



## WILDLIFE AND OFFSHORE DRILLING

### The 2010 Gulf of Mexico Disaster: Sperm Whale



SPERM WHALE NEAR OIL PLATFORM IN THE GULF OF MEXICO, PHOTO BY CHRISTOPH RICHTER FOR SWSS (MMS); OIL RIG © U.S. COAST GUARD

The sperm whale is the most abundant large whale residing year-round in the Gulf of Mexico—one of the busiest, most industrialized bodies of water in the world. In addition to the hazards posed by shipping traffic, commercial fishing and fossil-fuel exploration and extraction, sperm whales in the Gulf are faced with a new threat: oil from the BP Deepwater Horizon disaster.

#### SPERM WHALES IN THE GULF OF MEXICO

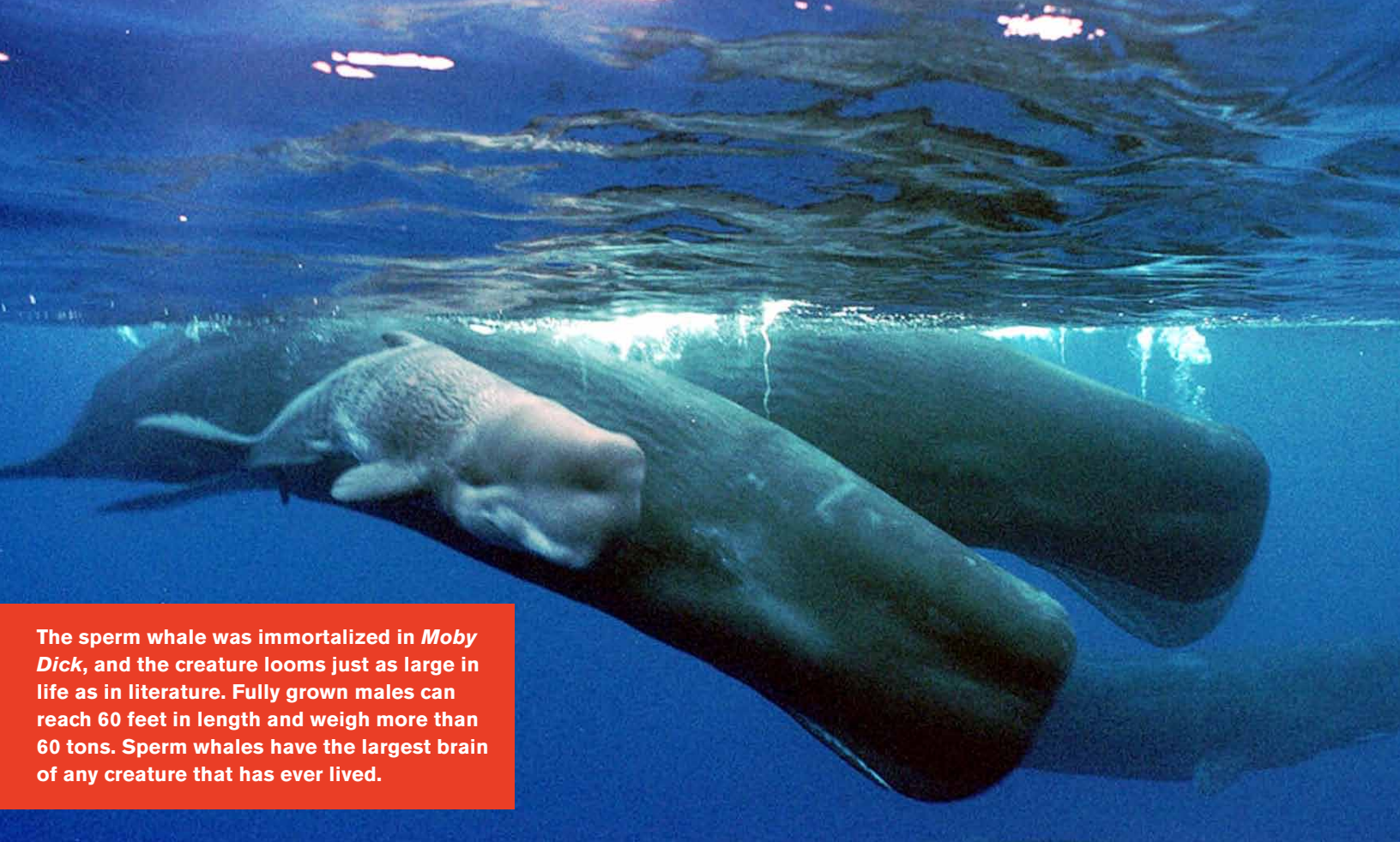
Sperm whales are leviathans of the sea. Males can reach lengths of 60 feet, and weigh as much as 125,000 pounds—about as much as a fully-loaded Boeing 737. Females are smaller, rarely more than 40 feet long. These animals possess the largest brain of any creature that has ever lived; their huge heads comprise a third of total body length. Their narrow, rod-shaped lower jaws hold 20 to 26 pairs of well-developed teeth, which are customized for seizing and grasping their deep-water prey. Sperm whales can live more than 60 years.

Sperm whales are found in deep waters from the equator all the way to the edge of pack ice at both poles. For more than two centuries they were pursued relentlessly by whalers for their oil (as chronicled in Herman Melville's classic *Moby Dick*)—a hunt that seriously depleted their population. Today, however, the animals are protected under the Endangered

Species Act, the Marine Mammal Protection Act and the International Convention for the Regulation of Whaling. They are the only whale listed under the Endangered Species Act found in the Gulf of Mexico.

Sperm whales in the northern Gulf of Mexico are considered to be a separate stock (or population) from other sperm whales. Recent studies indicate that the Gulf's sperm whales have distinctive acoustic signals used for communication as well as unique genetic markers—traits that often distinguish other whales inhabiting semi-enclosed, isolated bodies of water.

Family groups of females and young totaling 500 to 1,500 individuals reside throughout the northern Gulf. Including visiting males, the total number of sperm whales in this region may be as high as 3,000. Sperm whales in the Gulf of Mexico tend to aggregate only in the deeper waters beyond the



The sperm whale was immortalized in *Moby Dick*, and the creature looms just as large in life as in literature. Fully grown males can reach 60 feet in length and weigh more than 60 tons. Sperm whales have the largest brain of any creature that has ever lived.

continental shelf, especially where waters are deeper than about 3,000 feet. Sperm whales tend to cluster offshore of the Mississippi River Delta and at the Mississippi Canyon, extremely close to the site of the BP Deepwater Horizon oil spill.

#### **Foraging and diet**

Sperm whales make deep and prolonged dives for their prey, and can therefore use the entire water column. An average dive lasts about 35 minutes and usually goes down to about 1,300 feet, although some dives last over an hour and reach depths over 3,200 feet. Sperm whales feed regularly throughout the year, consuming 3 percent to 3.5 percent of their body weight each day. Their favored prey includes large squid weighing between 3.5 ounces and 22 pounds each, but they will also eat large, deep-dwelling sharks, skates and other fishes. They seem to forage mainly on or near the bottom, often ingesting stones, sand, sponges and other non-food items.

#### **Social and reproductive behavior**

Sperm whales organize into different kinds of social units. These include nursery groups, in which adult females, both related and not related, travel with sub-adult offspring. Females reach maturity at seven to 13 years of age. Mature females become reproductively active simultaneously, usually between March and June. Females give birth to a calf about once every five to six years. Females and juveniles generally remain all year in warm tropical waters such as the Gulf of Mexico.

Sperm whales also form harem or mixed schools, and juvenile or immature schools. Males eventually leave groups as they reach maturity, and live instead in bachelor schools. As males get older, the cohesion of these bachelor groups starts to decline. During the prime breeding period and in very old age, male sperm whales are mostly solitary. Males also wander further into colder ocean waters.

#### **IMPACTS OF OIL**

Due to their diving habits, sperm whales are vulnerable to disturbance from oil exploration, industrial development and associated shipping. Direct oil exposure also poses hazards to these animals. Contrary to some reports, whales do not necessarily avoid oil slicks or contaminated habitats. Whales have been seen swimming and feeding in or near oil. The animals' strong attraction to specific areas for breeding or feeding may override any tendency for them to avoid the noxious oil. Weathered or tar-like oil residues also pose long-term risks to whales.

Research indicates that inhalation of oil droplets, vapors and fumes are among the greatest risks to whales and other marine mammals, especially if the animals surface in extensive slicks to breathe. Exposure to oil in this way could damage mucous membranes, damage airways or even cause death. Other risks may include: hypothermia due to conductance changes in skin, resulting in metabolic shock; toxic effects and secondary organ dysfunction due to ingestion of oil; interstitial emphysema due to inhalation of oil droplets

and vapor; gastrointestinal ulceration and hemorrhaging due to ingestion of oil during feeding; eye and skin lesions from continuous exposure to oil; weight loss due to restricted diet and stress from oil exposure; and behavioral changes.

### Indirect effects

Oil development is often associated with the release of a wide variety of other contaminants into the environment. In the BP Deepwater Horizon spill, additional contaminant risk is posed by dispersants used to break up the oil. By BP's own account, it has mobilized a third of the world's supply of dispersants, including Corexit, to treat this spill. Dispersants can cause genetic mutations and cancer, further adding to the cumulative effects of oil toxicity. Levels of mercury, cadmium and other marine contaminants are already high enough in sperm whale tissue to raise concerns about reproductive impairment in this species.

### Impacts of oil spills combined with climate change and other threats

Increases in global temperatures are expected to have profound impacts on marine ecosystems and these impacts are projected to accelerate during this century. Because ocean currents and water temperatures influence sperm whale migratory routes, along with feeding and breeding areas, climate change will likely impact the animals' habitat and food availability. For example, in the equatorial Pacific there is some evidence that sperm whale feeding success and calf production are reduced by increased sea surface temperatures.

Other current threats include ingestion of marine debris; chemical pollution; and subsurface noise, including noise caused by oil and gas development, seismic testing and heavy shipping traffic. Sperm whales are known to respond dramatically to loud, unfamiliar underwater sounds, such as during seismic and military testing. Rare causes of natural mortality in sperm whales include predation, competition and disease, but these by themselves are generally not thought to be conservation threats. There are also many documented cases of beach stranding for which the cause is not known.

Entanglement in fishing nets (including "ghost nets") and collisions with ships represent the greatest direct threats to sperm whale populations currently. Due to their offshore distribution and deep feeding habits, sperm whales appear to be much less vulnerable to entanglement with fishing gear than some other cetacean species. Nevertheless, sperm whales sometimes get entangled with offshore fishing gear, such as long-line fisheries and pelagic drift gillnets targeting sharks, billfish and tuna. Because they spend long periods rafting at the surface between their deep dives, sperm whales are struck comparatively often by vessels.

Past whaling and the complex social structure of sperm whales makes it difficult to accurately assess the creature's population status. Because they range widely in deep waters and stay submerged for lengthy periods, it is challenging to count them. In addition, historical catch records are incomplete or inaccurate. Intensive whaling may also have fragmented the populations of sperm whales.





**Sperm whales are currently imperiled by entanglement in fishing nets and collisions with ships, along with the noise and pollution associated with offshore drilling. Inhalation or ingestion of oil can kill the animals directly or lead to chronic illness and organ damage.**

## WHAT CITIZENS CAN DO

- Support designation of marine sanctuaries and other marine protected areas where sperm whales and other marine life are buffered from disturbances caused by shipping and industrial development.
- Encourage reductions of human-made underwater noise at sites important to sperm whales. This includes stopping seismic surveys when towed air guns are within 1/3 mile of whales.
- Urge your elected officials to pass comprehensive climate change legislation that addresses the impacts of global warming on wildlife and our natural resources.

## WHAT POLICY MAKERS CAN DO

- Ensure that BP funds long-term research necessary for documenting impacts to sperm whales in all Gulf areas affected by the spill, including mitigation for the long-term damage caused to whales from nonlethal exposure.
- Support ongoing and additional studies to evaluate the effects of sound disturbance on sperm whales, including implementing regulations as appropriate for mitigating sound-production activities found to be potentially detrimental to sperm whales.
- 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.

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