodiversity under threat: Reviewing influence of marine litter on species. *Mar. Pollut. Bull.*, 98(1-2), 58-68.

[53] Wilcox C. *et al*. 2015. Threat of plastic pollution to seabirds is global, pervasive, and increasing. *Proc. Natl. Acad. Sci.* USA, 112, 11899-11904.

[54] Jackson G.D. *et al*. 2000. Diet of the southern opah Lamprisim maculatus on the Patagonian Shelf; the significance of the squid *Moroteuthis ingens* and anthropogenic plastic. *Mar. Ecol. Prog. Ser.*, 206, 261-271.

[55] de Stephanis R. *et al*. 2013. As main meal for sperm whales: plastics debris. *Mar. Pollut. Bull.*, 69, 206-214.

[56] see Ref. [18].

[57] Casale P. *et al*. 2016. Biases and best approaches for assessing debris ingestion in sea turtles, with a case study in the Mediterranean. *Mar. Poll. Bull.*, 110, 238-249.

[58] Romeo T. *et al*. 2015. First evidence of presence of plastic debris in stomach of large pelagic fish in the Mediterranean Sea. *Mar. Pollut. Bull.*, 95, 358-361.

[59] Alomar C. and Deudero S. 2017. Evidence of microplastic ingestion in the shark Galeus melastomus Rafinesque, 1810 in the continental shelf off the western Mediterranean Sea. *Environ. Pollut.*, 223, doi:10.1016/j.envpol.2017.01.015

[60] see Ref. [18].

[61] see Ref. [34].

[62] The average concentration found in Pelagos is 132,066 microplastics/km^2.

[63] Jacob T. and Fossi C. 2016. Impacts des microplastiques sur la population de Rorquals 3 communs du Sanctuaire Pelagos. Rapport GIS3M pour le Parc national de Port-Cros, Animateur de la Partie française de l'Accord Pelagos. Fr. : 19 pp.

[64] Teuten E.L. *et al*. 2009. Transport and release of chemicals from plastics to the environment and to wildlife. *Philos Trans R Soc Lond B Biol Sci.*, 364(1526), 2027-2045.

[65] see Ref. [45].

[66] Mato Y. *et al*. 2001. Pellet di resina plastica come mezzo di trasporto per sostanze chimiche tossiche nell'ambiente marino. *Environ. Sci. Technol.*, 35(2), 318-324.

[67] Teuten E.L. *et al*. 2007. Potential for plastics to transport hydrophobic contaminants. *Environ. Sci. Technol.*, 41, 7759-7764.

[68] Rochman C.M. 2015. The Complex Mixture, Fate and Toxicity of Chemicals Associated with Plastic Debris in the Marine Environment. In: Bergmann M., Gutow L., Klages M. (eds) Marine Anthropogenic Litter. Springer, Cham.

[69] Bakir A. *et al*. 2015. Enhanced desorption of persistent organic pollutants from microplastics under simulated physiological conditions. *Environ. Pollut.*, 185, 16-23.

[70] Lee Ref. [45]

[71] Lithner D. *et al*. 2011. Environmental and health hazard ranking and assessment of plastic polymers based on chemical composition. *Sci. Total Environ*, 409, 3309-3324.

[72] Zettler E.R. *et al*. 2013. "Plastisphere": Microbial Communities on Plastic Marine Debris. *Environ. Sci. Technol.*, 47(13), 7137-7146.

[73] Kiessling T. *et al*. 2015. Marine litter as habitat and dispersal vector. In: Bergmann M., Gutow L., Klages M. (eds) Marine Anthropogenic Litter. Springer, Cham.



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95%

of the waste
in the Mediterranean Sea
and beaches is plastic

7%

of global microplastics
are in the Mediterranean Sea



1/3

of plastic waste
is recycled in Europe

500,000

million tonnes/year
of macroplastics
are dumped in European seas

€ 61.7

million/year is the economic loss
caused by marine litter to the EU fishing fleet

100% RECYCLED

WWF

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To stop the degration of the planet's natural environment and to build a future in which humans live in harmony with nature.

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