

QUESTIONS & ANSWERS ABOUT WHALE SHARKS

Where and when are the greatest concentrations of whale sharks found?

Whale sharks mass at Ningaloo Reef, Western Australia, in March and April when the coral spawn. Large congregations of the sharks occur off Holbox, Mexico in July. In August and November, they appear in the waters surrounding the Seychelles. Many whale sharks are seen off East Africa, but the greatest concentration of the sharks appears to occur off Mozambique and the northern coast of South Africa from October through March. On January 15, 1994, a total of 95 whale sharks were observed between Durban and Umtentweni, South Africa, a distance of 68.3 miles [110 km], during an aerial survey conducted by the Shark Research Institute. However, whale sharks are rare; by 1986 there had only been 320 recorded sightings of whale sharks in all of Western scientific literature

Do whale sharks mass in the Pacific Ocean as well?

Large numbers of whale sharks have been seen off Mexico from Cabo San Lucas to Acapulco from March to August, and there are frequent sightings of the sharks off Australia's Queensland coast in November and early December.

What is shark "tagging"?

Although some species of sharks thrive in captivity, most do not. Another way we can learn more about sharks is by tagging them in the wild. When a shark is "tagged" by the traditional method it is caught and (if possible) measured, a tag is inserted on or below its first dorsal fin, and then the shark is set free. When the same shark is recaptured and re-measured scientists can see how much it has grown. Tagging also provides clues about a species' life-span. A school shark, thought to be 20 years old when it was tagged, was recaptured 33 years later, which indicates the species may live at least 53 years. Tagging may also indicate the range of a species: a blue shark tagged off New York was recaptured 14 months later off the coast of Brazil, and another was recaptured six years later off Liberia, West Africa.

Does the Shark Research Institute use the "traditional method" to tag whale sharks?

No, our tags are inserted in free-swimming whale sharks by divers. Sport divers report sightings of tagged sharks, and we also use spot-pattern recognition programs to identify and re-identify individual sharks. In addition, both satellite and radio tags are utilized to track some of the sharks.

How can I recognize a tagged whale shark?

Look for a Shark Research Institute tag on the shark's back, usually near its first dorsal fin. We've used many different types of tags since this project began in 1993. The ID tags currently in use are 2" x 8" yellow plastic placards. Please don't try to remove a tag; just record the identification number printed on it. The number is printed on both sides of the tag, along with the Shark Research Institute's web address. If you cannot get close enough to the shark to read the number, note its location. Report your sighting to the Shark Research Institute at P.O. Box 40, Princeton, New Jersey 08540, U.S.A, or send a fax to (609) 921-1505. You can also report sightings of tagged and untagged whale sharks directly to the Institute via the Whale Shark Sighting Report Form on the Internet: <http://www.sharks.org>

May an SRI-tagged whale shark be adopted by more than one person?

Yes, although SRI has placed ID tags on more than 800 whale sharks, and deployed satellite tracking tags on whale sharks in the Indian Ocean, the Caribbean Sea and the Pacific Ocean, some of the sharks have more than one guardian.

Why does the whale shark have such large gill slits?

Because it is a filter feeder. The whale shark's gills have two functions: in addition to extracting oxygen from seawater the gills filter the tiny planktonic organisms on which the shark feeds. When a whale shark is feeding it pumps large volumes of water over its gills and out its gill slits. The shark's gills have very fine gill rakers which function as sieves and strain plankton from the water.

Are any other sharks filter feeders?

Yes, two other species of sharks are filter feeders: the basking shark and megamouth. The basking shark (*Cetorhinus maximus*) grows to a length of 30 feet [9 m] and lives in temperate seas. It cruises close to the surface with its mouth open, filtering plankton from the water. Megamouth (*Megachasma pelagios*), discovered in 1976, lives in deep water. To date, comparatively few megamouth sharks have been caught, but we know that this species grows to at least a length of 15 feet [4.5 m].

Why do sharks also have Latin names and what is a whale shark's Latin name?

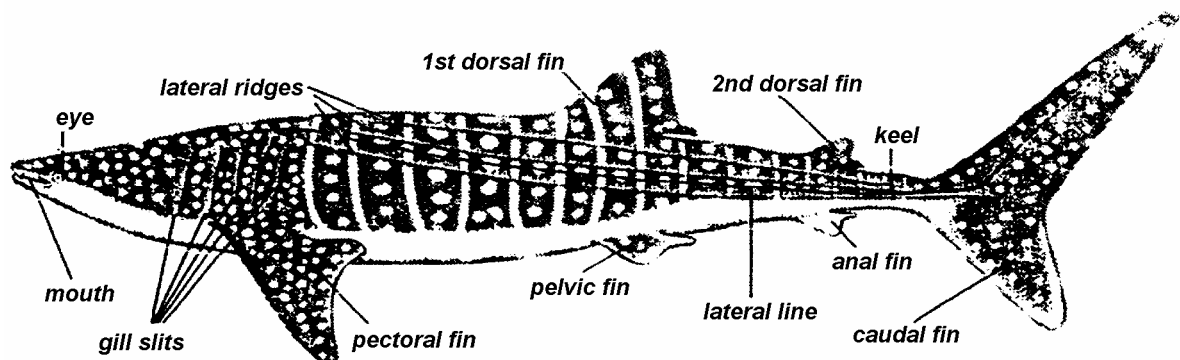
A species of shark may have various "common names" in different parts of the world, but to avoid confusion among scientists each species has only one scientific name. When scientists first devised classification of animals and plants Latin was the language of scholars. The first name of whale sharks (*Rhincodon*) tells us the genus to which the sharks belong; the second name (*typus*) is their species name.

Does the whale shark have any teeth?

Yes, and its original name (*Rhinodonte*) literally means "rasp tooth." The shark has several thousand teeth in 11 to 12 rows in its jaws, but each tooth is only 1/12th of an inch [3 mm] in length and they've never bitten anyone — divers call whale sharks the "gentle giants."

What is a shark's lateral line and how does it work?

Blow steadily on the palm of your hand. Can you feel the air movement? Now wave a finger between your breath and your hand, and feel the interruptions in air movement. Just as you feel the breaks in air pressure, so the shark's lateral line helps it detect changes in water pressure. The lateral line is a band of nerves running along each side of the whale shark from its head to its tail; it lies in the depression between its second and third lateral ridge. The shark uses this sense of 'distant touch' to determine the speed, size and form of an object moving through the water.



How does a whale shark reproduce?

In 1953 a shark egg case containing a 14.5-inch [36.8 cm] whale shark embryo was found in a trawl net in the Gulf of Mexico. The find created a controversy that lasted 42 years; some scientists speculated that whale sharks were oviparous (egg laying sharks), while others believed they were live-bearers and the egg resulted from a premature birth. In 1995 the controversy ended when a team of scientists from National Taiwan Ocean University examined a 35-ft [10.6 m] pregnant whale shark that had been harpooned by a Taiwanese fisherman. Her twin uteruses contained 300 embryos ranging in size from 16 to 25 inches in length [40 to 63 cm] - proof that the embryos emerge from egg cases while still inside the mother's body and that whale sharks are live-bearers. Of the 300 embryos, 15 were fully-developed and ready to be born. In 2010, of 29 embryos available for DNA testing, SRI molecular biologist Dr. Jennifer Schmidt determined that all had the same father.

How big is a newborn whale shark and where have they been found?

Newborn whale sharks measuring 21 to 25 inches in length [55 to 63 cm] have been caught in the Pacific Ocean off the coast of Central America, and in January 1996 there was an unconfirmed report that newborn whale sharks were found in the Marshall Islands. Newborn whale sharks have also been found in the Philippines, the Gulf of Guinea in the Atlantic Ocean, and in the Persian Gulf.

What is the size of the largest whale shark ever found?

In 1925 a whale shark estimated to be 60 feet in length [18 m] was caught in the Gulf of Thailand, but the largest accurately measured whale shark was a 40-foot, 7-inch [12.2 m] male caught in Bombay, India, in 1983. Its mouth was 4-feet, 6-inches wide [1.14 m], and its pectoral fins were more than 6-feet, 6-inches long [1.98 m].

How long do whale sharks live?

Scientists don't know for certain how long whale sharks live. We do know that some species of sharks that live for 100 years are not able to breed until they are 20 years old. This means they must spend 1/5th of their lives evading capture until they can reproduce at all. It appears that male whale sharks are not able to breed until they are about 30 years old. If 30 years is 1/5th of a whale shark's expected life span it may normally live for well over a century, possibly even 150 years or longer.

Why does a whale shark have such a peculiar color pattern?

Like many species of sharks that hunt near the sea's surface, whale sharks are counter-shaded; they have white bellies (which makes them hard to see if you are underwater and looking up at them) and dark backs (which makes them difficult to see if you are looking down on them). It has been suggested that the pale spots and lines on their backs are camouflage; to some, the pattern resembles a school of fish, to others it suggests reflections of sunlight on a shallow reef.

How deep can a whale shark swim?

Although the color pattern of whale sharks suggest that they spend most of their time near the surface, satellite tags reveal a whale shark may dive to depths of at least 2,500, often several times a day. (They may dive even deeper, but 2,500 feet is the maximum depth that satellite tags can record.)

Have whale sharks ever been exhibited in an aquarium?

Yes, Okinawa Churaumi Aquarium (former Okinawa Expo Aquarium) and the Ring of Fire Aquarium in Osaka, Japan, have exhibited small whale sharks. The Georgia Aquarium in Atlanta also exhibits small whale sharks.

Can't scientists learn enough about sharks by keeping them in an aquarium?

It would be helpful to shark scientists if every kind of shark could be studied in captivity, but most cannot be kept alive in existing aquariums. Even when a shark can live in an artificial habitat scientists learn little about the shark's distribution, migration, schooling and foraging behavior in the open sea.

Do whale sharks have any monetary value?

Whale sharks have great value to the tourist industry; and they have enormous potential value to the economies of third world and developing countries that have coastlines on tropical or subtropical seas. According to DEMA (Dive Equipment Marketing Association) American sport divers spend \$1.4 billion dollars annually on dive travel, and diving with sharks (all species) has become big business. As early as 1994, for example, some 21,000 sport divers participated in staged "shark dives" in the Bahamas alone. For many, the ultimate underwater experience is meeting a whale shark. Thousands of sport divers journey each year to Ningaloo Reef and East Africa (and pay more than \$3,000 apiece, excluding air fare) for the opportunity to dive with these charismatic giants.

Are whale sharks hunted anywhere in the world?

Whale sharks have few natural predators and they are not actively fished by any Western nation, but their fins are highly valued in Asian markets as an ingredient for soup. Australia, Palau, Honduras, India, the Maldives, the Philippines, the Seychelles, South Africa, and the USA protect whale sharks and all trade in whale shark products is prohibited, but the sharks are still slaughtered in many developing countries. On November 15, 2002, the whale shark and basking shark were placed on Appendix II of CITES (Convention on International Trade in Endangered Species), a United Nations Treaty Organization. The Appendix II listing requires the 175 member nations of CITES to monitor international trade in whale shark products and ensure that trade does not threaten survival of the species. The whale shark is also listed on Appendix II of CMS (Convention on Migratory Species, also known as The Bonn Convention). However, whale sharks still fall prey to poachers, particularly in the Philippines and in Mozambique.

Are sharks in danger of extinction?

Sharks breed very slowly; some species take more than 20 years to reach breeding size, and then have only 2 pups every other year. At present we are killing 73 million sharks a year; we are killing sharks much faster than they can reproduce. Some scientists estimate that the rate of depletion may be as high as 2% per year for certain species. A few years ago it was thought that if the carnage continued, species that have lasted some 400 million years could vanish within 50 to 100 years. That appears to be overly optimistic; a study conducted by Dalhousie University indicated that from 1986 to 2000, nearly all shark species declined at least 50%, with populations of some approaching collapse. Tiger shark populations plummeted 65%, numbers of white sharks fell 79%, and hammerhead sharks declined 89%. Aerial studies along the coast of South Africa from 1993 to 2001 documented an 83% decline in whale sharks.

Do sharks need protection?

Yes. Floating gill nets, often more than 30 miles [50 km] long, drift through the sea trapping every large creature in their path including whales, sea turtles and sharks. Longline fisheries catch huge numbers of sharks, and most are left to rot in the sea. Finning -- cutting the fins off living sharks and then tossing the mutilated creatures back into the sea to die - takes a heavy toll. The senseless slaughter continues because most people don't realize how important sharks are to the health of the oceans -- and to our planet!

Why are sharks important?

Sharks are the apex predators in the sea - they are the top of the ocean food chain. Apex predators prey upon healthy animals and thus ensure diversity and control populations. When apex predators are eliminated from any area an ecological imbalance results. Sharks, as apex predators, maintain the health of the oceans - 4/5th of the planet's surface - and an ecological imbalance in the environment spanning 4/5th of the world could cause real problems for the other 1/5th.

How can I help save sharks?

You have already taken an important step by adopting a whale shark. It is because of caring people -- like you -- that we are able to gather data that is needed to secure protection for this species; by your involvement in the Shark Research Institute's whale shark study, you are assisting in basic and long overdue essential research on the species. You can also support other conservation organizations that work to protect marine life. Refuse to buy products made from a shark. Don't patronize restaurants that serve mako shark or shark fin soup, and tell them why you won't eat there. Write to companies that distribute or sell shark products and express your disapproval. Check with your local library or marine research facility for the latest information about the plight of sharks, and keep yourself, your family and friends informed. Write to your local government officials and insist that sharks be included whenever protection is considered for other marine life.

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