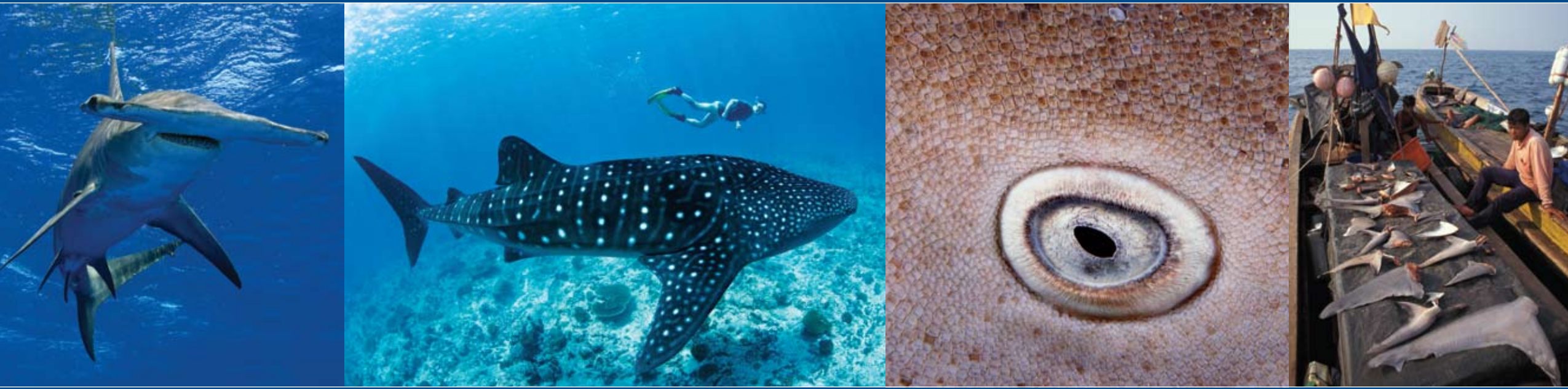


Sharks:

The New Fear Factor

*Fascinating Lives
In Danger*

*Pores of the gel-filled ampullae
di Lorenzini dot the nose of
a tiger shark.*



New reports say hammerhead sharks may go extinct due to shark finning; the plankton-eating whale shark is the biggest fish in the ocean; tooth-shaped denticles, like those covering this tawny nurse shark, improve sharks' ability to swim; shark fins sold in the markets of Malaysia, Singapore, and Thailand can fetch \$400 a pound.

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Underwater photographer Brandon Cole is diving in the Pacific Ocean at Cocos Island National Park, 340 miles (550 km) off the coast of Costa Rica. Nicknamed “The Island of the Sharks,” the park is world-famous for schooling hammerheads. Galapagos sharks, white and silvertip reef sharks, and the occasional whale shark swim here, too. Cole is not unaccustomed to waters like these, but he’s got a nagging fear anyway. His fear is not the irrational fear held by so many, that of a shark attack—Cole knows that the odds of that are miniscule. No, his fear is very real and very rational: He’s not afraid a shark will find him, but that he won’t find a shark. “The shark finning business has had a huge impact here, and continues to. And this is a national park!” says Cole. He still sees sharks here, just not as many. As for other places, he says, “On many reefs throughout the world, I might not see a single shark today, whereas before I might have seen a few or a dozen or fifty.”

For many people, the word “shark” evokes the image of man-eating great whites and the suspenseful soundtrack from the movie “Jaws,” but in this day of reality shows, you should know that the real fear surrounding sharks is the fact that some species may disappear before we even discover all about their fascinating lives. Picture a twenty-foot-long basking shark moving through sun-dappled water, its gargantuan mouth open wide like a cellar door. Filtering up to 1,500 gallons of water an hour, the gray beast takes in only the tiniest of ocean life.

But the second-largest fish in the ocean remains mysterious, says Dr. Gregory Skomal of the Massachusetts Division of Marine Fisheries. “We know nothing about the number of young, their size, or where they are born. Most significantly, until recently, we didn’t know about their habitat in wintertime.”

Skomal and his colleagues made a remarkable discovery when they attached satellite transmitters to 25 basking sharks off the coast of Massachusetts. “We were completely floored,” says Skomal. “When we saw the first tag pop up in the Caribbean, we thought it had come off the shark and gotten picked up by a fishing vessel or drifted.” Some sharks swam as far as the coast of South America.

At the same time that scientists are learning more about what makes sharks tick, these amazing animals face daunting threats, primarily from overfishing. If more people understood that the great white isn’t the only shark with Hollywood-size charisma, maybe they would demand better protections.

EVOLUTIONARY WONDER

Around 360 million years ago during the “golden age of sharks,” many and varied species developed. Today, more than 1,000 species of sharks and related rays swim the ocean, each adapted to ocean survival in its own way. Some are rounded like a torpedo, others are flat as a

flounder. Their camouflaging coloration, including blues, grays, and browns, can appear striped, solid, or spotted. The smallest, the eight-inch lantern shark, glows with luminescence in the dark depths. The largest fish in the world, the beautifully speckled bus-size whale shark, may live more than a hundred years.

Famous swimmers, sharks have some surprising help. Their skin looks smooth, but sweeping your hand across it from back to front is akin to stroking a cheese grater because of millions of tooth-like denticles that channel water across the shark’s body, greatly enhancing its ability to glide. Creating similar surfaces, researchers have improved the hydrodynamics of everything from racer’s swimsuits to submarines.

In addition to denticles, pectoral or side fins that function much like airplane wings help create the seemingly effortless underwater flight of a cruising shark. The fins—and the muscular body as a whole—create lift when the shark moves forward. When it comes to speed, mako sharks are the fastest, clocked at more than 45 miles an hour in pursuit of prey. Agility comes into play as well; spinner sharks confuse schools of fish by twirling in tight circles like ballerinas *en pointe*, snapping up startled prey. Some species are true distance swimmers: Elegant blue sharks have been known to swim 10,000 miles across entire ocean basins and back.

FIVE SENSES PLUS

Power-predators, sharks rely on sight, hearing, smell, taste, and touch. They may hear fish a mile away, and at a third-of-a-mile can smell blood in water. As they draw within about 300 feet, fluid-filled sensory panels on each side of the body detect pressure changes and movement in the water. Closer still, and they can see the object of their interest and move in a surprise attack to grab their meal. If sharks don’t like the taste of something, they move on. Sharks possess a bonus sixth sense. Small, jelly-filled pores along their snouts called the ampullae of Lorenzini pick up on electrical fields created by the contracting muscles of a swimming fish or a beating heart.

Shark reproduction can be as fascinating as their hunting prowess. Some species lay eggs, but most sharks give birth to live, fully formed young. For example, female spiny dogfish off the Pacific Northwest, (frozen and shipped to the UK to be used in fish-and-chips), are thought to not bear young until age 35. Spiny dogfish are found worldwide and have one of the longest gestation periods of any animal, nearly two years, which is on par with that of the African elephant.

Sharks also have super immune systems. Researchers have long been fascinated by low rates of infections and tumors in sharks, and may one day make discoveries that could enhance human health.

STILL, NO MATCH FOR MAN

Despite their survival skills, many shark species are now in danger. Sharks prey on each other, and killer whales hunt them, too, but humans pose the greatest threat. Sharks kill perhaps ten people a year worldwide; in contrast, fishermen catch tens of millions of sharks, either intentionally or as “bycatch” with hooks or nets targeting other species.

The reproductive timetable of many sharks makes them especially vulnerable to overfishing: How can fish that must live decades before they can reproduce possibly rebound quickly from a depleted state? Too many shark populations are declining rapidly because we are catching them faster than they can reproduce. Some species could disappear before we’ve even discovered their key roles in ocean ecosystems. The International Union for Conservation of Nature (IUCN) reports that one-in-five sharks or closely related rays are “threatened” with extinction. Unfortunately, few shark species are well-protected throughout their ranges and most countries do not regulate shark fishing at all.

Shark meat is increasingly popular; world landings have tripled since 1985. But, while there is a market for the meat and liver oil, demand for fins dominates. The popularity of shark fin soup, an Asian delicacy, has made fins some of the most valuable fishery products in the world. In the last few years, whole dried fins in the markets of Malaysia, Singapore, and Thailand have sold for \$400–800 a pound. The enormous dorsal fins from basking sharks are also used as restaurant signboards to advertise the sale of shark fin

soup and can fetch tens of thousands of dollars each. High demand for fins too often leads to “finning,” the practice of slicing off a shark’s fins at sea and tossing the body back into the ocean.

Like other highly migratory wildlife, sharks are a bellwether for ecosystem health and serve as a reminder that the ocean is truly one ocean—and successful management must transcend national boundaries. Humankind has made

progress, but more is needed in short order. Finning has been banned in the US and most of the world’s international waters, but loopholes exist. Widely-recognized great white sharks and whale sharks are among the world’s most protected, at least on paper. Yet, hundreds of other species are in steep decline from overfishing.

“A greater understanding of these superb creatures and their essential role in the ocean is paramount to their

survival,” says Dennis Takahashi-Kelso, executive vice president of Ocean Conservancy. “When we have changed the way we see sharks, when we have changed our perception from fear to appreciation, then we will be able to truly value sharks for their remarkable diversity and complex lives.”

And only then can we begin to care about their future and take action on behalf of these incredible species. 🐾

Slow and reclusive, the horn shark plays against the image of sharks as toothy killers.



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CREATURE FEATURE