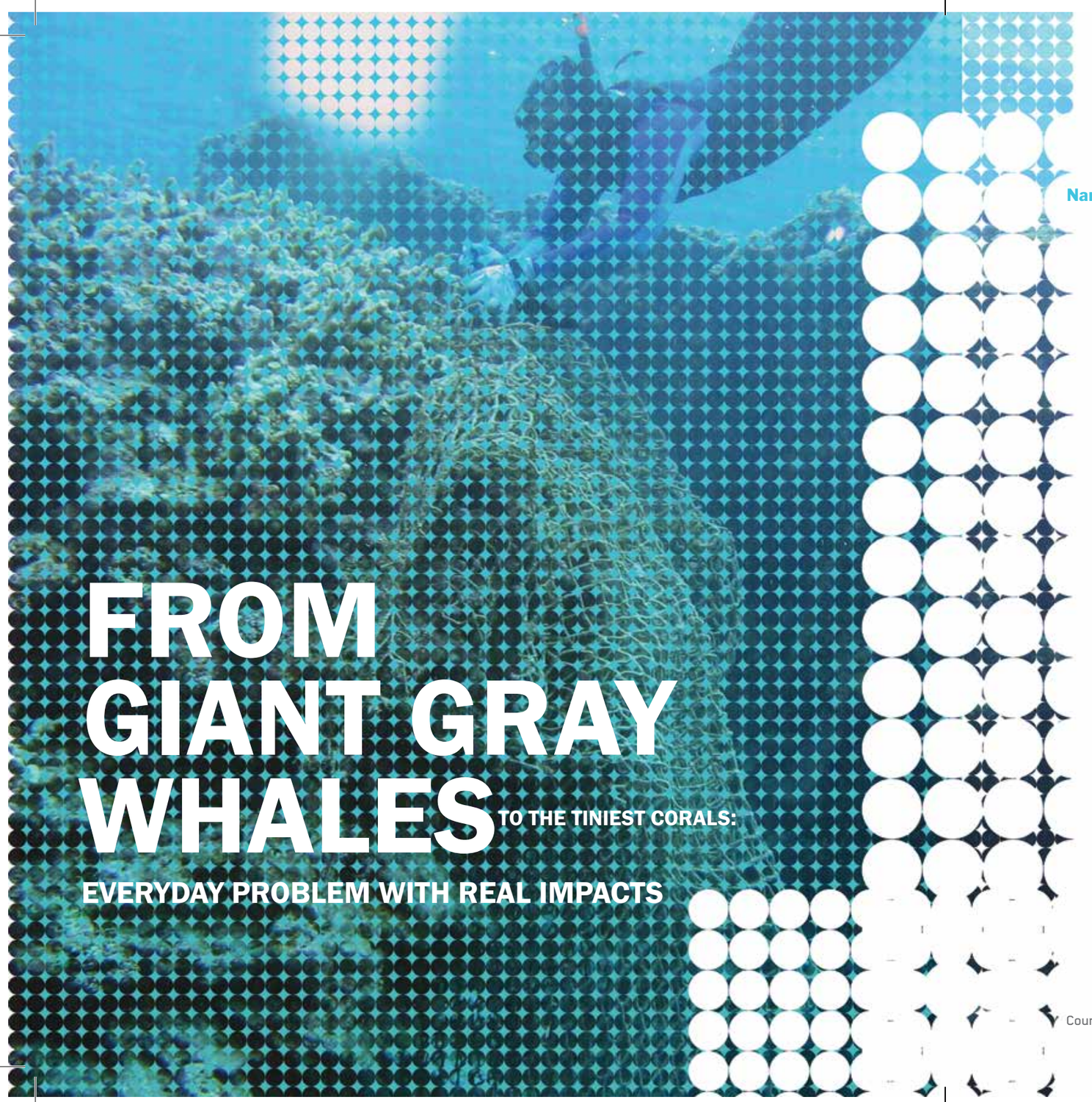

FROM GIANT GRAY WHALES TO THE TINIEST CORALS:

EVERYDAY PROBLEM WITH REAL IMPACTS

Nancy Wallace, Director NOAA Marine Debris Program

IN 2010, A 37-FOOT DEAD GRAY WHALE washed up on a rocky beach in West Seattle. While it was not the first whale to die in the Puget Sound that year, the necropsy surprised responders. Plastics, duct tape, rope, fishing line, sweat pants, towels, a juice pack, a sock, a golf ball, a *5 A Day* fruit and vegetable bag, and a host of other foreign items swirled around in its stomach. According to Cascadia Research, a non-profit that helped lead the examination, while there was no clear cause of death, the amount of human debris in the whale's stomach was larger than what they had ever found before.[1] "Most of the gray whales we see have plant material and wood chips in their stomachs," said Jessie Huggins, a stranding coordinator with Cascadia Research. "We hadn't seen that volume of trash before, so it was very surprising."[2]

Gray whales are bottom feeders, which means they eat near the sea floor, filtering tiny prey from water, sediment, and foreign objects through large baleen plates.[3] Unfortunately, the food they filter is not always food; it can be plastic bags, textiles, or any other debris found in industrial, coastal waters. The irony of a whale eating the very non-nutritious plastic remains of a *5 A Day* nutrition campaign should not be lost on anyone.

There is no solid data on how many marine mammals ingest plastic and other debris each year, but the Seattle incident is certainly not isolated. There are anecdotes from all over the globe, covering a range of species. For example, two sperm whales stranded on the Northern California coast in 2008 had large amounts plastic debris and fishing nets in their stomachs—nearly 134 different types of nets between the two. One whale's stomach was ruptured, and the other whale was emaciated. Both likely died from the debris blockage.[4] Just recently, in March 2013, scientists in southern Spain found nearly 38 pounds (17 kg) of plastic sheeting used to make greenhouses protruding from a dead sperm whale's stomach. One responder reportedly said, "there was so much plastic that it finally exploded."[5]

Courtesy of NOAA

WEST SEATTLE, 2010
A dead gray whale washed up on a rocky beach in West Seattle in 2010.
Photographs courtesy of Cascadia Research Collective

juice pack
fabric
golf ball
fabric
duck tape
5 A Day fruit and vegetable bag
rope
fishing line
plastic grocery bags
sweat pants

LAYSAN ALBATROSS
MIDWAY, HAWAIIAN ISLANDS
Courtesy of NOAA

Global Impacts to Natural Resources

Even the most remote areas of the world suffer from the impacts of marine debris. Refuge managers on Midway Atoll in the Northwestern Hawaiian Islands have come across the carcasses of Laysan albatrosses with lighters, bottle caps, and colorful bits of plastic spilling from their skeletons. Where a whale might inhale debris through its large mouth by accident, birds, fish, and other marine mammals can mistake broken-down plastics for prey and eat it. If it becomes stuck in their guts, they may not digest real food properly, which can lead to starvation and death.

We can observe the direct impact of debris ingestion, but what about what we can't see? Some plastics contain chemicals such as flame retardants and BPA *(bisphenol A)*, which may leach out in the ocean under the right circumstances. Plastic materials can also act as a sponge, absorbing persistent organic pollutants like PCBs *(polychlorinated biphenyls)* from the surrounding environment. If a plastic bottle enters the ocean, what happens to the chemicals in it? The bottle could hold on to its chemicals or release them—or both, depending on the environment.[6] If a Laysan albatross chick or marine mammal eats part of the bottle, does it absorb the chemicals into its muscle tissue? Today, there is an ongoing effort around the globe to answer these questions.

Besides ingestion, a major issue that has a profound impact on natural resources, especially around the Pacific Rim, is entanglement. Discarded nets, rope, crab pots, and fishing line will continue fishing, even as they drift through the ocean. They can entangle animals, maim them, or prevent them from hunting food. Surveys of Stellar sea lions in Alaska, whose populations have suffered declines over the past several decades, determined that entanglements were a greater problem than previously recognized. Plastic packing bands and rubber bands were the number one culprit.[7]

Marine debris also impacts habitats. Commercial crab pots and fishing nets sometimes weigh hundreds of pounds and, when they are lost, they can scour precious reefs and sea beds and entrap important target and non-target species for years. What's more, coastal communities spend millions of dollars annually trying to prevent and remove debris from washing up on their shorelines. It not only degrades our coasts' natural beauty, but it threatens the safety of those who work and play there.

Let's Solve the Problem

In 2010, Americans generated 250 million tons of trash—31 million tons of which were plastics.[8] If someone throws a plastic bag in the trash, it's possible that it will end up ingested by a whale, like the one in Seattle. It can stay in the ocean for decades, slowly degrading from salt and sunlight, or it can land on a remote coastline across the world. Everything is interconnected—streets and landfills connect to storm drains, which lead to rivers and estuaries, which empty into the ocean. Once that bag enters the marine environment, it can travel hundreds of miles from its starting point, carried by currents and winds.

So how do we solve this? The marine debris problem, on one hand, is very simple. Humans put debris in the marine environment, which means that we can keep it from happening. Marine debris is a very tangible issue, and it's preventable.

On the other hand, it is a very complex issue, with many factors—including multiple sources and types of debris, different global policies and initiatives—affecting what and where debris accumulates around the world. It is because of this complexity that there is no single solution. Addressing the marine debris problem requires responsibility and action at every level, collaborative efforts from governments, the private sector, and individuals to implement marine debris prevention initiatives and other solutions.[9] And indeed, these initiatives are happening every day across the globe—from organized cleanups by non-profits, to stronger waste management policies by municipalities, to increased awareness and action among the fishing industry. It's these types of initiatives, along with individual decisions that will help reduce the impacts of marine debris.

As individuals, we need to change how we live. While it may seem cliché, *The Three R's*—reduce, reuse, and recycle—are easy and effective ways for people to help prevent waste from entering the marine environment. Of the 31 million tons of plastics we generated in 2010, we recovered only eight percent from recycling.[10] Limit single-use items, join a cleanup, and raise awareness among your peers. Everyone has a contributing hand in the problem, which also means everyone can and must help solve it. We are the main cause of the problem, but also the key to the solution.

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