

PRESENTS

INLAND MANGROVES

SAN PEDRO MÁRTIR RIVER, TABASCO

Mangrove forests are ecosystems that thrive in areas where fresh water and sea water mix; however, there are cases documented where these forests develop despite having an intermittent connection with the sea or even lacking one altogether. In these cases, these forests are commonly known as "inland mangroves". In Tabasco, between 120-170 km inland along the San Pedro Mártir River there is a small population of red mangrove (*Rhizophora mangle*) that, together with another 112 plant species also considered coastal species make up a relict ecosystem from the last interglacial period (130,000-115,000 years BP).

DATA
SHEET



Ecosystem:

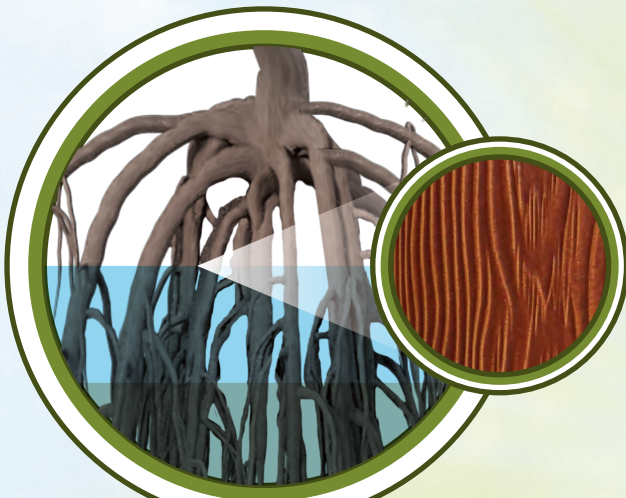
Inland mangrove

Altitude:

Between 17 and 45 meters above sea level

Type of vegetation:

Red mangrove (*Rhizophora mangle*), evergreen forest, marsh, populus and tulare



The red mangrove gets its name from the color of its wood. This colonizing species has a fast growing rate, which allows it to establish itself in unstable substrates.

BIODIVERSITY

	FAMILIES	GENERA	SPECIES
FISH	15	25	33
PLANTS	87	249	358
MOLUSKS	10	17	30
ARTHROPODS	7	13	13
ANNELIDS	3	3	3

EVIDENCE OF GLOBAL CLIMATE CHANGE

126 thousand years ago, sea level rose between six and nine meters, reaching Cascadas de Reforma in Balancán municipality allowing a small population of red mangroves to colonize. As sea level receded, this mangrove forest became surrounded by terrestrial vegetation.

2-25 meters

Range of height these interior mangroves can reach.

DISTRIBUTION

170 km Location of El Cacahuete lagoon in Tenosique, at 45 meters above sea level and the farthest point from the coast where the inland mangrove was recorded.

115 km Cascadas de Reforma Ecological Reserve, 17 meters above sea level, is the closest site to the coast where inland mangrove has been recorded.

RANGE AND COVERAGE

Along the SPMR, there are solitary mangrove trees and small groups of 3 to 5 individuals.

Most tree groups along the river cover between 100 and 300 m². In the El Cacahuete Lagoon, these dense forests can cover 3 ha.

5,000 ha of the SPMR, from the Usumacinta river mouth to Provincia in Balancán, are located within the Cascadas de Reforma Ecological Reserve.



Connectivity: The San Pedro River creates a large biological corridor between the Cascadas de Reforma Ecological Lagoon and the Cañón del Usumacinta Flora and Fauna Protection Area.

Nesting area: The riparian vegetation along the San Pedro Mártir River provides nesting habitat for local and migratory bird species. Sites like El Santuario de las Garzas and the small islands between San Pedro and Provincia are especially important.

TROPICAL FOREST

ECOSYSTEM SERVICES

Water capture, filter and purification:

The SPMR receives water from the higher plains of the Tenosique mountains and Guatemala. It is considered the cleanest river of the southeast.

Temperature regulation:

It helps regulate water temperature through the shade offered by the trees.

Erosion protection:

Red mangrove roots help retain soils and prevents ground loss and deterioration.

Refuge and nursery for species:

The mangrove's roots offer refuge to species of fish like carp, bass, and fresh-water turtles during their early life stage.

28 species

living along the SPMR are included in the Mexico's protected species list (NOM-059-SEMARNAT).

7 PLANTS	6 MAMMALS	9 BIRDS	4 REPTILES	2 FISHES
----------	-----------	---------	------------	----------

Microhabitats:

Epiphyte plants that develop on the mangrove's trunks and branches provide a microhabitat for arthropods, reptiles and amphibians.

The "ant gardens" are symbiotic associations between ants and plants.

CONSERVATION AND RESEARCH TIMELINE



1942: Lundell's first report of the region's flora, including the presence of mangroves along the SPMR is published.



1972: Development of the Plan Balancán-Tenosique results in the deforestation of most forests along the SPMR.



2002: The Cascadas de Reforma Ecological Reserve is implemented to protect an estimated 5,000 ha of the SPMR.



2016: The Universidad Juárez Autónoma de Tabasco and the Instituto Tecnológico Superior de los Ríos establish a collaboration to study the SPMR vegetation.



2021: Scientists from the UJAT, UC Riverside, UC Los Angeles and UC San Diego publish research of the origin and presence of inland mangrove in the SPMR.



2022: The UJAT launches research projects on biodiversity associated to inland mangroves in the SPMR.



2023: Operations of the Tren Maya are scheduled to begin, which includes ecotourism projects in Provincia and San Pedro communities.

THREATS



HUMAN-CAUSED OR NATURAL WILDFIRES.



VEGETATION DEGRADATION FROM FISHING, CATTLE AND AGRICULTURAL ACTIVITIES.



POLLUTION FROM SOLID WASTES AND UNTREATED SEWER WATER ALTER THE ECOSYSTEM'S ECOLOGICAL BALANCE.



KNOWLEDGE GAPS IN PLANT AND ANIMAL SPECIES RECORDS.

INFORMATION BY:
Biodiversidad y conservación de los manglares interiores del río San Pedro Mártir como elementos para desarrollo sostenible en Balancán y Tenosique, Tabasco, México.

SOURCES:
Burelo-Ramos C., et. al. (2021). Relict inland mangrove ecosystem reveals Last Interglacial sea levels. *Proceedings of the National Academy of Sciences*, 118, e2024518118. <https://doi.org/10.1073/pnas.2024518118>.

Castillo-Domínguez A., et. al. (2015). Composición y diversidad de peces del río San Pedro, Balancán, Tabasco, México. *Hidrobiología*, 75 (2), 285-292.

Estrella-Loreto F. (2011). Indicadores ecológicos de la zona riparia del río San Pedro, Tabasco, México. Tesis de Maestría. Colegio de la Frontera Sur (ECOSUR), 131 pp.

Lundell C.L. (1942). Flora of Eastern Tabasco and adjacent Mexican areas. *Contr. Univ. Michigan. Herb.*, 85: 1-74.

Periodico Oficial del Estado (2002). Acuerdo por el cual se declara Área Natural Protegida de jurisdicción estatal, clasificada como Reserva Ecológica, "Cascadas de Reforma" en el Municipio de Balancán, Tabasco. Gobierno del Estado de Tabasco. 23 de noviembre de 2002. Disponible en: <https://tabasco.gob.mx/sites/default/files/users/ibtabasco/DRE-CR-Reserva%20Ecol%3B%3Bcar%20Cascadas%20de%20Reforma.pdf>