

Plastic pollution case studies



Albatross

The albatross is a seabird found in the Southern Ocean and North Pacific. They are among the largest flying birds with the Great Albatross having a wingspan of up to 3.7m. They feed on squid, fish and krill by either scavenging, surface seizing or diving. They are colonial birds nesting on remote oceanic islands. Pair bonds between males and females last several years, pairs use ritualised dances to recognise each other and strengthen bonds. Both parents help raise the young; taking turns to incubate the egg and go fishing to bring food back for the chicks.



Of the 22 species of albatrosses, three species are critically endangered, five are endangered, seven species are threatened and seven are vulnerable. Threats include introduction of non-indigenous predators, hunting for feathers, over fishing and becoming caught on fishing equipment. As well as plastic ingestion.

A study of Laysan Albatross chicks in 2009 on Midway Island in the Pacific Ocean found large amounts of plastic in the stomachs of deceased chicks. Plastic takes up space in the albatross's stomach that should be for food or can cause an obstruction meaning no food can get through, which causes the bird to starve to death. Adults often regurgitate plastic for chicks to eat which means the chicks never eat enough nutrients and do not survive to adulthood.





Galapagos Green Turtle

Galapagos Green Turtles are found in subtropical waters in the Pacific Ocean and are the only species of green sea turtle to nest on the beaches of the Galapagos Islands. They differ from other marine turtles as they have serrated lower jaw and scales which cover their eyes, like eyelids. They can grow to 84cm long and weigh up to 136kg. Galapagos Green Turtles are extremely fast swimmers, their powerful flippers allow them to travel at speeds up to 35mph. They mainly feed on molluscs, crustaceans and seaweed, but also eat jellyfish and fish eggs.



Females return to the same beaches where they hatched to lay their eggs, laying between 50 and 200 eggs in nests dug out of the sand. After approximately two months the hatchlings emerge and immediately head for the sea. Those who make it can take up to twenty years to mature and return to lay their own eggs. Males can spend their whole lives at sea.



They are an endangered species. Many turtles ingest plastic bags mistaking them for jellyfish, causing fatal blockages in their guts or starving them because they feel full. Turtles also face the risk of becoming entangled in plastic debris such as plastic twine and nylon fishing lines, causing fatal injuries or drowning as they cannot surface to breath.



Zooplankton

Zooplankton are organisms drifting in oceans, seas and bodies of fresh water. The word zooplankton comes from the Greek zoon, meaning animal and planktos, meaning wanderer or drifter. Zooplankton are usually microscopic – copepods, a type of zooplankton could fit on the head of a pin. However, some such as jellyfish are larger and visible to the naked eye. They have hard shells and antennae to sense predators. Some copepods can move very quickly through the water at speeds up to one hundred times faster than Usain Bolt, relative to their size.



Zooplankton are found in surface waters where food is abundant, they feed on bacterioplankton, phytoplankton (tiny plants) and other zooplankton as well as 'marine snow' (tiny pieces of organic matter including dead animals). They are found in abundance across the ocean, their numbers are affected by water salinity and temperature.

They play a vital role in aquatic food webs as they are eaten by many higher consumers such as fish.



Recent research into copepods has been investigating whether ingestion of microplastics affects the health of these tiny creatures, which may then affect the carbon cycle and whether there are wider implications for animals further up the food chain who eat them.