Littering the seas

As a source of ecological problems, marine debris needs to be tackled through the simplest and most effective way of prevention

Marine debris is trash that gets into the marine environment as a result of careless handling or disposal. Marine debris includes all objects found in the marine environment that do not naturally occur in the ocean. Although items such as tree branches and the bones of land animals can be considered marine debris, the term generally refers to trash (articles that have been made or used by people and discarded). The most common categories of marine debris are plastic, glass, rubber, metal, paper, wood and cloth.

The two main characteristics of marine debris are buoyancy and degradability. Buoyancy means the ability to be blown around; degradability refers to how long the trash will remain in the marine environment. The longer a piece of trash remains in the marine environment, the greater the threat it poses to people, wildlife and vessels.

There are several sources of marine debris, both in the ocean and on land. Any trash that is improperly disposed, as well as any materials that are improperly transported or stored, can become marine debris. The main sources of marine debris are: beach-goers, trash improperly disposed on land, stormwater sewers and combined sewer overflow, ships and other vessels, industrial facilities, waste disposal activities, and offshore oil and gas platforms.

Thousands of people visit beaches every year throughout the world. Many of them leave behind materials that become marine debris, such as food wrappers, cans, cigarette butts, and toys like shovels, pails and beach balls. This trash can be blown into the ocean, picked up by waves or washed into the water during rains. Stormwater runoff (the water that flows along streets or along the ground as a result of a storm) can carry street litter into sewer pipes, which flow to the ocean. At the sewage treatment plant, sewage is separated into sludge (solid waste materials) and water. The sludge is dried and either disposed in a landfill or treated and sold as a fertilizer. The treated water is discharged into a river or other nearby waterway, free of solid waste.

Industrial facilities contribute to marine debris through the improper disposed of waste items generated by industrial processes on land. Finished products can also become marine debris if they are lost during loading and unloading at port facilities or when they are transported through waterways or over land. Waste disposal activities can cause a problem when trash is lost during collection or transportation, or when trash blows or is washed away from disposal facilities.

Boats are also sources of marine debris. Sometimes, trash is purposefully thrown overboard. One major reason for the overboard disposal of trash is the limited storage space aboard these vessels. Most of the time, however, trash is disposed into the ocean by people who are unaware of the problems that they can cause. Trash can also accidentally fall, blow or wash off vessels into the water. In addition, fishing nets and lines, and other types of equipment, can be lost at sea and become marine debris.

Sources of debris

Once debris has found its way into the ocean, it is very difficult to trace the source of the debris. A plastic cup, for instance, could have been left by a beach-goer, littered in a city street and washed into a storm sewer and out to sea, blown off a recreational boat, used on a shipping vessel and disposed of overboard, and so

on. Clearly, marine debris is a complex problem whose solution will require that many sources of marine debris be controlled simultaneously.

The two primary problems that marine debris poses to wildlife are entanglement and ingestion. Entanglement results when an animal becomes encircled or ensnared by debris. Entanglement can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. For example, an animal may use a piece of marine debris for shelter, as a plaything, or as a source of food (if other plants and animals are already trapped in the debris or if the debris resembles prey that is a normal part of its diet). Entanglement is harmful to wildlife for several reasons.

Not only can entanglement trap the animal, but it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can cause drowning or difficulty in moving about, finding food, and escaping predators. Ingestion occurs when an animal swallows marine debris. Ingestion sometimes happens accidentally, but, generally, animals feed on debris because it looks like food.

Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract and make the animal feel "full", lessening its desire to feed. Ingestion of sharp objects can damage the digestive tract or stomach lining and cause infection or pain. Ingested items may also block air passages and prevent breathing, thereby causing death.

Marine plastic debris can harm fish species and other aquatic organisms that use the coral reefs by continually rubbing against them or smothering them. Floating plastic is just like a poison pill, which is regarded as a potential endocrine disrupter. Most of the plastic floating on the surface of the ocean are mistakenly ingested by marine turtles. This may be a potential hazard to turtle populations that are regarded as endangered. Another major ecological problem contributed by marine debris is the movement of invading species. Debris floating in the sea can carry many organisms such as crustaceans, plankton, algae, bacteria and fungi. A raft of debris can even colonize some land-based species. When organisms from one environment are carried to another part of the world, significant problems can arise.

Wildlife is also affected when marine debris disturbs its environment. For example, lost or discarded fishing gear and nets can drag along the ocean floor or through coral reefs, disrupting the animals and plants that live there. Fish and crustaceans such as lobsters and crabs are frequently caught in lost or discarded fishing gear, in a phenomenon known as "ghost fishing". Lost traps also continue to attract fish and crustaceans, which enter them in search of food or shelter.

Nearly a million seabirds are thought to die from entanglement or ingestion each year. Since most seabirds feed on fish, they are often attracted to fish that have been caught or entangled in nets and fishing lines. As many as 100 birds have been found in a single abandoned net.

It is estimated that approximately 100,000 marine mammals die every year from entanglement or ingestion of marine debris. Of the different types of marine mammals, seals and sea lions are the most affected because of their natural curiosity and tendency to investigate unusual objects in the environment.

Recycling—the collection and reprocessing of materials so they can be used again—is one way to reduce trash. Before materials can be processed for reuse, they must be separated into different types (such as plastic, glass and metal). Although recycling has become widespread, not every type of material can be recycled.

Recycled waste

Paper is the most frequently recycled type of trash. Three types of paper are recycled: high-grade paper (such as computer paper), newspaper and corrugated cardboard. Metals are also commonly recycled, particularly aluminum cans. All types of glass, except light bulbs, ceramic glass, dishes and plate glass, can currently be recycled. Overall,

very little plastic waste is recycled, with the exception of plastic milk jugs and soft drink bottles.

Even better than recycling is adopting pollution-prevention strategies that produce less waste in the first place. Ways to produce less waste include reusing materials, using reusable items rather than disposable ones, and reducing the amount of packaging we use.

We can also take steps to keep waste from getting into the ocean. Most importantly, littering should be prevented. Boaters and beach-goers should ensure that trash and other items are not blown or washed away. Before trash is left out for collection, it should be tightly secured in bags or trash cans to ensure that trash stays in its proper place.

Marine debris has created many ecological problems throughout the world. Many governments and private organizations have become increasingly active in combating marine debris, but individual initiative remains one of the best ways to tackle ocean pollution. Since prevention is the simplest and most effective way to reduce marine debris, individuals can begin by examining their lifestyles, considering how much garbage they generate, and where it all ends up.

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