

The Pala Lagoon Case Study

The following information is adapted from a study of Pala Lagoon conducted in 1985:

Pala Lagoon is the only large, well-protected lagoon on the island of Tutuila (TOO-too-EE-luh) in American Samoa. Tutuila is mountainous and roughly circular, approximately 1 mile (1.6 km) across, and has a surface area of about 0.75 square miles (1.9 sq. km). Depths within the lagoon vary from 1-5 feet (0.3-1.5 m), depending on the tide. The lagoon entrance is approximately 1,200 feet (366 m) wide with most of it a shallow reef top-1-3 feet (0.3-0.9 m) deep. Water flows in and out through the channel with about 40 percent of the lagoon changing on each tidal cycle.

Along the eastern and northern shores of the lagoon, extensive stands of red mangle (*Rhizophora*) and oriental mangroves (*Bruguiera gymnorhiza*) cover an approximate area of 90 acres (36.5 hectares). Because the flat part of the island is the mangrove area, residents like to build homes there. The northern shore has several streams that carry freshwater into the lagoon. In addition to the larger Papa and Vaitele streams, there are a number of small streams. Except for the Papa, the streams flow only during rainy periods, which are frequent; the average yearly rainfall is nearly 200 inches (508 cm).

On the western edge of the lagoon is a public recreation and picnic area that is regularly used by large numbers of residents. Many of them use the lagoon on a daily basis for fishing, crabbing, and other food-gathering activities.

Mangrove ecosystems have been proven valuable in many ways. They help prevent shoreline erosion, settle sediment that is washed down from uphill, and break down organic material to be used in the food chain. One of the most valuable functions of the mangrove ecosystem is as a nursery and spawning area for many of the fish and invertebrates found on the reef outside the lagoon.

The residents need to realize the health risk and cost of an unhealthy lagoon. An example of the cost of an unhealthy lagoon was the 1984 outbreak of cholera in Truk (another island in American Samoa): Many lives were lost; tourism and fishing industries declined.

Another reason for special concern about Pala Lagoon is the flora found there. The mangrove forests on Tutuila are being threatened. Mangrove areas that existed in Pago, Fagatogo, Faga'alu, and Utulei have been completely eliminated. The only major mangrove forest still existing is found in Nu'uuli (Pala Lagoon), with smaller patches in Aua, Vatia Alofau, Masefau, and Leone. These

areas, however, are slowly being reduced. The mangrove and lagoon areas are presently being affected by numerous activities, including cutting and filling.

Most of the cutting and filling was to build home sites. At several sites, trash had been commonly used as the initial fill material over which layers of cinders were packed. In one particular area, behind a village called South Pacific Traders, an extensive portion of the mangrove forest and lagoon had been cut and filled by this method. Along Coconut Point, many families use the edge of the lagoon as a dump site.

The largest mangrove forest—along the main road near the intersection to Coconut Point—is slowly being cut and filled as the demand for new land and home sites increases. A large area near the end of Coconut Point has a new stand of mangroves that, if left undisturbed, should be comparable in size to the older forests in the next 20 to 30 years.

The area around the lagoon also contains two and possibly three species of plants that are considered endangered or threatened. These rare species, along with all other plants and animals in the lagoon ecosystem, maintain a balance and have a purpose, or niche. If this balance is not maintained, all plants and animals will be affected. With cooperation among and proper management by the surrounding villages and government agencies, future generations of Samoans and visitors may be able to see the natural wildlife and vegetation as it exists today in a "natural" balance.

One of these rare species is *Xylocarpus moluccensis*, known as "le'ile'i," or the puzzlenut tree. Originally recorded only along the western end of the lagoon, it was also found along the lagoon edge of Coconut Point during this study. More than a dozen trees were counted in this one area. Attempts to locate the tree along the western edge of the lagoon (Lions Park) were unsuccessful. Those trees may have been cut during one or more of the fill projects along the lagoon in the past five years. It is likely that the puzzlenut also exists along the northern shore of the lagoon.

Indiscriminate landfill and clearing for homes or plantations could be detrimental, not only to the mangroves and water quality of the lagoon, but also to the unusual and rare trees and shrubs on the island. These threatened species and the areas where they are found should be identified, and the village council and landowners should be told of their special values so they can be protected in the future.