

# MOBY DICK *in your* BACK YARD

The remarkable and mysterious sperm whale, great beast of literature and legend, can be spotted off the North Carolina coast.

Written and photographed by TODD PUSSER

The bulk of the animal was tremendous. From the tip of its head to the notch in its tail flukes, the whale measured 54 feet, 2 inches in length. It was estimated to weigh more than 100,000 pounds. The throngs of people who ventured onto Wrightsville Beach that spring to observe the behemoth looked like ants next to the creature's immense 33-foot girth.

The year was 1928, and for many North Carolinians, it provided their first glimpse of the legendary creature known as the sperm whale. By some estimates 50,000 people from six states came to view the dead whale as it lay and baked under the warm April sun. The whale, dubbed "Trouble" for all the headaches its decomposing body caused Wilmington health officials, was eventually acquired by the N.C. Museum of Natural Sciences, where its skeleton was prepared for display by museum director H.H. Brimley. Trouble's skeleton, one of only a handful of adult male sperm whale skeletons on exhibit anywhere in the world, can still be observed today, hanging high from the rafters in the marine mammal hall of the museum in downtown Raleigh.



Mouth agape, Trouble lay on Wrightsville Beach for weeks before his body was taken to the N.C. Museum of Natural Sciences.





Above: A wide view of Trouble and a few gawkers. Bottom, opposite page: sperm whale tail flukes can reach 16 feet from tip to tip.

My own introduction to the sperm whale, *Physeter macrocephalus*, came when I was in junior high school. Much to my dismay, I was assigned to read Herman Melville's novel "Moby-Dick." Like most teenagers whose grade depended on a well-written report about classic American literature, I judged a book not by its cover but by its size and length. My personal edition of "Moby-Dick," like the title character, was immense—a whopping 726 pages long. It was a daunting read for any student.

With the help of Cliffs Notes and repeated viewings of the 1956 movie version starring Gregory Peck, I eventually managed to write a passing essay on Melville's novel for my seventh-grade teacher. It was not until later in life, after spending the better part of 12 years at sea observing sperm whales around the world, that I began to really appreciate Melville's novel. Not only is it a great sea adventure, it is also an accurate depiction of the natural history of the sperm whale.

### DISTINCTIVE AND FASCINATING

Say the word "whale" and the image that usually comes to mind is that of a sperm whale. Sperm whales are the largest of the odontocetes, or toothed whales. Adult males can reach lengths of over 60 feet and weigh more than 60 tons. Females reach only half that size—around 35 feet and 25 tons. Largely because of "Moby-Dick" and stories such as the Bible account of Jonah and the whale, the sperm whale is instantly recognized by its unusual body form.

Its tremendous rectangular head, unique among the great whales, accounts for up to two-fifths of

the animal's length. Inside this disproportionately large head lies an immense cavity filled with a strange, colorless, oily liquid called spermaceti. This unique liquid was the driving force behind one of America's most important 19th-century industries. Whalers took to the seas far and wide in pursuit of the sperm whale and its spermaceti oil, which was considered to be the finest lubricant of its time.

Despite the examination of many specimens over the last 200 years, scientists still do not fully understand the function of the spermaceti organ. It has been speculated that spermaceti can absorb almost six times as much nitrogen as whale blood can, thus preventing the formation of deadly nitrogen bubbles during surfacing from the deep dives of which sperm whales are masters. The oil may also act as a buoyancy regulator, enabling the whale to remain neutrally buoyant at any depth. Perhaps it aims and modifies sound generated by the sperm whale, giving the creature a loud, effective sonar system. Whatever its primary function, spermaceti is unique to the sperm whale.

Beneath the rectangle-shaped head is a long, underslung mouth lined with as many as 26 pairs of white, conical teeth that erupt only in the lower jaw. The teeth consist of pure ivory and have no enamel covering. They were highly prized by whalers of old who, in an art form known as scrimshaw, etched on these teeth elaborate scenes of whaling.

For the seasoned whale watcher, sperm whales are easily identified at sea. Essentially, they look like large, knobby floating logs. Sperm whales have a small, thick, rounded dorsal fin located two-thirds of the way down their backs. Their coloration is typ-

ically described as dark gray, though they often appear brown in bright sunlight. Like the title character in Melville's novel, white sperm whales have been observed from time to time at sea. Recently, a completely white sperm whale was photographed in waters surrounding the Azores.

Sperm whales have a single S-shaped nostril known as a blowhole set forward on the left side of their heads, causing their blow to arch strongly at a 45-degree angle. This makes the species easily discernable at a distance. Sperm whales blow frequently while resting at the surface between deep dives.

Often, when a sperm whale begins its dive, it will arch its back high and lift its tail flukes completely out of the water. Melville, so enamored of the beauty and grace of the sperm whale, dedicated an entire chapter to the creature's tail: "In no living thing are the lines of beauty more exquisitely defined than in the crescentic borders of the flukes," he wrote. The flukes are broad, 16 feet from tip to tip, deeply notched and triangle-shaped. Scientists take photos of the underside of the tail flukes to recognize individual whales. Like human fingerprints, the scarring patterns and notches in the trailing edge of the tail flukes are unique in each individual whale.

The sperm whale has the largest brain in the animal kingdom, even larger than that of an adult blue whale, the largest animal ever to live on earth. The brain of a full-grown adult male sperm whale can weigh more than 20 pounds. By comparison, the human brain weighs only 3 pounds. Why does an animal like the sperm whale need such a large brain? After all, brains are metabolically expensive organs.

Perhaps the answer to this question can be found in the unique lifestyle of the sperm whale.

### EXTREME LIVING

Sperm whales are creatures of extremes. They spend most of their lives foraging in the dark recesses of the oceans, routinely diving to depths of a mile or more. At such depths it is almost pitch black, with little or no ambient light. Much like bats, sperm whales use echolocation, sending out sound and processing the returning echoes, for navigation and to locate their preferred prey: squid.

Contrary to popular belief, sperm whales do not feed exclusively on another maritime legend, the giant squid (*Architeuthis*). Remains of giant squids have indeed been found in the stomachs of sperm whales, but these marine mammals prefer to eat smaller, deep-water cephalopods. Scientists hypothesize that sperm whales might be able to stun prey using focused bursts of sound. The sound is generated at high pressure amidst cartilage valve structures along their nasal passages and directed into the surrounding water through the spermaceti. Sperm whales also produce a series of clicks and creaks often referred to as codas. These codas seem to act as a form of communication between individuals in a group.



Woodcarvings often showed whalers in mortal battle with sperm whales, which were documented to ram ships occasionally.







Female sperm whales often travel in groups with their calves off the North Carolina coast. Their small, rounded dorsal fin aids in identification.



Sperm whales have an interesting social structure, with females dominating the core unit of sperm whale society. A typical sperm whale herd consists of stable, closely related groups of females and their calves. The herds, which can number several dozen individual whales, are found in tropical and temperate waters around the world, including the offshore waters of North Carolina. Males born into these matrilineal societies begin leaving the herd by the age of 6 years, when they join other young males in what are known as “bachelor schools.” These bachelor schools tend to form in the colder, polar regions of the world’s oceans. The cohesion among individual males within a bachelor school declines as the whales grow older. As males become sexually mature, they become more solitary, particularly as they reach old age.

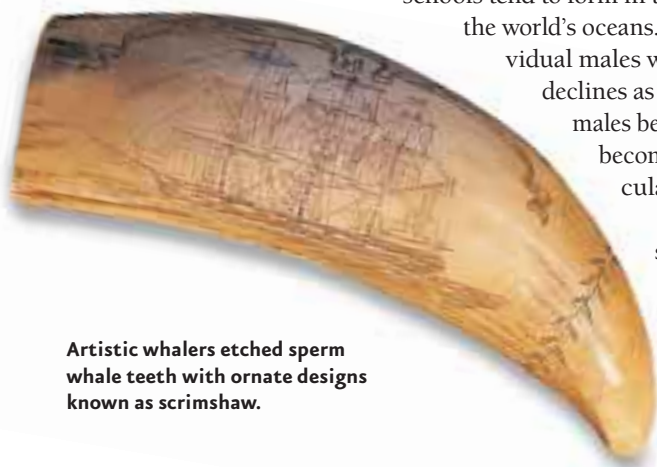
During the breeding season, which takes place in spring in the Northern Hemisphere, males migrate from polar waters to subtropical and tropical waters to compete for females. The heads of adult male sperm whales are often heavily scarred, indicating that fighting among males is intense. Many adult males have been observed with broken teeth and even broken jaws.

Female sperm whales reach sexual maturity at around 10 to 12 years of age and typically give birth to a single calf once every four to six years. The gestation period of a female lasts over 18 months, and the calf is not weaned until well after 2 years of age. Sometimes a calf will nurse for many more years. Incredibly, whalers have discovered milk in the stomachs of sperm whales that were older than 13.

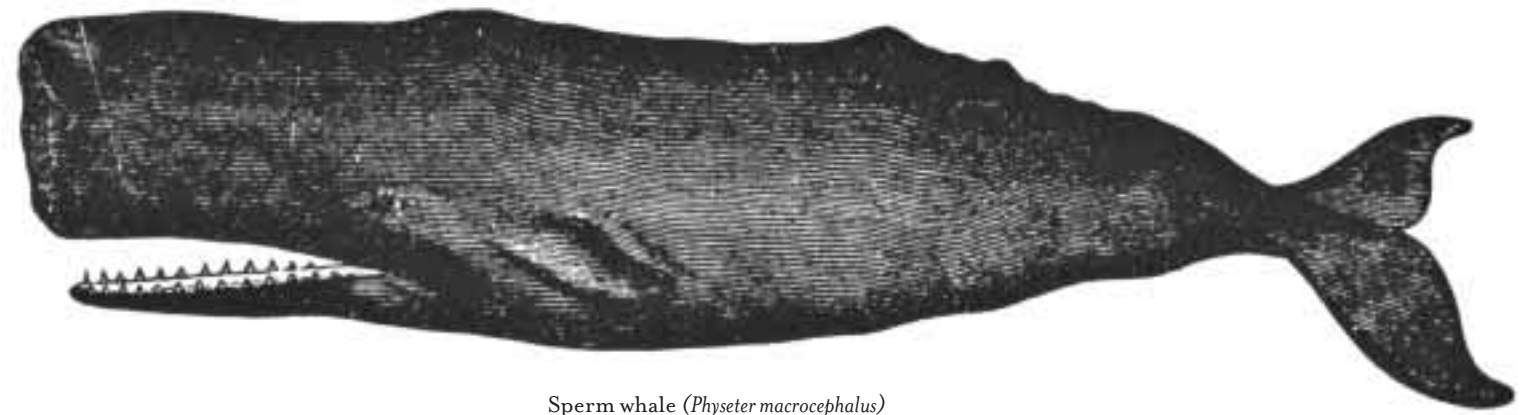
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### WHALES IN OUR WATERS

Off North Carolina I have encountered groups of female sperm whales with calves along the edge of the continental shelf in waters over 3,000 feet deep. It is likely that populations of female sperm whales are resident in the offshore waters of North Carolina.



Artistic whalers etched sperm whale teeth with ornate designs known as scrimshaw.



Sperm whale (*Physeter macrocephalus*)

I have never encountered an adult male sperm whale off our coast, but they certainly occur here from time to time, as indicated by the stranding of Trouble off Wrightsville Beach in 1928. Another large male sperm whale was found floating dead in Hatteras Inlet in January 1987. This huge specimen measured over 60 feet in length and was estimated to weigh 60 tons, making it the largest male sperm whale ever recorded from the Atlantic coast of the United States.

Whaling took a heavy toll on sperm whale populations around the world. It is estimated that between 1800 and 1980, more than half a million sperm whales were slaughtered for their body oil and spermaceti. Today, despite the widespread destruction caused by commercial whaling, sperm whales remain the most common species of large whale, with populations numbering in the high tens of thousands. However, because of their slow maturation and low reproductive rates, sperm whale populations remain vulnerable to such things as pollution, entanglement in fishing gear and collisions with ships.

Another potentially more serious threat to deep-diving whales is the mid-frequency sonar used by naval military vessels. Marine mammal scientists have linked this sonar to several mass strandings of whales in many areas of the world, including North Carolina. A proposed U.S. Navy sonar training range that would occupy 500 square miles of open ocean off the North Carolina coast has caused alarm among environmentalists and scientists alike. How such sonar activities will affect the behavior of sperm whales and other species of whales and dolphins along our coast remains to be seen.

Sperm whales are truly remarkable animals in every sense of the word. Scientists have come a long way in understanding the lives of these mysterious denizens of the deep. No longer slaughtered for profit, sperm whales are now having the puzzles of their lives unraveled through benign research and careful observation at sea. Scientists are placing high-tech tags on the animals to record their daily movements, how deep they dive and how they communicate with one another. Underwater video cameras are even being placed on the whales’ backs to give scientists unique whale’s-eye views of their underwater environment.

I have been fortunate enough to observe sperm whales in such far-flung places as the Mediterranean Sea, Hawaii, the Bahamas, Mexico, near the sub-Antarctic island of South Georgia and in the waters of my home state. Each time I observe their blow in the distance or watch as they gracefully lift their tails high above the water before a deep dive, I am reminded of Melville’s admiring words: “He is, without a doubt, the largest inhabitant of the globe, the most formidable of all whales to encounter; the most majestic in aspect. Hear ye! Good people all—the great . . . sperm whale now reigneth!”

*Todd Pusser is a marine biologist and a frequent contributor to WINC.*

A blowhole set on the left side of its head gives the sperm whale a distinctive blow that is discernable hundreds of yards away.

