COCOS ISLAND · COSTA RICA

The most beautiful island in the world

A complete guide to the geology, currents, marine life and diving of Cocos Island National Park

Dive For Fun®

Gabriel Vieira Costa

DIVE FOR FUN PRESENTS

The most beautiful island in the world

Geology, history, currents, marine life and diving at Cocos Island

FIRST EDITION
COCOS EXPEDITION 2026
SÃO PAULO · BRAZIL

The most beautiful island in the world
A guide to Cocos Island, Costa Rica. First edition, August 2026.

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"The most beautiful island in the world."

JACQUES-YVES COUSTEAU, 1994

COCOS EXPEDITION · SEPTEMBER 2026

For the ones who crossed the Pacific

Almost two years separate the first conversation about this trip from the day the Sea Hunter cast off in Puntarenas. This book is for the twenty people who agreed to the thirty-six-hour crossing.

- Aline de Fatima Antonelli
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- Andre Augusto Donadelli Pires
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- Tarsilla Silva Loureiro
- Thelma Gonçalves
- Vivien Rebecca Venturini Bautzer dos Santos Yoshida

*And to the crew of the **Sea Hunter**, who make this crossing dozens of times a year so that we can make it once.*

THIS COPY BELONGS TO

BEFORE WE BEGIN

A letter to those going

This book began with a simple question someone asked at a group meeting: “why does Cocos have so many sharks?”

The short answer is that there is a volcanic mountain in the middle of the Pacific, and a cold, nutrient-rich current runs into it. The long answer is this book.

Cocos is not an ordinary dive destination, and it is not a comfortable one. There are 550 kilometres of open ocean between you and the coast of Costa Rica, roughly 36 hours of sailing each way, rain almost every day, strong current and water colder than the surface lets on. None of that is an accident. All of it is precisely why the schools are there.

We believe a diver who understands what they are looking at dives better. Someone who knows that a school of hammerheads gathers at a cleaning station to have parasites removed will settle low, behind a rock, and wait, instead of swimming over the top and scattering everything. Someone who knows the thermocline is the boundary between two different water masses packs a 5 mm suit with hood, and does not cut the dive short shivering at 30 metres. Someone who knows that September's low visibility is made of plankton, and that plankton is the start of the chain that ends in a whale shark, stops complaining about green water.

So that is what this book is: what we wish we had known before our first dive at Cocos. How the island was born, who arrived before us, what makes the water behave the way it does, who lives there and why, how each

site works, and what is at stake, because Cocos is one of the most protected places on the planet and is still losing sharks.

Read it cover to cover, read it in pieces, read it on the boat during the crossing. It was made to fit in a backpack and to come home marked up. Good diving.

The Dive For Fun team

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PART ONE

The island

A two-million-year-old volcano alone in the Pacific, with seven thousand millimetres of rain a year and a forest that exists nowhere else

CHAPTER ONE

Where Cocos is

> *Five hundred and fifty kilometres of open ocean separate the island from the mainland. That distance explains almost everything that follows.*

Cocos Island sits at 5°31′ north and 87°04′ west, in the eastern tropical Pacific, about 550 kilometres southwest of the Costa Rican coast. There is no airport, no runway and no hotel. The only way in is by sea, and the crossing from Puntarenas takes 32 to 36 hours when the weather cooperates.

Administratively it is the 11th district of the canton of Puntarenas, in Puntarenas province, created in 1970. It even has a postcode, 60110. But the census treats the island as uninhabited, because the only people living there are national park staff, working in rotation, who are not counted as permanent residents. On 5 February 2006 the rangers voted in a national election for the first time without leaving the island.

How big it actually is

Cocos is small. The emerged area is roughly 23.5 km², less than many city districts. The shape is roughly rectangular, about 8 by 3 kilometres, with a perimeter of some 23 kilometres. You can circle the whole island by boat in a morning.

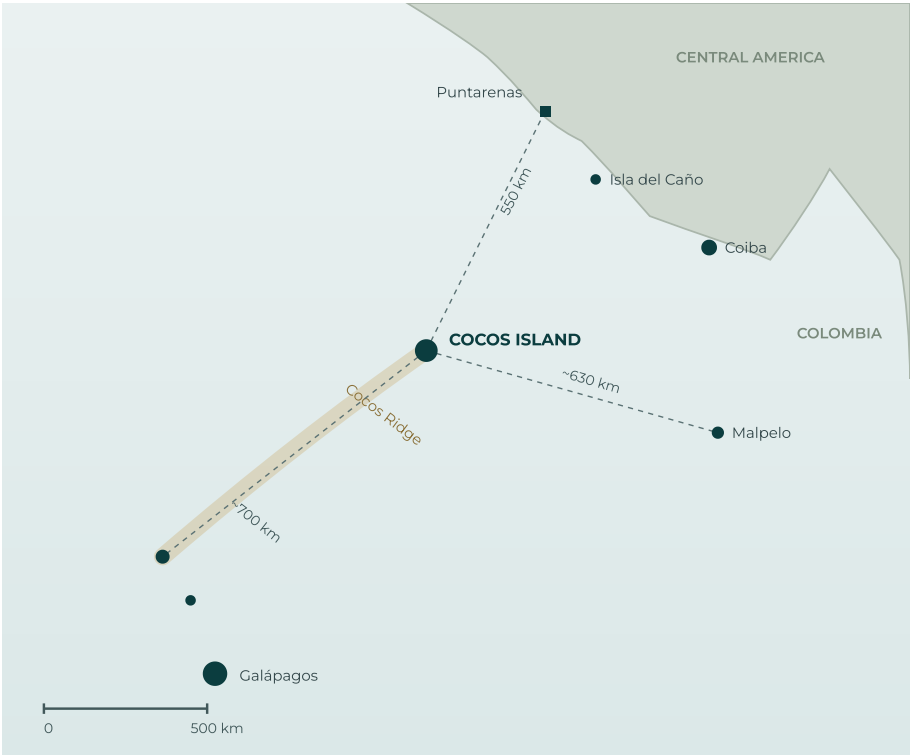
What is not small is everything around it. Since 2021, Cocos Island National Park covers 54,844 km², and the neighbouring Bicentennial Marine Managed Area covers a further 106,285 km². Together they add up to an area of protected ocean larger than England, created to protect an island the size of a neighbourhood.

550 km	23.5 km²	575.5 m	~36 h
TO THE MAINLAND	LAND AREA	HIGHEST POINT	SAILING TIME

The neighbourhood

Cocos is not truly isolated. It is a node in a network of oceanic islands in the eastern tropical Pacific that share animals, currents and geological history. The Galápagos lie about 700 kilometres to the southwest. Malpelo, in Colombia, about 630 kilometres to the east. Coiba, in Panama, and Isla del Caño, in Costa Rica itself, complete the set.

This geography matters to the diver, because the animals you will meet at Cocos are not residents of Cocos. Hammerheads tagged in the Galápagos have been detected at Cocos. Green turtles make the same journey. The island is a station, not an address.



Equirectangular projection. Coastline simplified.

Cocos in the eastern tropical Pacific. The submarine ridge linking the island to the Galápagos is the same structure the sharks use as a navigational reference. Map: Dive For Fun, from published coordinates.

CHAPTER TWO

How the island was born

> *Cocos is the summit of a dead volcano, the only piece of an entire tectonic plate that managed to break the surface of the sea.*

The floor of the eastern Pacific is divided into plates. One of them, the Cocos Plate, covers roughly 2.9 million km² and is entirely submerged, with a single exception: Cocos Island. It is the only emerged point on the whole plate, and it is where the plate got its name.

The island formed on the Cocos Ridge, an aseismic submarine chain running northeast from the Galápagos to the Costa Rican coast. That ridge is the trail left by a mantle hotspot, the same hotspot that builds the Galápagos today. As the plate slides over it, the hotspot punches through the crust and leaves a line of volcanoes behind, like a sewing machine running under moving fabric.

Two million years, which is young

Potassium-argon dating puts the age of the island's oldest rocks between 1.91 and 2.44 million years. On a geological scale that is recent, almost new. For comparison, the oldest rocks on the Brazilian coast are hundreds of millions of years old.

The island is the emerged summit of a Pliocene and Pleistocene shield volcano, composed mainly of basalt, the dark rock that forms when lava

cools quickly. Inside it there is a caldera, and inside the caldera a lava dome of trachytic composition. The most recent eruptions came from northeast-trending fissures that fed lava flows.

> **WHY THIS MATTERS UNDERWATER**
>
> A basalt shield volcano means vertical walls, isolated pinnacles, rock arches and caves. There is no shallow continental shelf around Cocos: the bottom simply drops away. That is why you descend to 30 metres a few metres from the rock, and why oceanic animals, which normally live far offshore, come so close.

A plate still on the move

The Cocos Plate is not standing still. It advances to the northeast and dives beneath the Caribbean Plate at the Middle America Trench, at a rate on the order of 78 millimetres a year, measured by a continuous GPS station installed on the island itself, at Wafer Bay, since 2011. That dive is the engine behind Central America's earthquakes and volcanoes.

Cocos, therefore, is slowly travelling towards Costa Rica. In a few million years it will reach the trench and be swallowed, or scraped off against the continent. It is a distant fate, but it is the fate.



One of the satellite islets of Cocos, seen from the sea. Basalt rock covered in vegetation above the waterline, and a wall dropping into deep water just below. Photo: Ministerio de Ambiente y Energía, Costa Rica (public domain).

CHAPTER THREE

The island from above

> *Seven thousand millimetres of rain a year falling on 23 square kilometres of volcanic rock. The result is a green wall streaming water.*

The first thing you notice on arriving at Cocos is that it is vertical. Cliffs up to 90 metres high ring much of the perimeter, which makes landing impossible along most of the coast. There are few access points, and the easiest is Chatham Bay.

The interior is mountainous and irregular. The highest point is Cerro Iglesias, at 575.5 metres. Between the hills there are flatter areas, between 200 and 260 metres of elevation, interpreted as a transitional stage in the geomorphological cycle of V-shaped valleys.

Water everywhere

The island has short rivers and streams that drain the rain into four bays, three of them on the north side: Wafer, Chatham and Weston. The largest rivers are the Genio and the Pittier, which empty into Wafer Bay. Steep relief combined with torrential rain produces more than 200 waterfalls across the island, some of them falling straight into the sea.

The soils are classified as entisols, highly acidic and young. Anywhere else with that slope and that rainfall they would have washed into the ocean long ago. What holds everything in place is the forest.

The climate, and why September is what it is

Cocos has a tropical rainforest climate (Af in the Köppen system), governed mainly by the Intertropical Convergence Zone, which keeps the island under cloud and rain all year. Mean annual temperature is 26.6 °C, and mean precipitation exceeds 7,000 mm a year. For comparison, London receives about 600 mm.

It rains in every month. Rainfall drops somewhat from January to March, and again in late September and October, but "drops" here means 235 mm in March, still more than the wettest month of many cities.

Month	Rain (mm)	Max (°C)	Min (°C)
January	585	28	24
February	348	29	26
March	235	29	26
April	470	29	26
May	858	29	25
June	938	28	24
July	806	28	24
August	674	28	24
September	**754**	**28**	**24**
October	793	27	24
November	626	27	24
December	555	28	24

Climatological series for the island. Different series and different measurement periods give somewhat different values for the same month; the order of magnitude is the same.

WHAT THIS MEANS ON BOARD

Dry clothing is a scarce resource at Cocos. Bring more shirts than you think you need, a light windbreaker and plastic bags to keep wet away from dry. Cameras and electronics live in a dry box or a sealed bag, not on your bunk.

CHAPTER FOUR

The forest that came from far away

> *There was never a land bridge between Cocos and the mainland. Everything growing there arrived floating, flying, or stuck to something that flew.*

Cocos is the only oceanic island in the eastern Pacific with true tropical moist forest, and the only one with cloud forest at higher elevations. That sounds like a botanist's footnote, but it is the reason the island has an ecological character shared neither with the Galápagos nor with Malpelo.

Because the island was never connected to a continent, every species living there had to cross hundreds of kilometres of ocean. A floating seed, a spore on the wind, a seed in a bird's gut. Whoever arrived, arrived by chance, and then had millions of years of isolation in which to become something else. It is the classic recipe for endemism.

The numbers

- 235 species of flowering plants, of which **70 are endemic**
- 74 species of ferns and fern allies
- 128 species of mosses and liverworts
- 90 species of fungi and 41 of slime moulds

And the list is incomplete. More thorough surveys are expected to reveal many more.

Three forests, stacked

Coastal forest, from the sea to 50 metres

Dominated by the purple coral tree (*Erythrina fusca*), the coconut palm (*Cocos nucifera*) and pond-apple (*Annona glabra*), with an understorey of ferns, shrubs, sedges, grasses and herbaceous plants.

Inland forest, from 50 to 500 metres

"Palo de hierro" or huriki (*Sacoglottis holdridgei*), island avocado (*Ocotea insularis*) and the endemic *Cecropia pittieri* form the canopy. The trees are festooned at every level with epiphytes: orchids, ferns, bromeliads and mosses. The understorey includes tree ferns such as *Cyathea armata* and the palm *Euterpe precatoria*.

Cloud forest, above 500 metres

At the top, where cloud sits for most of the day, plants of the family Melastomataceae dominate. It is the only oceanic-island cloud forest in the eastern Pacific.



Cloud forest on Cocos Island, above 500 metres. The sign marks the change in vegetation.
Photo: ALVivaldi, CC BY-SA 4.0, via Wikimedia Commons.

THE MYSTERY OF THE COCONUT GROVES

The buccaneer Lionel Wafer, who was on the island in 1685, described extensive coconut groves running inland. Those groves do not exist at that scale today. Thor Heyerdahl argued that it was unlikely they had arisen on their own, and proposed that pre-Columbian peoples had cleared land to plant coconut, provisioning balsa-raft voyages between Guatemala and northwestern South America.

It is a fine hypothesis, and it remains only a hypothesis: to this day there is no archaeological evidence of human occupation before European contact.

CHAPTER FIVE

Who lives on dry land

> *No amphibians, no native mammals, two lizards found nowhere else and three birds that fly nowhere at all.*

The land fauna of Cocos is a portrait of what the ocean lets through. Amphibians do not cross salt water, and so there is not a single frog on the island. Land mammals did not arrive on their own either: the five that live there today (pigs, deer, goats, cats and rats) were brought by people, and all are targets of control programmes because they eat native plants or prey on native animals.

Insects and spiders

More than 400 known insect species, of which 65, or 16%, are endemic. The greatest diversity is among moths and butterflies (Lepidoptera) and ants (Formicidae). Add more than 50 species of other arthropods: spiders, centipedes, millipedes and isopods.

Reptiles

Two lizard species, both endemic: the Cocos Island anole (*Anolis townsendi*) and the Pacific least gecko (*Sphaerodactylus pacificus*).

Birds

About 90 bird species have been recorded. The island and its neighbouring rocks host large nesting colonies of migratory seabirds, among them the Cocos booby (*Sula brewsteri*), the red-footed booby (*Sula sula*), the great frigatebird (*Fregata minor*), the white tern (*Gygis alba*) and the brown noddy (*Anous stolidus*). BirdLife International classifies the island as an Important Bird Area.

Seven land birds are resident, and three of them exist nowhere else on Earth:

Name	Scientific name	IUCN
Cocos cuckoo	*Coccyzus ferrugineus*	Vulnerable
Cocos flycatcher	*Nesotriccus ridgwayi*	Vulnerable
Cocos finch	*Pinaroloxias inornata*	Least concern

The Cocos finch deserves a paragraph of its own. It is the only living member of its genus and a relative of the famous Darwin's finches of the Galápagos. The difference is curious: in the Galápagos the group split into many species with different beaks for different foods. At Cocos, alone on a small island, it remained a single species, but different individuals specialised in different feeding techniques. One learns to pick insects from leaves, another to drink nectar, another to probe bark, and each keeps its technique for life.

THE LINK BETWEEN THE FOREST AND THE DIVING

The seabird colonies are not just scenery. They fish in the open ocean, return to the rocks and deposit guano, rich in nitrogen and phosphorus. Rain washes that guano back into the water, fertilising the coastal fringe. Dirty Rock, one of the most productive dive sites at the island, is named for exactly the white and brown colour the guano leaves on the stone. The mountain feeds the sea, and the sea feeds the mountain.



PART TWO

Five centuries of visitors

Cartographers, buccaneers, whalers, a German governor obsessed with a golden Virgin, and three hundred expeditions that found nothing

CHAPTER SIX

Discovery and the first charts

> *A small island, wrapped in cloud, on a route nobody needed to take. Cocos spent three hundred years appearing in the wrong place on maps.*

There is no evidence anyone lived at Cocos before the Europeans. In 2008, archaeologists from the Australian National University surveyed Cocos, the Desventuradas Islands, the Galápagos and the Juan Fernández archipelago, all uninhabited when Europeans arrived. They found indications that the Galápagos may have been visited by a Polynesian vessel; for Cocos, nothing conclusive.

The written record begins with Gonzalo Fernández de Oviedo y Valdés, who in his *Historia general y natural de las Indias* (1535) attributes the discovery to the Spanish navigator Juan de Cabezas, also recorded as Juan de Grado, in 1526.

The name before the place

The first document bearing the island's name is a map painted on parchment, known as the map of Henry II, which appears in 1542 during the reign of Francis I of France. On it is written “Isle de Coques”. Nicolas Desliens's planisphere, made in Dieppe in 1556, places the “Ysle de Coques” about a degree and a half north of the Equator.

Wrong, but not by much. Cocos sits at 5°31′ N. Over the following two centuries the island wandered around the charts: Willem Blaeu's Grand Atlas of 1662 and Frederik De Witt's atlas of 1680 place "I. de Cocos" right on the Equator. The Hondius map of 1590 puts it at 2°30′ N.

The explanation is prosaic. Fixing longitude at sea required a reliable chronometer, which did not really exist until the late eighteenth century. Until then an isolated island was recorded by estimate, copied from map to map, and the error travelled with it.

The first serious surveys

In **1793**, James Colnett, surveying eastern Pacific islands for the British whaling industry, visited Cocos and took on two thousand coconuts. He left a boar, a sow, a male and a female goat, a common practice of the era to stock food for future castaways, and a disaster for the native fauna.

Two years later, in **1795**, George Vancouver anchored his ships *Discovery* and *Chatham* in the bay that now carries the latter's name. He took on water, wood and a great quantity of coconuts. Before leaving he had the date of arrival and the names of the ships and their commanders carved into a rock, beside the single inscription already there. Both published charts in 1798, and among Colnett's was a "Plan of the Island Cocos".

In **1838**, Captain Edward Belcher anchored in Chatham and recorded that whalers had already cut all the wood fit for fuel, and that the only remaining coconut palms were in inaccessible places. He added his ship's name to the growing collection of inscriptions, which is still there.



Inscriptions carved into rock on Cocos Island. Ship names and dates accumulated over two centuries, left by whalers, cartographers and treasure hunters. Photo: ALVivaldi, CC BY-SA 4.0, via Wikimedia Commons.

CHAPTER SEVEN

Buccaneers and the two bays

> *The only two coves where you can land at Cocos are named after a pirate and after a Royal Navy ship. Between them they tell the island's whole story.*

In July 1685, the *Batchelor's Delight*, commanded by Edward Davis, left the Bay of Panama and ran up to Cocos before heading for the Galápagos. On board was Lionel Wafer, a Welsh surgeon, buccaneer and one of the sharpest observers of his time. Wafer Bay carries his name.

It was Wafer who described the extensive coconut groves, the abundant fresh water and the ease of resupply. For a ship operating outside the law in the Spanish Pacific, Cocos was perfect: off the route, with water, with food, and with nobody to raise the alarm.

The other bay, Chatham, took the name of one of Vancouver's ships in 1795. Both lie on the north side of the island, sheltered from the prevailing sea, and both remain the only safe anchorages. The ranger stations sit in each of them.

GEOGRAPHY DECIDES

It is no coincidence that almost the entire human history of Cocos happened in two coves on the north side. With 90-metre cliffs around most of the perimeter and a sea running in from the south and southwest, Wafer and Chatham were, and still are, the only doors in.

Whalers, and then emptiness

Cocos was annexed by Costa Rica in **1832**, by decree No. 54 of the Constitutional Assembly of the newly independent country. Through the 1830s and 1840s whalers anchored there for water and wood, until whaling shifted to other parts of the Pacific. After that the island went back to being almost always empty.

October 1863

One episode in the history of Cocos has nothing of adventure about it. In October 1863, the ship *Adelante* abandoned **426 Tongans** on the island, people who had been enslaved, on discovering that they had smallpox and posed a risk to the crew. When the vessel *Tumbes* arrived to rescue them a month later, it found **38 survivors**. The rest had died of the disease.

It is the greatest human tragedy associated with the island, and the least remembered. It is worth a minute of silence on deck.

CHAPTER EIGHT

The treasures nobody found

> *Three hundred expeditions, two centuries of digging, and a confirmed total of six gold coins.*

Few places in the world carry as much buried-treasure legend as Cocos. Three stories recur, and all three have the same shape: a fabulous cargo, a map, and nobody who can find it.

Captain Graham's gold

The first claim came from a woman named Mary Welch, who said that 350 tons of gold taken from Spanish galleons had been buried on the island by Captain Bennett Graham, a naval officer who turned pirate in 1818. Welch claimed to have been part of the crew and was transported to a penal colony in Australia. She kept a chart. Once released, she returned to the island with an expedition and found nothing: the chart's reference points had disappeared.

Benito Bonito

The Portuguese Benito Bonito began terrorising the west coast of the Americas around 1818 and is said to have buried his haul at Cocos. Bonito was hunted down and executed. The treasure was never recovered.

The Treasure of Lima

The best known of the three. In **1820**, with José de San Martín's army approaching Lima, Viceroy José de la Serna is said to have handed the city's treasure to the British trader Captain William Thompson for safekeeping until the Spanish could regain control. Instead of waiting in the harbour, Thompson and his crew killed the viceroy's men and sailed to Cocos, where they allegedly buried everything.

Shortly afterwards they were captured by a Spanish warship. The entire crew was executed for piracy except Thompson and his first mate, who offered to reveal the hiding place in exchange for their lives. Taken back to the island, the two escaped into the forest and were never recaptured.

If the treasure existed, it never left the island. If it never existed, it was the most profitable lie in the Pacific.

The scoreboard

More than **300 expeditions** are estimated to have searched for treasure at Cocos. Several of the early ones were based on the account of a man named Keating, said to have befriended Thompson, who claimed to have retrieved gold and jewels on one voyage.

The most persistent hunter was the German August Gissler, who lived on the island almost without interruption from 1889 to 1908 (the next chapter is his). In more than twenty years of digging, he found six gold coins. The British Antarctic explorer Aeneas Mackintosh mounted an expedition in 1910 and found nothing.

Today treasure hunting is prohibited by the Costa Rican government and no permits are issued. The whole area is a national park, and removing anything from the island, including a stone, is illegal.

CHAPTER NINE

Gissler, the only governor

> *Twenty years digging tunnels after a life-size golden Virgin. He found six coins.*

August Gissler, a German, arrived at Cocos in 1889 and stayed, with short interruptions, until 1908. He did not come for a holiday: he came for the Treasure of Lima, and specifically for the *Golden Virgin*, a life-size image of the Virgin Mary in solid gold and set with gems, supposedly buried by Captain Thompson in 1820.

Gissler was organised, and that organisation impressed the Costa Rican government. In **1897** he was authorised to establish a colony of German farmers on the island and named the first, and to this day only, **Governor of Cocos Island**.

The colony failed. Rain, isolation and the impossibility of serious agriculture on an island of acid soil and steep slopes brought the project down. The settlers left. Gissler stayed.

The tunnels

Over the years he dug a complex system of tunnels into the island, some of which can still be entered today. He dug, measured, cross-checked maps, tested hypotheses. In more than two decades he found six gold coins.

In 1908, discouraged, he left the island for New York, where he died in 1935. He is the most complete human figure in the history of Cocos: the man who spent twenty years living in the most beautiful place in the world looking for something that was probably not there.

WHAT IS LEFT OF HIM

The tunnels, a few stone foundations and the title. No governor was ever appointed after him. Since 1978 the island has been a national park, and authority rests with SINAC, Costa Rica's national system of conservation areas.

CHAPTER TEN

From pirate island to World Heritage

> *In forty-three years Cocos went from geographic curiosity to the largest marine national park in the Americas.*

Protection at Cocos came in layers, each one larger than the last.

1832 Costa Rica annexes the island by decree No. 54 of the Constitutional Assembly.

1970 The island is incorporated administratively as the 11th district of the canton of Puntarenas.

1978 Cocos is declared a **National Park** by executive decree. IUCN category II.

1997 UNESCO inscribes Cocos Island National Park on the **World Heritage List**, under natural criteria ix and x.

1998 On 10 April the island joins the list of **Wetlands of International Importance** under the Ramsar Convention, site No. 940.

2002 The UNESCO inscription is **extended** to include an enlarged marine zone.

2011 The Las Gemelas seamounts come under protection.

2021 On 17 December, decree **43368-MINAE** expands the National Park from 2,034 km² to **54,844 km²** and the Bicentennial Marine Managed Area from 9,649 km² to **106,285.56 km²**. Costa Rica's marine protection jumps from 2.7% to roughly 30% of its waters.

2022 Ecuador creates the **Hermandad Marine Reserve**, expanding the Galápagos reserve and connecting it to the protected area around Cocos.

Why UNESCO said yes

The park was inscribed under criteria ix and x, which deal respectively with ongoing ecological and biological processes and with significant natural habitats for the conservation of biological diversity. In diver's language: Cocos made the list not for being beautiful, but for being a living laboratory of how an oceanic island builds and sustains life.



The Cocos Island National Park sign ashore. Visitors may land only with ranger permission, and camping, overnight stays and the collection of any flora, fauna or minerals are prohibited. Photo: Ministerio de Ambiente y Energía, Costa Rica (public domain).

Today's rules

- Only Costa Rican park rangers live on the island, based at Wafer and Chatham.
- Visitors and crew may land only with ranger permission.
- Camping, overnight stays ashore and the collection of any flora, fauna or minerals are prohibited.
- Treasure hunting is prohibited and no licences are issued.
- Access is exclusively by authorised liveaboard, with capped passenger numbers.
- The park fee is charged per day of stay and is normally already included in the operator's package.

CHAPTER ELEVEN

Cocos in fiction: what is true

> *Three stories everyone repeats about Cocos. One is likely, one is half true and one is a myth.*

Treasure Island

Likely. The pirate and buried-treasure stories attached to Cocos are cited as one of the inspirations for *Treasure Island*, by Robert Louis Stevenson, published in 1883. Stevenson was never there, and the island in the novel is fictional, but the body of legend circulating in the late nineteenth century featured Cocos prominently.

Isla Nublar, of Jurassic Park

Half true, and the wrong half is the one everybody tells. The Isla Nublar of the books and films lies, in fiction, in the Costa Rican Pacific, and Cocos is frequently cited as the inspiration for that address. That much is reasonable.

What is not true is that the film was shot at Cocos. The opening aerial shots of the 1993 *Jurassic Park*, the ones of the helicopter approaching the island, are of the Na Pali coast on Kauai, Hawaii. Practically the whole production was made on Kauai and Oahu. If someone on the boat tells you that you are diving the Jurassic Park island, now you know what to say.

Robinson Crusoe

Unlikely. The book *Desert Island* proposed that Daniel Defoe used Cocos as the model for Robinson Crusoe's island. The problem is that Defoe placed Crusoe's island not in the Pacific but in the Atlantic, off Venezuela. The theory exists, but it is a minority view.

Cousteau and the phrase

Jacques-Yves Cousteau visited Cocos several times and, in 1994, called it "the most beautiful island in the world". The phrase stuck, became an operator slogan, and is the title of this book. It is probably the most efficient piece of marketing in the history of diving.

Cousteau was not alone. In 2009 Cocos was shortlisted for the New7Wonders of Nature, finishing second in the island category. PADI lists it among the ten best dive destinations in the world.

> **A NOTE ON NAMING**
>
> There is more than one "Cocos Island" in the world. The Cocos (Keeling) Islands are in the Indian Ocean and are Australian territory. There is also a Cocos Island in Guam. When searching, use "Isla del Coco" or "Cocos Island, Costa Rica" so you do not end up at the wrong island.



PART THREE

The engine

Currents, thermocline, upwelling and plankton. Everything you will see at Cocos is a consequence of cold water rising from below

CHAPTER TWELVE

The currents that feed the island

> *An isolated island in the middle of the ocean ought to be a desert. Cocos is the opposite, and the explanation lies hundreds of kilometres away.*

Tropical surface water is warm, light, nutrient-poor and, biologically, close to a desert. That is why the Caribbean is swimming-pool blue and transparent: there is almost nothing in suspension because there is almost nothing alive in suspension.

Cocos sits in tropical water. It ought to be a desert. It is not, and the reason is that three oceanographic systems meet in the neighbourhood and pump nutrients from the depths into the sunlit zone.

The North Equatorial Countercurrent

The main current reaching Cocos is the North Equatorial Countercurrent, running from the central Pacific towards the Americas. It is strong enough that at many sites diving is necessarily drift diving, and that carrying a surface marker buoy is mandatory rather than advisable.

It is the same current that makes the climate of Cocos so warm and so wet, and it is this current, together with the Intertropical Convergence Zone, that keeps the island under cloud.

The Costa Rica Thermal Dome

Here is the heart of the matter. A few hundred kilometres northeast of Cocos, near 9° N and 89° W, lies an oceanographic feature called the Costa Rica Thermal Dome. It is an area roughly 150 by 300 kilometres where the tropical thermocline, normally deep, rises to within 10 metres of the surface.

The dome forms through the cyclonic circulation generated where the Equatorial Countercurrent, the Costa Rica Coastal Current and parts of the North Equatorial Current meet. That spiralling circulation draws water upward. At the surface, the dome appears as a patch of slightly lower temperature, higher salinity, higher phosphate and lower oxygen, all classic signatures of upwelling.

UPWELLING IN ONE SENTENCE

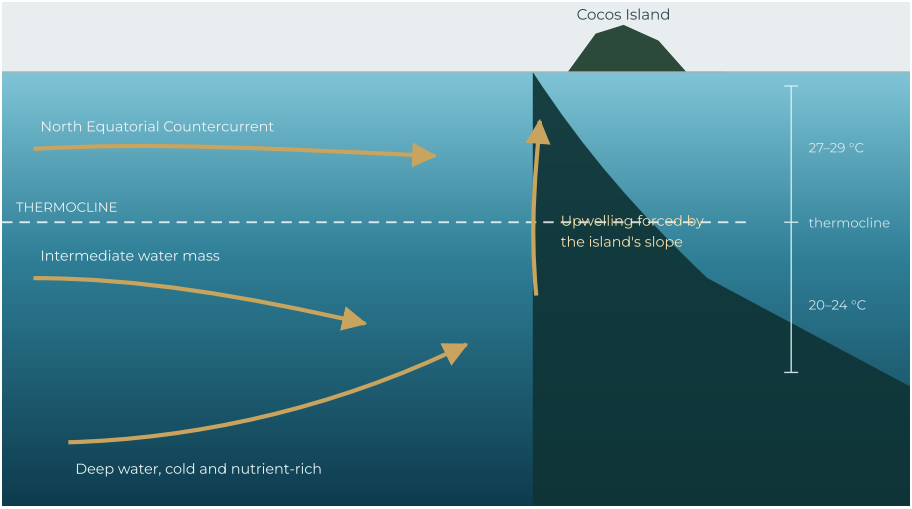
Organic matter sinks, decays and becomes nutrient at depth. Where a current brings that water back to the surface, sunlight meets fertiliser, phytoplankton explodes, zooplankton comes to eat it, small fish come to eat the zooplankton, and the top predator comes to eat the fish. Upwelling is the beginning of every productive food chain in the ocean.

The result is that phytoplankton and zooplankton biomass at the Thermal Dome is higher than in the surrounding tropical waters. That productivity does not stay put: it is carried by the currents, and Cocos is on the right side of the flow.

The island effect

Add the island itself. Cocos is a steep-sided volcanic mountain planted in the path of a current. When flow meets an obstacle like that, it is forced upward and sideways, creates eddies behind the obstacle and brings deep water up to diving depth. It is the same phenomenon that turns any seamount in the middle of nowhere into an oasis.

Put it all together: a current already loaded with nutrients, a mountain that forces it upward, and 7,000 mm of rain a year washing guano and organic matter from the forest into the sea. Cocos is a productivity machine.



Schematic of how Cocos works oceanographically. The current meets the volcanic slope, is forced upward and brings cold, nutrient-rich water to diving depth. Illustration: Dive For Fun.

CHAPTER THIRTEEN

The thermocline

> *The surface is Caribbean. Thirty metres down you are in a different season. The school is on the cold side.*

A thermocline is the boundary between two water masses of different temperature. It is not a gentle transition: it is a thin layer where temperature drops sharply over a few metres, and it is usually visible, because the refractive index changes and the water looks blurred and shimmering, like hot air over asphalt.

At Cocos the thermocline is a leading character. At the surface the water sits between **27 and 29 °C** in the rainy season. Below the thermocline, which typically appears from around 25 metres, temperature falls to **20 to 24 °C**. The drop can reach **6 °C at once**.

27–29 °C	~25 m	20–24 °C	up to 6 °C
SURFACE	WHERE IT USUALLY SITS	BELOW	DROP AT ONCE

Why the sharks are on the cold side

It is not a coincidence. The thermocline is the signature of water that rose from below, and water that rose from below carries nutrients. That is where the plankton concentrates, where the small fish concentrate, and where the cleaning stations on the pinnacles are. The hammerhead school

at Cocos is not in the warm shallows. It is in the band between 25 and 40 metres, moving through cold water.

That has three practical consequences for your diving, and all three arrive together:

- **Accumulated cold.** It is not the first dive that freezes anyone. It is the fifteenth, on the fifth day, with three dives a day and a suit that never dried. A cold diver breathes more, decides worse and tends to cut the dive short exactly when the school arrives.
- **Air consumption.** Cold, depth and current together increase consumption. A diver who does 60 minutes in 28 °C water may do 40 under the same conditions at 22 °C.
- **Decompression.** Deep diving in cold water is recognised as more demanding from a decompression standpoint. That is why nitrox and conservative profiles are not a luxury at Cocos.

> **EXPOSURE SUIT RECOMMENDATION**
>
> **5 mm with hood and gloves** is the standard for Cocos in the rainy season. Anyone who feels the cold easily should go 7 mm or wear a hooded vest under the 5 mm. Gloves are not only for warmth: at Cocos you hold onto rock to wait for the school, and volcanic rock cuts.
>
> A rash guard or a 3 mm suit works for the first dive and fails on the fifth day. It is the most expensive saving of the trip.

CHAPTER FOURTEEN

Plankton, visibility and the misunderstanding

> *In almost every destination in the world, green water is bad news. At Cocos it is the weather report for the school.*

Visibility at Cocos ranges roughly between 9 and 21 metres, reaching 30 metres in the dry season. In the rainy season, plankton blooms bring it down to somewhere between 10 and 25 metres. In September, expect something between **15 and 20 metres**.

For anyone coming from Fernando de Noronha or Bonaire, that sounds disappointing. It is the opposite. The particles in suspension that ruin the photograph are phytoplankton and zooplankton, which is to say food. Where there is food there are schools of small fish, where there are schools there are predators, and where there are predators there is what you came to see.

Water that is too clear at Cocos usually means an empty dive.

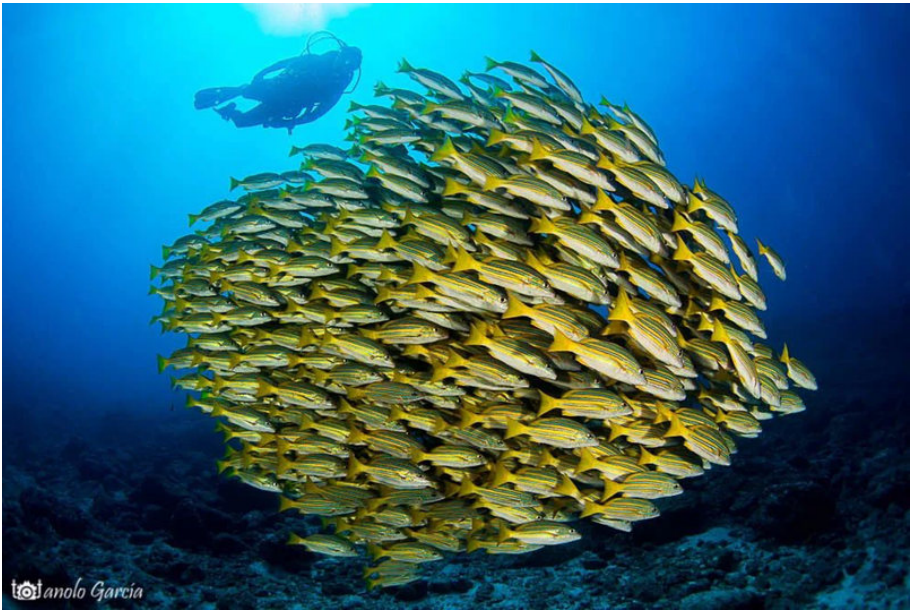
RULE OF THUMB OF THE LOCAL GUIDES

What it changes in practice

- **Photography.** Strobes pointed forward in particle-laden water produce backscatter, that snowstorm of white dots. Move the arms out, angle

the strobes outward and get close. Wide angle and proximity solve 90% of the problem.

- **Visual contact.** With 15 metres of visibility and current, a group separates fast. Agree in the briefing who follows whom, and keep the guide in sight.
- **Expectations.** The hammerhead school at Cocos is rarely sharp at 30 metres' distance. It appears as shadows that take shape as they approach. That is how it is.



A tight school of reef fish. Plankton-rich water supports dense schools, and dense schools attract predators. Photo: Manolo García / Dive For Fun archive. Taken outside Cocos.

CHAPTER FIFTEEN

Seamounts and the corridor

> *Cocos is not a lonely dot. It is the only visible part of a road of underwater mountains running to the Galápagos.*

The Cocos Ridge is a chain of submarine mountains linking the Galápagos region to the Costa Rican coast. Cocos is the only summit that breaks the surface, but there are dozens more just below it, and some are as productive as the island.

The best known is **Las Gemelas**, a pair of seamounts about 65 kilometres from Cocos, protected since 2011. A study published in 2020 documented hammerhead sharks making repeated crossings between Cocos and Las Gemelas through 2015 and 2016, suggesting a deep-water foraging corridor. In other words: the animals you see on the pinnacle spend part of their lives away from it.

The Cocos-Galápagos Swimway

Satellite tagging and acoustic telemetry conducted by the MigraMar network have shown that Cocos, the Galápagos and Malpelo share the same populations of scalloped hammerhead, Galápagos shark and green turtle. Of 35 hammerheads satellite-tagged in the Galápagos, eight followed the Cocos Ridge towards the island.

The route became known as the **Cocos-Galápagos Swimway**. In May 2020 Mission Blue designated it a Hope Spot. The proposal under discussion between Costa Rica and Ecuador would make it the world's first bilateral marine protected area connecting the national parks of two sovereign nations.

WHY THE CORRIDOR IS THE PROBLEM, NOT THE ISLAND

Cocos is well protected and reasonably well patrolled. The corridor between it and the other nodes in the network is not. A shark that spends its whole life inside the park is safe; one that crosses 700 kilometres of international water to breed is not. That is why an isolated marine protected area, however large, is not enough for a migratory species.

And the nursery

There is one more piece. Research by Misión Tiburón and the MigraMar network documented juvenile hammerheads using the sheltered bays of Golfo Dulce, on the Costa Rican coast, as a nursery before migrating to Cocos and beyond. A study conducted between March 2025 and March 2026 at Cocos, Isla del Caño and the coastal waters of the Osa Peninsula, using acoustic tagging, baited underwater video stations, photo-identification and genetic sampling, confirmed the migratory corridor linking Cocos to the Osa Peninsula.

Which means the protection of the shark you see at Bajo Alcyone depends on a mangrove 550 kilometres away.

CHAPTER SIXTEEN

The year at Cocos, month by month

> *There is no bad season at Cocos. There are two seasons that deliver different things.*

The classic division is between the dry season, December to May, and the rainy season, June to November. The word "dry" is generous: it rains in both. What changes is the sea, the visibility and who shows up.

Dry season, December to May

Calmer sea, a more comfortable crossing, less rain and the best visibility of the year, reaching 30 metres. This is the season of **mobula rays**, which can gather in very large schools, of silky sharks, marlin and tuna in the blue. The hammerheads are still there, in smaller numbers.

Rainy season, June to November

Rougher sea, near-daily rain, lower visibility and the peak of the **hammerhead** aggregations. Chances of whale shark increase, especially from August to October. This is the season experienced divers choose, and not by accident.

Period	Sea and visibility	Highlights
Dec to Feb	Calm, good visibility	Mobulas, silkies, blue water
Mar to May	Calm, best visibility	Mobulas, marlin, tuna, fewer hammerheads
Jun to Aug	Rougher, visibility dropping	Hammerheads building, whale shark from May
Sep to Oct	Roughest, visibility 15 to 20 m	**Peak hammerhead**, whale shark
Nov	Transition, sea settling	Hammerheads still high, visibility improving

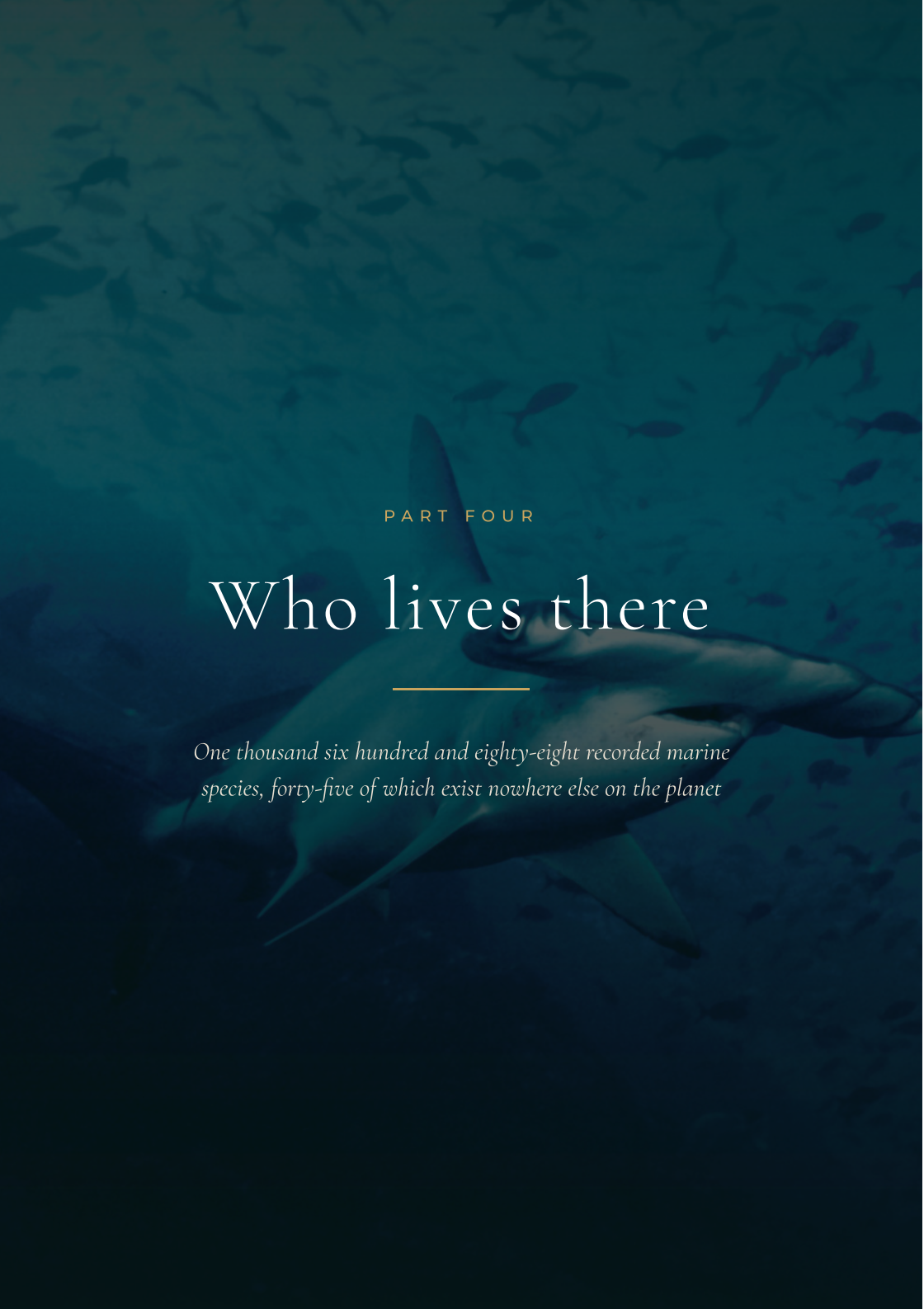
SEPTEMBER, THE MONTH OF THIS EXPEDITION

September is the peak of hammerhead season and one of the wettest months of the year. Those two things are the same thing: rain brings nutrients, nutrients bring plankton, plankton brings schools, schools bring sharks. Expect water of 27 to 29 °C at the surface, 20 to 24 °C below the thermocline, air between 24 and 28 °C, visibility of 15 to 20 metres and a lively crossing. Start seasickness medication before boarding, not after.

El Niño and La Niña

On top of the annual cycle there is a multi-year one, ENSO. In strong El Niño years, surface water in the eastern Pacific warms, the thermocline deepens, upwelling weakens and productivity falls. Shallow corals may bleach and the distribution of large pelagics shifts. In La Niña years the opposite happens: colder water, stronger upwelling, more food.

No operator can predict that a year in advance, which is the lead time on which a trip to Cocos is bought. It comes with the territory.



PART FOUR

Who lives there

One thousand six hundred and eighty-eight recorded marine species, forty-five of which exist nowhere else on the planet

CHAPTER SEVENTEEN

The big picture

> *Cocos has the highest density of marine species per kilometre of coastline in the entire eastern tropical Pacific. That is not an operator's opinion, it is a published result.*

In 2012, the researcher Jorge Cortés published in the *Revista de Biología Tropical* the most complete compilation ever made of the marine biodiversity of Cocos, drawing on more than a century of records. The figure that came out was **1,688 documented marine species**.

Group	Recorded species
Gastropods	383
Bony fishes	354
Crustaceans	at least 263
Total marine	**at least 1,688**
Endemic to Cocos	45 (2.7% of the total)

What makes Cocos Cocos

Forty-five endemic species is not impressive in absolute terms. What is impressive is the proportion: those 45 species represent **47.4% of all endemic marine species in Costa Rica**. Almost half of an entire country's marine endemism is concentrated on an island of 23 square kilometres.

Endemism is concentrated in three groups: fishes (33.3%), crustaceans (28.9%) and molluscs (15.5%).

The same work calculated species-density indices. The linear biodiversity index for Cocos is **58.6** species per kilometre of coastline, against a maximum of 3.8 anywhere on the mainland. The index per area of seabed shallower than 200 metres is **5.3**, against a continental maximum of 0.3. These are the highest values ever recorded in the eastern tropical Pacific.

WHAT IS STILL UNKNOWN

The survey itself points out the gaps: the south side of the island, the pelagic environment and deeper waters are poorly studied. Whole groups, such as cyanobacteria, flatworms, nematodes and gelatinous zooplankton, remain badly known. Submersible expeditions, first the Johnson-Sea-Link and later the DeepSee, descended beyond 450 metres and found deep-water endemics nobody knew existed. The figure of 1,688 is a floor, not a ceiling.

An improbable relationship

About one third of the shore fishes of Cocos have affinities with the western Pacific, on the other side of the ocean, rather than with the American mainland 550 kilometres away. It is the record of larvae that crossed the entire Pacific on currents, found a mountain along the way and stayed.

CHAPTER EIGHTEEN

The scalloped hammerhead

> *This is the animal everyone crosses 550 kilometres of ocean for. It is worth understanding why it is there.*

Scalloped hammerhead CR

Sphyrna lewini

Typically 2.5 to 3.5 metres long, sometimes over 4. Recognised by the central notch on the front edge of the head, which gives the species its name. Listed as **Critically Endangered** by the IUCN.

The head

The hammer-shaped head, called a cephalofoil, is not decoration. It does three things at once.

First, it separates the eyes, widening the binocular field of view and improving depth perception. Second, it works as a hydrofoil: the flattened head generates lift and helps the animal manoeuvre. Third, and most important, it spreads the ampullae of Lorenzini, the electroreceptive organs, across a far larger surface. The hammerhead sweeps the bottom with its head like a metal detector, and picks up the electric field generated by the muscles of a ray buried in the sand.

Those same receptors appear to play a role in navigation. Research led by A. Peter Klimley showed that hammerheads swim along highly direc-

tional routes relative to irradiance, temperature, bathymetry and the geomagnetic field. The hypothesis is that they read the magnetic anomalies of the seafloor, left by magnetised volcanic rock, as a road network.

Why they gather at Cocos

There is no single answer. The literature points to several functions for these aggregations at oceanic islands and seamounts, probably acting together:

- **Cleaning stations.** Cleaner fish, mainly wrasses, remove parasites from the skin, the gills and even inside the mouths of the sharks. Hammerheads have been documented interacting with cleaners at Costa Rican seamounts. This is the behaviour you will watch at Bajo Alcyone.
- **Social interaction and reproduction.** Aggregations bring individuals together, and mating behaviour of *S. lewini* has been recorded in the eastern tropical Pacific.
- **A base of operations.** The pinnacles are areas of relatively reduced current, which saves energy. The sharks spend the day there and head out at night to forage in the surrounding open ocean, returning in the morning.

HOW NOT TO RUIN EVERYONE'S DIVE

The cleaning station is the reason the shark is there. If you swim over the top of it, the shark leaves and will not come back while you are nearby. The guides' rule is simple: keep 1.5 to 3 metres away from the station, stay low, behind the rock, and let the animal come to you. Never cross an active station.

Bubbles are the other problem. Scalloped hammerheads are notoriously sensitive to open-circuit bubbles. Breathe slowly, long and calm. Divers who control their breathing see more sharks, and that is literally how it works.



Scalloped hammerhead (*Sphyrna lewini*) at Cocos Island, beneath a dense school of fish.
Photo: Barry Peters, CC BY 2.0, via Wikimedia Commons.

How big the schools get

September and October concentrate the largest aggregations of the year at Cocos, with schools that can exceed a hundred animals at the cleaning stations of Bajo Alcyone and Dirty Rock. At Alcyone, with the right current, the school passes above you in silhouette against the surface, and that is the image on every Cocos poster.

An honest warning is due: it is not guaranteed. A school is a biological phenomenon, not a theme-park attraction. There are days of five animals

and days of two hundred, and the difference may be the state of the tide, the direction of the current, or nothing anyone can explain.



A school of scalloped hammerheads at Cocos. In September and October the aggregations can exceed a hundred animals at the cleaning stations. Photo: Edwar Herreño / Undersea Hunter.

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CHAPTER NINETEEN

The other sharks

> *Cocos has more than a dozen shark species. The hammerhead takes the credit, but it is not the one you will see most.*

Whitetip reef shark VU

Triaenodon obesus

The most abundant shark at Cocos and the easiest to see. Reaching about 1.6 metres, slender, with the unmistakable white tips on the dorsal and tail. During the day it lies motionless on the bottom, stacked under rock ledges, sometimes dozens together.

At night it changes completely. Whitetips hunt as a pack, forcing their way into cracks and holes after sleeping fish, and the collective hunt becomes a confusion of bodies and torchlight. The night dive at Manuelita, done for exactly this, is one of the most famous in the world.

Galápagos shark LC

Carcharhinus galapagensis

Robust, curious and large: individuals of 3 to 3.5 metres are seen regularly at Punta María and Dirty Rock. It is an oceanic-island shark par excellence and tends to approach divers with more confidence than the hammerhead. Stay vertical, face the animal and do not back away with your back turned.

Silky shark VU

Carcharhinus falciformis

An oceanic species, elegant and smooth-skinned, hence the name. It appears in the blue, often during the safety stop, and groups are commonly seen circling the boat's hull at night, drawn by the lights and the fish they gather.

Silvertip shark VU

Carcharhinus albimarginatus

Recognisable by the sharply marked white margins on all fins. Cocos has a shallow site dedicated to it, Silverado, where a cleaning station on top of a small pinnacle draws the animals in. They are shy at the start of the dive and gain confidence as the divers settle.

Tiger shark NT

Galeocerdo cuvier

The big news of the last two decades at Cocos. The tiger had been absent from the island for around thirty years and was recorded again in 2012. Sightings have increased since, and it is now seen with some regularity in the shallows at Manuelita and at Dirty Rock.

It is a large, powerful and genuinely predatory animal, and it deserves a different kind of respect from a whitetip. The boat briefings will cover this, and the instructions are to be followed: keep the group together, keep visual contact with the animal, do not chase and do not isolate yourself.

Whale shark EN

Rhincodon typus

The largest fish in the world, and a harmless filter feeder. At Cocos it appears mainly between May and October, with the best chances from August to October, following the plankton blooms. It drifts slowly past the more exposed sites, sometimes escorted by remoras and an entire school of fish.

The rule everywhere in the world, and mandatory here: do not touch, do not ride, do not block its path, do not fire a strobe in its face.



Whale shark (*Rhincodon typus*), the largest fish in the world, closely accompanied. Photo: Gabriel Vieira Costa. Taken outside Cocos.

CHAPTER TWENTY

Rays

> *From a seven-metre giant manta to the ray buried in the sand you almost stepped on.*

Giant manta EN

Mobula birostris

A wingspan that can exceed 6 metres. A filter feeder, a glider, and one of the most memorable encounters the ocean offers. At Cocos it turns up unpredictably at the more exposed sites and at cleaning stations, where it hangs motionless while wrasses work over its skin.

Mobulas

Mobula spp.

Smaller cousins of the manta, with wingspans of 1 to 3 metres, and far more gregarious. They are the great spectacle of the dry season at Cocos, when they can form enormous schools in the blue.

Marble ray

Taeniurops meyeni

Large, with a rounded disc and a mottled black-and-white pattern. It rests on sandy bottom or under rock ledges, and is common at Manuelita, Bajo Alcyone and Dos Amigos. When it lifts off it leaves a cloud of sand behind and is usually trailed by opportunistic fish.

Spotted eagle ray

Aetobatus spp.

An unmistakable silhouette, with a pointed snout and a very long tail covered in pale spots. It usually passes in small groups, in formation, along the edges of the pinnacles. Dirty Rock and Punta María are good places to see them.



A manta in blue water with a diver alongside for scale. Photo: Gabriel Vieira Costa. Taken outside Cocos.

CHAPTER TWENTY-ONE

Schools, fishes and the batfish with lipstick

> *Three hundred and fifty-four species of bony fish. A third of the endemism of Cocos is here.*

The sharks take the credit, but what gives a Cocos dive its volume are the schools. At any exposed site you will find living walls of fish that open and close around the group.

The schools you will see

- **Bigeye trevally** (*Caranx sexfasciatus*), in tight silver balls that turn slowly.
- **Cottonmouth jack** (*Uraspis helvola*), recognisable by the white interior of the mouth.
- **Bluestriped snapper** (*Lutjanus viridis*), in dense yellow curtains against the rock.
- **Grunts** (*Anisotremus* spp.), hanging in groups under ledges.
- **Soldierfish** (Holocentridae), red and huge-eyed, in the dark of the crevices.
- **Yellowfin tuna** (*Thunnus albacares*), moving fast through the blue, often alongside the hammerhead school.

Rosy-lipped batfish

Ogcocephalus porrectus

Endemic to Cocos Island. It exists nowhere else on the planet. A flattened, strange, unforgettable fish, with lips of a vivid pinkish red that look like lipstick.

It barely swims. It uses modified pectoral and pelvic fins as legs and literally *walks* along the bottom. On its forehead it carries an illicium, a retractable rod with a lure at the tip, inherited from the anglerfish family, which it uses to attract prey. It has only two and a half gills, with none on the reduced first gill arch.

It lives on the bottom between **35 and 150 metres**, which means finding one on a recreational dive is luck, and depends on being in the right place, over sand, looking down while everyone else looks into the blue. It is worth looking.

> **DO NOT CONFUSE THEM**
>
> Its famous relative, the red-lipped batfish of the Galápagos (*Ogcocephalus darwini*), is a different species. The Cocos one is the rosy-lipped batfish, and it is exclusive to here.

Other macro subjects worth hunting

- **Giant frogfish** (*Antennarius commerson*), motionless, camouflaged, about the size of a football.
- **Giant morays**, in almost every crevice, often with cleaner shrimp at work.
- **Octopuses**, especially on the night dive.

- **Cocos barnacle blenny**, small and territorial, peering out of a hole in the rock.



A green moray at the mouth of its hole. Common in the volcanic rock crevices of Cocos, often accompanied by cleaner shrimp. Photo: Gabriel Vieira Costa. Taken outside Cocos.

CHAPTER TWENTY-TWO

Turtles, dolphins and whales

> *The warm-blooded vertebrates and the three turtles that use the island.*

Marine reptiles

Green turtle EN

Chelonia mydas

The one most often seen at Cocos. It rests under rock ledges and frequents cleaning stations, where surgeonfish and wrasses scrape algae and parasites from its shell and skin. Tagging has shown that the green turtles of Cocos, the Galápagos and Malpelo belong to the same connected population.

Hawksbill turtle CR

Eretmochelys imbricata

Smaller, with a pointed beak and a shell serrated along the rear edge. Critically Endangered globally, largely because of historic hunting for the shell.

Olive ridley turtle VU

Lepidochelys olivacea

Less frequent near the island, more common in open water on the crossing. Worth keeping an eye on the sea while under way.

Marine mammals

Bottlenose dolphin

Tursiops truncatus

Resident and curious. They follow the tenders, ride the liveaboard's bow wave and, with some luck, turn up during a dive. At Cocos there are records of dolphins interacting with trevally schools and with sharks in the same field of view, which is one of the most striking scenes the island offers.

Orca

Orcinus orca

Rare, and unforgettable when it happens. There are records of orcas preying on rays and sharks in the region.

Short-finned pilot whale

Globicephala macrorhynchus

Seen in groups at the surface, generally while under way, moving slowly.

Humpback whale LC

Megaptera novaeangliae

The Costa Rican Pacific is unusual in the world for receiving humpbacks from both hemispheres at different times of year. At Cocos encounters are occasional, but the song is sometimes audible underwater long before any animal appears. If you hear a low, modulated sound during a dive, stop and listen.



Green turtle (*Chelonia mydas*). The same population moves between Cocos, the Galápagos and Malpelo. Photo: Dive For Fun archive.

CHAPTER TWENTY-THREE

Corals and the shallow bottom

> *Cocos is not a coral reef destination, and it still has one of the most extensive reefs in the southeastern Pacific.*

Anyone arriving at Cocos expecting the palette of Raja Ampat will be disappointed, and anyone expecting bare volcanic rock will be too. The truth sits in between.

The eastern tropical Pacific is a hard place for coral: relatively cool water because of upwelling, wide temperature swings and recurring El Niño events that cause bleaching. Even so, Cocos hosts about **18 species** of reef-building coral and one of the most extensive reefs in the whole southeastern Pacific, concentrated in sheltered areas, especially the Coral Garden at Manuelita.

What dominates the shallows

- **Corals of the genus *Pocillopora***, branching, forming dense patches in the protected shallows.
- **Massive corals** of the genera *Porites* and *Pavona*.
- **Encrusting coralline algae**, which cement the structure together.
- **Sea urchins**, in high density, the main grazers of the reef.
- **Sea stars and sea cucumbers**, abundant on the sandy bottom.

Most of the relief, however, is basalt: walls, boulders, arches and caves. It is that architecture, not the coral, that makes Cocos work as a dive site.

THE PARK'S THERMOMETER

NOAA maintains a virtual monitoring station for reef thermal stress at Isla del Coco, tracking sea surface temperature and accumulated heat leading to bleaching in near real time. It is the same tool used to forecast bleaching events on the Great Barrier Reef. Cocos is on the global radar.



PART FIVE

Diving Cocos

The sites, the technique, the equipment and the safety margin a place thirty-six hours from a shore-based chamber demands

Gabriel Vieira Costa

CHAPTER TWENTY-FOUR

What a diving day looks like

> *Three dives a day, seven days running, all from a tender, all in open ocean. The routine is simple and it wears you down.*

There is no shore diving at Cocos. The island has no infrastructure ashore, and the park does not allow it. Every dive leaves the liveaboard by inflatable tender and returns to the liveaboard.

A typical day runs like this: early breakfast, briefing, first dive, surface interval with a snack, second dive, lunch, rest, third dive, dinner. On boats that offer it, there is also the night dive at Manuelita. On the Dive For Fun 2026 expedition there are **21 dives over 7 days**, three a day, with nitrox, weights and guide included.

The park rules

- Every guide needs park authorisation to lead groups.
- **One group per site at a time.** If another boat is at Alcyone, yours waits or goes elsewhere.
- Maximum depth and bottom time are limited by the operation, typically 40 metres and 60 minutes.
- Diving within no-decompression limits. Conservative profiles are not a recommendation, they are policy.

The anatomy of a pinnacle dive

Almost every hammerhead dive at Cocos follows the same structure, and it is worth having in your head before the first one:

1. **Negative entry.** You go in from the tender with the BCD already empty, so the surface current does not take you. You drop and descend immediately.
2. **Fast descent.** Some sites have a permanent line (Alcyone, Punta María). At others the descent is in open water, through the blue, watching the guide.
3. **Reaching the bottom and getting positioned.** You find shelter behind a rock, at the edge of the cleaning station, and settle low. Reef hook, if the operation permits, or a gloved hand on dead rock.
4. **The wait.** This is the part nobody mentions. You stay still, breathing slowly, looking into the blue, for ten, fifteen, twenty minutes. This is where the dive is won or lost.
5. **The exit into the blue.** Once bottom time is up, the group lets go and drifts with the current, ascending slowly. It is in the blue, on the way up, that the whale shark, the silky and the manta appear.
6. **Safety stop and buoy.** Everyone with a surface marker buoy in hand, without exception. The tender finds the buoy, not the diver.

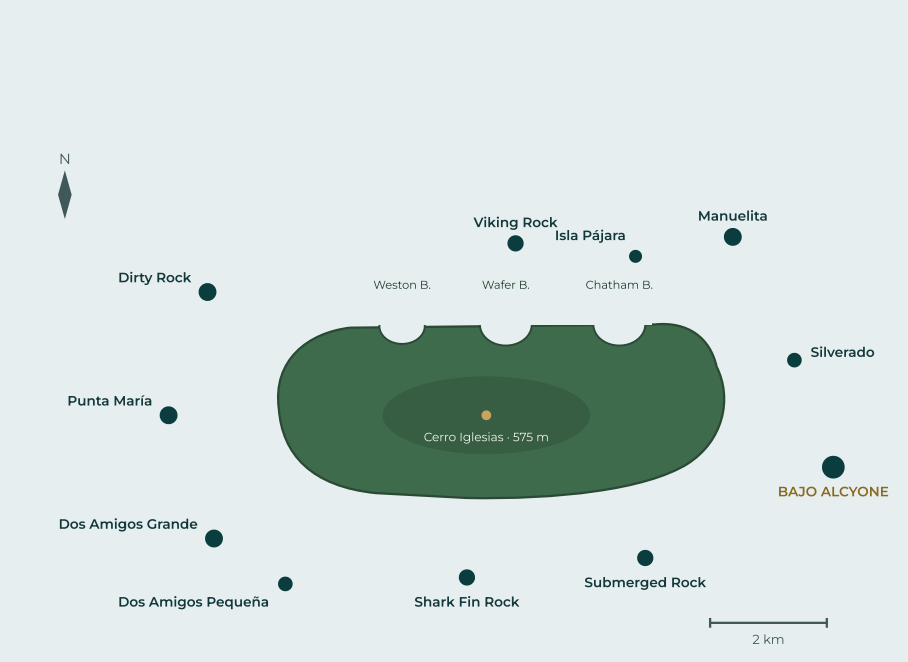
THE ONE SKILL THAT MATTERS

If you are going to train one thing before Cocos, train **buoyancy and buoy deployment in blue water, with no visual reference**. It is not depth that separates the divers who enjoy Cocos from those who suffer at Cocos. It is knowing how to stay still in a current and how to be found at the end.

CHAPTER TWENTY-FIVE

The map of the sites

> *An eight-kilometre island with more than twenty catalogued dive sites. These are the ones you are likely to dive.*



Orientation sketch. Not a nautical chart and not to be used for navigation.

Approximate positions of the main dive sites around Cocos Island. Illustration: Dive For Fun, from published descriptions by local operators.

The geography of the sites is easy to remember. **Manuelita** sits to the north, beside Chatham Bay. **Dirty Rock**, **Viking Rock** and **Punta María** are on the west and northwest sides. The **Dos Amigos**, **Shark Fin Rock** and

Submerged Rock are to the south. And **Bajo Alcyone**, the most famous of all, lies to the east, offshore, with nothing on the surface to reveal it.

CHAPTER TWENTY-SIX

The sites, one by one

> *What to expect, how deep it goes, what usually shows up and what goes wrong at each of them.*

Bajo Alcyone

SEAMOUNT · EAST OF THE ISLAND · TOP AT ABOUT 25 TO 30 M, BOTTOM BEYOND 40 M · PERMANENT LINE · STRONG CURRENT

The most famous site at Cocos and one of the most cited in the world. It is an isolated seamount with nothing visible at the surface, named after Cousteau's research vessel. The tender drops you over blue water and you descend a line to the top of the bank.

Down there is a rocky platform with cleaning stations. The procedure is to find shelter from the flow, stay low and wait. When it works, the hammerhead school appears above you in silhouette against the surface, dozens or hundreds of animals in file. Alongside them: large schools of jacks, yellowfin tuna, silkies, whitetips, marble rays and oceanic blacktips.

What goes wrong: lifting off the rock to "see better" and scattering the school; letting go of the line on descent and being swept off; burning through your air fighting the current instead of sheltering from it.

Manuelita

ISLET TO THE NORTH · THREE DISTINCT DIVES · 12 TO 40 M · THE MOST VERSATILE SITE ON THE ISLAND

The largest of the satellite islets of Cocos, and small enough to be circled in a single dive. It is usually the first dive of the trip, the check dive, and it is also the last. It works as three different sites:

Coral Garden (south side, 12 to 21 m): the easiest and most sheltered site on the island. Boulders, coral patches, whitetips resting on the bottom, marble rays, frogfish and schools. Excellent for sorting out weighting and camera.

Manuelita Outside (north wall, to around 40 m): a wall dropping into deep water, with hammerhead cleaning stations. More exposed, more current, more big animals. Tiger sharks and whale sharks have been seen here.

The night dive: the most famous whitetip night dive in the world. Dozens of sharks hunting as a pack in the dark, forcing into crevices, crossing the torch beam and at times passing between divers' legs. It is safe, it is intense, and it is not for the easily startled.

Watch out: the channel between Manuelita and the main island has very strong current in the middle. Respect the briefing about where to enter and where to exit.

Dirty Rock (Roca Sucia)

OUTCROP TO THE NORTHWEST · 6 TO 39 M · BUSY CLEANING AREA · STRONG CURRENT

A cluster of rocks breaking the surface, with the white and brown colour that gives the site its name, courtesy of the seabirds. Below, a sheltered channel where hammerheads gather, plus a small cave and cleaning stations at around 30 metres.

It is one of the most consistent sites at Cocos and is usually visited more than once per trip. Besides the hammerheads: Galápagos sharks, eagle rays, green turtles, lobsters, octopuses and dense schools. Tiger sharks have appeared here with some frequency in recent years.

Punta María

SEAMOUNT TO THE WEST · TOP AROUND 20 TO 25 M · DESCENT LINE · STEEP SLOPE

A bank with a long rocky spine, a gentle slope on one side and a sharp drop on the other. The descent is on the line, on the shallow side. It is the best site on the island for large **Galápagos sharks**, with animals of 3 to 3.5 metres, and a good site for eagle rays and hammerheads.

Dos Amigos Grande and Dos Amigos Pequeña

TWO ROCKS TO THE SOUTHWEST · 20 TO 34 M · THE UNDERWATER ARCH · HIGH DIVERSITY

Two neighbouring sites a few hundred metres apart, on the exposed southern side. Dos Amigos Grande holds the geological postcard of Cocos: an enormous **underwater arch** whose ceiling sits at around 20 metres and whose base is at around 30, big enough to pass through with room to spare.

The descent is usually fast, out of the surge zone straight to 30 metres. These are considered the most diverse sites at the island: hammerheads, tuna, schools, marble rays and, occasionally, whale sharks.

Submerged Rock

SOUTH AND SOUTHEAST · DESCENT TO AROUND 30 M · NARROW SWIM-THROUGH

A pinnacle rising from a submerged bank, with a small passage to swim through. The route, clockwise or anticlockwise, is set by the current and the swell of the day. Good for whale shark, hammerhead, tuna and dense schools.

Silverado

NEAR CHATHAM BAY · MAXIMUM AROUND 13 M · THE SHALLOWEST SITE ON THE ISLAND

A low pinnacle, about 2 metres high, on a sandy bottom. What makes it a site is the cleaning station on top, frequented by **silvertip sharks**. The animals start out shy and come closer as the divers settle. Being shallow, it is excellent for natural-light photography and for a last dive before the crossing home.

Viking Rock

NORTH, AT THE EDGE OF WAFER BAY · BEST BETWEEN 10 AND 20 M

A quieter site, often used as the third dive of the day. Rays, whitetips, pufferfish and, with luck, hammerheads and whale sharks passing through.

Isla Pájara

BETWEEN WAFER AND CHATHAM BAYS · SHALLOW, OVER SAND

A shallow dive in a channel with strong current that brings plankton and fish. It is a good site for rays and a good way to slow down after a run of deep dives.

Shark Fin Rock and the others

SOUTH AND SOUTHEAST · VARIED

Cocos has more than twenty catalogued sites, and each trip's list depends on wind, current and which boats are at the island. Besides those above, you may hear of Shark Fin Rock, Lobster Rock, Bajo Dos Amigos, Manta Corner, Cabo Atrevida and Cabo Barceló. Take the guide's suggestion: at Cocos, the right site is whichever one is working that day.

CHAPTER TWENTY-SEVEN

Technique

> *Cocos does not ask for difficult diving. It asks for disciplined diving.*

Negative entry

You enter from the tender with the BCD completely empty and little air in your lungs, so that you sink immediately. This avoids being dragged along the surface, where the current is strongest. Before entering: regulator in, mask on, one hand holding mask and regulator, and the decision to descend already made.

The classic mistake is entering with "just a little" air in the BCD and spending thirty seconds on the surface. In those thirty seconds you are already fifty metres from the group.

Equalising under pressure

A fast descent with difficult equalisation is a recipe for barotrauma. Start equalising at the surface, before you submerge, and equalise every half metre for the first ten. If an ear locks up, go up a metre and try again. Losing a dive is annoying; losing the whole trip to a burst eardrum is worse.

The reef hook

The reef hook is a short line with a carabiner at one end and a hook at the other. You set the hook in **dead rock**, never in living coral, clip the line to

your BCD and add a little air. The result is that you fly like a kite in the current, without effort, with both hands free for the camera.

Confirm in the briefing whether the operation permits its use. Where it does not, the standard is a gloved hand resting on dead rock.

Positioning at a cleaning station

- Stay **low**, against the rock, and never above the station.
- Keep 1.5 to 3 metres away from where the cleaners are working.
- Do not cross an active station. Go around.
- Do not chase. A chased shark disappears.
- Long, slow breathing. Fewer bubbles, more sharks.

Drift and buoy

Most dives end in the blue, drifting. That means you will surface far from where you entered, probably far from the boat and possibly in a lumpy sea. A surface marker buoy at least 1.5 metres long, orange or yellow, with a reel, is **mandatory**, and you need to be able to deploy it at 5 metres, with no visual reference, without tangling in the line and without going up with it.

Carry a whistle too, and ideally a signal mirror. A personal satellite locator (PLB or AIS) is expensive and is the best insurance policy there is for open-ocean drift diving.

THE RULE THAT SUMS IT ALL UP

At Cocos, the person who gets closest to the animal is the one who moves least. That applies to technique, to breathing and to patience.

CHAPTER TWENTY-EIGHT

Equipment

> *Seven days, twenty-one dives, cold water, current and no dive shop within 550 kilometres.*

Thermal

- **5 mm suit** with **hood** and **gloves**. If you feel the cold: 7 mm, or a hooded vest underneath.
- Gloves are not optional: you will be resting a hand on volcanic rock.
- A second pair of gloves and a second hood take up almost no space and save the week.

Safety and location

- **Surface marker buoy** of 1.5 m or more, with a reel, and the skill to use it.
- **Whistle** on the BCD and, if possible, a signal mirror.
- **Reef hook**, if the operation permits.
- Personal satellite locator, if you can.
- **Dive computer** with nitrox, plus a second computer or backup tables. At Cocos, a failed computer means lost dives.

Everything else

- Spare mask. A broken mask on day two ruins the trip.
- Repair kit: o-rings, fin strap, tape, cable ties, neoprene glue.

- Primary and backup torch, for the Manuelita night dive.
- Spare batteries and memory cards. There is nowhere to buy them.
- Microfibre towel, light windbreaker and plastic bags to separate wet from dry.
- Reef-safe sunscreen, free of oxybenzone and octinoxate.

> **CHECK THIS BEFORE BOARDING**
>
> Regulator serviced, BCD inflator working with the cylinder you will use, computer battery and display tested, nitrox certification in hand, and dive insurance covering hyperbaric treatment and evacuation. None of that can be fixed in Puntarenas the night before.

Nitrox

The standard at Cocos is EAN32, and it is strongly recommended. Over a week of three daily dives between 25 and 40 metres, the difference in decompression margin is large. If you are not yet certified, take the course before you travel: it is an afternoon of class and it changes the whole trip.

Rebreathers are permitted by prior arrangement with the operator, and have a real advantage at Cocos, since the absence of bubbles brings shy animals closer.

CHAPTER TWENTY-NINE

Safety 36 hours from the mainland

> *There is no helicopter, no runway and no hospital. Every decision underwater has to account for that.*

This is the least glamorous part of the book and the most important. Cocos has no airport. The nearest shore-based hyperbaric chamber is in San José, some 36 hours of sailing away plus the transfer. A medical emergency requires evacuation by sea to Puntarenas.

Some liveaboards operating the route, including the Sea Hunter, carry a **decompression chamber on board**. That changes the picture considerably, and even so an onboard chamber is a stabilisation resource, not a free pass.

Decompression

- Always dive within no-decompression limits.
- Use nitrox and set the computer conservatively.
- Do a 3-minute safety stop at 5 metres, always, and longer if you have the air.
- Ascend slowly, under 9 metres per minute in the final section.
- Hydrate. Seasickness, heat and three dives a day dehydrate more than you would think.
- Respect the pre-flight interval. The last dive of the trip already falls days before the flight home, and that gap exists for a reason.

Current and separation

The most concrete risk at Cocos is not sharks. It is being carried off by the current and not being found. That is why the buoy is mandatory, why diving is done in groups, and why the guide's instructions about where to enter and exit are not suggestions.

If you get separated from the group: search for one minute, ascend under control, deploy the buoy, blow the whistle and stay with it. Do not swim towards the boat. The tender looks for buoys.

Seasickness

The crossing takes 32 to 36 hours each way and can be lively, especially in the rainy season. Start medication **before** boarding, following medical advice, and not once you already feel sick, because by then it is too late. Patches, tablets and wristbands work differently for different people: test at home, not on the trip.

Insurance

Dive insurance covering hyperbaric treatment and evacuation is mandatory to board. Check the policy before you leave home, and carry the emergency number printed, not only on your phone.

SHARKS AND REAL RISK

Shark diving at Cocos is safe and is done by thousands of people every year. Even so, there is a record of one fatal incident involving a tiger shark at Manuelita, in December 2017. That is not a reason for fear; it is a reason to take the briefing seriously. Group together, visual contact with the animals, no chasing, no isolating yourself, and no swimming alone on the surface at dusk.

CHAPTER THIRTY

Underwater photography

> *Particle-laden water, big animals, low light and current. Cocos is a difficult place to photograph and a generous one to anyone who prepares.*

Which lens to bring

Wide angle or fisheye, full stop. The subject at Cocos is schools, sharks and seascape, and the suspended particles force you to get close. Macro only makes sense on one or two shallow dives, if you get the chance to change ports.

Light

- On a pinnacle dive, with the school above you, **turn the strobes off** and shoot silhouettes against the surface. That is the classic Cocos image, and it is made with natural light.
- When you do use strobes, **move the arms out** as far as they go and angle the heads outward, crossing the beams in front of the subject. It is the only defence against backscatter.
- Manual white balance works very well in blue water, and it is faster than fixing it later.
- High ISO is not a sin. A noisy sharp photo beats a clean blurred one.

Behaviour, which is what matters

The best photograph at Cocos is taken by someone who is standing still. Choose your position before the school arrives, anchor yourself, and wait. Chasing a shark with the camera in front of your face is the most efficient way to end the dive with an empty card and an irritated group.

And the boat etiquette applies: you are not the only photographer on board. Do not block the cleaning station, do not swim into other people's frames, and do not let the camera dangle loose, banging into rock and coral.

> **PHOTOGRAPHER'S CHECKLIST**
>
> Batteries and chargers with a plug adapter, spare cards, spare o-rings and silicone grease, a soft brush to clean the seal groove, silica gel, microfibre cloths and one dry cloth reserved for the port. Do the leak test in fresh water on the first day, before the first real dive.

PART SIX

What is at stake

One of the most protected places on the planet lost almost half its hammerheads in two decades. Understanding why is the useful part of this trip

Gabriel Vieira Costa

CHAPTER THIRTY-ONE

The decline, in numbers

> *The best dataset on the sharks of Cocos was not produced by scientists. It was produced by dive guides writing down what they saw, every day, for twenty-one years.*

In 2015 the journal *Conservation Biology* published a study analysing 21 years of sighting records made by a small group of divers at Cocos Island National Park, one of the oldest marine protected areas in the world. The result is the most important piece of information in this book.

21 years	**-45%**	**8 of 12**
OF RECORDS	RELATIVE HAMMERHEAD ABUNDANCE	ELASMOBRANCHS IN DECLINE

The relative abundance of scalloped hammerhead fell by 45%. Eight of the twelve monitored elasmobranch species showed significant decline over two decades.

This happened *inside* a national park, at a World Heritage Site, with enforcement, with research vessels and with international attention. The uncomfortable conclusion is that a marine protected area, however large and however well managed, is not enough on its own to conserve species that migrate beyond it.

CRITICALLY ENDANGERED

The scalloped hammerhead (*Sphyrna lewini*) is listed as **Critically Endangered** on the IUCN Red List. That is the category immediately before extinct in the wild. The animal you are crossing half an ocean to see sits in the same risk category as the black rhinoceros.

CHAPTER THIRTY-TWO

Illegal fishing and the corridor problem

> *There is no point armouring the island if the road to it is wide open.*

The main pressure on Cocos is illegal fishing inside and around the protected waters. Growing demand for tuna, shark fin and other seafood sustains a fleet operating at the edge of, and sometimes inside, the park.

The most destructive gear in this context is the **longline**: a main line kilometres long carrying thousands of baited hooks. It does not choose what it catches. Sharks, turtles, seabirds and marine mammals come up as bycatch, and most of them die.

The difficulty of enforcement

Costa Rica greatly expanded the protected area, but patrolling 54,844 km² of national park plus 106,285 km² of managed area is expensive, and enforcement faces financial and bureaucratic limits and, according to documented reports, problems of corruption. There are recorded cases of vessels seized with abundant evidence whose crews were released under questioned circumstances.

None of that is grounds for cynicism. The 2021 expansion is real, it is one of the largest marine protection expansions ever made by a single country, and enforcement has improved. But it does not on its own solve the main problem, which is geographic.

The gap in the middle

The sharks of Cocos do not stay at Cocos. They cross hundreds of kilometres of water to the Galápagos, to Malpelo and to the coast of Costa Rica, and much of that route is unprotected. An animal that spends its whole life inside the park is safe. A migrating animal is not.

That is why the conservation agenda in the region has stopped talking about "protecting the island" and started talking about **protecting the corridor**. The Cocos-Galápagos Swimway proposal, under discussion between Costa Rica and Ecuador, would create the world's first bilateral marine protected area linking the national parks of two sovereign nations. Organisations such as MigraMar, Misión Tiburón, Turtle Island Restoration Network and the Fundación Amigos de la Isla del Coco are working towards it. Ecuador's creation of the Hermandad Marine Reserve in 2022 was a concrete step.

> **CMAR**
>
> Costa Rica, Ecuador, Colombia and Panama are members of the Eastern Tropical Pacific Marine Corridor, a regional initiative to coordinate management of the protected areas of Cocos, the Galápagos, Malpelo, Gorgona and Coiba. It is the diplomatic skeleton on which the corridor has to be built.

CHAPTER THIRTY-THREE

What a diver can do

> *You have already done the expensive part: you paid to make a living shark worth more than a dead one.*

Well-run dive tourism is one of the few economic arguments that works against predatory fishing. A living hammerhead at Bajo Alcyone generates revenue every year, for guides, crew, hotels, restaurants and the park itself. The same animal, dead, is worth money once. By buying this trip, you entered that equation.

But there is more you can do, and almost all of it is cheap.

During the trip

- **Touch nothing.** Not sharks, not turtles, not mantas, not coral. It is not only etiquette: contact removes the protective mucus layer from an animal's skin.
- **Control your buoyancy.** A fin in coral kills coral.
- **Collect nothing.** No shells, no stones, no branches. It is illegal and it is enforced.
- **Reef-safe sunscreen**, free of oxybenzone and octinoxate. Or a rash guard, which is better still.
- **No single-use plastic** on board. Bring a reusable bottle.
- **Respect the briefing.** The park rules exist because damage happened before them.

Your photographs count as data

This is the most underrated point. Several research projects in the region work with **photo-identification**: every whale shark has a unique spot pattern, every manta a unique ventral marking, every turtle a unique facial scale pattern. One of your photographs, with date and location, can feed directly into a scientific database.

- **Whale shark:** photograph the left flank, behind the gill slits. Submit it to Wildbook for Whale Sharks.
- **Manta:** photograph the whole belly, straight on and square.
- **Turtle:** photograph the head in profile, from both sides.
- Ask the crew where to send them. Several Cocos boats collaborate formally with researchers.

After the trip

- Support the people working in the region: MigraMar, Misión Tiburón, Fundación Amigos de la Isla del Coco (FAICO), Turtle Island Restoration Network, Mission Blue.
- Do not eat shark fin, under any circumstances, in any country.
- Choose seafood with traceable origin, and avoid top-predator species caught on longlines.
- Tell the story. A diver who comes back from Cocos and explains what they saw convinces more people than any campaign.

Cocos survived pirates, whalers, treasure hunters and a governor with a shovel. This generation's test is different: nobody needs to land in order to empty it.

APPENDIX A

Species list

> *The species mentioned in this book, with scientific names and IUCN Red List status. To take on the boat.*

Sharks and rays

Common name	Scientific name	IUCN
Scalloped hammerhead	*Sphyrna lewini*	CR
Whale shark	*Rhincodon typus*	EN
Whitetip reef shark	*Triaenodon obesus*	VU
Galápagos shark	*Carcharhinus galapagensis*	LC
Silky shark	*Carcharhinus falciformis*	VU
Silvertip shark	*Carcharhinus albimarginatus*	VU
Tiger shark	*Galeocerdo cuvier*	NT
Giant manta	*Mobula birostris*	EN
Mobula rays	*Mobula spp.*	varies
Marble ray	*Taeniurops meyeni*	threat-ened
Spotted eagle ray	*Aetobatus spp.*	threat-ened

Fishes

Common name	Scientific name	Note
Rosy-lipped batfish	*Ogcocephalus porrectus*	endemic
Yellowfin tuna	*Thunnus albacares*	LC
Bigeye trevally	*Caranx sexfasciatus*	
Cottonmouth jack	*Uraspis helvola*	
Bluestriped snapper	*Lutjanus viridis*	
Giant frogfish	*Antennarius commerson*	
Indo-Pacific sailfish	*Istiophorus platypterus*	

Reptiles and marine mammals

Common name	Scientific name	IUCN
Hawksbill turtle	*Eretmochelys imbricata*	CR
Green turtle	*Chelonia mydas*	EN
Olive ridley turtle	*Lepidochelys olivacea*	VU
Bottlenose dolphin	*Tursiops truncatus*	LC
Humpback whale	*Megaptera novaeangliae*	LC
Short-finned pilot whale	*Globicephala macrorhynchus*	LC
Orca	*Orcinus orca*	DD

Terrestrial endemics

Common name	Scientific name	IUCN
Cocos cuckoo	*Coccyzus ferrugineus*	VU
Cocos flycatcher	*Nesotriccus ridgwayi*	VU
Cocos finch	*Pinaroloxias inornata*	LC
Cocos Island anole	*Anolis townsendi*	endemic
Pacific least gecko	*Sphaerodactylus pacificus*	endemic
Cocos cecropia	*Cecropia pittieri*	endemic

CR critically endangered · EN endangered · VU vulnerable · NT near threatened · LC least concern · DD data deficient. IUCN Red List classifications, subject to revision. Where the assessment is at genus level or uncertain, the table says “varies” or “threatened”.

APPENDIX B

Timeline

> *Five centuries of Cocos in a page and a half.*

2.44–1.91 Ma	Age of the island's oldest rocks, dated by potassium-argon.
1526	Discovery attributed to the Spanish navigator Juan de Cabezas.
1542	First document bearing the island's name, “Isle de Coques”, on the map of Henry II.
1556	Nicolas Desliens's planisphere records the “Ysle de Coques”.
1685	Lionel Wafer arrives with Captain Edward Davis. Wafer Bay carries his name.
1793	James Colnett surveys the island, takes two thousand coconuts and leaves pigs and goats.
1795	George Vancouver anchors with the *Discovery* and the *Chatham*. Inscriptions carved in rock.
1818	Period attributed to the activities of Bennett Graham and Benito Bonito.
1820	The supposed Treasure of Lima is taken away by William Thompson.
1832	Costa Rica annexes the island by decree No. 54.
1838	Edward Belcher records that whalers have cut all accessible timber.
1863	The *Adelante* abandons 426 Tongans with smallpox. A month later, 38 survivors are rescued.

1889	August Gissler arrives and begins twenty years of digging.
1897	Gissler is named the first and only Governor of Cocos Island.
1908	Gissler leaves the island with six gold coins.
1910	Aeneas Mackintosh's expedition, unsuccessful.
1970	Cocos becomes the 11th district of the canton of Puntarenas.
1978	Creation of Cocos Island National Park.
1994	Cousteau calls Cocos “the most beautiful island in the world”.
1997	Inscription on the UNESCO World Heritage List.
1998	Designation as Ramsar site No. 940.
2002	Extension of the UNESCO inscribed area.
2006	The rangers vote for the first time without leaving the island.
2011	Protection of the Las Gemelas seamounts. Continuous GPS installed at Wafer Bay.
2012	Publication of the inventory of 1,688 marine species. Return of the tiger shark after three decades.
2015	A study documents a 45% fall in relative hammerhead abundance over 21 years.
2020	The Cocos-Galápagos Swimway is designated a Hope Spot by Mission Blue.
2021	Decree 43368-MINAE expands the park to 54,844 km^2 and the Bicentennial Area to 106,285 km^2.
2022	Ecuador creates the Hermandad Marine Reserve, connecting to the Cocos area.

2026 A study confirms the migratory corridor between Cocos and the Osa Peninsula.

APPENDIX C

Glossary

> *The terms that come up in the briefings and in this book.*

Ampullae of Lorenzini

Electroreceptive organs in the head of sharks and rays, able to detect the electric fields generated by other animals' muscles.

Marine protected area (MPA)

A portion of ocean with legal restrictions on use. It may be fully protected (no-take) or regulated-use.

Backscatter

White dots in an underwater photograph caused by strobe light reflecting off particles suspended in the water.

Bajo

Spanish for bank or seamount. Bajo Alcyone is "Alcyone bank".

Cephalofoil

The hammer-shaped head of sphyrnid sharks, which widens vision, provides hydrodynamic lift and spreads electroreception across a larger area.

Elasmobranchs

The group of cartilaginous fishes with exposed gill slits: sharks, rays and their relatives.

Endemic

A species that occurs naturally in one place and nowhere else.

ENSO (El Niño-Southern Oscillation)

A multi-year climate cycle that alters Pacific surface temperature and, with it, upwelling and productivity.

Negative entry

Entering the water with an empty BCD, in order to sink immediately and avoid being carried by the surface current.

Longline

Fishing gear with a main line kilometres long and thousands of hooks. High by-catch of sharks, turtles and birds.

Cleaning station

A fixed spot on the reef where cleaner fish remove parasites from larger animals, which arrive and wait their turn.

Reef hook

A short line with a hook, set into dead rock, that holds a diver still in a current without effort.

Hope Spot

A Mission Blue designation for ocean areas considered critical to the health of the ocean.

IUCN and the Red List

The International Union for Conservation of Nature and its global system for classifying extinction risk.

Seamount

An underwater mountain that does not reach the surface. It concentrates life by forcing currents upward.

Nitrox (EANx)

A breathing mixture with more oxygen and less nitrogen than air. It widens the decompression margin on repetitive dives.

Pelagic

Of the open water column, away from the bottom and the coast. “Large pelagics” are tuna, oceanic sharks, mantas.

Upwelling

The rise of deep, cold, nutrient-rich water into the sunlit zone. The basis of the ocean's most productive areas.

SINAC

Costa Rica's National System of Conservation Areas, the body that administers Cocos Island National Park.

SMB (surface marker buoy)

An inflatable buoy deployed from depth to mark a diver's position. Mandatory at Cocos.

Thermocline

A thin layer where water temperature drops abruptly, separating two water masses.

Intertropical Convergence Zone (ITCZ)

The belt around the Equator where the trade winds of both hemispheres meet, generating cloud and rain. It governs the climate of Cocos.

APPENDIX D

Sources

> *Where each figure in this book came from, for anyone who wants to check or go further.*

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3. **UNESCO World Heritage Centre.** Cocos Island National Park, site No. 820, inscribed 1997, extended 2002, natural criteria ix and x.
4. **Ramsar Convention.** Isla del Coco, site No. 940, designated 10 April 1998.
5. **Government of Costa Rica, MINAE.** Decree No. 43368-MINAE of 17 December 2021, expanding Cocos Island National Park to 54,844 km² and the Bicentennial Marine Managed Area to 106,285.56 km².
6. **SINAC.** Costa Rica's National System of Conservation Areas, visitation rules and management of Cocos Island National Park.
7. **IUCN Red List.** Assessments of *Sphyrna lewini*, *Rhincodon typus*, *Triaenodon obesus*, *Carcharhinus galapagensis*, *Carcharhinus falciformis*, *Galeocerdo cuvier*, *Mobula birostris* and of the turtles and birds mentioned.
8. **Wyrtki, K. (1964).** Upwelling in the Costa Rica Dome. *Fishery Bulletin*, NOAA. *Source for the description of the Costa Rica Thermal Dome.*
9. **Fiedler, P. C. (2002).** The annual cycle and biological effects of the Costa Rica Dome. *Deep-Sea Research.*
10. **Klimley, A. P.** Work on the directional swimming of *Sphyrna lewini* in relation to irradiance, temperature, bathymetry and the geomagnetic field.
11. **PLOS ONE (2011).** Oceanic sharks clean at coastal seamount. *Source on cleaning stations used by oceanic sharks.*
12. **MigraMar.** Tagging and telemetry programme in the eastern tropical Pacific; connectivity between Cocos, the Galápagos and Malpelo.

13. **Misión Tiburón.** Research on hammerhead nurseries in Golfo Dulce.
14. **Mission Blue (2020).** Designation of the Cocos-Galápagos Swimway as a Hope Spot.
15. **Fundación Amigos de la Isla del Coco (FAICO).** Biodiversity and endemism data for the island.
16. **Divers Alert Network, Alert Diver.** Technical guide to diving Cocos: conditions, depths, procedures and safety.
17. **Undersea Hunter Group.** Operational information on dive sites, vessels and the DeepSee submersible.
18. **NOAA Coral Reef Watch.** Virtual station monitoring thermal stress at Isla del Coco.
19. **Oviedo y Valdés, G. F. (1535).** *Historia general y natural de las Indias. Record of the 1526 discovery.*
20. **English and Spanish Wikipedia,** entries “Cocos Island”, “Isla del Coco” and “August Gissler”, used as a starting point and checked against the primary sources they cite.

A NOTE ON DISAGREEMENTS

Serious sources disagree on some points, and where they do, this book says so. The main cases are monthly rainfall (different climatological series give different values for the same month), the count of endemic insects (between 64 and 65, depending on the survey) and the exact position of some dive sites, for which no official public chart exists.

APPENDIX E

Image credits

Image	Author and licence
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Island from the sea; satellite islet; park sign	Ministerio de Ambiente y Energía, Costa Rica. Public domain, via Wikimedia Commons.
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School of hammerheads	Edwar Herreño / Undersea Hunter.
Whale shark; manta with diver; green moray	Gabriel Vieira Costa. Taken outside Cocos.
School of snappers	Manolo García / Dive For Fun archive.
Green turtle	Dive For Fun archive.
Maps and diagrams	Dive For Fun, from published coordinates and descriptions.

Species images not photographed at Cocos Island are identified as such in the caption. They illustrate the species, not the place.

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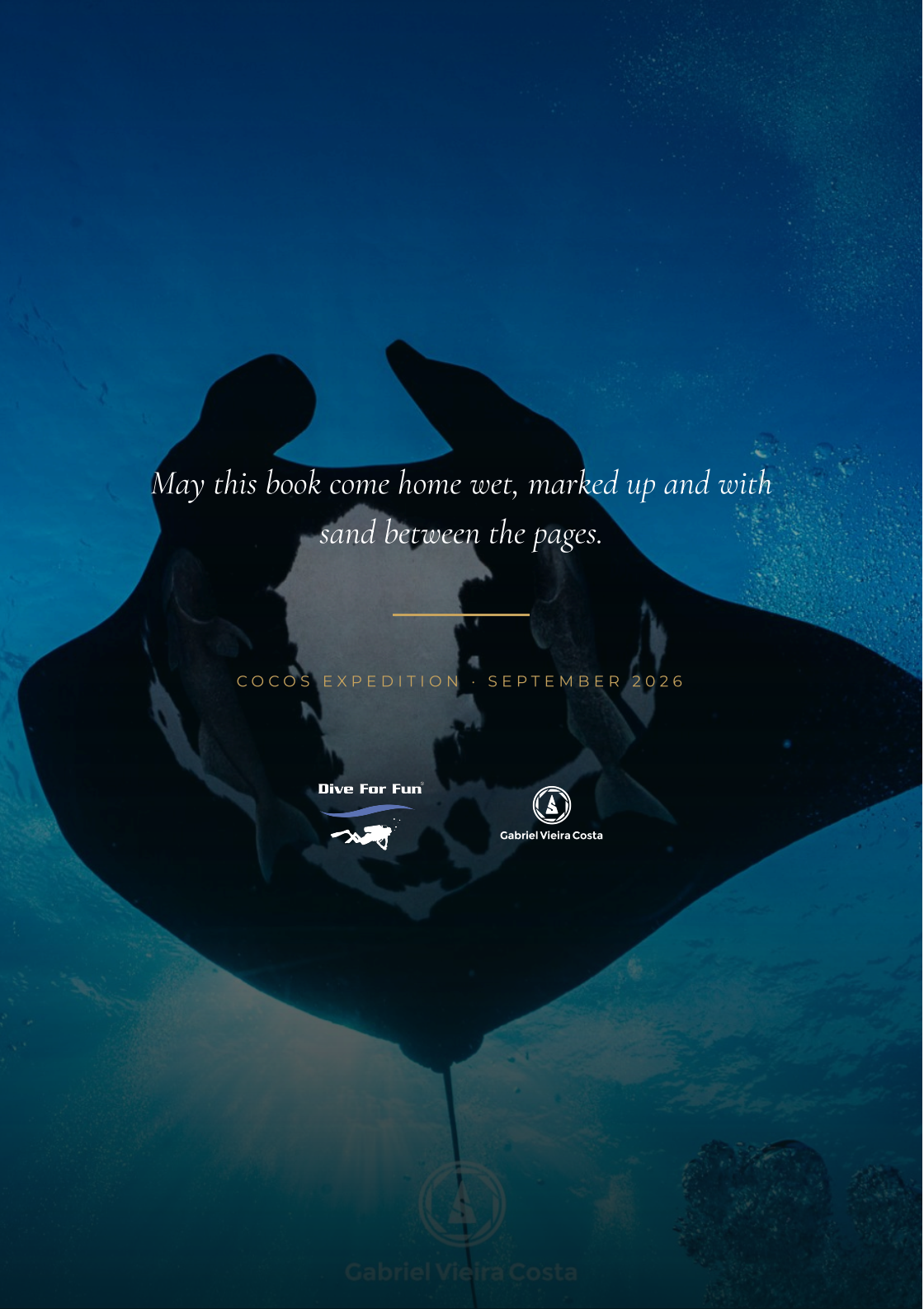
Notes



May this book come home wet, marked up and with sand between the pages.

COCOS EXPEDITION · SEPTEMBER 2026

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