

## **IF WE DON'T CLEAN UP OUR SHORELINE, WHERE COULD THE LITTER GO? WHAT DAMAGE WOULD IT DO? HOW CAN BEACH CLEAN-UPS HELP SEABIRDS, SEA TURTLES, MARINE MAMMALS AND OTHER MARINE ANIMALS?**

**Marine Debris:** any man-made object discarded, disposed or abandoned that enters the coastal or marine environment.

About 80% of marine debris comes from land. It is blown or carried in streams or rivers into the ocean.

Most of floating debris is plastic.

It is estimated that more than 1 million birds, more than 100,000 whales, seals and turtles, and countless fish worldwide are killed by marine debris every year. These deaths occur through entanglement, suffocation, and starvation by ingestion.

Marine debris poses a serious threat of **entanglement**. Curious animals poke their noses into plastic six-pack rings or plastic containers and get stuck, making it difficult to feed and breathe. Birds dive for baited hooks and get tangled in lines. Turtles get caught in discarded nets.

**Ghostfishing** refers to discarded fishing nets, lines, traps and ropes that continue to capture marine life. Caught animals may drown immediately or drag debris around until they weaken and die.

Lost or abandoned fishing nets, plastic tarps and other trash can also drift underwater and smother and crush coral reefs, seagrass beds and other sensitive habitat.

Marine debris also assists the transport of species to places they don't naturally occur which can lead to problems of introduced species.

Some debris looks like food. Floating plastic bags look like jellyfish and are **ingested** by turtles. Small plastic pellets look like fish eggs and are ingested by many marine animals. Waves break up Styrofoam into small white beads that also look like fish eggs. Other debris is ingested accidentally while feeding. Once ingested, these materials can lead to injury and starvation. Ingesting plastic can cause cuts, infections and obstructions. Sharp edges can injure stomach linings and guts. Eating plastic leads to false feelings of satiation and dehydration, leading to weakness and possible starvation.

Ingesting styrofoam can also decrease an animal's buoyancy, making it harder for the animal to dive for food or escape from predators.

Plastic is popular because it is often less expensive, can be used in many different ways, and lasts a long time. That "lasts a long time" is a big problem.

Plastics do not **biodegrade** (they are not broken down by microorganisms such as bacteria). Rather they break into smaller and smaller pieces, but never completely. Plastics simply break apart into ever smaller pieces, eventually forming minute particles of broken-down plastic referred to as **microplastics**. No matter how large or small they are, plastic bits are not digestible.

Even the finest particles of plastic are a danger as they can be ingested at the base of the food web by zooplankton and other filter feeders.

Most plastics float on the surface, but not all. Marine debris can float, sink, or remain suspended in the water column. When a sinking piece reaches a layer of water whose density matches its own, it stops sinking and remains suspended in the water (neutrally buoyant).

Therefore, marine debris can be mistaken for food at the surface and all depths.

Chemical additives are used in the production of plastic to alter flexibility, durability and color. These chemical pollutants leach into the water and possibly into the animals that ingest the plastic.

Plastic also acts like a “sponge”, absorbing certain hydrophobic organic chemical pollutants in the water, such as PCBs and DDT. Studies show concentrations of these chemical pollutants on plastic pieces to be much higher (100,000 to 1,000,000 times) than in the surrounding water.

Toxins in and on plastics enter the food web and bioaccumulate. **Bioaccumulation** is the adding up of toxins in the tissues of organisms as they feed on other organisms containing toxins. Bioaccumulation means that concentrations of toxins increase up the food chain, eventually reaching humans. These toxins can weaken or kill organisms, affect their ability to function and their ability to reproduce.

Currents transport marine debris around the planet, even far from land.

While marine debris is found throughout the oceans, major oceanic gyres around the world trap and concentrate marine debris. Within these areas are “**marine garbage patches**”, concentrations of marine debris, some of which cover an area the size of Borneo. Studies in the North Pacific central gyre have documented 6 lbs of plastic for each pound of surface zooplankton. The size and location of the patches change seasonally as circulation patterns shift. While there are large pieces of debris within the patches, much of the debris is small bits of plastic and therefore difficult to see or measure.

Before plastics are molded into a variety of products, plastic is first produced as small round or disc-shaped pellets that resemble fish eggs. These pellets (“**nurdles**”) are transported all around the world. The nurdles are showing up on beaches all over the world.

Other impacts of marine debris: Medical and hygiene litter can contain harmful bacteria and pathogens. Broken glass, needles and other hazardous items are a danger to bare-foot beachgoers and swimmers. Plastic bags, nets, fishing line, rope and other litter can wrap around boat propellers and clog seawater intakes.

**Each one of us can help to solve the problem of marine debris!**

**What You Can Do:**

- **Reduce the amount of disposable plastic products you use.**
- **Reuse items and recycle as much as possible.**
- **Pick up litter.**
- **Help with beach and stream clean-ups.**
- **Properly dispose of all fishing gear.**
- **Teach others about marine debris.**

**We all share responsibility for keeping litter, especially plastics, from going into the ocean.**

Sources: NOAA, The Ocean Conservancy, Algalita Marine Research Foundation

