



Welcome to the  
**QUIRIMBAS ARCHIPELAGO**



Sandy and rocky beaches, dunes, coral reefs, estuaries, bays, seagrass beds and mangrove forests: the Quirimbas archipelago supports pristine ecosystems, high biological diversity, unique local species and endangered species.

This area of Northern Mozambique hosts a high diversity of corals and fish, important nesting ground for sea turtles, is home to migratory whales, dolphins and many bird species.

Here is also where southern African birds meet with east African birds, making the archipelago a special place for birdwatching.



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# Quirimbas Archipelago

## MARINE SANCTUARIES



### WHAT IS A MARINE SANCTUARY?

A marine sanctuary is an area set aside for conservation. **Marine life, is fully protected:** no fishing is allowed into the sanctuaries

Marine sanctuaries are marine protected areas designed to:

- maintain essential ecological processes and life support systems;
- preserve biological diversity;
- ensure the sustainable use of species and ecosystems.

### A MARINE SANCTUARIES SYSTEM

Creating a net of marine no-take areas, is an essential and long-overdue contribution to improving stewardship of the marine environment.

Marine sanctuaries are a highly effective tool for enhancing biodiversity and protecting not only fish species: **many threatened species**, like sharks, dolphins, dugongs and marine sea turtles, **take advantage of these protected areas.**

### MORE THAN FISHY BUSINESS: THE VALUE OF MARINE SANCTUARIES

Marine sanctuaries represent a viable management tool to protect marine life and to preserve fish communities. The creation of marine sanctuaries (no-fishing zones) results in **increase in fish number, dimension and diversity over a wide area** (known as "spillover effect"), benefiting marine biodiversity as well as local communities, who can catch more and bigger fishes in the surroundings.

### SANCTUARIES AS A RESOURCE FOR TOURISM DEVELOPMENT

Recreational and touristic activities are allowed in the sanctuaries.

The Quilaleia sanctuary is characterized by a rich coral reef, while the Ibo sanctuary is home of a residential group of Bottlenose dolphin (*Tursiops truncatus*).

#### MAP LEGEND

- MARINE SANCTUARIES
- MANGROVE
- CORAL REEF



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## Quirimbas Archipelago

# MANGROVES AND CORAL REEFS

An immense value to the environment and to humankind



### MANGROVES

Mangroves grow where fresh waters mix with the ocean, creating a unique ecosystem. To survive regular flooding, variable salinity, droughts and storms, mangroves have evolved peculiar ecological features:

- Mangroves can tolerate high concentrations of salt in the water. Some of them can actively secrete salt from the leaves!
- Most of mangroves species have aerial roots to transport oxygen.
- Prop roots help mangroves to remain anchored in the mud during tides and storms.

### NO MANGROVES, NO FISHES

Mangroves are home to many fish, crab, shrimp and mollusk species; they serve as nurseries for many fish species and represent roosting and breeding sites for many birds, contributing to conserve a high biological diversity.

### NO MANGROVES, NO SHELTER

Their dense roots system stabilizes the coastline and prevents erosion from waves and storms. Where mangroves have been cleared, coastal damage from hurricanes and typhoons is much more severe.

### AND MORE

Mangroves also offer water regulation services and serve as a substantial store of below-ground carbon, thus mitigating climate change.



### CORAL REEF

Coral reefs are some of the most diverse and valuable ecosystems of the planet. About one-third of all marine fish species live part of their lives on coral reefs

Coral reefs are large underwater structures composed of the skeletons of corals, marine invertebrate species also known as polyps. New coral polyps live on the calcium carbonate exoskeletons of their ancestors. As the centuries pass, coral slowly grow.

### FISH NURSERIES

Coral reefs are the nurseries for about a quarter of the ocean's fish. About one billion people worldwide depend on them for food and income.

### BIODIVERSITY SUPPORT

Coral reefs are often called the rainforest of the sea, due to the vast amount of species that the harbor: not only fish, but also many invertebrates, including sponges, shrimp, lobsters, crabs, mollusks, starfish, sea urchins, sea cucumbers, and vertebrate as sea turtles and sea mammals.

### LAND PROTECTION

Coral reefs dissipate wave energy from storms and tsunamis, reducing damage on adjacent lands.

### FOSTERING LOCAL ECONOMIES

Coral reefs are home to a natural wonderland that attracts visitors from all over the globe. Tourism revenues generated by coral reefs are significant. Sustainably managed coral reef-based tourism can provide additional income to local communities.

### MEDICINE VALUE

Coral reef organisms are used in treatments for human diseases. We may continue to find underwater the answers to medical problems.

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## THE BEST BEACHES

### OBSERVE AND EXPLORE

- The Quirimbas Archipelago is a **birdwatching paradise**. Many storks, ibis and heron species can be sighted foraging on the shore at low tide. Among shorebirds it is easy to see: Common Sandpiper, Common Greenshank (*Tringa nebularia*), Whimbrel (*Numenius phaeopus*), Ruddy Turnstone, Curlew Sandpiper (*Calidris ferruginea*), White-fronted Plover, Greater Sandplover.
- You can observe a large variety of **shells and invertebrate** species in low tide such as crabs, serpentine starfish, large to very small sea snails, bivalves, sea urchins and sea cucumbers.
- All the islands of the Archipelago are in direct connection with the **coral reef**. You can snorkel among a surprisingly rich fish fauna and swim over vast seagrass beds, feeding ground for many life forms, such as the green turtle.
- Walk around and explore the Quirimbas islands' **villages and daily life**.

### TIPS

- Always contact a community guide to plan your trip.
- Always ask the guide if you need to bring your own water and food: some islands are uninhabited and do not have facilities.
- Wear sun cream, a hat and appropriate shoes to walk across mangroves or on rocky beaches.
- Bring a diver's mask.
- Consider bringing something to make some shade.

### DO'S AND DON'TS

- **Be clean:** never leave garbage or any kind of trash behind you.
- **Preserve the environment:** don't remove corals and shells from the beach and avoid buying them.
- **Don't give money for nothing:** promote sustainable development and support the local economy by buying local products and choosing community restaurants and facilities.
- **Respect birds:** don't go too close to bird roosting sites. Roosting birds are very sensitive to any kind of disturbance.
- **Snorkel responsibly:** when snorkeling during low tide, pay attention not to step on live coral formations and don't touch anything underwater.

### MAP LEGEND



### IBO

- 1 A biodiversity treasure! This beach is an easy spot for birdwatching and ideal for sighting sponges, many species of crabs, starfish, sea snails, bivalves, sea slugs, sea urchins and much more.
- 2 A sand beach and potential nesting site for sea turtles.



### MATEMO

🕒 40/50 min from Ibo

- 3 A stunning sand beach.



### ROLAS

🕒 60/75 min from Ibo

- 4 A small, beautiful and desert island.



### QUIRIMBA

🕒 40/50 min from Ibo

- 5 A white sand beach with mangroves. During low tide it is possible to see coral rocks emerging from the water.
- 6 A long sand beach and a coconut plantation.
- 7 A sand beach with mangroves and beautiful rocky formations about 2.5 km off the coast.



### MEFUNVO

🕒 60 min from Ibo

- 8 A coral rocky beach and a nice walk along the shore.



### QUISIVA

🕒 90 min from Ibo

- 9 A long stripe of white sand covered with sea urchins and used in the afternoons by flocks of terns as roosting site.
- 10 A bay that can be reached at the end of a nice walking path from point 9 (45 minutes), with plenty of coral rock formation.



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## PROTECTED SPECIES

The Humpback Whale, the Indian Humpback Dolphin and the Green Turtle are among the protected species of Mozambique and play a very important role in the equilibrium of the Quirimbas natural system.

### HUMPBAC WHALE

(*Megaptera novaeangliae*)

**Description:** whale (Cetacea), up to 16 m long.

**Distribution:** in the oceans all over the world.

**Where and how:** the Quirimbas archipelago is on the migratory route of humpback whales; they can be seen during boat excursions in the Pemba bay or along the Quirimbas islands.

Humpback whales, excluding rare exceptions, are **migratory animals**. The individuals seen along the coast of Mozambique are usually heading toward the colder waters of Antarctica, where plankton and small fish are abundant. They will then return to the warmer tropical waters just north of Mozambique's coast between June and late November, to pass the winter, mate and give birth, after a gestation of almost twelve months.

Humpback whales are well-known for their long and articulate underwater vocalizations, the so called '**whale songs**', produced mainly by males during courtship.

### WHALES ROLE IN OCEAN ECOSYSTEMS

- They help regulate the flow of food by contributing to the maintenance of a stable food chain, thus stabilizing ecosystems.
- They mix the water column: after feeding at depth, they release surface plumes of fecal material. This "whale pump" supplies iron and nitrogen, which are essential fertilizers for primary producers in the surface.
- By migrating between highly productive, high-latitude feeding grounds and low-latitude calving grounds they release nitrogen in the form of urea into comparatively nutrient-poor areas, **transporting nutrients** for nearly 10,000 kilometers.

### INDIAN HUMPBAC DOLPHIN

(*Sousa plumbea*)

**Description:** dolphin (Cetacea), up to 2.8 m long.

**Distribution:** eastern coast of southern Africa.

**Where and how:** Indian humpback dolphins are more common in shallower coastal waters (e.g. less than 50 m deep). Within the Quirimbas Archipelago they can be found in the coastal waters between Ibo and Matemo islands.

The Indian Humpback Dolphin is **a very rare species**, to be found only along the coast of southern Africa. This is where it feeds on small fishes living in the reefs and seagrass beds. Quite often single dolphins work together to hunt: they locate their prey, which herd in banks, and then they dive, one by one, in a coordinated series of attacks.

Living **close to the shore**, makes it highly vulnerable to human coastal activities. The waters of Mozambique, particularly offshore, also host common dolphins (*Delphinus delphis*), spinner dolphins (*Stenella longirostris*), and Risso's dolphins (*Grampus griseus*).

### DOLPHINS ROLE IN OCEAN ECOSYSTEMS

- They are **top-level predators** in the ocean food chain: they control populations of fishes and squids and maintain the balance of the ecosystem.
- They are good indicators of ecosystem health and pollution: they consume several species of fish and squid, concentrating in their bodies possible contaminants in the water, thus acting as sentinels of the coastal marine ecosystems (**bio-indicators**).



### GREEN TURTLE

(*Chelonia mydas*)

**Description:** reptile (Chelones), up to 1,5 m long.

**Distribution:** tropical seas all over the world.

**Where and how:** sea grass beds and internal lagoons are the favorite habitats of sea turtles. They can be easily spotted near Ibo, while their nesting sites are mainly on the beaches of Matemo, Quirimba and Quilalea, where they lay eggs between October and January.

Large green turtle adults can weigh up to half a ton; even so they swim more swiftly than any diver and can stay underwater for more than 20 minutes.

This species, typical of warm seas, **feed on sea grass beds**.

During their **long lives** (up to 80-100 years), green turtles migrate for thousands of kilometers. Once they reach breeding age, between 20 and 50 years old, females **return to the beach where they were born** in order to lay their eggs in the warm sands. It is thus particularly important to **protect nesting sites**.

The Quirimbas archipelago hosts also other species, like hawksbill, olive ridley's and the rare leatherback turtle. Sea turtles are **threatened or endangered** worldwide **due to human actions**. Coastal development, poaching and illegal trade of eggs, meat, and shells, entanglement in fishing gear are some of the main threats.

### SEA TURTLES' ROLE IN OCEAN ECOSYSTEMS

- They **maintain sea grass beds**. By grazing, they help to preserve seagrass blades, which are a fundamental feeding and developmental grounds for many species of fish, shellfish and crustaceans.
- They **improve the diversity** of the reef community stabilizing the presence of sponges and jellyfish species in coral reefs.
- They **provide nutrients** to beach and dune ecosystems. Unhatched nests, eggs and trapped hatchlings on the beaches are very good sources of nutrients for the dune vegetation.
- They are an **important part of the food web**: sea turtles produce large numbers of offspring benefitted by birds, crabs and all sorts of fish.

