WILDLIFE AND OFFSHORE DRILLING

The 2010 Gulf of Mexico Disaster: Sea Turtles

OIL RIG © U.S. COAST GUARD

The waters of the Gulf of Mexico and Florida's Atlantic coast are home to five species of sea turtles: green, hawksbill, leatherback, loggerhead and Kemp's ridley. All are listed as endangered or threatened under the Endangered Species Act. The oil gushing from BP's Deepwater Horizon oil rig poses several additional threats to the already precarious existence of these rare creatures.

SEA TURTLE SPECIES

The Gulf of Mexico's sea turtles are all diving marine reptiles that are long-lived and slow to mature. Even though they are protected under the Endangered Species Act, the populations of most of these creatures are declining. Development, lighting and erosion of nesting beaches; accidental capture in fisheries; poaching for meat and tortoiseshell; and the effects of pollution, pathogens and climate change continue to overwhelm public investments and efforts for sea turtle conservation.

Sea turtles spend most of their lives at sea feeding at or below the waves and returning to the surface to breathe. In spring, females return to beaches along the coast of the Gulf of Mexico to nest under cover of darkness where they dig a nest and lay about 100 eggs. In late spring and summer, tens of thousands of vulnerable hatchlings will emerge from their nests and scramble towards the ocean. If the oil spill continues to spread in the Gulf, these vulnerable nests and nestlings face the highest threats from exposure.

Green (*Chelonia mydas*) Greens can reach 4 feet in diameter and weigh up to 440 pounds. In the United States, they nest from Florida to North Carolina, from June through September. Nesting has been on the increase in recent years on Florida's Atlantic coast. Unlike many sea turtles, green turtles feed almost exclusively on seagrasses and algae, and thus spend more time in shallow waters and lagoons than other species.

Loggerhead (*Caretta caretta*) Loggerheads are named for their large, blunt-shaped head, which can be 10 inches wide. Loggerheads can reach 4 feet across and weigh up to

The world's second-largest loggerhead nesting area is on the beaches of the southeastern United States. Young turtles like this hatchling are especially imperiled by oil on beaches and in the water.

350 pounds. Roughly 14,000 nest on the beaches of the southeastern United States—the world's second-largest loggerhead nesting area. Loggerheads feed on a wide array of marine invertebrates and sometimes even catch fish. They nest from April to September on beaches and barrier islands. The number of nesting females has declined by 50 percent in the past decade, leading the U.S. Fish and Wildlife Service to consider reclassifying loggerheads from threatened to endangered.

Leatherback (*Dermochelys coriacea*) Named for their leathery skin, leatherbacks are the largest and most specialized sea turtles. Adults can reach 8 feet in diameter and weigh as much as 2000 pounds. Leatherbacks range from the Gulf of Mexico and Caribbean all the way to Iceland. They spend most of their time out at sea, but are occasionally found in shallow coastal waters. Their diet consists almost entirely of jellyfish. They congregate offshore near nesting beaches for courtship and mating. About 35 females nest in eastern Florida each year between March and July.

Hawksbill (*Eretmochelys imbricata*) These turtles take their name from their long, curved beaks. Hawksbills are some of the smallest sea turtles, generally reaching 2½ feet across and weighing 95 to 165 pounds. Hawksbills are the only turtles that feed mainly on marine sponges, but they also eat sea anemones and jellyfish. Due to their feeding habits, they are associated with coral reefs and are found mainly in tropical waters, including those off of Florida and the Caribbean.

Kemp's ridley (*Lepidochelys kempii*) These are the smallest and most endangered sea turtles. Adults generally reach less than 2 feet in length and weigh less than 100 pounds. Kemp's ridley turtles are found only in the Gulf, Caribbean and Atlantic Ocean. Due to their low numbers and limited range, Kemp's ridleys are probably the species most imperiled by the Deepwater Horizon oil spill. Most females nest on a single beach in Tamaulipas, Mexico, from April to August; some also nest on and around Padre Island, Texas. Most remain in the Gulf, but some are carried by currents out to the Atlantic Ocean. These turtles feed on crabs, clams and sea urchins in shallow waters near the coast. The salt marshes and wetlands of Louisiana are particularly important habitats for Kemp's ridley turtles.

IMPACTS OF OIL

Sea turtles are vulnerable to oil exposure at all life stages and through several routes of exposure: contact with skin, ingestion and inhalation of vapors. The exact impact will also vary with the type of petroleum product involved, and by how long it has been in the environment.

Eggs and hatchlings

The impact of oil on turtle eggs depends on the amount and method of the exposure. Oil poured directly on eggs can kill or maim developing turtles, probably because the oil prevents vital oxygen from entering the eggs. Since most turtle nests are located well above the high tide line, eggs laid prior to the spill may be safe from spilled oil on and below the high-tide line unless they are hit with storm surges. However, females attempting to nest after the spill has hit shore will have to cross the oiled zone of the beach to reach the high ground. Thus, they risk exposure to the oil, and may forego nesting in contaminated areas entirely.

Turtles that survive to hatching must crawl from the nest to the water, avoiding predators such as gulls and crabs, and on oiled beaches this means crossing a potentially toxic zone. Once in the water, hatchlings face a number of risks from oil spills. Because they are small, they are more easily overwhelmed by any toxic substance. They are also more likely to choke on clumps of oil and tar, or have their mouths or stomachs blocked. Small turtles are likely to disperse and

forage by moving in the same Gulf of Mexico currents that concentrate the oil. These young creatures also have to spend more time at the surface than adults, since they can't hold their breath as long. This increases the likelihood that they will encounter a floating oil slick.

Juveniles and adults

Sea turtles of all ages have trouble distinguishing tarballs from food, and will ingest anything that appears food-sized—including plastics and other garbage as well as tarballs. Ingested oil and tar can be toxic to sea turtles, and can also accumulate in the esophagus and stomach—interfering with feeding and diving. Sea turtles' tendency to inhale rapidly and deeply before diving also puts them at risk of exposure to oil slicks and vapors.

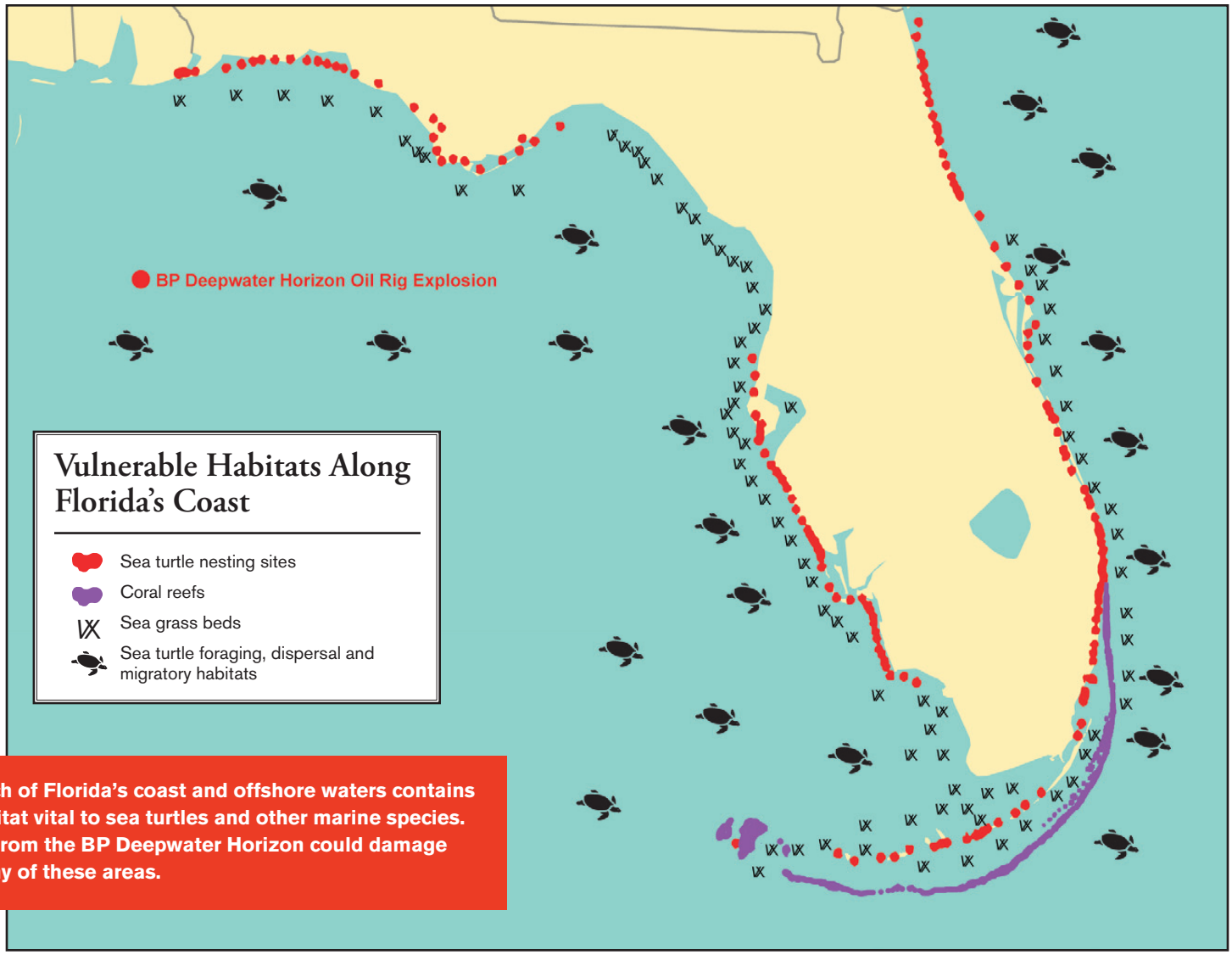
Both sudden exposure to large amounts of oil and long-term exposure to small quantities of oil harm turtles internally and externally. Internal effects include drops in the volume of red blood cells, elevated levels of white blood cells, changes in liver enzymes, and a shutting down of the glands that help the turtles get rid of excess salt. External effects include skin inflammation and swelling, with the loss of skin layers over several weeks following exposure.

Indirect effects

In addition to the direct harm caused by exposure to oil, sea turtles may suffer indirect impacts for weeks or months afterwards. Sea turtles may ingest small amounts of oil from the water or their food that, over time, may accumulate in their bodies and harm or kill them. They may also suffer from lack of food if a spill is large enough that it kills off seagrass beds, shellfish and other food sources. Low levels of oil exposure that don't cause obvious harm could also have subtle but damaging effects, like impairing the turtles' sense of smell, hampering their immunity or reducing their levels of gut-dwelling, digestion-aiding bacteria.

Impacts of oil spills combined with climate change and other threats

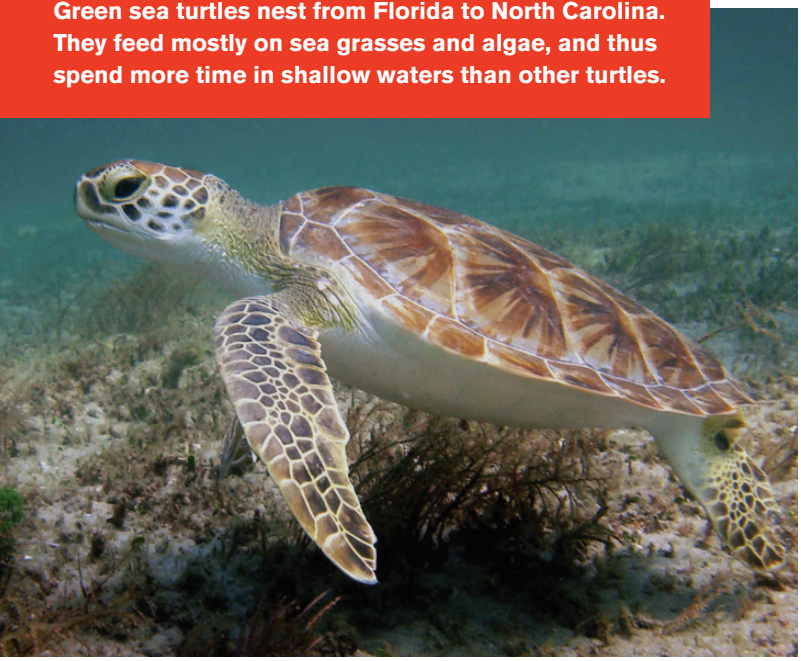
Oil in the water is not the only problem for sea turtles. The burning of oil and other fossil fuels is a leading contributor to climate change. Climate change poses a unique threat to sea turtles, since the temperature at which their eggs incubate determines the sex of the turtle. As global temperatures continue to rise, sea turtles could be faced with the reality of



Much of Florida's coast and offshore waters contains habitat vital to sea turtles and other marine species. Oil from the BP Deepwater Horizon could damage many of these areas.

SOURCES: FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION, REEFBASE

Green sea turtles nest from Florida to North Carolina. They feed mostly on sea grasses and algae, and thus spend more time in shallow waters than other turtles.



© STEPHEN SCHELB

only females being born in clutches that are laid in sand with temperatures over 88.6 degrees F.

Sea level rise and storm surge could also destroy sea turtle nesting beaches. Beaches are already being lost to erosion caused by development, dredging and chaneling projects. Furthermore, efforts to protect seaside buildings and other structures from sea level rise—particularly beach armoring, shoreline hardening and beach renourishment projects—result in the loss of nesting beaches.

Sea turtles also suffer in red tide events, outbreaks of toxic algae that are on the rise due to warming waters. Strandings of sea turtles increase during red tides as the turtles are poisoned by toxins produced by the algae.

WHAT CITIZENS CAN DO

- If you live on or near the Florida coast, sign up for Neighbors Ensuring Sea Turtle Survival (NESTS) at www.turtlenests.org to help protect sea turtles and their nesting areas.
- If you live near a beach, turn off outside lights at night. Sea turtle hatchlings use light to find their way to the water.
- Reduce the amount of garbage you produce and clean up trash you see on the beach.
- Be aware of sea turtle nesting areas and avoid nesting and hatchling turtles.
- Reduce your use of chemicals such as fertilizers and pesticides that can wash from gardens and lawns into coastal waters, harming plants and animals.
- Urge your elected officials to pass comprehensive climate change legislation that addresses the impacts of global warming on wildlife and our natural resources.
- Urge your elected officials to enact policies that secure coastal lands from development, improve coastal management policies, enhance wildlife refuge management and reform fisheries practices.

WHAT POLICY MAKERS CAN DO

- Make sure that sea turtles in all stages of their lives—eggs, juveniles, nesting females and adults—are protected in oil spill cleanup operations.
- Ensure that BP funds long-term restoration of sea turtle populations in all Gulf areas affected by the spill, including mitigation for the long-term damage caused to turtles from nonlethal exposure.
- Increase federal support for sea turtle conservation throughout the Gulf and globally; successful conservation with the Kemp's ridley and green sea turtles shows that significant dedicated investments can turn around the decline of these species.
- Impose greater safety and environmental standards and develop comprehensive spill response plans on existing offshore drilling operations.
- Prevent expanded drilling operations off the coast to limit future spill risks.
- Enact comprehensive energy and climate change policies to transition away from harmful oil and fossil fuels.

REFERENCES

Lutz, P. L. and M. Lutcavage. 1989. The effects of petroleum on sea turtles: Applicability to Kemp's ridley. In: *Proceedings of the First International Symposium on Kemp's Ridley Sea Turtle Biology, Conservation and Management,* C. W. Caillouet, Jr. and A. M. Landry, Jr., eds. TAMU-SG89-105, Texas A&M University Sea Grant Program, Galveston. pp. 52–54.

Natureserve Explorer Database. **www.natureserve.org**

National Oceanic and Atmospheric Administration. 2003. Oil and Sea Turtles: Biology, Planning and Response. 116 pages. **http://response.restoration.noaa.gov/book_shelf/35_turtle_complete.pdf**

U.S. Fish and Wildlife Service. Sea Turtle Information Pages. **http://www.fws.gov/northflorida/SeaTurtles/seaturtle-info.htm**

DEFENDERS OF WILDLIFE
1130 17th Street, N.W.
Washington, D.C. 20036
202.682.9400
www.defenders.org