

# Tides of time



Sundarbans National Park, a Unesco World Heritage site in India, is home to the Bengal tiger and the world's largest mangrove forest, both of which are threatened



A Rhesus Macaque feeding on lotus.

**SPOTLIGHT** | Botanical treasure house

## Sundarbans National Park in India: Protecting the mangroves

Called a "botanical treasure house" and known to every Indian schoolchild, the rich world that is the Sundarbans covers 10,000 square kilometers (3,900 square miles) of land and water — nearly 6,000 in India and the rest in Bangladesh. It is part of the planet's largest delta (80,000 square kilometers), formed by three rivers: the Ganges, the Brahmaputra and the Meghna, which converge on the Bay of Bengal. The flat landscape is crisscrossed by a mesh of interconnecting waterways, some more than a mile wide and opening to the sea. This makes it a home for aquatic mammals such as dolphins, porpoises and terrapins, who live alongside many waterbirds, including kingfishers, osprey, terns and owls. The area is particularly important for storks and other waders.

First made a national park in 1984, India's Sundarbans National Park was inscribed on the World Heritage List in 1987. Inside the park are three wildlife sanctuaries dating from 1977. These sites, which protect threatened reptiles like crocodiles and pythons, were restructured as a Unesco Biosphere Reserve in 2001 and grouped together, as they all share what is the Sundarbans' most important feature: its mangrove ecosystem. These trees drive their thick roots deep into the mud along the coastlines in the tropics and subtropics. They are unique in that they can grow in salt-

water, providing habitat for fish and serving as nurseries for many invertebrate marine species. Mangrove ecosystems provide habitat for nearly all forms of life, aquatic and terrestrial, making them a particularly vital element in the Sundarbans.

Occupying most of the delta, the Sundarbans is by far the largest mangrove forest in the world. The Everglades in Florida, with less than 100,000 hectares (247,000 acres), come a distant second. The Sundarbans is home to more than 40 species of mangrove, which makes it of particular interest to botanists.

Today, these mangrove forests are threatened, first of all by climate change. Should global warming alter the sea level, these mangrove forests would face serious consequences. About the Sundarbans park on the Bangladeshi side, Unesco Program Specialist Marc Patry says: "Any marked rise would drown out the tightly circumscribed protected area in which the mangroves are located." One estimate says that two-thirds of the Sundarbans, which sits at sea level, would vanish following a 45-centimeter (18-inch) sea-level rise.

The mangroves are also threatened by people. Though fish is the dietary staple of the local Bengali farmers, they are also attracted by the riches of the mangrove forest; numerous cases of woodcutting, particu-

larly for firewood, occur each year. This region of India, southwest of Calcutta, is one of the world's most densely populated, and the local communities use every square meter of the land and live in a constant search for resources. World Heritage status has facilitated the work of the Indian authorities who protect the Sundarbans, helping them make the case among their own people and allowing them to inaugurate, for example, special mobile patrol squads and a network of watchtowers, and

### The shrinking forest forces Bengal tigers into populated areas

even undercover informers, to try and stop destruction of the forest. Nevertheless, the threat remains.

The Sundarbans is also the only mangrove ecosystem inhabited by tigers. Sundarbans National Park is a 133,000-hectare core area within a 250,000-hectare tiger reserve, which, until recently, has been spacious enough to maintain India's largest population of threatened Bengal tigers. No other protected area on earth contains more than 100 of these felines. But as the forest shrinks under clandestine logging, the tigers are forced to roam elsewhere. This brings them in contact with people, with the result that an average of 45 humans are killed yearly by the animals.

Finally, the disappearance of the mangroves would remove a crucial line of defense against monsoons. Without the trees,

the low-lying surrounding land would be left open to the ruinous effects of the hurricane-force winds that regularly lash the region.

Ten percent of the world's tropical hurricanes occur in the Bengal basin, according to the 1987 International Union for Conservation of Nature report on the Sundarbans nomination for World Heritage. "Further destruction of the mangroves would diminish their critical role as natural buffers against cyclones," the report concluded. "Any harm to the mangrove forests will leave India and Bangladesh vulnerable to the effects of disturbances in the Bay of Bengal."

Cyclone Sidr, which pummeled Sundarbans in 2007, illustrates the havoc cyclones can cause, but also shows what Unesco can do to help. Unesco's Patry was in the Sundarbans on the Bangladeshi side when the cyclone hit. "It came ripping through with high-category winds, causing tremendous damage to the ecosystem, but also to the park infrastructure," he says. "I was

amazed at the total destruction of the forest. There was not one leaf left on any of the trees. In the tropics, this is very rare."

The Sundarbans' employees live in remote field stations whose accommodations, boats, jetties and other amenities were all wiped out by Sidr. Unesco responded with an onsite mission that evaluated the extent of the devastation and helped the site's management re-establish its presence in the field. For the damage to the park on the Bangladeshi side, Unesco allocated \$75,000 — augmented by another \$30,000 raised through a direct appeal campaign — used to repair the field stations deemed most strategic in assuring the presence of park rangers in Sundarbans' remotest areas. Says Patry: "The World Heritage Centre is there at all times to help assess the damage and restore any of the lost infrastructure. Here we were able to help the country put together and finance a plan to rebuild what was lost." J.J.

### Tourism program

Millions of visitors to the 900 World Heritage sites have made tourism management an important issue, but site personnel and local community members sometimes lack experience in managing the tourist flow. The World Heritage Tourism Program develops policies, processes and practical manuals for site directors and state signatories to the World Heritage Convention on how to manage tourism on World Heritage properties, advising them on how to retain World Heritage values and fight threats. The program cooperates with Unesco partners, such as its advisory bodies, and works with the tourism industry to maximize tourism's benefits and minimize its adverse effects on World Heritage sites. Visit <http://whc.unesco.org> J.J.

**EXPLORING** | A secluded sanctuary

## From Bengal tigers to cruises through the waterways

When one finally sees a Bengal tiger in the wild, the most surprising thing is not its tremendous size or glowing golden eyes, but rather how well it blends into the Indian underbrush. No wonder its prey doesn't have a chance — and neither would a human on foot. Fortunately for tourists, the best and often the only way to explore India's sprawling Sundarbans National Park is by boat, cruising the region's innumerable waterways and scanning the shoreline with binoculars.

The secluded Sundarbans is one of India's least-known yet most rewarding nature reserves, and not just because of the tigers. The park's 54 islands are part of the world's largest estuarine mangrove forest, an emerald-green labyrinth that long ago formed at the spot where rivers flow into the Bay of Bengal. In addition to a large tiger population, the reserve harbors other Indian species, including saltwater crocodiles, king cobras, chital deer, river dolphins and several hundred different types of bird.

The park, located a few hours southeast of Calcutta, is best visited during the cooler, drier winter months (December to February). Visitors stay at wildlife lodges in the biosphere buffer zone around the park. The lodges offer guided visits to nearby villages to learn about how the local Bengalis have coexisted with the tigers and other wildlife for thousands of years. They can also arrange guided boat trips into the heart of the park. Alternatively, visitors can book passage aboard live-aboard boats like the M.V. Paramhansa, which explore the delta region on multi-day trips from Calcutta. Cruise passengers in the Sundarbans spend their days visiting wildlife projects and local fishing villages, transferring to smaller boats for

journeys up narrow mangrove creeks and calling on the 300-year-old Hindu temple on Netidhopani Island. There are also short shore excursions and nature walks, but given the difficult terrain, a boat is the best way to view nature in the Sundarbans.

While a cruise through the park tops every visitor's list, there are plenty of other wildlife attractions in the surrounding buffer zone, most of them also reached by boat. Sajnekhali Island is home to a renowned bird sanctuary and a mangrove interpretation center. Southeast of the park is the Bhagatpur Crocodile Project. The forest service watch-towers at Dobanke and Sudhan-yakhali are good for spotting animals.

Despite all the other animals and natural attractions in the delta, tigers remain the major draw. "The Sundarbans are reckoned to contain the greatest amount of tigers left in India," says Julian Matthews of Travel Operators for Tigers, a nonprofit dedicated to

responsible and sustainable wildlife tourism. Sundarbans tigers are also considered India's most dangerous. In recent times, the forest service has greatly reduced the threat of predation on humans, but the legend of the Bengal tigers continues. In "The Man-Eating Tigers of the Sundarbans," Sy Montgomery writes: "So much about this unusual forest and its fierce tigers remains mysterious. Do these tigers really have powers that other tigers don't?" J.J.



Bengal tigers are the park's major tourist draw.

### Reverso: Origins of a legend

About 80 years ago, a Swiss merchant traveling in India befriended some English polo players, who asked him if it would be possible to create a wristwatch they could wear during matches without risking damage to it. When the merchant returned to Switzerland, he went to his friend, Jacques-David LeCoultre, head of the watchmaking company Jaeger-LeCoultre. They started working on a way to protect the watch's crystal, and the Reverso was born. Its swivel-case design allowed players to turn the dial around, so that the watch's steel backing, not its delicate glass, was exposed. Introduced in 1931, the Reverso was an immediate success with both polo enthusiasts and all those seeking a special timepiece. Ever since then, the Reverso has maintained its position as one of Jaeger-LeCoultre's flagship products. In 2006, for the Reverso's 75th anniversary, Jaeger-LeCoultre introduced the Reverso Squadra, a sporty, updated model of the original, now considered a classic. Last year's Grande Reverso, the latest in the line, offers a new movement and more high-frequency functions for even greater precision. It comes in two versions: the Grande Reverso 986 Duodate, with two time zones, and the Grande Reverso 976. J.J.



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