

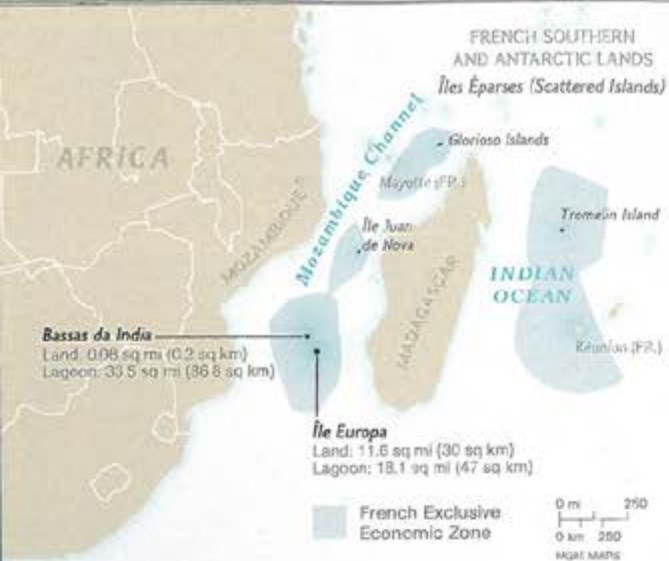
A Tale of Two Atolls

One of a pair of tiny French territories tucked between Madagascar and southern Africa provides a mating area for green turtles. The other is home to Galápagos sharks.

EUROPA Clutched in the embrace of her partner, a female green turtle glides through indigo seas at Europa atoll, a vital breeding area for this endangered species.

BASSAS Galápagos sharks, though named for the islands that furnished Darwin with insights into evolution, are found around tropical oceanic reefs worldwide. Almost all the sharks in the protected lagoon at Bassas da India are Galápagos sharks; the lagoon is thought to be a nursery for the species.





By Kennedy Warne
 Photographs by Thomas P. Peschak

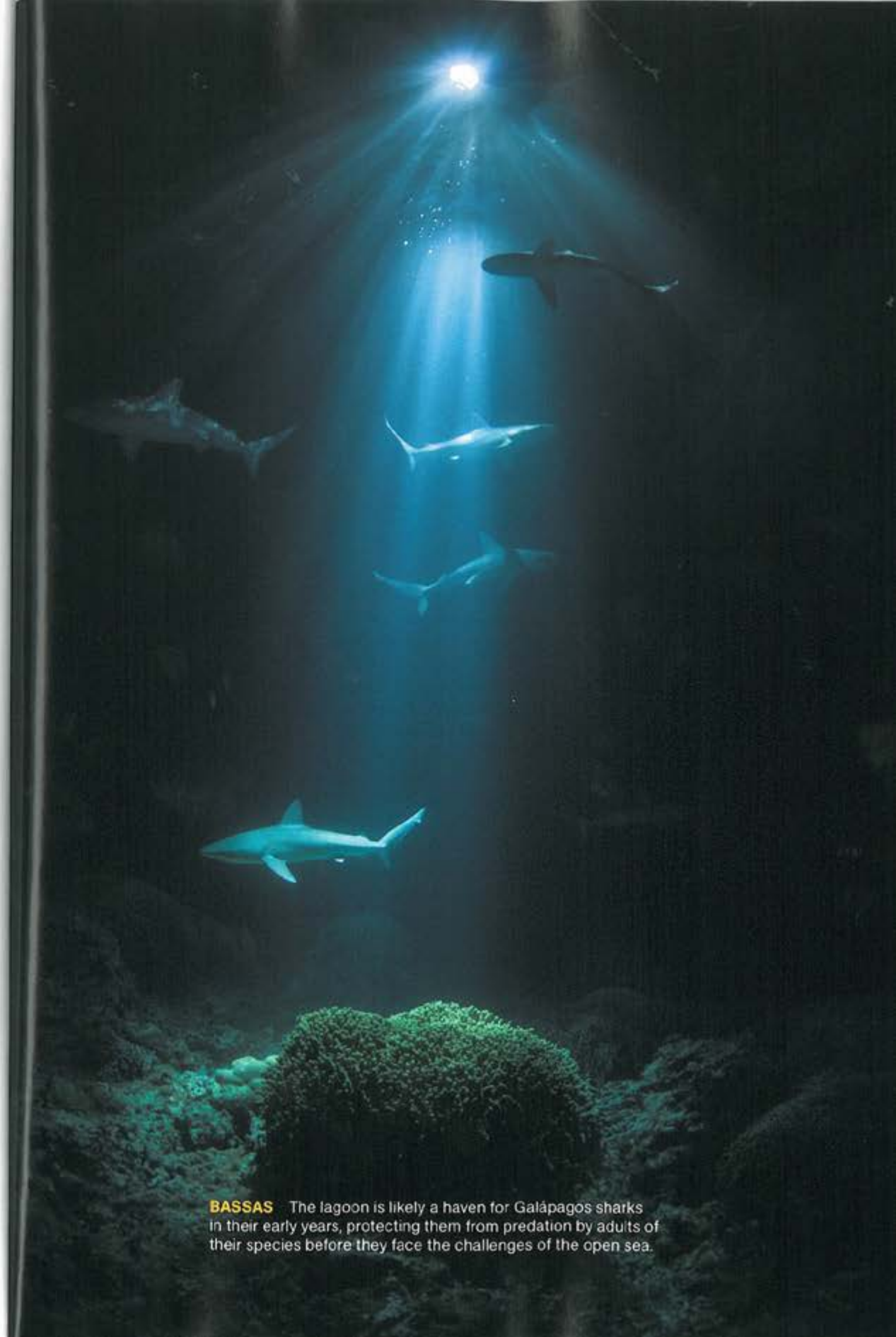
PICTURE TWO BOULDERS DANCING. That's an approximation of green turtle sex: two sumo-size behemoths clipped to each other's shells, finning languidly through the crystal waters of a coral reef. A reef such as the one that encircles Île Europa, off the southwestern coast of Madagascar, where on average more than 10,000 female green turtles congregate each year to mate, later going ashore to lay their eggs.

Green turtles have a reproductive strategy known as "scramble polygamy." Rather than expend energy defending a territory or engaging in combat, males focus their elephantine effort on finding an unattached female—or attempting to cut in on a mating in progress. Males have large claws on their flippers and tail, and use these to attach themselves to the shell of the female. Other males attempt to knock a successful paramour off his perch, jousting and biting and often wounding both members of the pair.

Occasionally a hormone-addled rival will clip on to the shell of the mounted male. "This is going absolutely nowhere for male number two," notes marine biologist Wallace J. Nichols. Nichols has seen stacks of up to four males, each clinging to the turtle in front. "When this sort of thing happens with earthworms in the garden, it's merely curious," he observes. "With 400-pound sea turtles, it's a circus."

EUROPA'S TURTLE CIRCUS is rarely seen by human eyes. The island is a nature reserve, and its waters are protected. Like its neighbor, Bassas da India, 70-odd miles to the northwest, it is part of the Scattered Islands, five specks of land that ring Madagascar like moons. Remnants of the once mighty French colonial empire, they fly the Tricolor as part of the French Southern and Antarctic Lands.

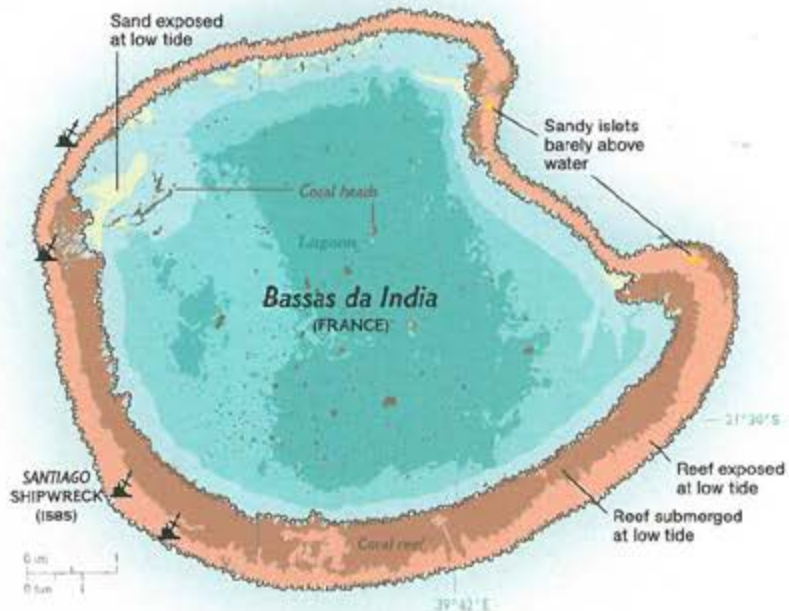
French sovereignty, though contested by Madagascar and other states, is strategic. The total land area of the Scattered Islands is a mere 16 square miles, but their collective exclusive economic zone is 15,000 times greater—an expanse of ocean almost the size of Texas. Crucially for the islands'



BASSAS The lagoon is likely a haven for Galápagos sharks in their early years, protecting them from predation by adults of their species before they face the challenges of the open sea.

BASSAS

At high tide only a few rocks show above the waterline at Bassas da India. When the tide ebbs, it exposes a ring of coral 300 feet wide and six miles in diameter. This atoll is the summit of an undersea volcano that rises from the seabed 10,000 feet below the surface.



biodiversity, France curbs illegal fishing and turtle poaching. Military garrisons and a gendarmerie maintain a presence on several of the islands—Europa included—and naval ships patrol their waters.

ALTHOUGH EUROPA and Bassas da India lie close together in the middle of the Mozambique Channel, they are very different places. Europa is a scrub-covered island that is home not only to nesting turtles but also to a million breeding pairs of seabirds. Bassas is an atoll that barely shows above the waterline and has a shark-filled lagoon the size of Manhattan. Both are among the last vestiges of healthy marine ecosystems in the western Indian Ocean—sanctuaries for wild nature in depleted seas. “On the surface these places look like nothing—like insignificant dots,” says marine biologist Thomas Peschak, who photographed this article. “But once you’ve dived here, you’re spoiled for the rest of your life.”

The two islands occupy an expanse of ocean whose vexing currents and eddies have challenged mariners for centuries. Today’s marine scientists have found a way to study this environment without even going to sea. Because of the close ecological connection between seabirds and marine life, they can use birds as proxies for open-water species such as tuna. Many seabirds rely on these ocean-roaming hunters to drive prey to the surface, within reach of their bills and talons.

Boobies and terns form low-flying flocks that track marine life from just above the surface. These network foragers fan out from their roosts on land, keeping each other in sight, ever alert in case one should encounter prey. Other species track the trackers, soaring to high altitudes to survey the panorama. Frigatebirds are supreme among the high fliers. These exceptional

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EUROPA

A million pairs of seabirds, including sooty terns, red-footed boobies, and two species of frigatebird, breed on Europa, and several thousand green turtles nest on its beaches. Unlike Bassas da India, which is uninhabitable, Europa hosts French troops.

aerialists soar on thermals, rising up to a mile high to scan not just the sea but also the low-flying birds. When they spot a foraging flock, they swoop down on their jet-black, angular wings—seven feet from tip to tip—to snatch squid from the waves or take flying fish in midair.

At Bassas da India there are no trees for seabirds to roost in and no beaches where turtles can lay their eggs. Bassas is a young atoll, still forming on its parent volcano, a seamount that erupted from the seabed almost two miles below the surface. From the air it looks like a blue plate with a bite-size chunk missing from its northeast rim.

Where Europa has mangroves and a shallow lagoon that drains almost dry at low tide, Bassas has not a sprig of vegetation and a lagoon that’s up to 45 feet deep—a giant tropical aquarium full of young sharks. Nearly all are Galápagos sharks, a species often found around tropical islands but rarely in the concentrations seen here. Biologists, puzzled as to why Galápagos sharks should be so predominant at Bassas, have suggested that the limited range of habitats available in the comparatively barren Bassas lagoon favors these sharks, whereas in Europa’s lagoon the presence of mangroves and sea grasses offers habitat or refuge for other species. Bassas may offer a unique snapshot in a shark’s life history—and an all-too-uncommon example of a healthy juvenile population of a heavily exploited species.

The ebbing tide at Bassas da India reveals the anchors of ships that have been wrecked on the reef over the centuries. In 1585 the *Santiago*, a 900-ton Portuguese vessel, split in two when it plowed into the reef in darkness. Imagine the horror as dawn revealed the passengers’ plight—a disintegrating ship, an intimidating expanse of reef, the lifeboats washed away or broken. More than 400 perished, and a trove of bullion spilled from the ship’s belly into the depths.

In the 1970s divers recovered some of this treasure: silver coins, bronze cannon, jewels, an astrolabe. But these are mere baubles compared with the real wealth of Bassas da India and Europa—not the bullion of ancient ships but the biodiversity that flourishes in these tiny islands. □



BASSAS Young Galápagos sharks nose the camera in the lagoon. The relatively undisturbed reefs of the two atolls are marine baselines, says Thomas Peschak. "Other places in the Indian Ocean, all I see is what's missing."



EUROPA Few divers ever explore the reefs around Europa, which lies in a stretch of the Mozambique Channel known for its massive eddies, productive nutrient upwellings, meandering currents—and spectacular surf.



EUROPA The bumps and bites of turtle courtship (left) precede a mating that may last several hours, the male clinging to the shell of the female with his flippers and tail. Promiscuity is rampant, and hormone-juiced males will attempt to dislodge rival males from their partners.