

THE LOWER WATERSHED OF THE SAN PEDRO MEZQUITAL

The Rio San Pedro Mezquital is the seventh largest river in Mexico in terms of flow and the last one that crosses the Sierra Madre Occidental free of dams. Its watershed is an immense territory of nearly three million hectares that connects the Chihuahuan Desert to the Gulf of California. It has its source in the mountains of Durango, descends to the Mexican altiplano, crosses the mountains through the Mezquital Canyon and flows across the coastal alluvial plains ending its course in the Pacific Ocean.

Along its 540-kilometer trajectory, many tributaries join the main channel, which naturally increases its flow volume and enriches its waters with nutrient-loaded sediments. The San Pedro Mezquital is thus the main contributor of freshwater and nutrients for the Marismas Nacionales, an enormous system of wetlands along the coast between Nayarit and Sinaloa. Its 115,000 hectares of mangroves, the most extensive of the Mexican Pacific, represents between 15-20% of the total area of this valuable ecosystem in Mexico. This is a region of great biological richness and enormous productivity that sustains numerous human settlements.

For that reason, these wetlands have been recognized with conservation statuses such as Biosphere Reserve of the Red de Áreas Naturales Protegidas de México and Wetland of International Importance under the Ramsar Convention.



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LIVES LINKED TO THE FLOODS



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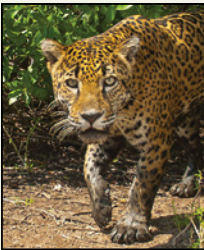
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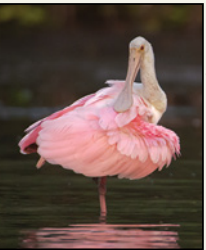
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The lower watershed of the San Pedro Mezquital accommodates great natural richness and a valuable economic, cultural and social fabric. The farmer that takes advantage of the fertile soil that remains when the flood waters recede; the girl that lives on the banks of the river and knows and respects its pulses; the oyster farmer awaiting floods to be able to cultivate his strings of oysters; or the panga boat driver that organizes visits to the canals of the wetland during the wet season are only some of the thousands of lives that pass by according to the pulse of the floods of the San Pedro Mezquital. A river is and is worth much more than the water that it carries, in the same way that a forest is much more than the wood that it produces. Let's keep the San Pedro Mezquital free and flowing to ensure a great source of life and richness for the region.



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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La Fundación Gonzalo Río Arronte I.A.P. as part of its social objectives, makes donations in money or in kind to institutions and Health Centers, as well as sponsors and carries out projects of social benefit focused on the conservation of water resources. The FGRA and WWF signed an alliance to foster the Program "Manejo Integrado de Cuencas Hidrográficas: Desarrollo de Nuevos Modelos en México" in the Rio Conchos in Chihuahua; the hydrological complex Copalita-Zimatán-Huatulco in Oaxaca; and the watershed of the Rio San Pedro Mezquital in Durango, Nayarit and Zacatecas. This project is carried out under the sponsorship of the Fundación Gonzalo Río Arronte I.A.P. www.fgra.org.mx

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THE FLOODS OF THE RIO SAN PEDRO MEZQUITAL SOURCE OF LIFE AND WEALTH

SEASONAL FLOODING

When a river flows naturally, it is a constantly changing ecosystem, and its quantity of water varies throughout the year —with maximums in the rainy season and minimums when the water recedes— and between wet years and dry years. This variation is the key to the life of the river. If the changes in the natural flow are controlled or eliminated by artificial barriers, the extraordinary mechanism of self-regulation of the floods is negated.

Every year during the rainy season, the San Pedro Mezquital floods naturally with varying intensity, and the water extends to the flood plains formed hundreds of thousands of years ago from the sediments of the river.

This phenomenon allows the river and its associated ecosystems to maintain their natural cycles. In this way, the annual floods trigger physical and chemical processes in the channel, the cultivated lands and the wetlands, which contribute to the biological richness of the lower watershed of the San Pedro Mezquital and to the well-being of its inhabitants.

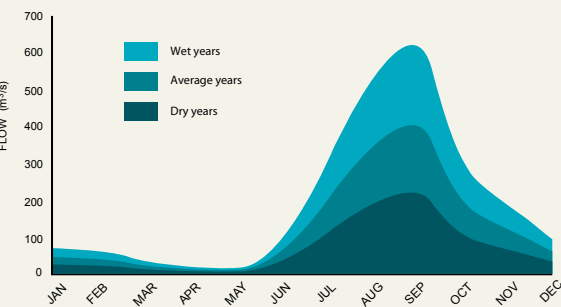


Figure 1 Natural flow of the Rio San Pedro Mezquital in Ruiz, Nayarit showing its natural seasonal variation according to the conditions of rainy, average and dry years.



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Farmers, fishers, livestock farmers and providers of tourism services benefit from the environmental goods and services of the floods including most notably that they:

- Balance the salinity and improve the oxygenation of the water by increasing the current.
- Provide sediments and nutrients that multiply the food available for fish species and enrich the soils.
- Keep the soil moist throughout various agricultural cycles.
- Wash and desalinate the soils, taking with them the weeds and pollutants such as agrochemicals.
- Facilitate transport between the bodies of water of the Marismas Nacionales.
- Beautify the landscape and increase the biodiversity, which attracts more visitors and favors typical local gastronomy.

ECONOMIC BENEFITS OF THE FLOODS



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The lower watershed of the Rio San Pedro Mezquital is home to around 70,000 inhabitants, of which 40,000 are economically active. More than half of them perform work related to the floods, which generates an annual gross value of \$1.25 billion pesos (US\$ 89.3 million) and is the primary source of income for 12,000 families.

Fishing – More than 2,000 fishers benefit from the floods. They catch 6,000 tons of 40 species annually and hire 3,250 people each season. It has an annual production of \$150 million pesos (US\$ 10.7 million).

Agriculture and Livestock – 7,500 farmers and 1,400 livestock farmers work in the 55,000 hectares that benefit from the floods. Together they employ 7,500 people and have an annual production that exceeds one billion pesos (US\$ 71.4 million).

Tourism – Around 500 residents provide tourism services and generate employment for another 1,250 people, turning over approximately \$36 million pesos (US\$ 2.6 million) each year.

What do these numbers mean?

- More than 23,000 people have employment each year due to the floods in the lower watershed of the San Pedro Mezquital. 11,400 are producers that work permanently in an activity — an amount greater than the big companies such as the Volkswagen union with 9,000 employees, or of Mexicana de Aviación with 8,000 employees – to which must be added 12,000 seasonal workers hired each year by the producers.
- The annual gross value of agricultural production in the watershed is nearly \$1.5 billion pesos (US\$ 107.1 million). 68% of the residents of the area (merchants, day laborers and employees in industries not related to the floods) earn less than \$3,400 pesos (US\$ 243) monthly, compared to the \$11,500 pesos (US\$ 821) generated by a farmer, the \$6,250 (US\$ 446) by the fisher and the \$6,000 (US\$ 429) by the provider of tourism services. For all of them, the cost of the monthly basic food basket is \$5,600 pesos (US\$ 400). The flooding of the river allows these residents and their families to have a standard of living above the limits of food poverty.



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THE MANGROVE, A VITAL ECOSYSTEM



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Mangroves are characteristic of coastal areas and have a high ecological value because of the numerous environmental goods and services that they provide including the following:

- Absorb carbon and fix it in the soil, which helps mitigate the effects of climate change.
- Are an excellent natural water filter.
- Protect human settlements from hurricanes and other natural events.
- Retain soil and prevent erosion.
- Reduce the salinization of water and soils.
- Give beauty to the landscape.
- Contribute to the stabilization of the coastline and river banks.
- Offer shelter to numerous aquatic species such as shrimp and various types of fish which are the main resources of many inhabitants of the area.



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The mangroves of the Marismas Nacionales depend directly on the flow of water from the floods of the Rio San Pedro Mezquital. In turn, many living beings need this habitat for their survival, among them the nearly 500 vertebrates that have been documented in the entire system. Thus the biodiversity is also related to the processes derived from the floods, which then allows for the majority of the productive activities of the watershed.

The National Commission for Knowledge and Use of Biodiversity (CONABIO) estimates the value of the services that the mangroves provide to the fisheries in Mexico at \$500,000 pesos (US\$ 35,714) per hectare per year. The lower watershed of the San Pedro Mezquital alone has 37,000 hectares of this ecosystem – almost the same area as all of the mangroves in Chiapas and more than double the surface area of Ecatepec, the most populated municipality of the country – that would be valued at nearly \$18.4 billion pesos (US\$ 1.3 billion), more than all of the tomatoes produced in Mexico in 2009.