



Effects of Oil on Gulf of Mexico Wildlife

The Deepwater Horizon oil spill may have devastating effects on the wildlife of the Gulf of Mexico, as many different types of wildlife are vulnerable to the toxic components of oil. Exposure can result in damage to tissue and organs, including eyes, skin, reproductive systems, lungs, liver and stomach. The Gulf of Mexico is an important spawning area for fish. Eggs, larva and young animals are generally very sensitive to contamination. Even at very low levels, toxic components of oil can lead to developmental deformities, genetic mutations and death.

Turtle and bird eggs are also vulnerable to oil that may be transferred by their parents, and there are currently species of turtle and seabird laying their eggs now in the Gulf, including Kemp's Ridley (endangered) and Brown Pelicans (just came off the endangered species list last year).

Marine mammals and turtles are air-breathers and need to surface. If they do so in the slick they can inhale toxic fumes which can lead to stress, disorientation and brain lesions. They can also ingest the oil and toxic components which are known to contain carcinogens. Four species of sea turtle and 28 species of whales and dolphins inhabit the Gulf, including sperm whales and bottlenose dolphins (which gave birth in the Gulf in March through May of this year, during the spill). As wildlife swim or dive through oil they can become coated in it, which can impede their ability to swim and fly. Their airways, mouths, throats and stomachs can also become blocked with oil which prevents breathing, feeding and nutrient absorption.

In addition to direct impacts of oil on wildlife, the fragile habitats that these species depend on for feeding, breeding, spawning and shelter are at risk of contamination. This will have many negative impacts on the multitude of species that depend on these habitats for survival.

There are many charismatic and commercially important species found in the Gulf of Mexico that are at risk from the Deepwater Horizon oil spill.

These species include:

- oysters
- snapper
- grouper
- tuna
- marlin
- dolphins
- whales
- turtles
- corals (shallow and deep sea)
- sharks

Atlantic Bluefin Tuna: The Gulf of Mexico is one of only two nurseries worldwide for the severely overfished Atlantic bluefin tuna. Each spring (April – June), bluefin gather in the Gulf and release their fertilized eggs into the loop current to begin their journey along Florida’s coast. More than 90 percent of spawning bluefin tuna are returning to the place they were born. There is a “hot spot” of concentrated bluefin during spawning season in the northern slope waters of the Gulf. The fish enter the Gulf along the continental slope through the Straits of Florida, and move into the northern slope of the Gulf where the warm waters present favorable conditions for development of eggs and larva. Fish larvae are particularly susceptible to the negative impacts of oil, and the severely overfished bluefin tuna could suffer greatly if their eggs and larvae are impacted by oil.

Snapper and grouper: These reef fish support fishing communities all along the Gulf coast. Several of these species are at risk of commercial extinction and their future depends on successful spawning when large groups gather at specific reef banks or cliffs. **Gag grouper** is one of the most valuable finfish from the Gulf of Mexico for both commercial and recreational fishing. Spawning for this species peaks in early April, so their larvae were drifting around the Gulf of Mexico during the spill on their way to nursery habitats in estuaries and salt marshes along the gulf coast (where the oil is headed). **Red snapper** spawning starts in late May, peaking from June-August. Red snapper is the poster child for overfishing and one of the most well-known fish from the Gulf of Mexico. This year’s generation of these fish will likely be severely impacted.

Oysters and other bivalves: Bivalves are filter feeders and pull toxic substances such as oil out of the water as they feed. These substances can accumulate in their flesh and be passed up the food web as they are eaten by other species, including humans. Long-term contamination can occur when large amounts of oil are trapped in the sediment.

Spiny Lobsters: Lobsters begin their life swimming and floating at the surface of the ocean – where the oil is. Young lobsters from the Caribbean, Mexico, and the US swim through the Gulf of Mexico all year round, and peak season in Florida starts in April. Juvenile lobsters ride the current toward the coast to land in seagrass beds, which is in the same direction that the oil is headed.

Shrimp: Brown shrimp are the most important species in the Gulf fishery, so negative impacts on this species due to oil could have serious economic implications. Shrimp are vulnerable to oil throughout most of their early life stages. Their eggs are released deep in Gulf waters and float around in the water column. April-May and Sept-Nov are peak spawning times for Brown shrimp, so it’s likely that there are eggs floating around that the gulf during the spill and may come in contact with oil. As the eggs grow and turn into larvae they feed on plankton, which also may have come in contact with oil. Maturing larvae are carried towards shore by tides and currents and then into estuarine waters where larvae begin to mature and cling to the bottom most of the time. Oil is also carried to these areas by the same tides and currents and can contaminate estuaries and marshes that serve as habitat for young shrimp. In the estuaries, larvae develop into juveniles that prefer shallow, salty water along the edges of marshes - which if contaminated with oil can remain contaminated for many years. Juveniles grow larger and turn into sub-adults when they get ready to return to the open waters of the Gulf. Back in the Gulf adults live on the bottom at 60-500 feet and feed opportunistically on what is available. Here they are less likely to come in direct contact with oil, but could be eating food that is contaminated with it.

Sea Turtles: Five species of sea turtles are found in the Gulf waters and nest on its beaches. Four of these species are listed by the Endangered Species Act as “endangered” (Kemp Ridley, Hawksbill, Green and Leatherback) and one as “threatened” (Loggerhead). Because turtles need to surface to breathe air, they can breathe and ingest oil as well as become coated in it which can block airways and fill stomachs, as well as damaging tissues and organs. Turtles are not only vulnerable to oil in water but also on beaches where they nest in the northern Gulf of Mexico. Some turtles in the Gulf were nesting in May during the spill, while others nest all year round. Oil on beaches can cause developmental defects and death for turtle eggs. In addition, oiled beaches and surrounding waters provide another obstacle that hatchlings must overcome.

Whales and Dolphins: 28 species of whales and dolphins are known to inhabit the Gulf, and 20 of those species live there year round, including bottlenose dolphins and endangered sperm whales. Bottlenose dolphins are the most common species of cetacean in the Gulf, and they breed in the summer and give birth from March to May, so the oil spill is likely affecting their young. In addition to dolphins, other marine mammals such as sperm whales and endangered North Atlantic Right Whales are found in the Gulf. All of these species are vulnerable to oil as they are air breathers and spend time on the surface, like turtles.

Seabirds: Many species of seabirds are found in the Gulf, including brown and white pelicans, terns, gulls, shorebirds, skimmers and herons. These species mainly inhabit mangroves and wetlands – areas that are extremely difficult to clean up when contaminated by oil. There are no large populations of pelagic birds that float or feed in the offshore areas of the Gulf of Mexico; however coastal birds are highly at risk if the oil comes ashore, which is currently happening. These nesting and feeding areas such as marshes and beaches could become oiled and result in the birds becoming oiled as well.

Brown Pelicans: These birds are permanent residents of the coastal areas of the Gulf of Mexico. They dive through the surface of the water for fish and crustaceans, therefore are particularly susceptible to oil coating. Brown pelicans are very sensitive to DDT, a chemical used in pesticides, and their numbers plummeted due to its use. Since DDT was banned, the species rebounded and was just removed from the Endangered Species List last year. The slow reproducing Brown pelicans breeding season overlaps with the spill and oil can be transferred from adults' feet and feathers to eggs, which are particularly vulnerable to oil. This species has only just recovered, and the oil spill could potentially push it back to endangered status.

Fragile Habitats: Habitats such as coral reefs, wetlands, mangroves, marshes, canyons, seagrass and Sargassum beds are found throughout the Gulf. These fragile habitats provide feeding, breeding and spawning grounds for a multitude of species, and could be devastated by an oil spill.

- **Deep Sea Reefs:** On the edge of the continental shelf, hundreds of feet below the surface of the shores of Mississippi and Alabama, an area of steep-sided deep-sea reefs called the Pinnacles can be found. These formations off of the shelf edge are areas of high biodiversity that are important habitat and spawning sites for commercially fished species in the Gulf of Mexico. They also support high densities of invertebrate populations including sponges and both soft and hard deep sea coral gardens. These coral structures provide important habitat for abundant, diverse, and often commercially valuable fish species, including grouper, snapper, bass, and amberjack.
- **Marsh land:** Marshes across Louisiana's coast are threatened by the spill and it has been reported that oil is entering these areas, an occurrence that is predicted to increase with time. Marshes are sensitive ecosystems that are particularly vulnerable to oil, as when oil contaminates these areas it is very difficult to remove. One way to clean oil out of marshes is to burn the marsh and then let it recover, however this is obviously extremely damaging to the marsh and its inhabitants. This habitat acts as nurseries for many important fish and crustacean species, including blue crabs, shrimp and oysters. Marshes are also important habitat for resident and migrating birds that are passing through the area.
- **Canyons:** Thousands of feet below the surface, canyons are carved deep into the Gulf of Mexico. The Mississippi Canyon – the continuation of the Mississippi River – harbors shark eggs on branches of deep sea corals and mussel beds, and fields of coral thrive on patches of hard seafloor throughout the canyon. Much is still unknown about these areas and the wildlife they support.
- **Seagrass:** Bottlenose dolphins, sea turtles, birds, lobster, conch, scallops, shrimp and juvenile fish seek food and shelter in the seagrass ecosystems of the Gulf. Seagrasses

can be smothered by oil spills or they can suffer impacts from its toxicity, including disruption in photosynthesis.

- **Sargassum:** There are many different species associated with sargassum seaweed habitats, including more than 145 species of invertebrates, 100 species of fish, 5 species of sea turtles and 19 species of seabirds. Many of the species associated with this floating seaweed are temporary residents, seeking refuge during specific stages of their life cycles. Sargassum provides protection from predators, and the shade and food it provides are very important to many fish and sea turtles that use it as nursery habitat. Many large predatory fish and dolphins are drawn to these habitats to feed, so there is an abundance of game fish associated with Sargassum including jacks, dolphin fish, yellowfin tuna, marlin and billfish. Sargassum is recognized as a critical nursery and feeding ground for marlin, swordfish and tuna, and manatees and green sea turtles are known to graze on Sargassum as well. With such a large and varied group of species reliant upon this habitat, negative impacts from the oil spill could be devastating for both these species and humans that depend on them.