

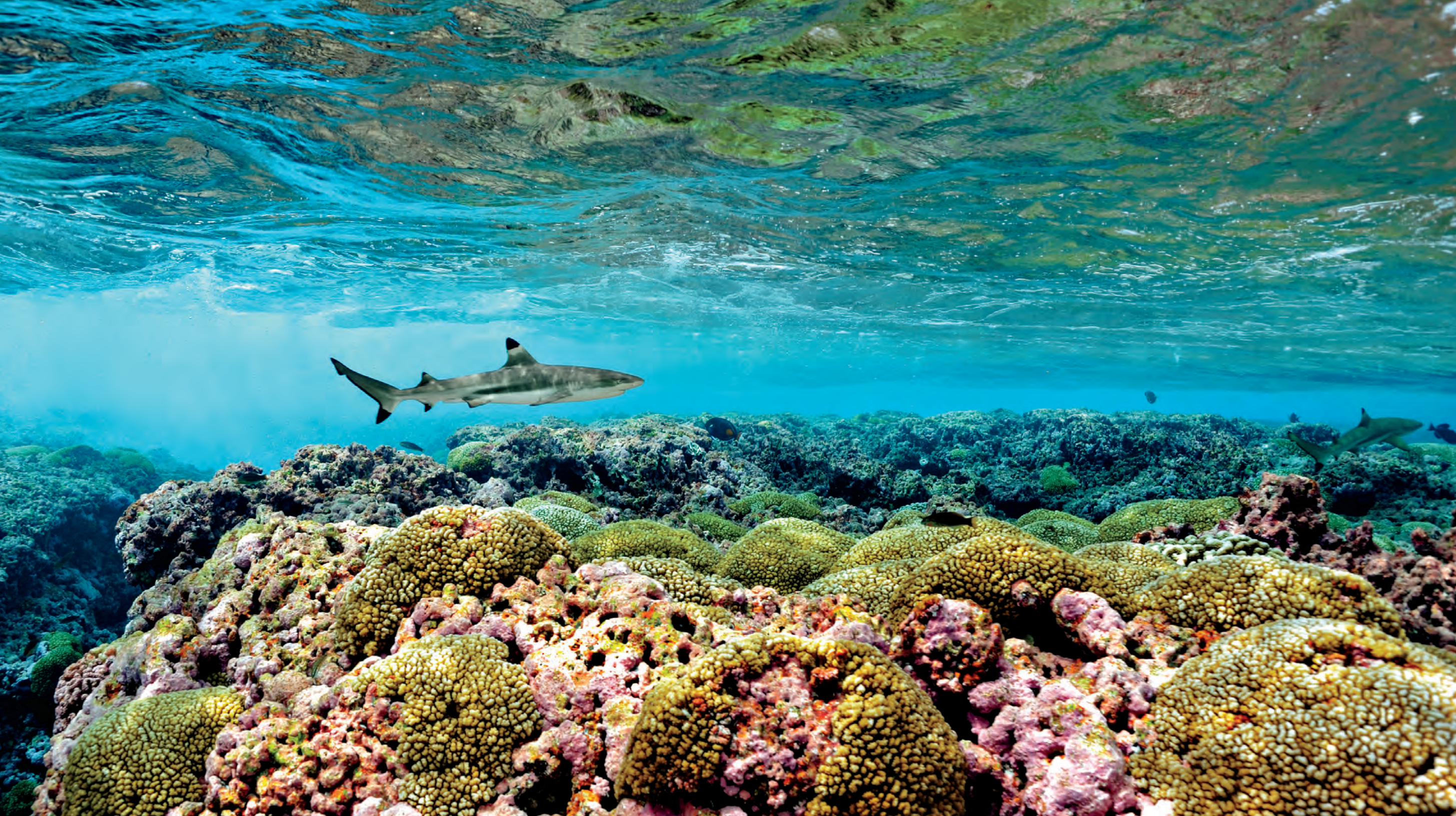


SHARK

SHARK

BRIAN SKERRY





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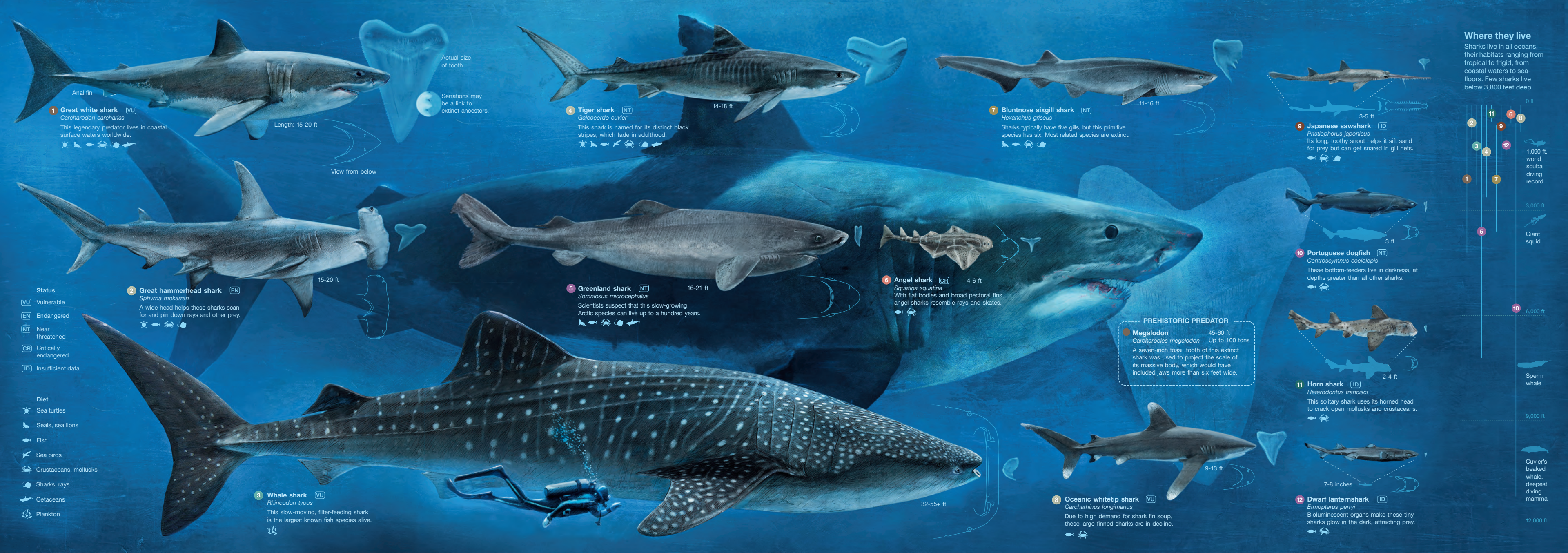
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FIRST PAGE: A tiger shark swims over a coral reef in the Bahamas, with a nurse shark (left) and a Caribbean reef shark (right) in the background.

PREVIOUS PAGES: Whale sharks are the largest fish that currently exist.

LEFT: A blacktip reef shark patrols the reef at Millennium Atoll, a tropical paradise that has been largely unmarred by human activity.



1 Great white shark **VU**
Carcharodon carcharias
 This legendary predator lives in coastal surface waters worldwide.

Length: 15-20 ft

Actual size of tooth
 Serrations may be a link to extinct ancestors.

4 Tiger shark **NT**
Galeocerdo cuvier
 This shark is named for its distinct black stripes, which fade in adulthood.

14-18 ft

7 Bluntnose sixgill shark **NT**
Hexanchus griseus
 Sharks typically have five gills, but this primitive species has six. Most related species are extinct.

11-16 ft

9 Japanese sawshark **ID**
Pristiophorus japonicus
 Its long, toothy snout helps it sift sand for prey but can get snared in gill nets.

3-5 ft



View from below

2 Great hammerhead shark **EN**
Sphyrna mokarran
 A wide head helps these sharks scan for and pin down rays and other prey.

15-20 ft

5 Greenland shark **NT**
Somniosus microcephalus
 Scientists suspect that this slow-growing Arctic species can live up to a hundred years.

16-21 ft

6 Angel shark **CR**
Squatina squatina
 With flat bodies and broad pectoral fins, angel sharks resemble rays and skates.

4-6 ft

PREHISTORIC PREDATOR
Megalodon 45-60 ft
Carcharocles megalodon Up to 100 tons
 A seven-inch fossil tooth of this extinct shark was used to project the scale of its massive body, which would have included jaws more than six feet wide.

10 Portuguese dogfish **NT**
Centroscymnus coelelepis
 These bottom-feeders live in darkness, at depths greater than all other sharks.

3 ft



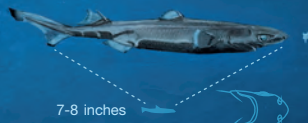
11 Horn shark **ID**
Heterodontus francisci
 This solitary shark uses its horned head to crack open mollusks and crustaceans.

2-4 ft



8 Oceanic whitetip shark **VU**
Carcharhinus longimanus
 Due to high demand for shark fin soup, these large-finned sharks are in decline.

9-13 ft



12 Dwarf lanternshark **ID**
Etmopterus perryi
 Bioluminescent organs make these tiny sharks glow in the dark, attracting prey.

7-8 inches

3 Whale shark **VU**
Rhincodon typus
 This slow-moving, filter-feeding shark is the largest known fish species alive.

32-55+ ft

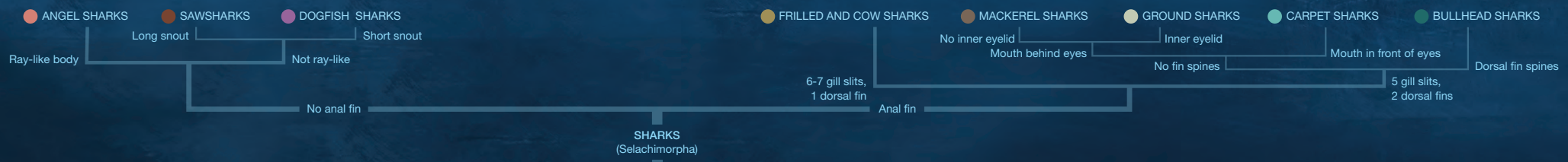
Where they live
 Sharks live in all oceans, their habitats ranging from tropical to frigid, from coastal waters to sea-floors. Few sharks live below 3,800 feet deep.



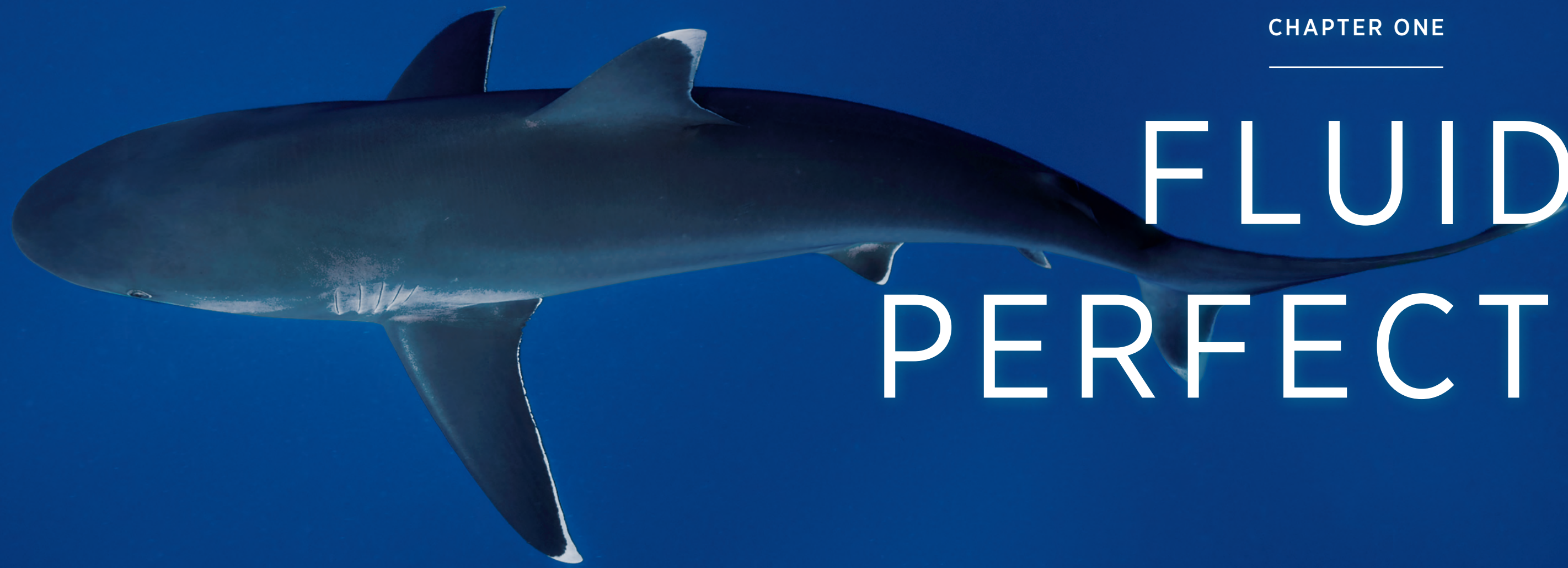
SHARKS

LORDS OF THE SEA

There are more than 500 species of sharks, predators crucial to maintaining ecosystem balance. Scientists estimate that more than 70 species are threatened with extinction, mostly because of overfishing.



Shark spotting
 Scientists identify sharks based on a series of characteristics, including the presence or absence of anal fins, the number of gills, body shape, and the shape of the snout.



CHAPTER ONE

FLUID PERFECTION

Around the world, scientists are finding that healthy coral reef ecosystems, like this one in the Bahamas, are teeming with sharks. All parts of these environments are connected: Caribbean reef sharks need abundant populations of prey, and those smaller fish need their own food, along with coral, anemones, and sponges to hide, mate, lay eggs, and grow in.





Great white sharks are some of the most amazing creatures I have ever encountered. They barrel through the water when attacking, and their powerful jaws can extend from their bodies, sharp teeth ripping chunks of flesh from prey like whales and other sharks. When they venture into deep water where food is scarce, great whites can rely on fats and oils stored in their livers.



This mangrove forest in Bimini, Bahamas, is a nursery for lemon shark pups. At only a few weeks old, they are perfect miniatures of adult lemon sharks. The mangrove roots keep them safe from predators during the first few months of their lives, before these sharks head out into open waters. I wanted to capture images of sharks at this vulnerable stage of their lives to help show people that these animals are more than dangerous predators. They're fascinating, multidimensional animals with rich lives.

Bull sharks are one of the most adaptable species of sharks. They're comfortable in water that many other sharks aren't, including brackish and occasionally freshwater. Many search marinas, docks, and other populated areas for scraps left behind by humans. They tend to be aggressive and territorial.





Sharks have incredible eyesight, especially in low-light environments. The iris of this silky shark almost looks like a cat's eye—and for good reason. Cats and sharks both have a mirrorlike layer in the back of their eyes called the tapetum lucidum, a structure that boosts their sensitivity to light.



Caribbean reef sharks are developing a taste for the invasive lionfish (opposite). Lionfish have no natural predators in the Caribbean, but Honduran scientists are coaching sharks to see them as prey in an effort to control their booming populations. In Mexico a remora investigates the mouth of a whale shark in search of food scraps (above).



At Tiger Beach in the Bahamas, tiger sharks have acclimated to the presence of humans (and know that many will have food for them). Vincent Canabal is an ecotourism guide who works at Tiger Beach and knows many of the sharks here on sight.

CHAPTER TWO

GREAT WHITE



Great whites are usually solitary animals, but in hubs like the Neptune Islands they can be found in groups, especially near feeding grounds. During this dive I saw sharks on every side. Between the hazy water and the schools of silverfish, visibility was low, and I was surprised when one shark swam right up to my cage and pressed her face against my camera.





Like other sharks, great whites have sharp low-light vision, and many actively hunt and patrol as the sun sets. In the Neptune Islands, schools of silver jacks swim alongside sharks, something that you don't see often. They're not a fish that great whites are terribly interested in eating and may be used as cover while the sharks hunt larger prey.



Greg Skomal has been studying sharks for more than 20 years. When a new population of great whites emerged in Massachusetts in the early 2000s, he was ecstatic. He is studying the Cape Cod population with a variety of methods. Here, he's recording a white shark swimming near Nauset Beach, one of the most popular on the Cape.



This shot is from my first season working on the Cape, while I was trying to figure out the best way to capture these truly wild sharks. They weren't interested in any of our bait, and the Cape's shallow, murky water and strong currents made underwater shots especially challenging.

Satellite tagging provides scientists with new understanding of the great white's impressive migration. Sharks that spend the summer and fall off the coast of California head out to deep water in the central Pacific in the winter and spring, to an area scientists call the great white café. So far, Australian sharks like this one don't seem to have a similar pattern.



In Australia these small silver jacks would sometimes school underneath a shark, occasionally coming up to bump up against the shark's rough skin. Like other smaller fish species, they may be using the shark as a form of protection. They're too small for a shark this size to have much interest in eating them, but larger fish that might make dinner of them are too wary to venture close.





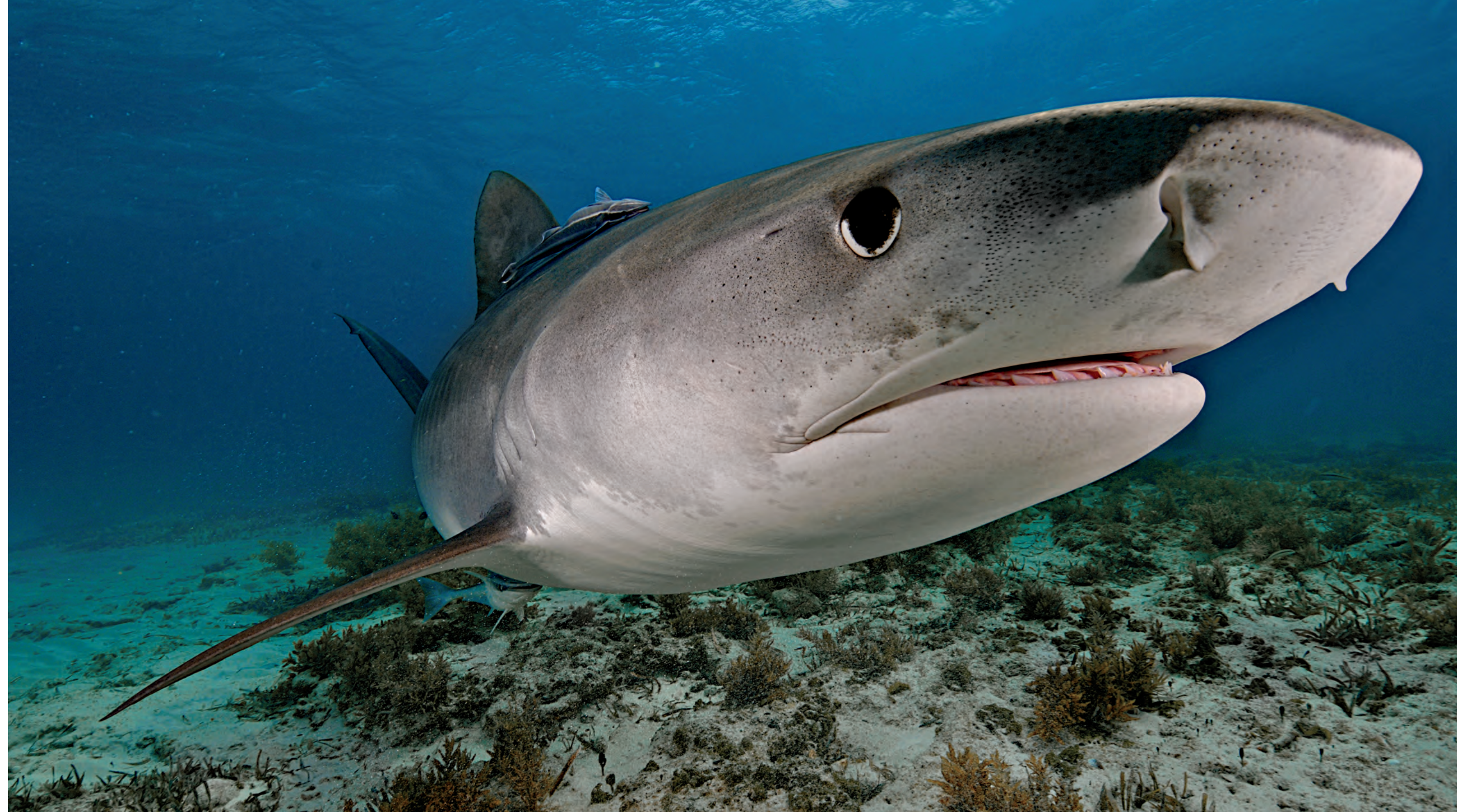
It might appear that this great white is chasing down a tiny snack, but this small silver jack isn't something a shark is particularly interested in. You see this with a lot of larger sharks—small fish swim just in front of their noses, like dolphins swimming at the front of a boat. The jack may be taking advantage of how the larger fish cuts through the water, making it easier to swim.

CHAPTER THREE

TIGER



Most of the sharks that swim through Tiger Beach are habituated to humans and are well behaved with visiting divers. It's not without risk, but these unique circumstances make it a good place to capture intimate portraits. I've learned that each shark has its own distinct personality—some are curious and friendly, while others are standoffish or aggressive.





Even at Tiger Beach sharks tend to be initially cautious around humans. They approach slowly and often investigate by bumping divers with their noses. As the sharks become acclimated to humans, they become friendlier and visit the area regularly. On any given day Tiger Beach will have multiple tiger sharks waiting at the bottom. This shark also had its sensitive eyes closed, to protect them from sand and debris on the ocean floor.



When I set out to make photographs of tiger sharks, I wanted to emulate their terrestrial namesakes. Like a tiger slinking through tall grass in the jungle, this tiger shark approaches from behind a purple sea fan. The lush sea grasses on the ocean floor provide cover for sharks hunting in these shallow waters.



A tiger shark's mouth is an impressive thing, as I saw firsthand when one started investigating my camera with its mouth. With wide jaws and heavy serrated teeth, these sharks have been known to bite through license plates, paint cans, and other debris—they're not particularly picky eaters.

The ocean floor in the Bahamas is littered with the evidence of old wrecks, like this anchor chain from an unknown ship. Tiger sharks hang out near many of these shipwrecks and, along with small reef fish, have colonized these remnants from human travelers, transforming them into their own habitats.





Calm, clear waters and low winds really showcase the shark presence on Tiger Beach. Each of these sharks is about 12 to 14 feet long—many of them are females who spend their pregnancies in the warm waters of the Bahamas. I made this photograph using a camera attached to a blimp (you can see the tether attaching it to the boat on the left side of the image).

Tiger sharks patrol the water column, passing through shallow and deep environments in search of prey. They're the ultimate tropical predator: resilient, adaptable sharks that play a key role as apex predators. Some of the hot spots for tiger sharks overlap with centers of human activity, giving them a reputation as particularly dangerous sharks.





You can see a bit of food from a dive operator at Tiger Beach inside this tiger's mouth, but almost none of its razor-sharp teeth are currently showing. When they attack living prey, tiger sharks' jaws can cut through just about anything—one shark was found with an entire suit of armor in its stomach.



Part of why sharks are such efficient predators lies in their finely tuned senses. Like other sharks, tigers have good low-light vision. They also have jelly-filled nerve endings on their snouts, called the ampullae of Lorenzini (the small dots behind the nostrils). These allow them to detect electrical signals and home in on nearby prey.

Sharks also have exceptional senses of smell, and specialized teeth round out an already impressive lineup.

Sharks with hooks and fishing lines trailing from their mouths like this female tiger shark have become a common sight in the Bahamas. Commercial shark fishing is illegal there, but when fishermen reel in sharks, many don't feel like they can safely remove the hooks before releasing them back into the wild.





CHAPTER FOUR

SHORTFIN MAKO



Makos are abundant in New Zealand, compared to the rest of the world's oceans. They tend to lead solitary lives, so it's rare to see multiple makos together. Off of New Zealand's North Island I saw groups multiple times—once nearly 20 in the same place.



Being in the water with mako sharks is exhilarating and exhausting. They're smart, quick sharks, and you have to stay vigilant when one is around, much less three. I was free diving with these makos and had to stay on my toes to keep track of where they were.



Makos are some of the fastest animals in the ocean, with bodies built like a bullet to reduce drag in the water. They can swim in short bursts of up to 45 miles an hour, and even their cruising speed is fast—makos can travel more than 60 miles in a single day.



Strong, capable predators, mako sharks are well equipped for life throughout the water column. Their eyes are larger than many other shark species, allowing them to hunt effectively in deep water where sunlight doesn't reach. I like to call this image "the last thing a tuna sees."



Most fishes, including most sharks, are ectothermic, meaning their body temperature matches the temperature of the water. But makos, along with a few other species, are partially endothermic, meaning they can generate their own body heat. This allows them to swim into deeper, darker, colder waters that many other sharks wouldn't survive in for long.



Like tiger sharks, makos are ambush predators. They sneak up from below and take a chunk of their prey—a tuna or a bluefish, sometimes a dolphin. Then they'll let it bleed out until it's too weak to fight back and drag it to deep water to feed.

In nearly all of the world's waters you find copepods, small crustaceans that float in the open water or live on the ocean floor. About half of the 13,000 known species of copepods are parasites that attach themselves to marine animals. On this mako shark you can see parasitic copepods attached to the dorsal fin, trailing behind as it swims.





Makos have a reputation as aggressive sharks, which is part of what makes people see them as such a prize catch. But these efficient, elegant predators are declining in number. In New Zealand they're seen as a good eating fish (though more often picked up as bycatch rather than targeted fishing).

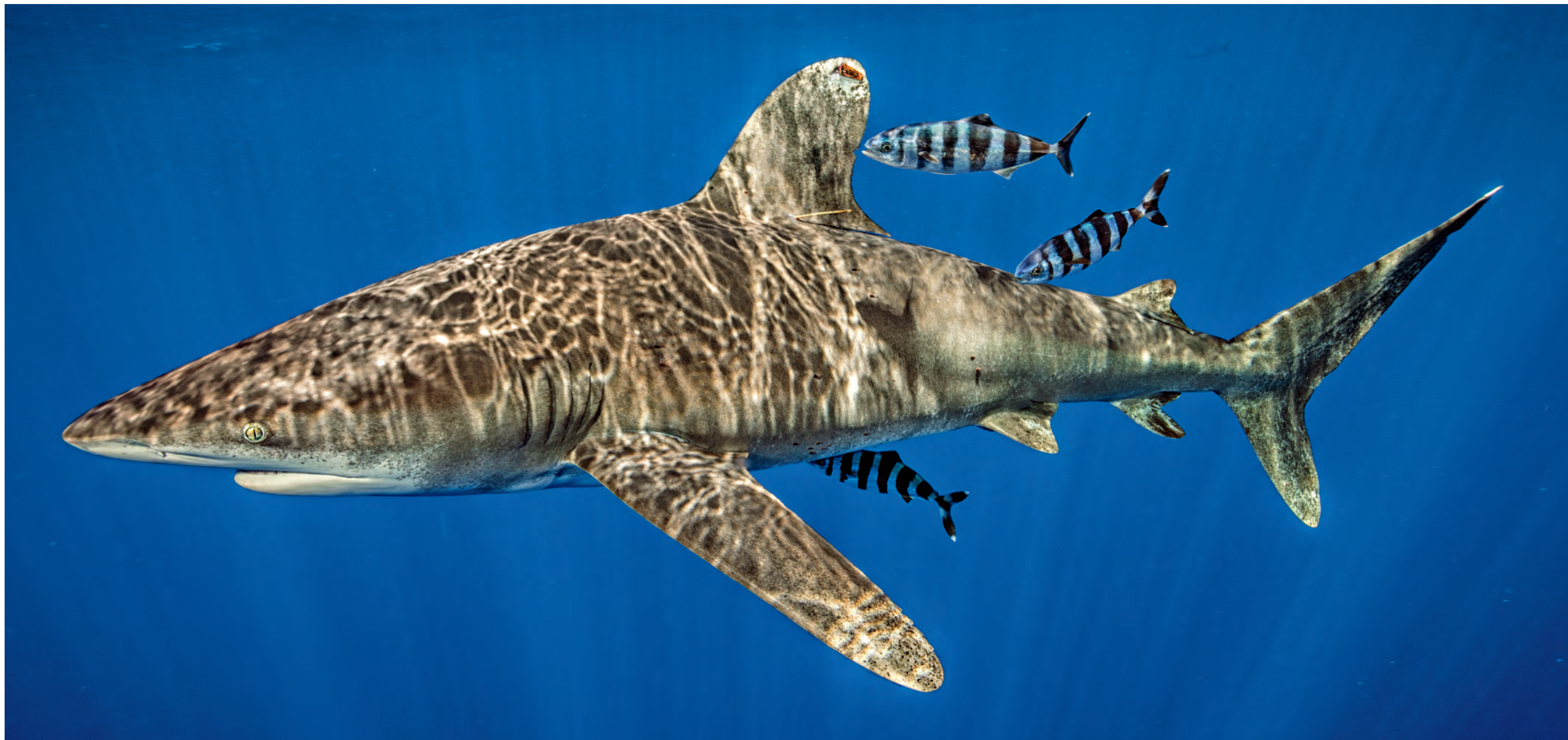


CHAPTER FIVE

OCEANIC WHITETIP

Joe Romeiro captures close-up video of an oceanic whitetip swimming off Cat Island, one of the only known hot spots for these elusive sharks. Oceanic whitetips earned a reputation as killers and are often hunted for their fins. Their numbers have been in decline for years, with an estimated 93 percent population decline between 1995 and 2010.





Around the world, oceanic whitetips are accompanied by pilot fish. By hanging around larger predators, pilot fish ensure that nothing bigger is coming along to eat them. In exchange for this protection, the pilot fish pick parasites off the shark and sometimes even clean bits of food out of the shark's teeth.



I first encountered an oceanic whitetip near Cat Island in 2006, with my mentor Wes Pratt (above). Since then I've been lucky to swim with and photograph many more of these beautiful pelagic sharks (opposite).





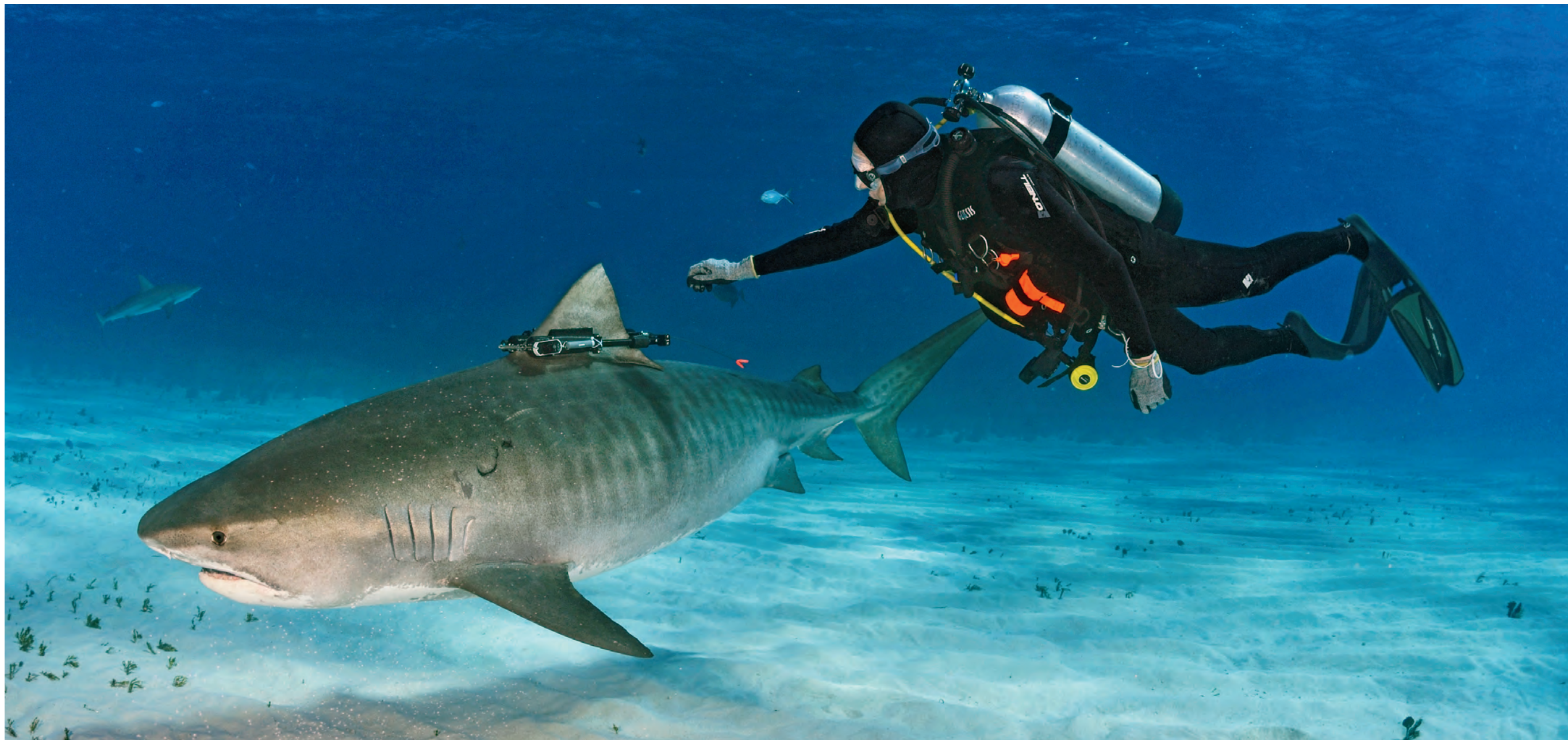
Before that first trip to Cat Island in 2006, I had no experience with oceanic whitetips and could only base my expectations on rumors about these man-killing sharks. We brought along a shark cage, but I felt perfectly safe swimming alongside them in the open water.

Like the numbers for other species of sharks, oceanic whitetip numbers are in decline. The population that frequents Cat Island may be as small as 300 sharks, and it's one of the largest groups known today. While sharks benefit from a commercial fishing ban in the Bahamas, their range expands far beyond Bahamian waters, and if we want to keep these sharks around they're going to need more protections.





The industrial fishing industry is responsible for most of the 100 million shark deaths per year, many for nothing but their fins. I came across this big eye thresher shark caught in a net in the Gulf of California in Mexico and felt overwhelming sympathy for the plight of these incredible animals. I hope that through photography I can share my experiences and get people to really care about sharks' lives.



Neil Hammerschlag affixes a National Geographic Critter Cam to a tiger shark in the Bahamas. This tiger left the shallow waters near Tiger Beach for deeper water before returning to the shallows where divers might offer him food. Sharks' lives are full of so much more nuance and wonder than many people realize. They're intelligent animals with rich lives—not just predators to be feared.

At Kingman Reef, a pristine coral reef environment is the backbone of a thriving, diverse population of animals. Sharks may be at the top of the food web, but every part plays an important role in maintaining a healthy and balanced ocean. As the oceans respond to the effects of climate change, it's important that we support and respect every part of the complex ocean environment.

FOLLOWING PAGES: A mako shark swims through the bright, clear waters near San Diego. This is one of my favorite places to photograph sharks, where they freely roam the open waters.

