

## Ecology of the Maya Forest and El Pilar

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El Pilar is a major Maya archeological site with components located on either side of the Belize-Guatemala frontier. This site presents an opportunity to explore the concept of "multiple use" of the natural resources of the greater Maya Forest in ways that have not yet been attempted. Success in such an endeavor would provide benefits to Mexico, Guatemala and Belize that envelop, countries with direct responsibility for management and conservation of the Maya forest, the largest contiguous tropical forest remaining in Mesoamerica.



As with many of the archeological treasures of the Maya forest, El Pilar is situated within a standing forest. On the Guatemalan side, the surrounding forest is extremely extensive. On the Belizean side, forest cover is limited to the immediate vicinity of the archeological structures themselves, and gives way quickly to an agricultural landscape in all directions east of the north-south oriented frontier of the Petén.

The site itself is protected in both countries. In Belize, El Pilar is a designated Archeological Reserve. The surrounding landscape is mostly government owned, but may be designated as a Special Development Area (SDA) . In Guatemala, El Pilar, like all such sites, is protected as "national patrimony" surrounded by forest within the Maya Biosphere Reserve under the jurisdiction of CONAP. Considering both sides of the frontier at once, it is possible to conceive of the El Pilar site in conventional park management terms as a strictly protected "nuclear zone" surrounded by a "buffer zone" to be used in ways compatible with biodiversity conservation, including research and development.

In recent years, archeological research at El Pilar has begun to illuminate the economics and organization of the ancient Maya culture and society. Although it remains clear that maize was an essential and abundant staple in the diet of the apparently very large, dense populations of people living in the Classic Period, the findings at El Pilar suggest that the

landscape of those times was by no means an endless monoculture of corn. It has become increasingly apparent that corn cultivation was balanced with extraction from natural forests and from "managed" forests for food, fibers, building materials and fuel, essential to the lives of the inhabitants of the Maya forest. Interpretation of archaeological surveys of settlements and other artifacts indicates that the Maya had developed sense of "land-use capability." It becomes an inescapable conclusion that the Maya had evolved a lore or science that took account of soil chemistry and structure, slope, drainage, micro-climate, forest composition and ecological succession. From these insights, the Maya developed complex and strategic uses of the landscape in the past.



Are there lessons to be learned from the ancient Maya that would be helpful to the survival of modern society &mdash; whether in the Maya forest, or elsewhere in the world? Did the Maya achieve a balance with nature? To answer the question is to confront a perplexing paradox. Whereas, unlike the deserts of Mesopotamia and other Mediterranean foci of civilization, the Maya forest is today one of the great forests of the Neotropics, but the Maya themselves, the civilization, does not survive.

Leaving that paradox unresolved, it is valid to consider that a sophisticated land use evolved in the ancient Maya forest that was maintained for centuries; and for centuries was able to support one of the highest densities of human populations living in the New World. The proposal suggests that there are lessons to be learned from the ancient Maya&mdash;lessons of contemporary utility to life in and around the Maya forest, and, potentially, of both academic and practical importance in understanding the evolution and decline of the Maya civilization.



**Contemporary slash and burn techniques use chainsaws as opposed to the stone tools of the past**

Research at the Belizean component of El Pilar has already established a living model of a house compound where a Maya family once thrived. With both demonstration and research values, the site will include plots of cultivation of staples like maize, but also, near the dwellings, plants of use, such as herbs, medicines and even ornamentals. On a broader scale, the model aldea or village will include a "forest garden." This term suggests that forests were manipulated on a scale that was much more extensive than the patio or immediate surroundings of a house. The maintenance of forest gardens by the Maya suggests that trees and plants with certain values were "mapped" and preserved for those uses. It suggests that forests were possibly "enriched," to use a contemporary term in forest management. Enrichment may call for the planting of desirable trees, and even deliberately removing less desirable species to give competitive advantage to the valued types. The forest garden implies rotating milpa, or slash and burn agriculture, a practice which results in a mosaic of more and less mature serial stages of forest recovery. Importantly, classical ecology states that the net productivity of young forest is greater than a mature forest. If evidence suggest that the Maya were aware of this principle of energetics, did they manage for it, consciously? Unconsciously?

## Guanacastes



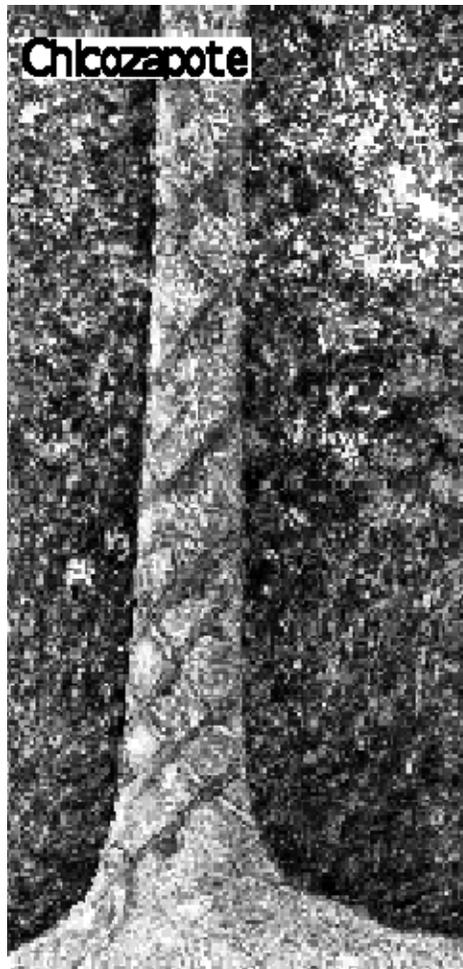
Given that large domesticated animals are unheard of in the Maya culture, it may be assumed that, beyond the essential crops of maize, beans, and squash, some fraction of the protein requirements of the human population was derived from wildlife. To the degree that this is true then, a form of wildlife management is not implausible as an admixture to the forest management suggested above. Management in this case could mean as little as official recognition of a certain forest or forest type as productive for game, and actively protected for that purpose.

The landscape suggested by current research and conjecture taken from those early studies is that the Maya forest was never a vast sea of corn and humanity, as one might expect from the alleged magnitude of the human population of the Classic Period (c. 3 million). Instead, the region was probably a mosaic of vegetative cover, ranging from open fields to closed canopy forests. In fact, assuming rotational milpa agriculture, and an abundance of fallow, recovering plots, forests, as opposed to plantations, probably dominated the scene. Such a landscape, combined with the absence of modern weapons, can easily predict the presence, even abundance, of vertebrate wildlife species that today are considered endangered or very vulnerable to extirpation.



At El Pilar, these observations and hypotheses can be tested. Owing to pre-existing management criteria for the land surrounding the archeological sites, large-scale, long-term manipulation schemes can be introduced that will allow immediate benefits to local people (harvests of forest products, for example) and invaluable experimental data.

It is proposed that an area of several thousand hectares on both sides of the frontier become incorporated as an experimental "landscape" for research into sustainable land use in the Maya forest. The area and, especially, the configuration of the proposed research polygon is not given here. Importantly, it would include substantial areas of highly "disturbed" cattle land on the Belizean side, and the rural communities found therein. Communities in Belize and Guatemala would be drawn into the experimental process, becoming integral to it.



At the risk of speculating, the genre of research expected for the area could be called landscape ecology. This would be guided by the findings and predictions of Maya archeology to form a rare interdisciplinary relationship. Initially, it would be necessary to describe the ecology of the designated polygon in some detail. Relationships between major components of the landscapes, such as seed dispersal, pollination patterns, and animal migration, would be defined. With such fundamental baseline data in place, manipulative experiments could begin. These would range from basic timber extraction, as called for in the current Guatemalan forestry concessions, to voluntary modifications to cattle grazing regimens on the Belizean side. With the scientific community present and sensitized to the strengths, weaknesses and aspirations of the local people, it is entirely appropriate to seek at El Pilar a community-scale experimental design.

Meanwhile, at the heart of the polygon would be the protected archeological sites in both countries, and development and interpretation programs are underway or contemplated for them. It is expected that gradually the educational attractions, combined with the growth of traditional archeological

research, and research into landscape ecology and land use, would bring increased international prestige to the site of El Pilar. Importantly, it will also bring new and eagerly-sought economic investments into this very impoverished region.

