

AN EXPLORATION OF OCEAN GARBAGE PATCHES

SHELLY'S ADVENTURE

Kate Herring



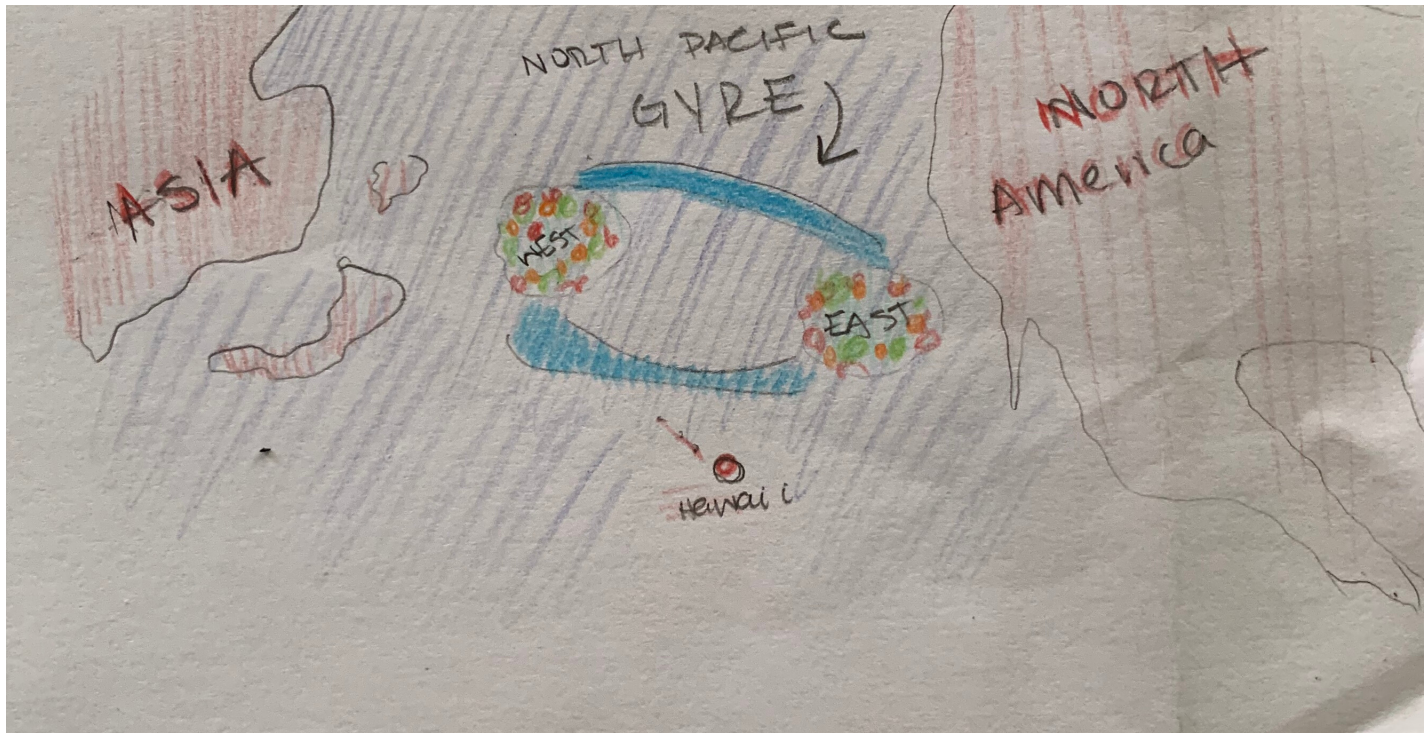
Splish Splish. The gentle sound of the ocean on a calm day greeted Shelly, a loggerhead sea turtle, when she regained consciousness. She had been asleep since the tropical storm swept her away from her home near Honolulu, Hawaii two days ago. Looking around, Shelly realized she had no idea where she was: all she could see was plastic.



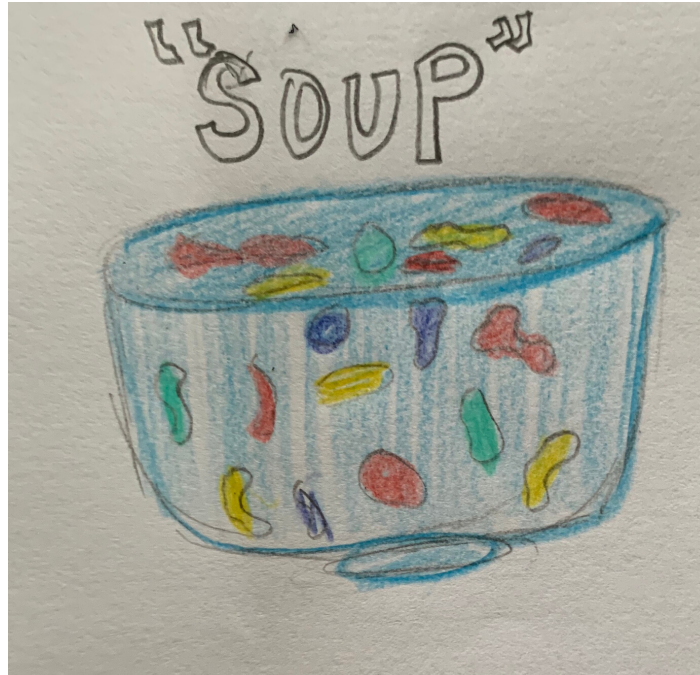
Bottles, fishing nets, plastic beach toys, toothbrushes, and plastic bags surrounded Shelly. The swirling plastic did not concern her: the discarded fishing net wrapped around her neck did. The net weighed her down, making each stroke more difficult as Shelly struggled to keep her head above water.



In her panic, Shelly did not notice the boat approaching her. Her instincts told her to swim away, but she could not summon the energy. Luckily, the boat was a research boat, and a friendly scientist carefully untangled Shelly from the fishing net. The scientist explained that Shelly, like many other marine animals in the Pacific Ocean, was a victim of "ghost fishing," a phenomenon where cheap, discarded fishing gear continues to catch, entangle, and suffocate wildlife.



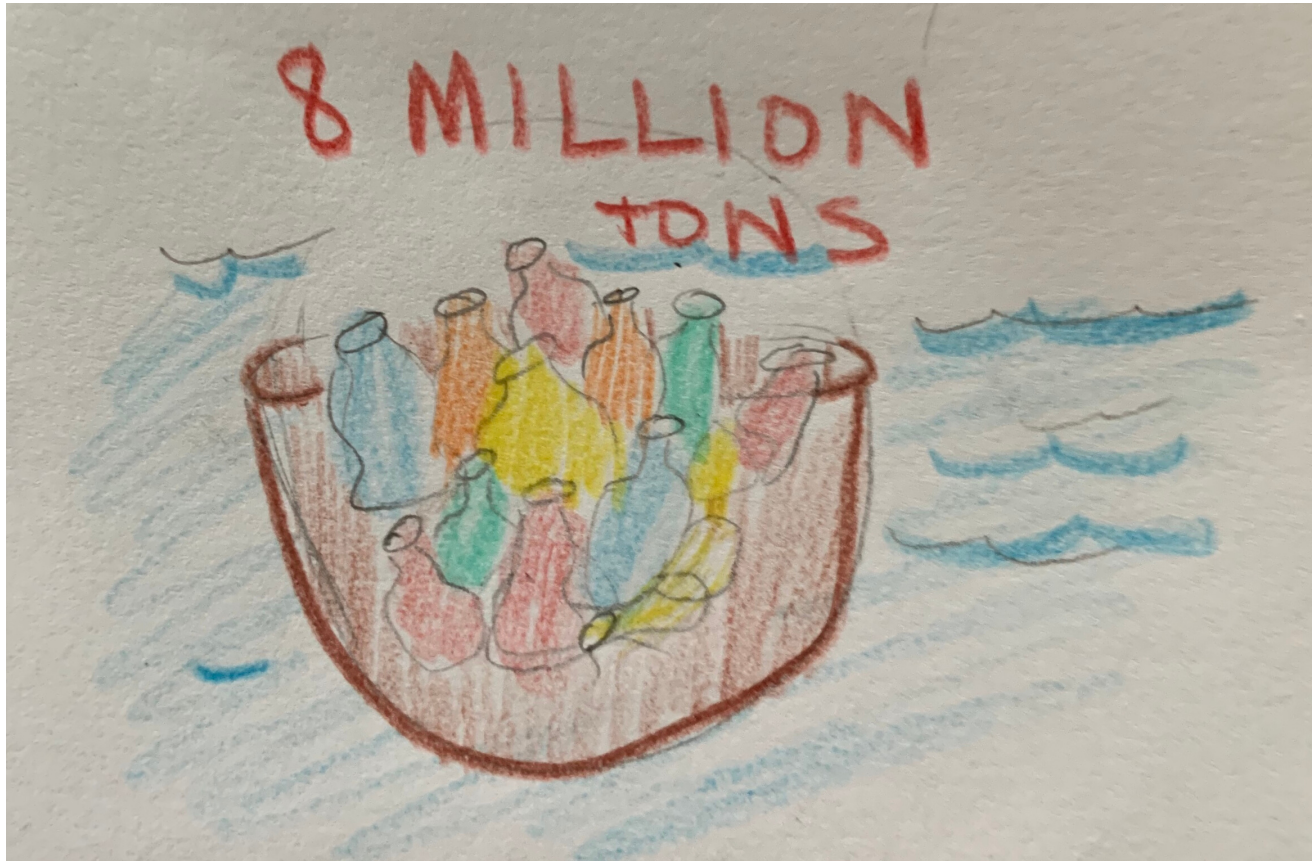
"We're in the North Pacific Gyre, in an area known as the Great Pacific Garbage Patch," one of the scientists remarked. "Plastic and other waste collect in the relatively calm waters where several currents converge, and a plastic bottle from as far away as South America can end up in the garbage patch. The net you were caught in is one of the few larger items, including shoes and beach toys. The majority of the waste, however, is microplastic: tiny pieces of plastic that cannot be seen with the human eye. The garbage patch is ugly on the surface, but its real danger lies in the cloudy soup of microplastics."



"What's so dangerous about microplastics?" Shelly asked. "It doesn't seem like they can strangle anybody like big fishing nets can."

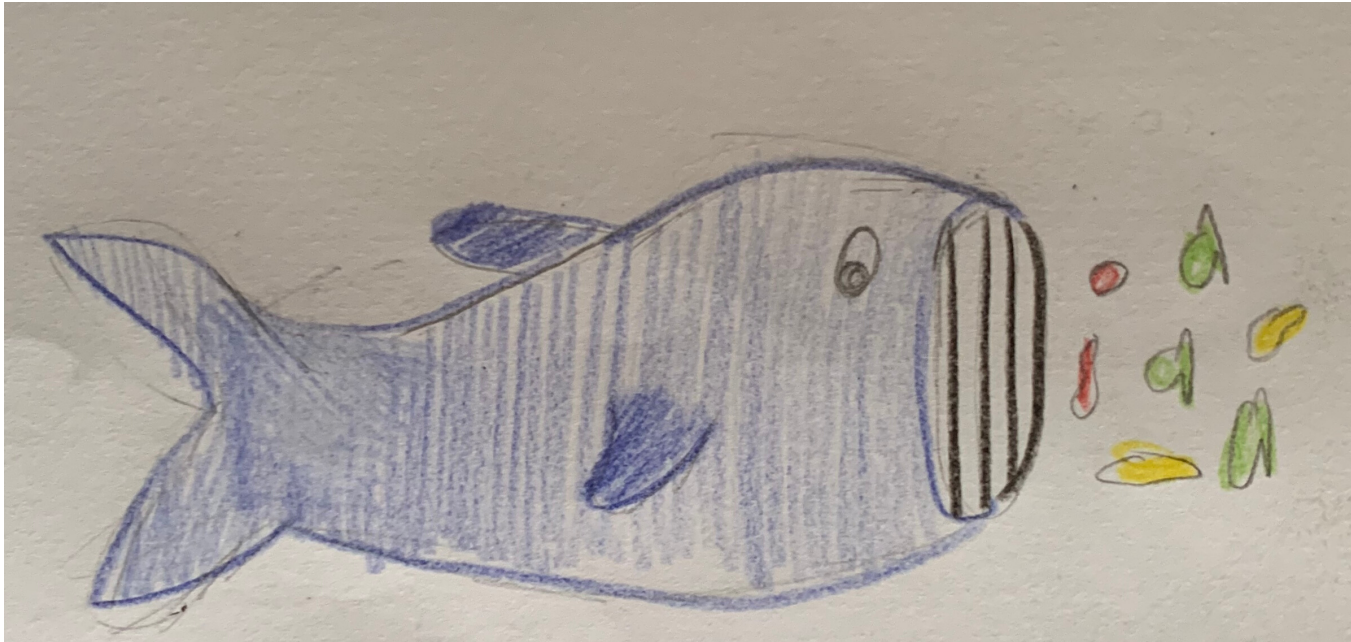
"That may be the case," replied the scientist, "but microplastics can wreak havoc on every layer of an ecosystem. They fill the water column in a peppery, cloudy soup, and block out sunlight. Phytoplankton - tiny photosynthetic organisms that support entire marine food chains - rely on the sun to make food. Marine debris, however, blocks sunlight, and decreased phytoplankton populations have widespread negative effects.

Primary, secondary, and tertiary consumers decrease in number as food becomes scarce, and this can even effect humans in terms of seafood shortages and high prices."



"Well, doesn't the plastic come from humans?" Shelly asked.

"It sure does." answered the scientist. "Because of its low cost and durability, plastic is widely consumed by humans. Unfortunately, eight million metric tons of plastic end up in the ocean each year, and that plastic is not biodegradable. Instead of decomposing and returning to organic matter like wood, plastic breaks into smaller and smaller pieces in a process known as photodegradation caused by the sun." The scientist looked defeated, and Shelly was beginning to understand the magnitude of the issue.



"When the plastic is exposed to the sun and the ocean, it releases harmful chemicals such as BPA and absorbs toxins, like PCBs, that enter the food chain through ingestion, affecting many species including humans. Animals also mistake the plastic for food - a plastic grocery bag looks like a tasty jellyfish snack to a hungry turtle."

"That's awful!" Shelly remarked, stunned.

"Indeed. Plastic clogs the victim's intestines and stomachs, as animals often mistake it for food. Filter feeders inadvertently consume microplastics, and many albatross chicks are victims of plastic ingestion, too. The plastic makes the animals feel full, and they eventually starve to death."

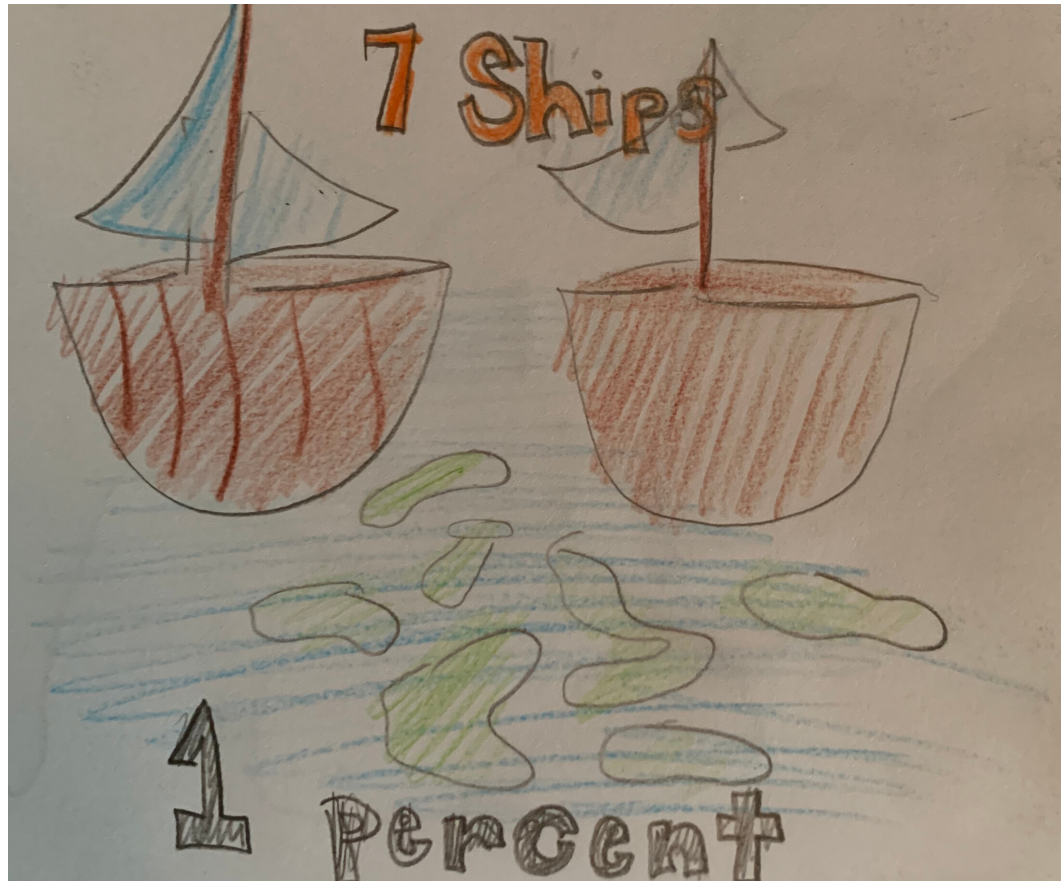


Shelly could not believe her eyes. The albatross was huge and majestic, and the mother was feeding her chick tenderly. As the young chick opened its beak in anticipation for the delicious treat, Shelly froze in fear. The mother was feeding its baby a plastic bottle cap!

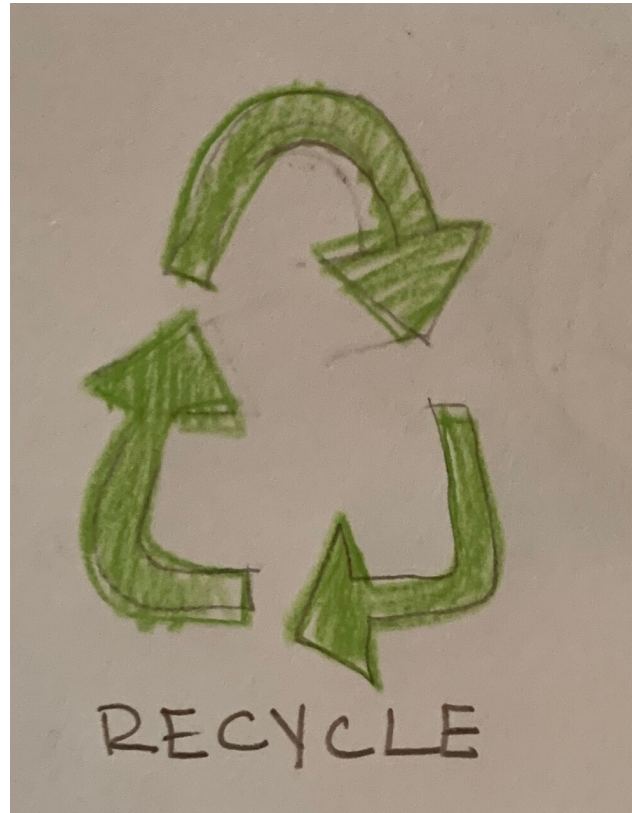
"STOP!" Shelly yelled, frantically paddling over to the albatross. "Plastic is dangerous!"

Shelly *had* to save the helpless chick, so she shared all she had learned from the scientist about plastic with the chick's mother.

"That's not a fish egg?" the albatross asked. "It sure looks like one."



"Why can't big boats just clean up all the plastic?" Shelly asked. "I wish it were that easy," replied the scientist sadly. "Studies have shown it would take seven ships over a year just to remove just one percent of the garbage, and that does not account for the microplastics. Nets small enough to remove microplastics would also capture marine life, so the only way to solve the problem is to eliminate the source. Humans need to change their behavior."



Sadly, the Great Pacific Garbage Patch is not the only one in the world; trash collects in all five major gyres and in the calm centers of other ocean currents. As Shelly learned, ocean garbage has far-reaching effects that impact everyone, yet the issue is a completely solvable problem. Individual lifestyle changes, reducing, reusing, and recycling plastic, participating in beach cleanings, and using biodegradable materials are just a few ways to help. Debris touches even the most remote areas of the world, and it is the responsibility of everyone to contribute to a cleaner, more sustainable future.