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Culturally Modified Landscapes from Past to Present: Yalbac, Belize

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By

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DEDICATION

For my brothers:
Payton, Clark and Hoyt

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The trek beneath the rainforest canopy was sticky, hot, and treacherous. The Maya traveler emerged from a landscape rife with gaping holes now filled with water from the frequent downpours; it was the beginning of the rainy season. As he entered a comparatively dry patch, he regained his bearings, lost through the intensive heat and swatting of persistent swarms of mosquitoes, and noticed the stands of gumbolimbo trees lining a pathway to nearby house mounds. This stand represented the most concentrated group of this species yet observed on his trek, and they were clustered around a group of two house mounds located nearly one kilometer from the Maya center of Yalbac. This arrangement of trees appeared to have remained hidden from observers for centuries, yet their proximity to ancient houses indicated their importance to the people who once lived here. Living in the midst of poisonwood, whose resin burns when in contact with skin, it would have been advantageous to propagate gumbolimbo, the natural antidote for this effect, close to their habitation sites. These and other plants likely reflect ancient imprints that the Maya left on their landscape.

In fact, Gómez-Pompa (1987) hypothesized that the descendant forest present on the landscape today echoes the modifications that the Classic Maya made to the forest, who treated it as a garden consisting of domesticated plant species (maize, beans, squash), and various native plants (copal, *ramón,* wild plum, palm). While research has been conducted using paleoethnobotany to assess past lifeways (Pope et al. 2001; Lentz et al. 1996; Lentz et al. 2005; Morehart et al. 2005), modern home gardens (Agelet et al. 2000; Barrera-Bassols and Toledo 2005; Nations and Nigh 1980) and current floral composition near Classic sites, little research has been conducted on the correlation between current and past plant uses and Classic Maya landscape management (Ross 2011; Ross and Rangel 2011). My research examines how the Maya landscape changed over time, how those changes are still observed today, and how the Classic Maya (A.D. 250-900) descendants continue to maintain these practices. I am specifically interested in the construction of home gardens and the relationship between this constructed landscape and the floral composition present in the forest today. This research will document the plight of the Maya landscape and the possibilities for their modification as a blueprint for current forest management.

Results of this pilot study will provide a preliminary understanding of Maya utilization of native plants in combination with domesticated ones. This research is also useful for sustainability studies, as it will indicate if the Classic Maya landscape modification method is applicable to current conservation research (Bourbonnais-Spear et al. 2006; Nations and Nigh 1980; Nigh 2008). If the Maya method of incorporating native and domesticated species into gardens surrounding their habitation sites can be applied to current tropical landscapes (De Clerck and Negreros-Castillo 2000; Nations and Nigh 1980), and possibly other areas of the world, then this research could serve as a basis for future investigations into sustainability methods. Sustainability research is especially applicable in the tropics, where botanical biodiversity is high (Bourbonnais-Spear et al. 2006), but where deforestation continues to be an escalating problem (Benhin 2006).

To address these issues, I conducted a pilot study by collecting botanical specimens near and distant from Maya sites from May-June 2010 in Belize. I collected over 200 different plant species from six locations within the first kilometer (400 meters wide) of an 11 km transect near the center of Yalbac (Figure 1) surveyed by Andrew Kinkella (2009) (Figure 2).

Collection sites were located near temple mounds, in the forest, around habitation sites close to Yalbac, and habitation sites distant from this center. The preliminary results indicate that useful plant species are more frequently found near habitation sites versus the uninhabited forest.

I first present a brief background on Classic Maya landscape modification and then outline two countering hypotheses concerning the impacts of these modifications, highlighting evidence for Classic Maya environmental guardianship. Following this analysis, I explore how soil composition impacted the Maya environmental footprint. Next, I present the pilot study conducted in summer of 2010 in Yalbac, highlighting key findings and results. I conclude with a discussion of the merits of this research, including the implications that it could have for conservation in the tropics, archaeological research in the Maya region, and modern Maya cultural preservation.

Ancient Maya Forest Management

During the Classic Period (A.D. 250-900), the Maya lived in portions of present day Mexico, El Salvador, Honduras, Guatemala, and Belize. The Maya are noted for pyramid temples, whose associated centers varied in size depending on availability of resources, water systems, political economy, territory, integrative strategies, and other unifying factors (Adams and Jones 1981; Lucero 2002, 2006, 2007). People migrated and maintained loyalty to

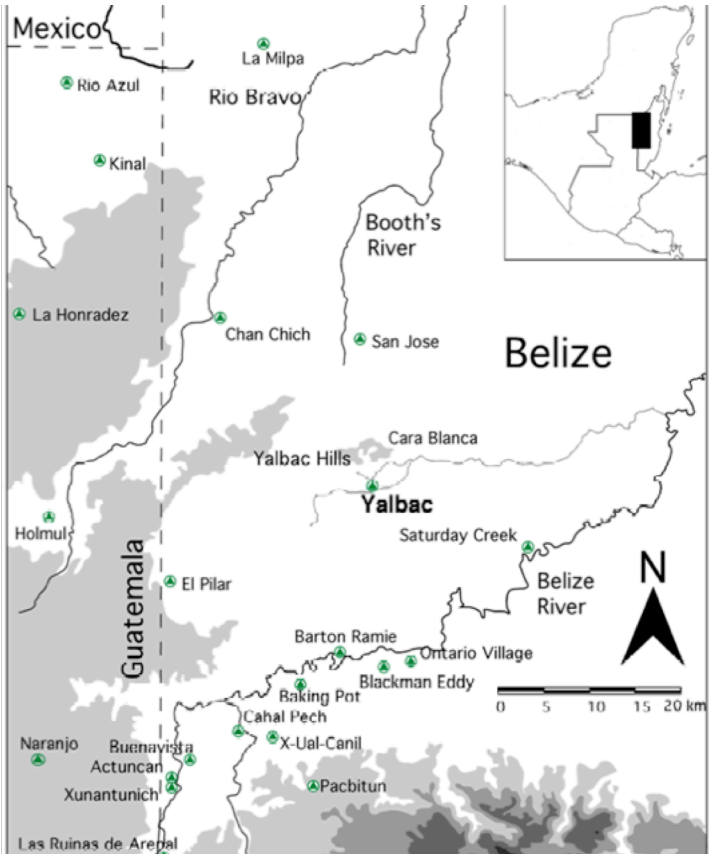


Figure 1: Maya area with sites mentioned in text
Courtesy of VOPA

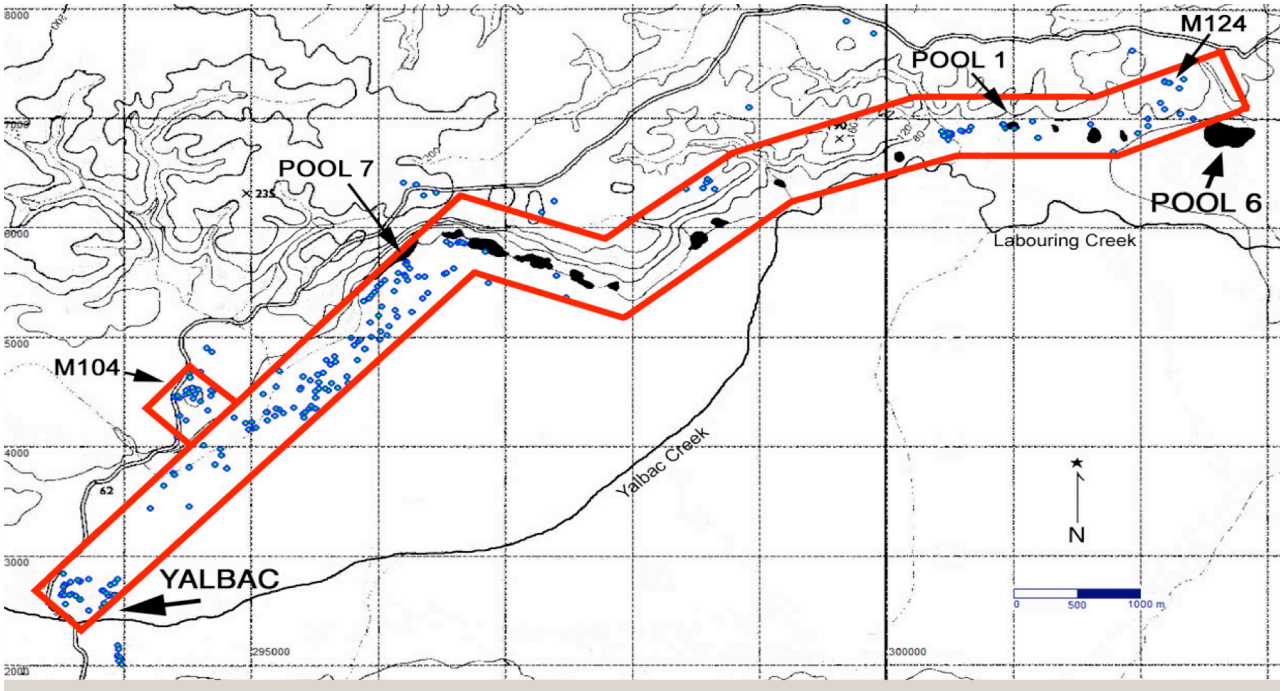


Figure 2: 11 km Yalbac Transect (Kinkella 2009: Figure 4.12). Circles represent settlement; solid black areas represent pools; and the double-line north of the transect represent an all-weather road.

centers based on the ruler's ability to supply and maintain water resources (Davis-Salazar 2003; Lucero 1999), among other necessities, such as trade monopolies and prestige goods (Rathje 1971; Sharer and Traxler 2006). The largest centers emerged in regions with only seasonal water sources, without lakes or rivers, or those with an overabundance of water (Lucero 2003, 2006). Smaller centers emerged in regions with a constant, viable water supply. During the dry season, farmers returned to centers to supply manual labor for constructing temples. Temples provided an arena for rulers to demonstrate their ability to communicate with the gods through rituals, which further drew commoners to centers.

The building and maintenance of temples were not the only interaction that Classic Maya had with their environment; they also utilized their landscape in a sustainable manner for over 5,000 years and up through the present. The Maya modified their landscape and managed certain native plants (Ford and Nigh 2009; Lentz et al. 1996; Rico-Gray and Garcia-Franco 1991). The Maya were familiar with the landscape in which they lived and farmed, erecting terraces, raised fields and other agricultural features (Beach et al. 2002; Beach et al. 2006; Fedick 2010; Gómez-Pompa 1987; Puleston 1977), which supported the growing Maya population (Ford and Nigh 2009). These innovative agricultural modifications were impressive, but their knowledge and use of wild plants echoed the knowledge passed down from previous generations as they continued to harvest native plants as their ancestors had done. They spared these native plants, propagated them vegetatively and planted their seeds. Their management of native trees and plants created an environment that was fruitful, shady, and allowed for native species to persist (Fedick and Morrison 2004; Rico-Gray and Garcia-Franco 1991). The plants present within Maya sites today can reflect landscape modifications performed in the past (Ford 2008; Ford and Emery 2008; Ford and Nigh 2009; Gómez-Pompa 1987; Steinberg 2005; Wernecke 2008) and how those changes have persisted through time.

Landscape modifications can be isolated by examining modern floral patterns within archaeological sites in relation to surrounding areas without sites. In contrast to modern deforestation and monocropping, the Maya method of native vegetation conservation coupled with the introduction of domesticated species created a unique pattern. This patterning resulted in a descendant forest echoing its ancestral condition, and the modern landscape can be examined as a forest with a long history of human interaction (Fedick 2010; Gómez-Pompa 1987; Rico-Gray and Chemás 1991; Rico-Gray and Garcia-Franco 1991).

Classic Maya "forest gardens" contained domesticates and wild plants (Colunga-GarcíaMarín and Zizumbo-Villarreal 2004; Gillespie et al. 2004; Gómez-Pompa 1987; Ford 2008; Rico-Gray and Garcia-Franco 1991). One example of a key subsistence plant that maintained its use throughout Maya history is *ramón*. *Brosimum alicastrum* (*ramón*; Collection #2)[1] is a native Maya tree (Puleston 1982) whose nuts were easily stored (Turner and Miksicek 1984) and used as a staple crop before the introduction of maize (Gillespie et al. 2004). This tree frequently occurs near Classic Maya sites, including Yalbac. This abundance of *ramón* created an environment that was ill suited to maize growth, which needs sunlight to flourish (Puleston 1982). Since the caloric intake of *ramón* is high and the labor input is low, the tree could have had continued to be a staple in the Classic Maya diet despite the domestication of maize. One supposition is that the Maya were domesticating and maintaining this native tree around their centers (Bronson 1966; Turner and Miksicek 1984). Around Tikal, Guatemala, *ramón* trees, which thrive in shady conditions (Peters 1983), dominate the landscape. Unlike natural *ramón* groves, whose trees produce fruit once annually, *ramón* around Tikal render fruit twice annually (Peters 1983, 2000). Further, forest *ramón* are

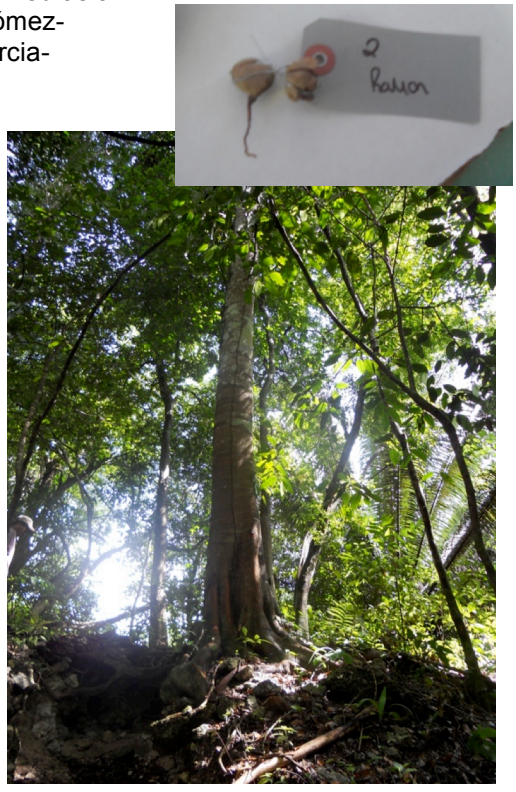


Figure 3: Ramón tree growing on Mound 2D, (top) ramón nuts

[1] See Appendices for full collection tables.

dioecious, with male and female flowers occurring on different trees. In contrast, the *ramón* around Tikal are monoecious, with the male and female flowers on the same tree (Peters 2000). In the natural groves only the female trees produce fruit, while the male trees solely pollinate; clearly the Maya created a new form of *ramón* where a tree of both sexes can bear fruit and pollinate. This example of a modification represents only one example of many native tree and herb species modified by the Classic Maya.

After abandonment in certain areas of the southern lowlands in the A.D. 900s, remnant gardens directed the forest composition and these botanical conservation systems still dictate the composition of the current floral communities. The research in changes to flora over time guided by the Maya has relatively recent roots (Fedick 2010; Ford 2008; Freidel 1992; Gòmez-Pompa 1987; Lentz et al. 2005; Lentz et al. 1996; Morehart et al. 2005; Rico-Gray and Chemás 1991; Pope et al. 2001), and therefore provides fertile grounds for information. Researching garden structures from the past to the present aids in a fuller understanding of how the Classic Maya interacted with their landscape (Ford 2008; Rico-Gray and Chemás 1991), as well as providing information on its sustainability.

The Maya abandoned the southern lowlands between A.D. 850-950 likely due to a series of intensive droughts (Hammond 2007; Medina-Elizalde et al. 2010). The imbalance of wet and dry seasons caused farmers to abandon the rulers and their centers because of the inability of the rulers to provide them with water through rituals or other means (Lucero 2002). Sediment core analysis in the Maya area has detected changes in sulfur and oxygen isotopes corresponding to a drier climates and the abandonment of Maya centers (Curtis et al. 1996). The Preclassic Maya period is marked by a wetter environment, but with the rise of the Maya society the climate steadily got drier. The collapse of the Maya political system is marked by a distinctly arid environment (Curtis et al. 1996; Hodell et al. 1995). Additional analyses involving stalagmite (Medina-Elizalde et al. 2010) and tree-ring (Stahle et al. 2011) analysis also indicate Terminal Classic droughts.

The Maya agricultural system, still evident on the landscape today, can provide clues to their past lifeway that remain undetected by a mere perusal of temple walls. It can also furnish key information about the abandonment of the Classic Maya centers, whether by human means or not. My research examines the links between current flora and past subsistence and management practices, as well as aiding assessment of its use in sustaining or draining the Maya landscape.

Exploring Forest Management

In addition to the drought, some researchers posit that the Maya turned from their sustainable system of preserving the native plants to a monocropping system (Atran 1993; Turner 1974), and that anthropogenic interactions led to deforestation and vegetation changes evident in the Late Classic (Estrada-Belli and Wahl 2010; Mueller et al. 2010). These changes in agricultural techniques are indicated by a rise in silica and phosphorus sediments in Lake Petén Itzá, in the northern Guatemala region of the Maya Lowlands (Mueller et al. 2010). Increasing erosion into this lake, taking with it valuable phosphorus, also indicates that deforestation was occurring, which further weakened the Maya ecosystem. Some have argued that environmental and ecological degradation, caused by improper agricultural techniques and the destruction of trees for production of limestone plaster, were driving factors in the eventual downfall of centers (Beach and Dunning 2010; Pohl et al. 1996; Wahl et al. 2006; Webster et al. 2007). However, others have argued that the Maya agricultural system was sustainable and did not involve monocropping or environmentally destructive processes (Fedick 2010; Ford and Nigh 2009; McNeil et al. 2010; Wernecke 2008). In fact, some suggest that erosion was primarily a problem in the Preclassic (2000 B.C.– A.D. 250), which the Classic Maya remedied through a shift to sustainable agricultural practices (Anselmetti et al. 2007; Beach et al. 2006). While droughts have plagued the Maya area since the Preclassic Period (Dunning and Beach 2010), the Late Classic centers were abandoned most likely from a combination of intensified droughts, the resulting impoverished landscape and increased warfare (Dunning and Beach 2010; Estrada-Belli and Wahl 2010; Lucero 2002; Medina-Elizalde et al. 2010).

One primary argument in favor of Maya deforestation was their lime production. Lime was used in many traditional Maya practices, including surface treatment of pottery, as medicines, nixtamalization of maize, preservation of food, pest control, purification of stored water, and fish stupefaction (Schreiner 1994). However, the primary use for lime was in wall plaster and pavement for the temples and courtyards of Maya centers. To create lime, limestone has to be burnt at temperatures of 800-900°C (1472-1652°F); the limestone production process creates quicklime (calcium oxide) and releases carbon

dioxide (Schreiner 1994). The fuel requirement to create enough lime to coat one temple at El Mirador (El Tigre pyramid, the second largest at the site) was the equivalent of the annual returns of 16.3 km (1,630 ha) of forest. Extending the estimate to the other cities and connecting causeways in the entire Mirador Basin, a forest of 19,590 km (1,956,000 ha) needs to be harvested annually (Schreiner 1994). However, the "destructive" lime technology has proved to be more sophisticated and less environmentally damaging than previously believed (Wernecke 2008). One confounding observation is that lime is only one ingredient to the plaster; binders and aggregates would have decreased the need for pure lime (Wernecke 2008). Also, through the effects of time on degrading lime, it is impossible to differentiate between burnt-lime and calcium carbonate substitutes (i.e. *sascab*). *Sascab* is a soft limestone conglomerate, or calcareous sand, that was used in Maya monumental architecture construction as a substitute for burned lime (Littmann 1958). *Sascab* is easily compacted and was used for fill, plaster, mortar and lime-*sascab* mixtures (Erasmus 1965; Folan 1978; Littmann 1958, 1962). This reddish-yellow to white unconsolidated limestone forms a clay-like paste when wet, and hardens into a cement-like material when dry (Rapp 2009; Wernecke 2008). These two considerations have made the question of deforestation into a hotly contested debate. This debate is one aspect of the competing hypotheses regarding Maya environmental effects: (1) they degraded their landscape, (2) they sustained it.

The first hypothesis assumes that the Maya changed their environment resulting in erosion. The second assumes that the Maya conserved the forest by keeping key components of the landscape, such as native trees and herbs, intact while incorporating domesticates, thus favoring a modern landscape not much changed from the ancient one. The first hypothesis would lead us to assume that Maya landscape modifications not only were detrimental to the environment, but that they ultimately led to the collapse of the Maya society. Thus, their efforts at environmental changes need only to be examined as relics of cultures past with no positive contributions for present conservatory goals.

In contrast, the second hypothesis assumes that forest management allowed the forest to regenerate in ways that were beneficial to the environment and conserved the ancient floral populations long after the area was abandoned. If this was the case, Maya conservation attempts, which preserved ancient flora and allowed a natural turning of the landscape from field back to forest, can aid scientists seeking to halt the erosion of the tropical rainforests, aid botanists attempting to understand the history of forests, and aid archaeologists searching for cultural attributes of the forests surrounding ancient habitation sites.

To assess if this were the case, the Maya landscape management process needs to be examined as a blueprint for modern tropical conservation efforts. My research seeks to uncover what the impacts and results of the Classic Maya landscape changes are by examining the merits and downfalls of both hypotheses. There is growing support for the second hypothesis, indicating a sustainable agricultural practice that withstood societal and environmental stress. This model poses implications for modern sustainability research, providing a usable method for conserving the tropical forest while propagating useful plants. The Classic Maya agricultural system, no matter how ingeniously devised, still required good topsoil to produce crops, which further bears on forest management strategy.

Soil Classes

Scott Fedick developed a soil classification system whereby he classified soil based on capability of supporting crops and suitability for them. Fedick assesses three different factors: soil, parent materials, and topography finding correlations between soil types and Maya settlement density (Fedick 1995, 1996). To further distinguish soil types, Fedick divided them into capability classes based on effective root zone, susceptibility to erosion, workability, drainage, and inherent fertility. These factors were combined to create five capability classes: Classes I (alluvium) and II were more suitable for farming; while Class III had fairly poor soils and was used infrequently. Classes IV and V soil were strictly non-farmable lands.

The Maya were familiar with the soils and used their own classification system (Barrera-Bassols et al. 2006). Current Maya soil classification, as demonstrated through ethnographic analysis, involves texture, color, consistence and stoniness (Barrera-Bassols and Toledo 2005; Rainey 2005; Wells and Mihok 2010). Soil was also classified according to the context of potential use, including agricultural potential, hazards, etc.

Fedick found that some people lived in lower classes of land than would have been expected (Fedick et al. 2008). Farmers might have used these less-fertile lands on which to build houses while they farmed better land nearby. Fedick also notes that Class II soils supported a higher population than

did Class I soils (alluvium), mainly because of the differences in agricultural outputs. Class I soils were better for cash crops such as cacao (Fedick 1995), while Class II soils were better suited for subsistence crops. Another explanation is that the farmers resided in Class I lands and traded their crops for goods from specialists in other regions (Fedick and Ford 1990; Ford and Fedick 1992), thereby allowing labor specialization (Lentz et al. 1996).

Fedick's soil classification system was used to decrease a survey strategy applied during field research from 1997-2001 in the Valley of Peace Archaeology (VOPA) project area (Lucero et al. 2004). The soil classification explained the distribution of minor and secondary centers and habitation sites. Most centers were located on Class II soils; however, one area, Cara Blanca, was situated in Class V and Class II soils yet had little settlement. Lucero explained that it was a sacred site with its 25 pools; therefore the settlement was based on ceremonial activity and not agricultural potential. Pools were thought to be portals to the underworld and people would offer gifts to gods through them. Buildings were found at the Cara Blanca site, perhaps for a shrine or priest houses (Lucero and Kinkella in press).

Preliminary results of the pilot study suggest that while some Class III-V lands might not be suitable for agriculture, native plant species that would have been useful to the Maya are still found in these regions. In the transect, soil classes II and III predominate (Figure 3), with settlements appearing only on Class II soils. In both the 500 m and 1 km forest surveys, broom tree (*Cryosophila stauracanatha*; Collection #13) and cohune palm (*Attalea cohune*; Collection #4) were found (see Figure 2). At 500 m,

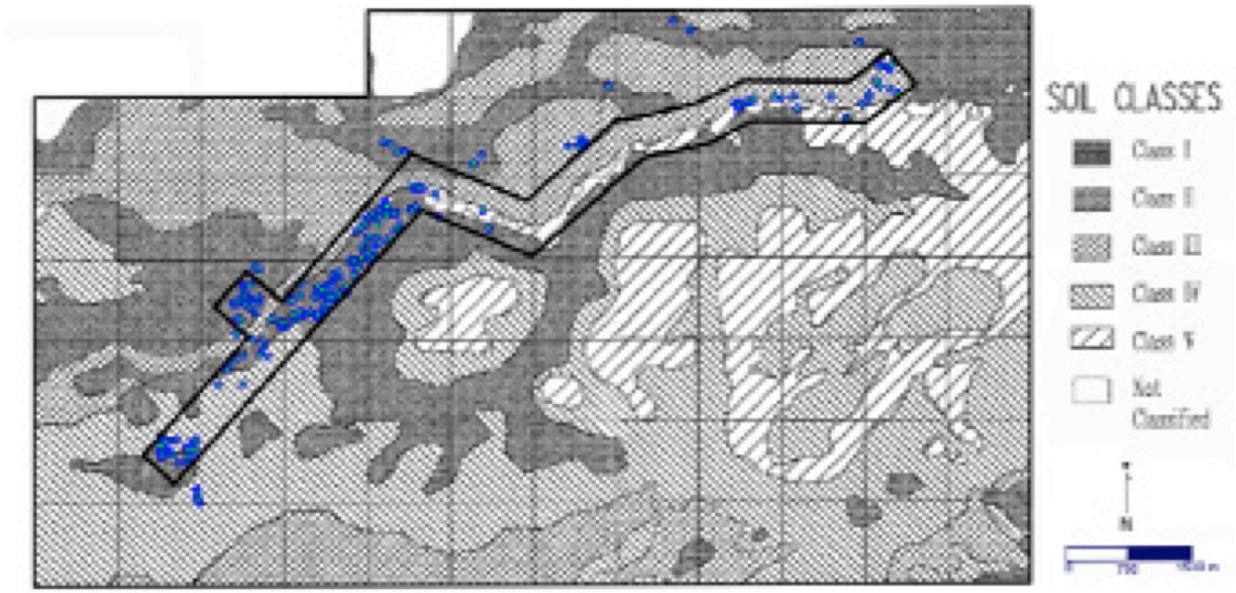


Figure 4: Soil Classes of 11 km transect (Kinkella 2009: Figure 5.4)

xate (*Chamamadorea sp.*) was also identified. Therefore, even poor soils were still able to support beneficial plants. I expand on these patterns in the following section.

Pilot Study: Yalbac, Belize

Since 2001, under the direction of Lisa J. Lucero, Yalbac, Belize has been a source of fresh data about the Classic Maya, including archaeological, botanical, and settlement analyses. Yalbac is located in the eastern edge of the southern Maya lowlands in Belize along Yalbac Creek. The site itself is situated within 160,000 acres owned by Yalbac Ranch, a logging company. Protected by gated entrances, Yalbac is under full-time surveillance. The first analysis of Yalbac was made in the 1930s by J. Eric Thompson (Thompson 1939). However, Thompson did not discover the main site core, which was first documented in 2001 (Graebner 2002). Since then, three large plazas, several range structures, a ballcourt, six pyramid temples (8-16m in height), and an acropolis (over 20 m in height) have been recorded, along with multiple smaller habitation sites in the surrounding forest (Figure 5).

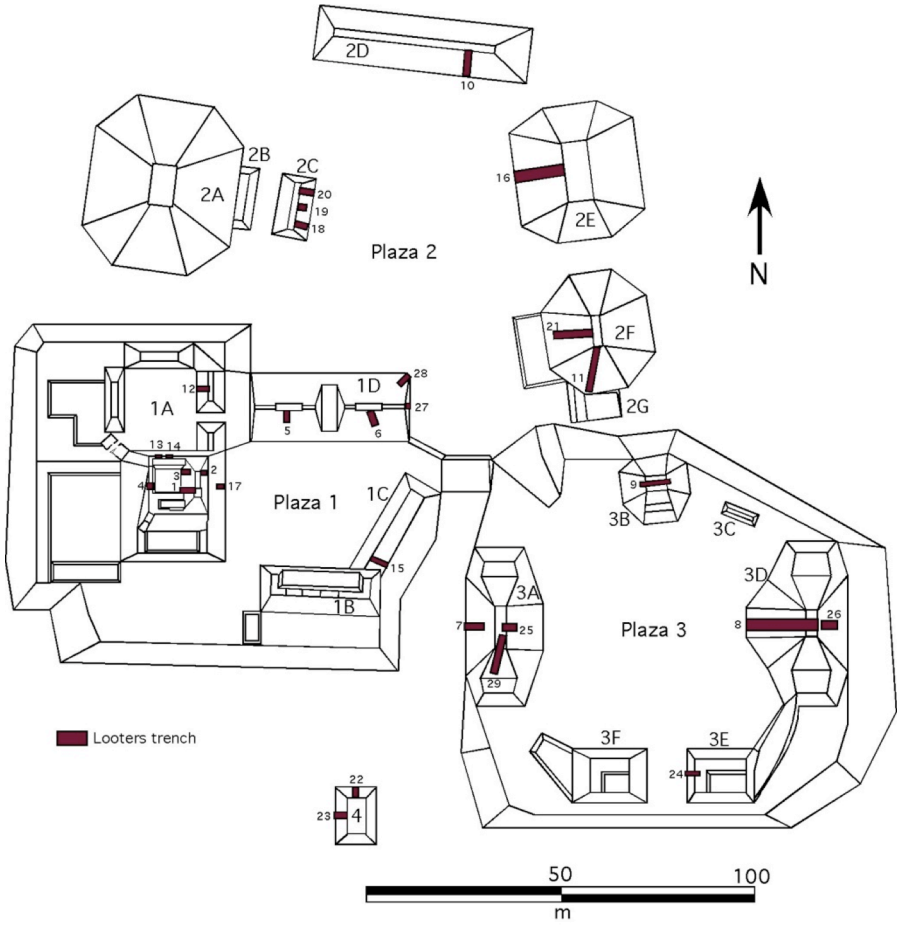


Figure 5: Yalbac, Courtesy of VOPA

During the summer of 2010, botanical surveys were conducted near Yalbac. Cleofo Choc[2] identified over 200 plants around the Yalbac region, many of them vital to the Classic Maya, and many of those are still in use today. The overwhelming majority of the plants near undisturbed Classic Maya habitations were profitable to Maya livelihood. Those useful plants include ones used in ceremonies, including the copal tree (*Protium copal*; Collection #6); those used for food, the pacaya (*Chamaedorea spp.*; Collection #10), *ramón (Brosimum alicastrum*; Collection #2), wild plum (*Spondias spp.*; Collection #11) and mamey (Collection #212), a fruit; those used for household items (brooms, ties and thatch), the bayleaf palm (*Sabal spp.*; Collection #17), cohune palm (*Attalea cohune*; Collection #), the broom tree (*Cryosophila stauracantha*; Collection #13) and tie-ties (vines); and medicinal plants, including fungi (*Ganoderma lucidum*; Collection #57), used as medicine for babies (Figure 6). All collected specimens are included in three different appendices: Appendix I, organized by collection number; Appendix II organized by species; and Appendix III organized by plant use.

Overview

I conducted my pilot study as part of the VOPA project during the summer 2010 field season (May-June 2010), focusing near Yalbac. The goal of this preliminary survey was to assess whether it is possible to determine ancient landscape modification. Botanical functions were clarified through 4ethnographic interviews of Cleofo, an excavation assistant and Mopan Maya who has extensive

[2] I will refer to him as "Cleofo" in proceeding references. He gave me written permission to use his real name. IRB permission was granted to interview him regarding plant names. Documentation is available upon request.

Figure 6: Useful plants of Yalbac
From Left to Right: Pacaya (Collection #10), Bayleaf Palm (Collection #17), Choobac (vine for tying; Collection #27), Water vine (Collection #38), Broom Tree (Collection #13), (top) medicinal mushroom (Collection #57)

knowledge of the forest and its plants. To accurately depict which plants the Maya might have maintained and which they would have immediately destroyed upon contact, a better awareness was needed of which plants were used daily, which were used infrequently, which not at all, and which were deleterious (Arvigo 1994; Balick et al. 2000; Beletsky 2005; Harris 2009; Honychurch 1980; Schlesinger 2001). Cleofo provided the description of the plants we encountered during plant surveys and his knowledge of the plant uses was the basis of the forthcoming description of a few of the useful and harmful plants of the Maya, where they are seen, and brief assumptions as to why.

I identified the plants I had collected based on the common names provided by Cleofo. These common names were mentioned in Belize floral guides such as: *Trees of Belize* (Harris 2009), *Animals and Plants of the Ancient Maya* (Schlesinger 2001), *Caribbean Wild Plants and their uses* (Honychurch 1980), *Checklist of the Vascular Plants of Belize* (Balick et al. 2000), and Belize: *Travelers Wildlife Guide* (Beletsky 2005).

Plants were collected from seven plots[3] (May 25-June 17) in three distinct areas around Yalbac: monumental buildings, small settlement mounds (Graebner 2002; Kinkella 2009), and forested areas free of obvious human occupation (Lindsay 2011). Eight areas were sampled during this time: eight 20-meter units and seven 1-meter units. Given the distance traveled, difficulty of finding certain mounds, and the intemperate weather (we were unable to sample due to rain during several days), we were only able to survey 12 days.

One of the biases that had to be overcome in this research is that the collections took place over the summer. This was during the end of the dry season and the beginning of the rainy season. Although this is an ideal time to test for both plants that thrive in the dry season along with those in the rainy season, the plants, which will flourish during the middle of either one of those seasons, were not able to be collected. Portions of the plants could still be collected but the fruits and flowers of some were not present during the season of collection.

GPS locations were taken from the center of all survey circles and from the centers of each of the house mounds, particularly the ones discovered by me. All GPS locations were collected using a Garmin handheld GPS unit.

[3] Due to a mapping error, there is no Plot 4.

To collect specimens, I used established methods tailored by UIUC plant biologists David S. Seigler and John E. Ebinger, whose expertise in botanical sampling in regions similar to Belize was utilized in my research, along the first one kilometer of the 11 km transect line plotted by Kinkella. Circular collection units are commonly used by plant biologists (Epinger and Seigler).

The locations for the circular collection units were chosen based on location within the transect created by Andrew Kinkella (Kinkella 2009). The survey circles were 20-meter collection circles, inside which all the known trees, vines and herbaceous plants were sampled, and each sample was plotted to assess inter-species relationships. In a one-meter circle, I collected samples of herbaceous plants less than 1 meter tall. In most cases, the complete plant was collected. After each plant collection, a photo was taken of the original plant to indicate the original condition of the plant and the habitat in which it grew. The plants were collected either by hand, machete or hand clippers. I collected the specimens and placed them in plastic bags for transport back to camp, using a permanent marker and flagging tape/labels to indicate which plants were present in each bag. A collection numbering system was devised, starting at 1, which encompassed all of the collected specimens. Plants known to be the same were given the same number. If plant identification was doubtful, it was assigned a different collection number. After each plant collection, a photo was taken of the original plant to indicate the original condition of the plant and the habitat in which it grew.

Throughout collection, I took careful notes of habitat and surrounding plants or features of the plant samples collected. The useful properties, conveyed by Cleofo, were also noted as well as the common names given to the plant in English, Spanish, Mopan, and K'iche,' if known. Since I did not know how to spell all the words, I recorded Cleofo pronouncing the names, and these were later translated by Dr. Andrew Hofling, Linguistic Anthropologist at Southern Illinois University Carbondale. These names were compared with flora indexes to attempt to determine to which scientific name and classification the plant belonged. The leaves of the plants were pressed using a standard plant press and the fruit or flowers (if available) were dried using a lighting source with the plants contained by a cardboard triangle and metal racks and later with a blow dryer.

I attempted to collect more than one specimen of each living plant species. The limitations to these samples were the number of specimens that can be identified, time and space available for storage, and transportation back to the US. Also, certain plant specimens, such as orchids and citrus fruits, cannot be exported from Belize.

Methods

Monumental structures

Two monumental structures located in different plazas in Yalbac were chosen to collect botanical specimens. At Str. 2D (60 x 10 m, 4 m in height), the center of the collection circle was located directly on top of the range structure and collections were made surrounding the central point (Plot 1). At Str. 3C (7 x 3 m, 1 m in height), the center of the circle was located slightly off the mound and collections were made on the back side of the mound and in the area directly behind the mound (Plot 2). The plant data gleaned from these analysis provided a better picture of which plants remained around the temples during the time of their use. Throughout the 2010 field season, Structure 3C was under excavation. Excavations conducted near the sites of plant collections can indicate more about the people who lived in these locations and add to the significance of the plant patterns.

House Mounds

The next regions surveyed were small house mounds. They were selected based on their proximity to Yalbac and previous excavations of mounds, which provided archaeological background to my botanical surveys. The first house-mound settlement survey was conducted between two mounds in a three-mound group (M23, M93, M92) (Plot 6). These mounds were selected for proximity to each other. The third mound (M93) was excluded from the survey because of an old logging route that had been cut between that mound and the other two. However, part of the surveyed region did include a portion of that logging road, which turned up some interesting anomalies to the research and better indications that the Maya were indeed modifying their environment. One plant collected in that logging road region was *Cnidoscolus spp.* (Collection #200), a tree whose leaves, sap, fruit and flowers all have a damaging effect on human skin. No common name was mentioned for this species. This plant was not found in the forest regions, around temples or house mounds. The survey circle for this survey was begun approximately in the center of the two nearby mounds (M23 and M92) to get as much information about inter-mound flora,

as well as the flora located on top of both mounds. It is thought that the Maya would have been modifying their landscape, which would have started with the plants directly surrounding house mounds. These mounds were also located in close proximity to Yalbac, within 300 m.

The next mound group selected was excavated in 2002 (Lucero and Graebner 2003) (Plot 7), Lucero labeled the mounds 94E22N-14 and 94E22N-18 while Kinkella called it M18. The excavated portion was avoided because of the recent nature of the disturbance. The survey also included one other known mound and one I discovered before the plant survey began. This mound group was also in close proximity to the Yalbac mounds, within 200 m.

The final house mound survey region was located on the other side of the 400-meter transect from the previous two settlement selections (M73). In addition, it was located approximately 500 meters from the Yalbac center (Plot 8). The surveyed region included one known mound and one mound discovered before the plant survey began. The plant survey was begun in the center of the two mounds and encompassed both mounds and the flora between them. The survey provided a controlled region of house mounds outside of the close influence of the Yalbac center. One difference between the house mounds around Yalbac versus those in the rain forest that became evident was the number of gumbo-limbo (*Bursera simaruba*; Collection #65) trees. These trees are the natural antidote for the burning resin from the poisonwood tree. They were almost non-existent near the center of Yalbac, yet settlements located within the forest, where poisonwood is common, contained stands of gumbo-limbo. One property of the gumbo-limbo is its ability to propagate vegetatively from cut branches. This property would have made for easy transportation and re-growth of this tree around Maya sites.

Forest Regions

The last Yalbac botanical surveys were conducted in the forest, away from any known settlement (Plot 3 and 5). These surveys were located 500 m and 1 km from Yalbac, providing a comparison between settlement and non-settlement botanical compositions.

Ethnographic Analysis

Finally, for the sake of comparison, I mapped Cleofo's house lot (37 x 30m). Cleofo's information about plants and his garden construction are important to determining more about the Maya plants and past forest garden composition.

Collection plots

During my pilot study, I collected over 200 plants from seven areas over a one-kilometer-long by 400-meter-wide transect (Table 1). The preliminary results are exciting and indicate that certain plant species are more frequently found around living areas versus the forest. This pilot study will serve as preliminary data my dissertation project to be conducted in 2012 to collect along the remaining 10 km of the transect.

Plot No.	Location	Type
1	On Structure 2D	Center
2	Behind Structure 3C	Center
3	500 m from Yalbac	Forest
5	1 km from Yalbac	Forest
6	Between Mounds 23 and 92, near Mound 93	House Mounds near Yalbac
7	Near Mounds 18 and 25, and new Mound 9710	House Mounds near Yalbac
8	Between Mound 73 and new Mound 10610	House Mounds in Forest
9	Valley of Peace Village, Cleofo Choc's Home Garden	Modern Maya Home Garden

Table 1: Plot descriptions

I began my plant collections on the 25 of May 2010 around Yalbac Str. 2D. I began by using a known traverse point, point "YL", recorded by Kinkella (Kinkella 2009) (Figure 7). Kinkella had previously mapped specific locations useful to his dissertation research, but his coordinates were recorded using

NAD27 and now have to be converted to WGS84. In addition to Cleofo, my crew consisted of 1-2 field assistants and/or field school students.

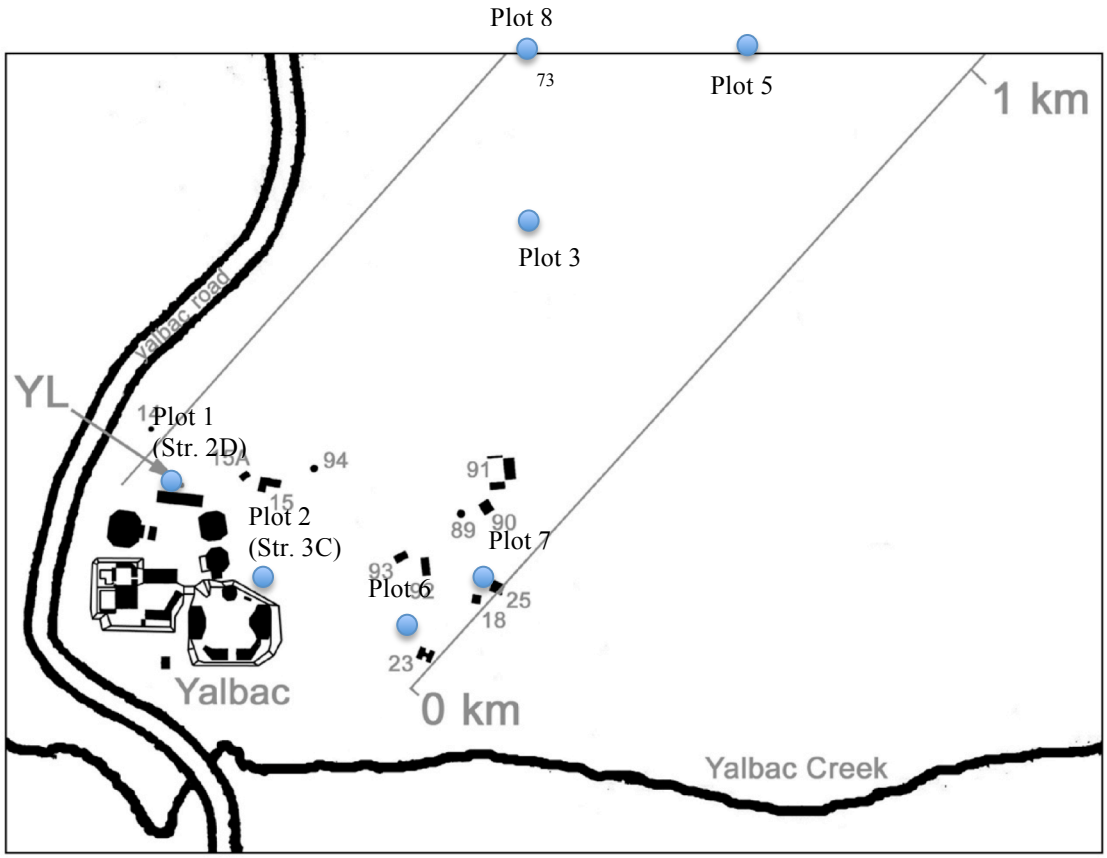


Figure 7: 1 km of 11 km Yalbac Transect with blue dots showing 2010 botanical surveys (Kinkella 2009: 239).
Plots 1, 2, 6, 7, 8 are on Class II soils; Plots 3 and 5 are on Class III.

I began at Str. 2D using a four-step approach outlined by Seigler and his colleague Dr. John Ebinger, Professional Scientist and Botanist at UIUC (Table 2).

Radius	**Collection type**
20 m	Tall trees
10 m	Trees >1 m tall
5 m	Saplings >1 m tall
1 m	Herbaceous plants

Table 2: Four-step Approach, Ebinger and Seigler

Plot 1

In implementing this approach for Plot 1, I first set up a central point located on the Str. 2D. From traverse point "YL", I walked 20 meters south toward Str. 2D and set up a point, which was located directly on top of Str. 2D, marked as waypoint 006 on my GPS. This waypoint was the center of my collection circles and stakes were set up at each of three points (south, east and west) around the 40 m

(diameter) circle. Traverse point YL was also used as a corner of my 40 m survey region. I also set up three points around each of the smaller circles. All of these points were recorded using the GPS.

I began recording plants observed within the 40 m circle (Figure 8). The first observed plant, which was “horse ball” tree, was recorded as Collection #1. Subsequent specimens were numbered according to the order in which I observed them. Specimens were named using the common names given by Cleofo, as well as plant uses. Photos of the plants in their native habitat were taken. Leaves and fruit were preferred with a bark sample collected from trees in which the fruit and leaves were too high, and stem vine portions collected from any vines observed whose leaves and fruit could not be reached. If a neighboring tree of the same species contained a leaf or fruit specimens and the tree within my survey region was too mature to have access to these fruit and leaf specimens, I collected from the former and made note of it. Also, fruit was sometimes collected from the ground. All specimens were tagged with their assigned number and brought back to our living area in plastic bags. Once back at home base, I pressed the flat specimens and set up a plant drier to dehydrate the larger specimens.

When collecting around Str. 2D, only the south side was surveyed. The north side contained plants already collected on the south side and the terrain was not easily surveyed due to a steep incline. The total number of different specimens surveyed around Str. 2D was 30. We determined that the four-step method of collecting from 20, 10, 5 and 1 m radius circles was not as effective since I was able to collect all plants within the 40 m collection circle and did not need the small circles to assess smaller specimens. In most instances, the smaller plants were the seedlings of the trees. Therefore, I amended my earlier approach and began to collect everything in the entire region of survey, which was the 40 m circle. All successive surveys were conducted using this approach, unless otherwise noted.

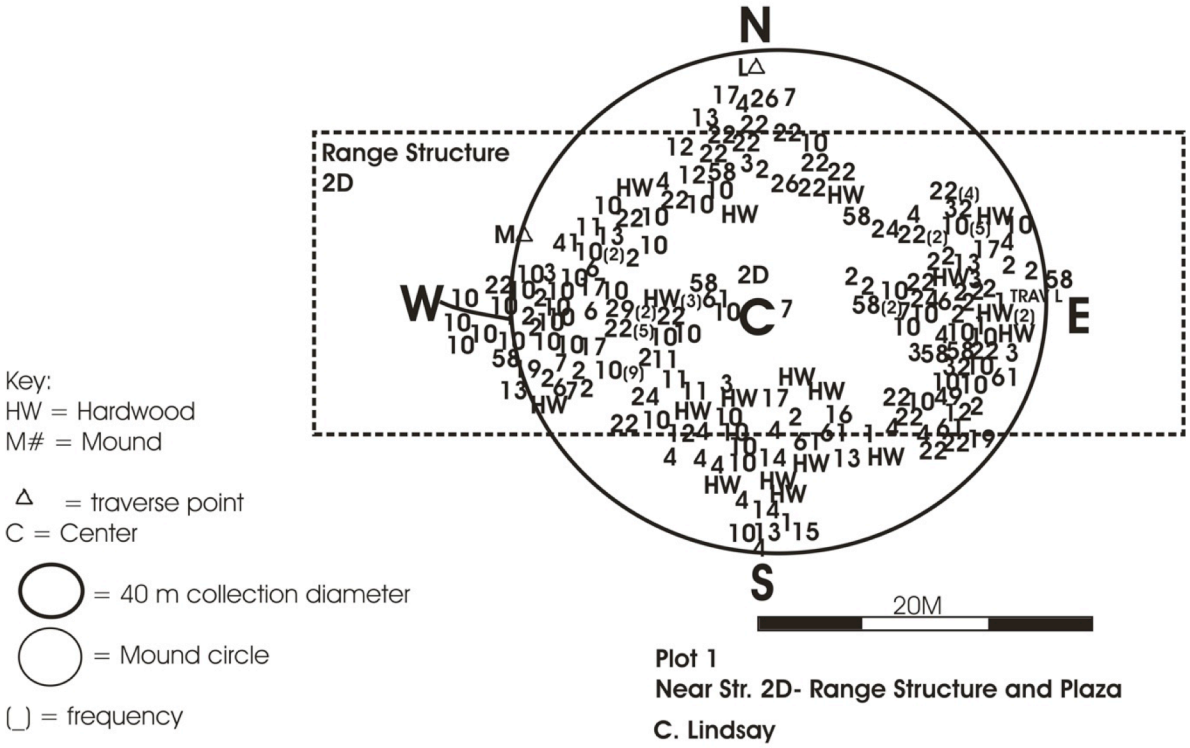


Figure 8: Plot 1, near Str. 2D

Plot 2

I collected at 150 meters from YL, at the center of Kinkella's transect, which was near Str. 3C, the focus of 2010 excavations (Lucero 2011; Olszewski 2011). I did not survey on the excavated area, as this would have given an inaccurate indication of which plants had been growing there during the Classic Maya time. Nineteen additional plants were gained from this survey (Figure 9). I collected samples from specimens already collected and labeled them with their assigned number followed by the letter "B" to denote that I had already collected them previously. I collected repeat specimens to ensure that I had enough to analyze for my research, to document possible changes in the species from location to location, and to perhaps create a reference collection to give to either a botanical garden in the United States or to the Belize Herbarium.

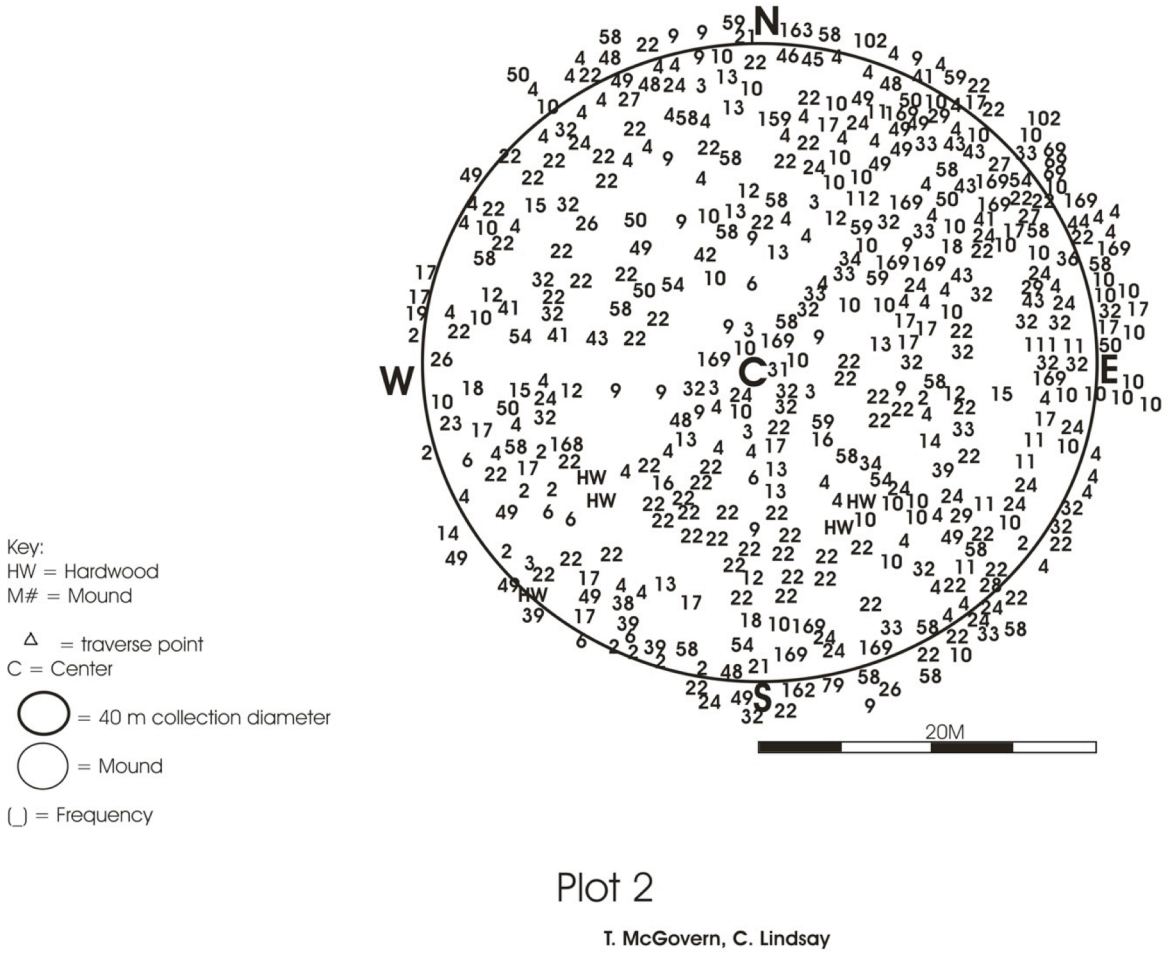


Figure 9: Plot 2, near Str. 3C

Plot 3

Next, I went 500 meters into the forest via Kinkella's 41.5° heading (Kinkella 2009). There appeared to be an abundance of small plants, since we were in the midst of unsettled forest; therefore I elected to construct a smaller 5 m collection radius and collect the small plants that only grow in the understory. Five meters is too large of an area in which to map all the small plants. In future mapping, I reduced this region to the earlier suggestion of Seigler and Ebinger of one meter. At the conclusion of

collecting from Plot 3, my collection had numbered up to 158 (Figure 10). It was assumed that most of the small plants were small trees or vines.

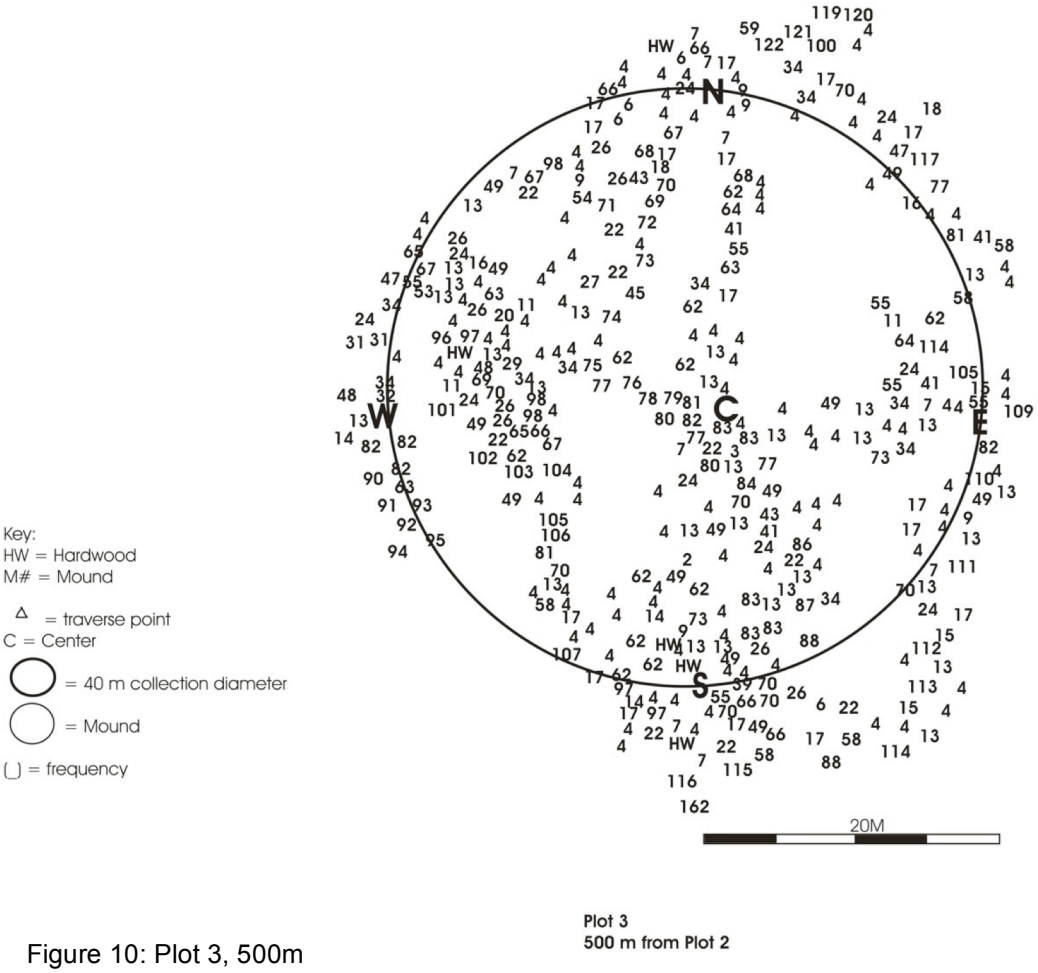


Figure 10: Plot 3, 500m

Plot 5

For the next collection region, we went to another area of forest with no surrounding settlement. The goal of this collection was to get at least two of every designated region of study: near Yalbac, in the forest, and near small house mounds. We had, at this point, two different mound samples. Plot 5 concluded the last of two forested collections and the remaining task was to survey house mound regions (Figure 11).

During forest surveys, we noticed a difference in collected specimens. Pacaya (*Chamaedorea* spp; Collection #10), a staple of the ancient Maya diet and frequent plant at Maya sites, was not found at this location. Pacaya likes hilly areas and this location was in a swamp. We reached Plot 5, located one kilometer from Yalbac's Str. 3C and also mapped a one-meter area. We mapped and recorded small herbaceous plants under one-meter in height and reached collection number 194.

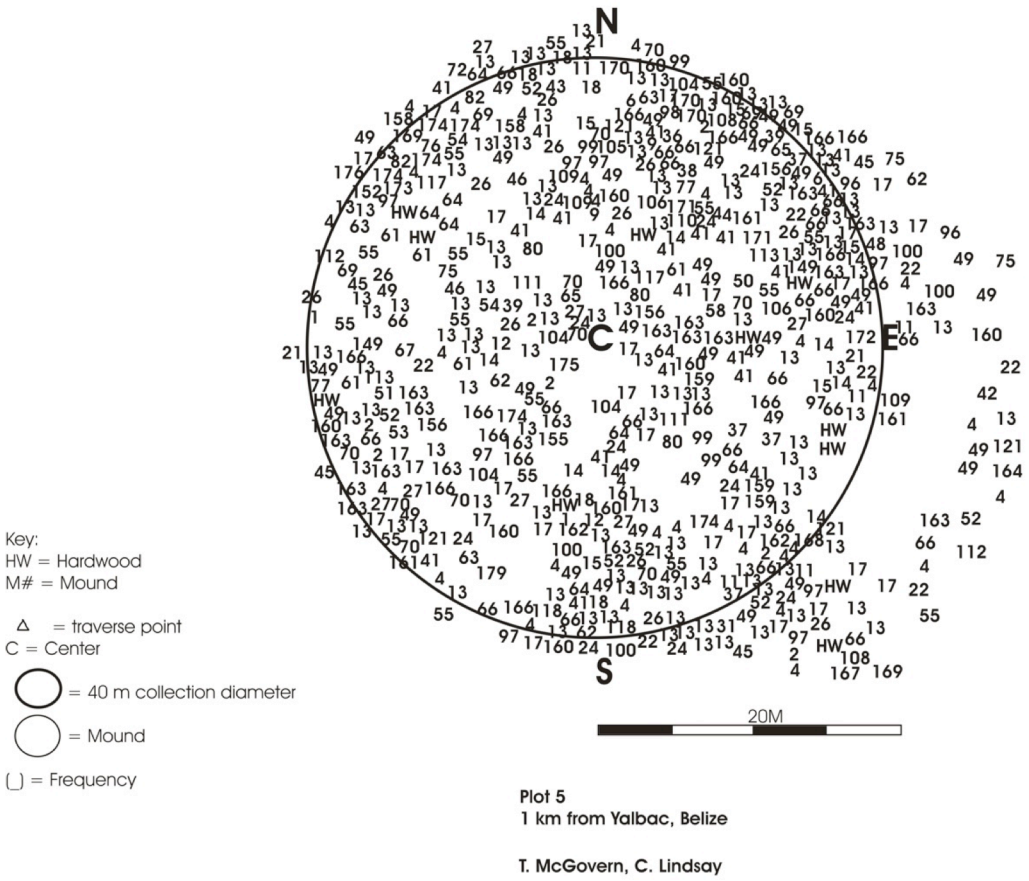


Figure 11: Plot 5, 1KM

Plot 6

Our next plot was located between M23 and M92 (Figure 12). M92's GPS location was taken near the center of the mound next to a copal tree (*Protium copal;* Collection #6), and M93 was taken in the center next to a quebracho tree (*Krugiodendron ferreum*; Collection #48). Cleofo explored east of our location and located M18 and M25. We placed a center marker between M92 and M23 and measured 20 meters north, south, east and west of this central point, marking all locations with stakes and flagging tape. We then began collecting and mapping plants of Plot 6. Poisonwood, whose sap creates a skin reaction when in contact with human flesh, was only found in saplings in Plot 6. There were no adult poisonwood trees and only two saplings for the entire plot. We saw other unique plant distributions for this plot. The road that cut between M92 and M93 was a relatively recent addition to the landscape, probably cleared in the last 50 years. Plants found in this region were not located in any previous plot. We collected specimens through collection number 206.

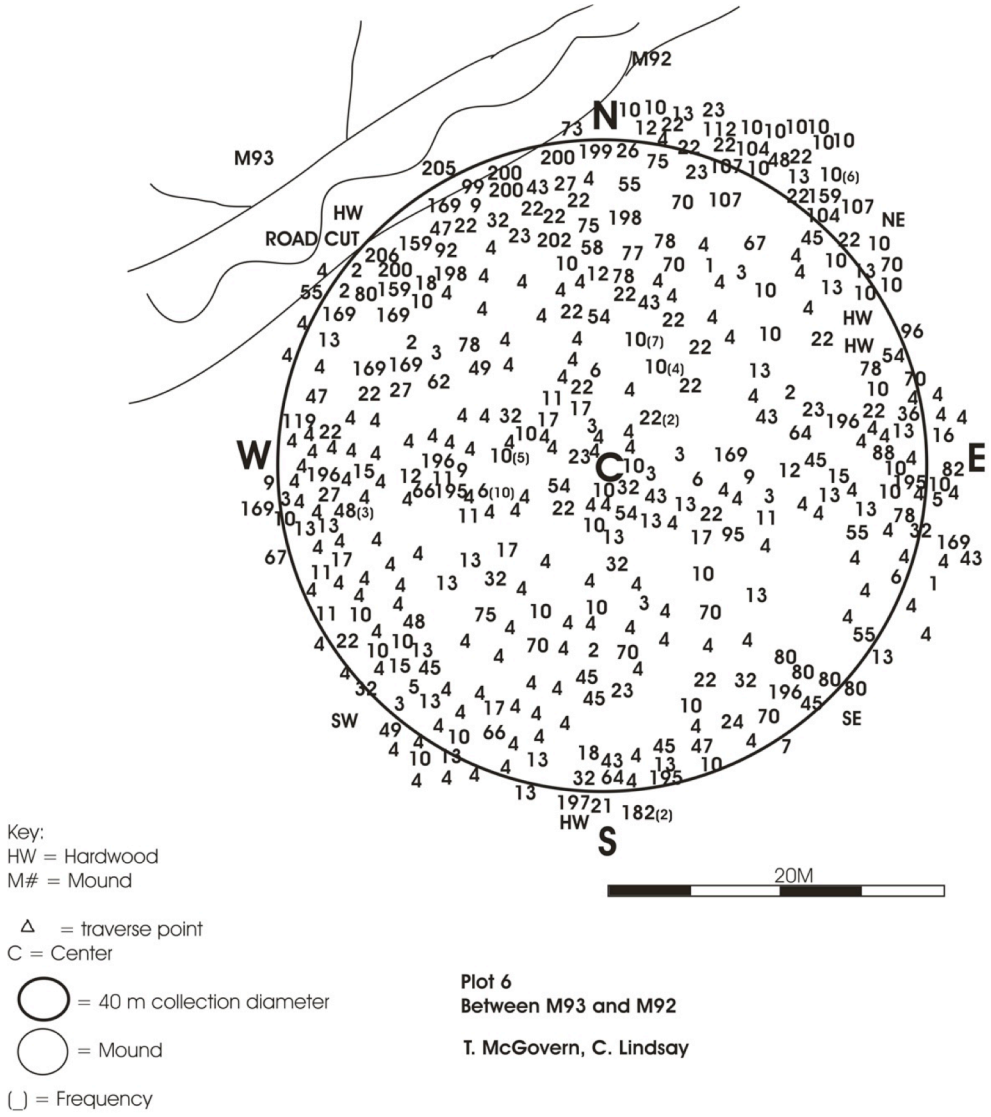


Figure 12: Plot 6, between Mounds 93, 92 and 23

Plot 7

We also located M18 via Cleofo's directions and recorded the location of the center of that mound using the GPS (Figure 13). Cleofo pointed out where the corners of the old excavation unit were, which had been marked with pink flagging tape. We set up a 40 m (diameter) circle plot around M18, but did not include the old excavation unit. To create this center point, we measured northeast 20 meters from the center of M18. Since we covered a small portion of M25, I recorded its location next to a *ramón* (*Brosimim alicastrum*; Collection #2) in the center.

We determined that an area northeast of M18 and parallel to M25 was possibly a small mound and labeled it M9710. This number was selected to coincide with the day, month and year of collection, although a slight error led to the month being coded incorrectly. I scraped around the surface near the stake we had placed into this area and found a collection of cobbles, indicating a mound. We continued to surface scrape about a 25 cm area and found cobbles, but no surface ceramics or other artifacts. After finishing collecting specimens within the 40 m plot, we set up stakes around a one-meter region in the center of this plot. We recorded plants through collection number 214.

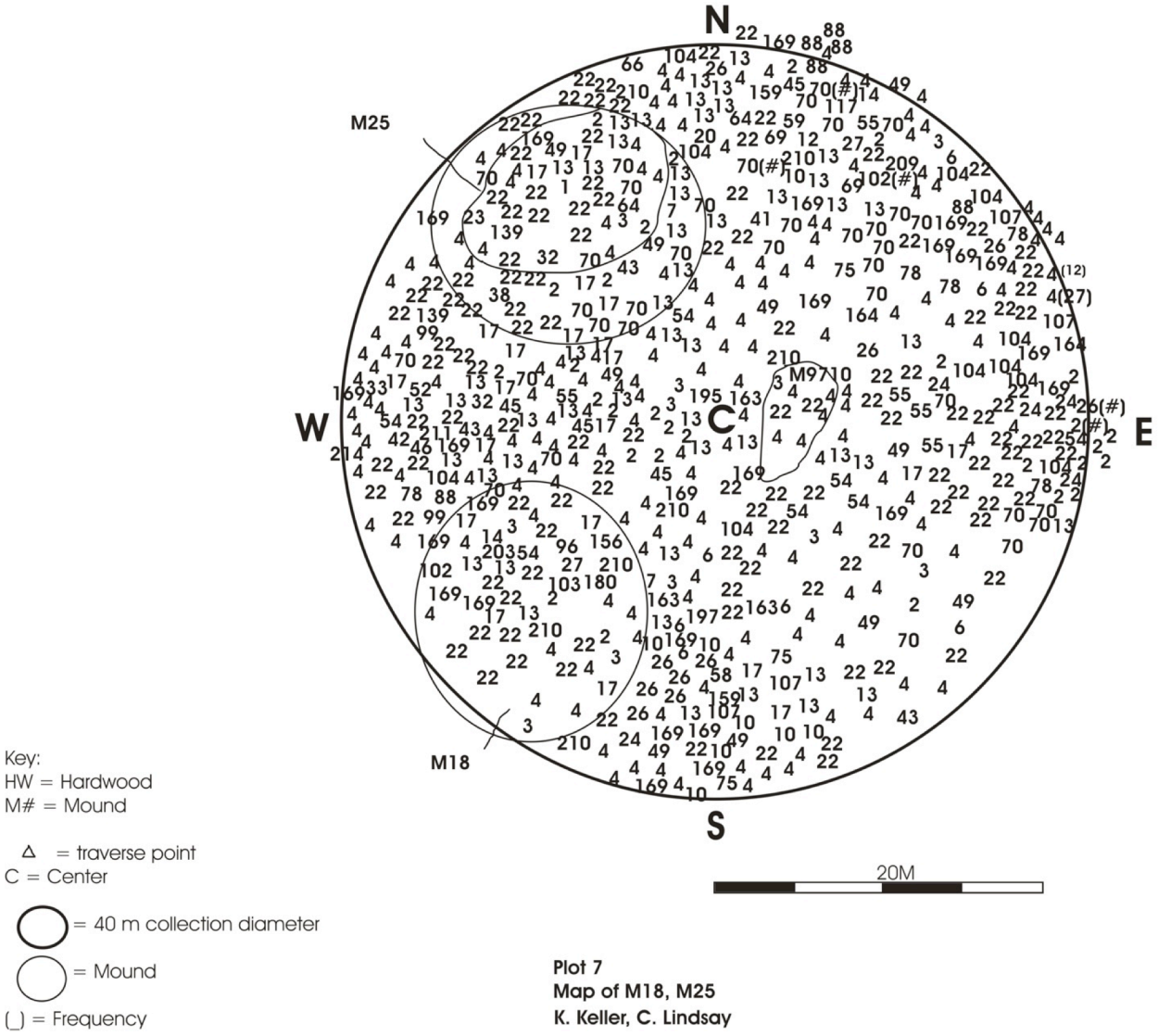


Figure 13: Plot 7, near Mounds 18, 25.

Plot 8

Finally, we set out to locate M73 (Figure 14). This mound was located at some distance from the main center of Yalbac and would prove a good contrast to the other house mounds collected from, which had been relatively close to the Yalbac center. We located M73 and adjoining mound, which we labeled

M10610, and surveyed plants between them. We our last specimen from Plot 7 was collection number 216.

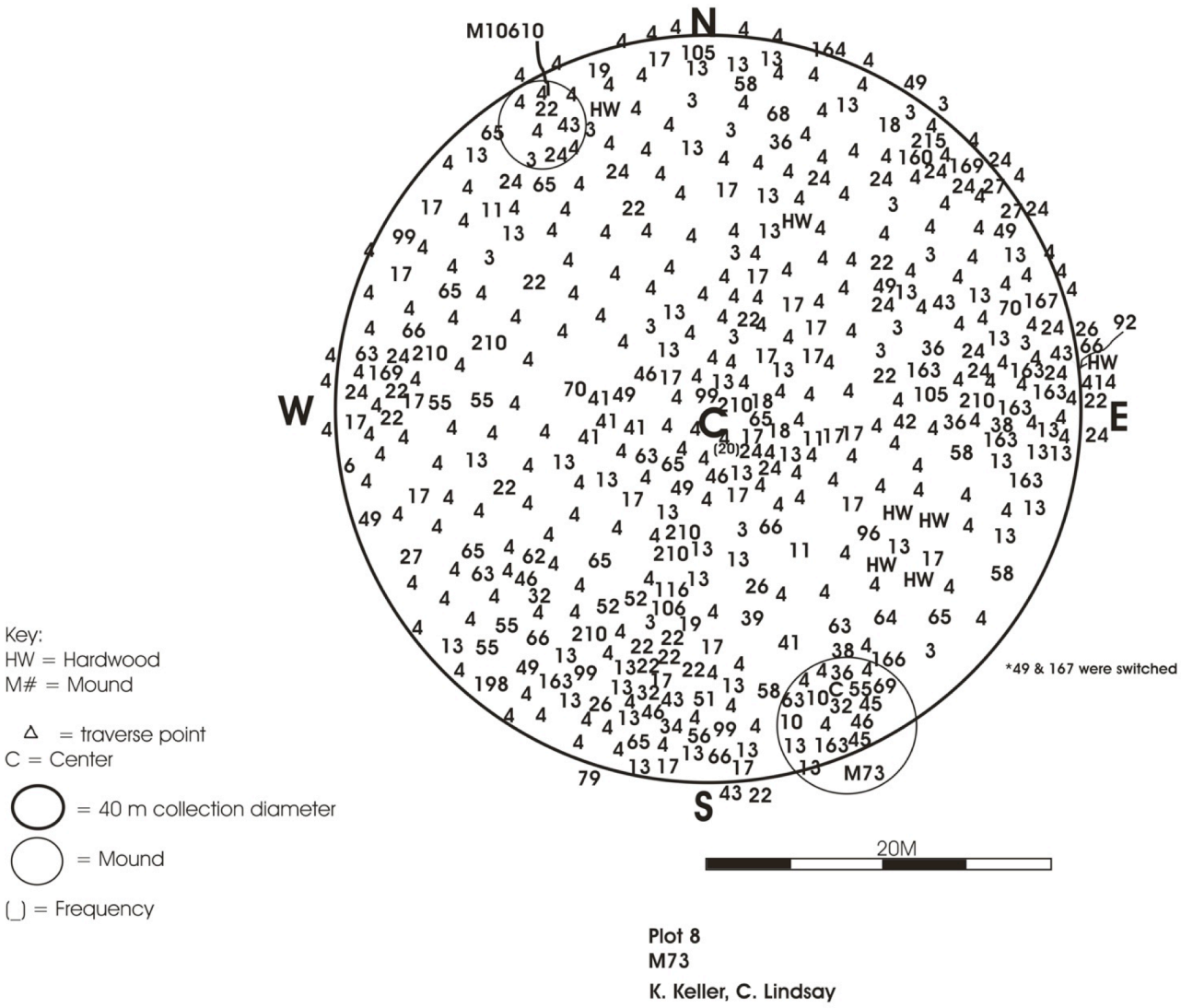
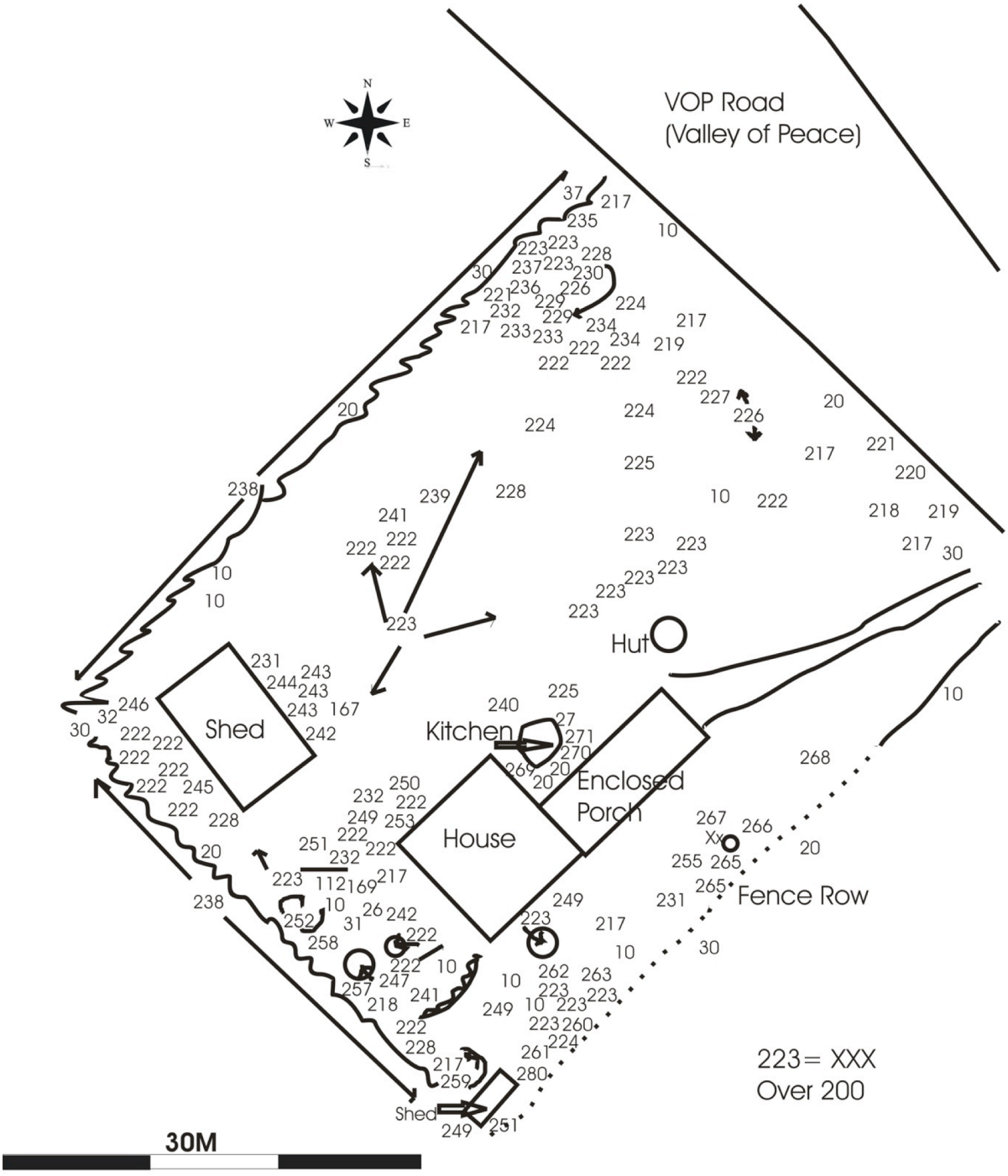


Figure 14: Plot 8, Mound 73.

Plot 9

I surveyed a final plot in the Valley of Peace village for an ethnographic comparison (Figure 15). The plot surveyed was the house garden of Cleofo. Collection numbers 217-273 were found exclusively in Cleofo's garden, which is not surprising considering most are new imported domesticates.



Plot 9: Cleofo Choc's House

C. Lindsay

Figure 15: Cleofo's Home Garden, Valley of Peace Village, Belize

Results

The preliminary results of my pilot study indicate that certain plant species are more frequently found around living areas versus non-habitation areas[4]. Floral compositions differ significantly between previously settled and uninhabited areas, regardless of the type of settlement or the proximity to Yalbac. One clear example of this difference can be seen in the analysis of poisonwood (*Metopium brownie;* Collection #62). The tree resin causes a skin reaction producing welts, blisters and pain at the site of contact for weeks (Harris 2009). This plant was found in areas of uninhabited forest as large trees and small saplings. However, it was not found in its mature form near any habitation sites. The only examples of poisonwood found adjoining Maya habitation sites were two small saplings near one of the house mounds that was also recently disturbed by a logging road. It is worth noting that this mound was also located near a historic logging road, where recent disturbance negatively impacted the plant community and introduced deleterious species.

Gumbolimbo (*Bursera simaruba*; Collection #65), the antidote for poisonwood, tree concentrations differed between house mounds near Yalbac compared to those in uninhabited areas. Several grown trees were found near forested settlements, but they were almost non-existent near the center of Yalbac. Between 100 and 200 plants were documented per plot, and of those plants, gumbolimbo was not found around the Yalbac mounds or the house mounds located near Yalbac (Plots 1, 2, 6, 7). Only three were located 500 km into the forest from Yalbac (Plot 3), and one kilometer into the forest (Plot 5). However, at the house mound 1 km from Yalbac, almost 10 were located within the plot, with more lying on the outskirts of survey (Plot 8). This comparison indicates that the inhabitants perhaps needed more access to the antidote of poisonwood, which was found frequently near this mound group. However, there were no small gumbolimbo trees found around the area, indicating a lack of easy propagation in recent years, unlike the poisonwood whose saplings are found densely surrounding adult poisonwood trees. One property of the gumbolimbo is its ability to propagate vegetatively, from cut branches. This property could have made for easy transportation and re-growth of this tree around Maya sites.

As survey entered the logging road area previously discussed, more deleterious plant species were encountered. One of those was a tree species (*Cnidoscolus spp.*; Collection #200) whose stinging hairs cause contacted skin to be effected for days (Webster 1986) and which is frequently found in cleared areas (Turner and Harrison 1983). *Cnidoscolus* was only found in this historically logged region; one implication could be that the Maya were modifying and partially maintaining forested regions distant from their residences.

Another point of comparison between the house mounds and uninhabited areas were distinctive differences in the intensity of the plant populations. In the uninhabited areas, and behind Str. 3C, the surveyed region was overgrown. In contrast, the areas around the house mounds were not as dense and provided easy access around the area surveyed.

A final contrast exists between Cleofo's garden and the Maya house mounds. In the settlement areas, the tree compositions consisted mainly of Cohune Palm, which is useful for some forms of thatch roof construction. In fact, palms are integral in the tropics for raw building materials, food products and clothing (Balick 1984). Other trees present that were also important to the Maya included *ramón* trees, whose fruit was often used as a staple crop (Fedick 2010; Turner and Miksicek 1984). In Cleofo's garden, the majority of the plants, many non-native, are useful in cooking; including peppers, oregano, apple-bananas (Collection #222), sweet potatoes (Collection #230), cassava (Collection #241) and orange (Collection #224) and mango (Collection #225) trees. These differences could possibly equate to a change on reliance from native plant species to domesticated and imported ones. However, with the time difference, it could also have been purely a case of the forest absorbing the domesticated species once the farmer left, leaving only those which could survive the forest regrowth, those that originated there.

[4] Identification of plant names is very preliminary. Complete identification, with the help of Dr. David Seigler and Dr. James Dalling, will be conducted when the 11 km transect is completed.

Figure 16: Plants from Cleofo's Home Garden
From Left to Right: Apple-Banana Tree, Orange Tree, Cassava, Sweet Potato

Preliminary analysis indicates that implications of botanical research around Maya regions can greatly enhance previous archaeological analysis and provide correlating research that can be used to analyze both ancient human pathways as well as future directions for floral conservation.

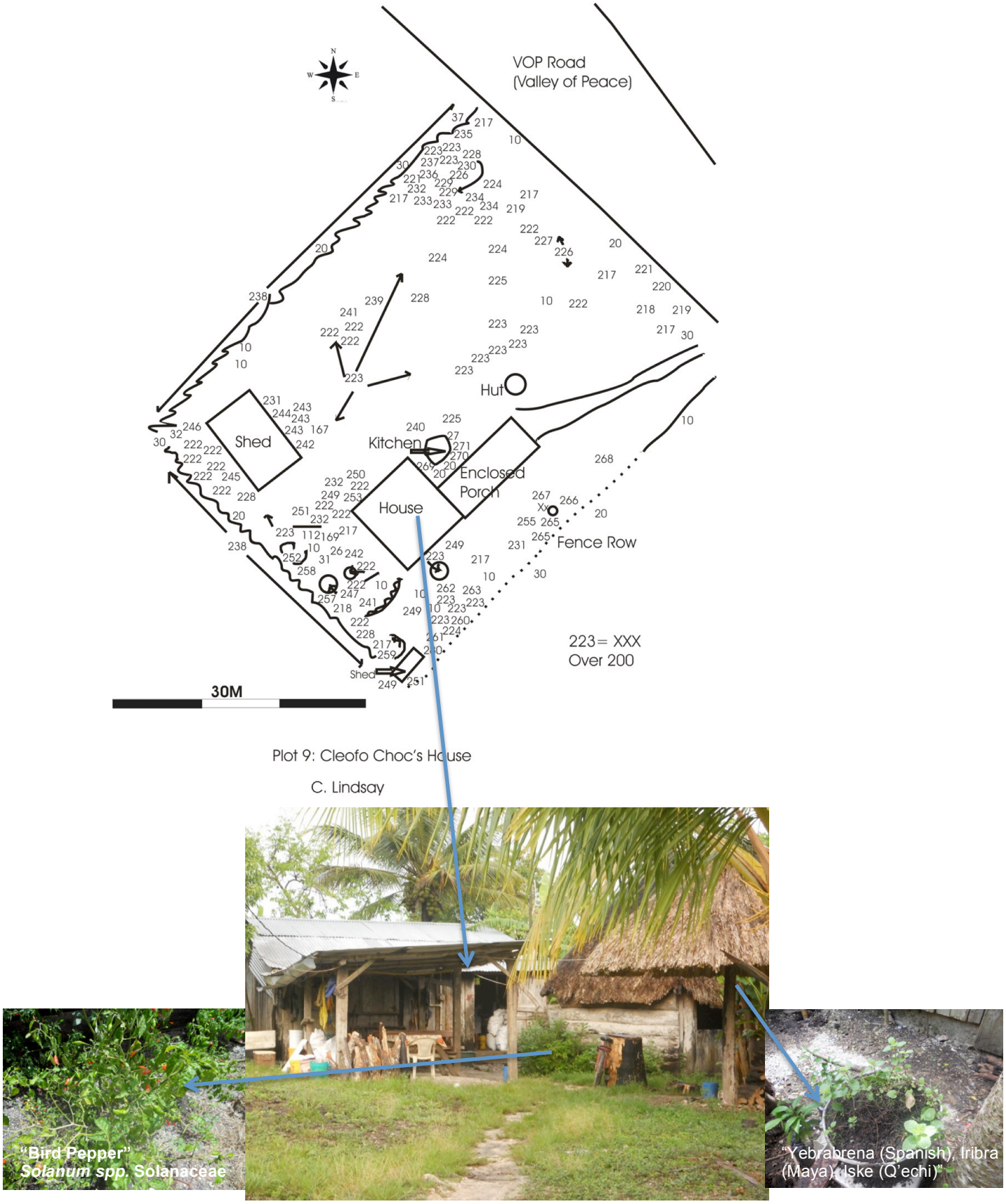


Figure 17: Drawn and digitzed map of Cleofo Choc's garden in the Valley of Peace village with images of his house and selected plants. Numbers represent different plant specimens. Also note the thatch roof house (e.g. Collection #17) and the hollowed out tree stump (front of kitchen) used to churn butter.

Discussion

This groundbreaking pilot study is one of the first to correlate past and present botanical data to determine ancient Maya forest management and subsistence strategies. Reconstruction of ancient landscapes can be accomplished through analyzing the Classic Maya landscape in comparison with modern Maya house gardens. Assessing these landscapes allows researchers to better understand the Classic Maya forest and how the Maya interacted with it; modern botanical specimens present the current floral landscape, permitting them to determine how the Maya modified their landscape and indicating if these modifications continue to shape the composition of the modern forest. This research can also indicate whether ancient Maya landscape modifications aided or hindered the continuation of this society. Did Maya landscape modification increase erosion and deforestation rates, or did it insure the survival of prehispanic Maya in the face of devastating drought? If the ancient Maya created a sustainable landscape, my research will provide more data about how the Maya landscape alterations were put into practice. Ancient Maya conservation methods at Yalbac can be used as standards of comparison to better understand the ecology of other Maya sites and possibly other cultures as well.

If the botanical landscape of 2010 descends from Classic Maya landscape modifications, this could provide interesting comparative data for other Maya sites. If we can determine the composition of the ancient managed forest, we can assist in planning current tropical conservation models. The conservation methods used by the ancient Maya can shape current environmental and landscape practices (Nations and Nigh 1980; Nigh 2008). The Maya process of conserving useful native plants, clearing detrimental ones, and incorporating novel domesticates can be used as a unique blueprint for conservation (De Clerck and Negreros-Castillo 2000), with the potential to transform modern tropical landscapes.

My research indicates how the ancient process of sustainable landscape modification can be used to remedy modern processes of landscape destruction. If we can predict what the forest will look like if the landscape is modified in a pattern similar to that constructed by Classic Maya, we might also be able to predict and accommodate for other anthropogenic landscape modifications, such as logging, slash-and-burn agriculture and domestic animal grazing. The deleterious impacts of these practices could potentially be lessened by incorporating some ancient Maya practices to increase sustainability. Maya practices can aid in tropical forest restoration, both in Central America and worldwide. Globally, the tropics are similarly impacted by modern deforestation and poor land management practices; thus, an introduction of Maya methods might aid in forest restoration throughout the tropics.

The Maya created an environmentally sustainable method of agriculture, in contrast to modern practices (Williams-Linera and Lorea 2009). The technique of conserving plants through generations aids the preservation of natural resources (Bourbonnais-Spear et al. 2006). Preserving natural flora opens up additional pathways to preserving the purposes and uses of these species. In particular, this research could aid scientific ethnomedical exploration for natural remedies for illnesses (Michel et al. 2007), while providing the indigenous communities an avenue for preserving and sharing their ethnobotanical knowledge (King et al. 2004). Cleofo's knowledge of the medicinal plants we encountered in our botanical surveys clearly demonstrates that the awareness of useful versus non-useful plants is still being culturally translated. Through the input of modern Maya in my project, I seek to form a bridge between the past and the present, while creating an outlet for traditional Maya knowledge and experience to be more widely shared. These traditional methods could eventually have a wider audience, but any information release would need to be tempered with complete support of the community.

Finally, my research contributes knowledge about the Classic Maya while incorporating the modern practices and knowledge of the modern Maya population. This knowledge will become more accessible to the modern Maya. My research also provides a model for other native cultures to preserve their botanical practices. Through the engagement of both methods for learning about Classic Maya agricultural practices and ways to discover more about the existing body of modern Maya ethnobotanical knowledge, we can better arrive at a sustainable future for the tropics.

Plants were important to Maya livelihood; forest plants also provided the Maya with medicine, hallucinogenic drugs (Gómez-Pompa 1987), fruit, fiber for mats and many other uses. All these materials came from landscape around them, and they continue to be used today, bringing the traditions of the past into the present. The Maya did not view plants as mere tools for subsistence; plant depictions appear in written documents, iconography and inscriptions, indicating their cultural significance. Maya compared

their rulers to trees (Freidel 1992), their ancestors to seeds (Pauketat et al. working paper) and their forests to dangerous and mysterious places (Taube 2003).

> …the Maya forest and its denizens try continuously to invade and battle its fields and towns... wild plants have emotions and 'get angry' when they are felled, and 'laugh' when they overtake a maize field. In contrast, cultivated plants…are 'happy' and 'industrious' (Taube 2003:528).

Rulers had the ability to subtend the dangers of the forest, while they obtained further power by incorporating the forest imagery into their centers via ball courts (Taube 2003). Rulers epitomized the forest through their direct association with trees; Maya commoners spoke of their rulers as trees that could be shaped through devotion and skill (Freidel 1992). In a final connection to the forest, Maya ancestors were viewed as seeds from which future generations would grow (Pauketat et al. working paper).

Iconographic symbols, which appear on pottery, gourd bowls, temple paintings and written texts, have been interpreted as depictions of important native plants such as copal (*Protium copal*; Collection #6) and sapodilla (*Manilkara zapota*; Collection #167) (Turner and Miksicek 1984). Dipictions of maize (*Zea mays*; Collection #273), a Mexican import turned staple crop that rose to importance in the Maya region as early as 3500 B.C. (Pohl et al. 1996; Puleston 1977; Wells and Mihok 2010) are also common in Maya iconography. Cacao (*Theobroma cacao*; Collection #263), a plant used to make a ritual and medicinal drink (Lee and Balick 2001), and the water lily, the indicator of clean water (Cano and Helllmuth 2008; Puleston 1977) are other frequently depicted plants. Some hieroglyphs even document soil types (Wells and Mihok 2010). Reviews of these interpretations indicate elite Classic Maya interactions with the flora, in comparison with my research on the farmers' interactions with their landscape. Clearly, the importance of plants to the Maya transcended societal hierarchies, especially since plants satisfied ritualistic as well as subsistence needs.

Concluding Remarks

This paper synthesizes botanical research I conducted during the summer of 2010. The goal of my research was to test the hypothesis that the Classic Maya modified the floral landscape surrounding their houses and centers. Based on my results, which are depicted in figures and appendices, I conclude that the Maya of Yalbac did modify their landscape in noticeable and long-lasting ways. My research can contribute to an overall understanding of how the Classic Maya modified their landscape by providing an ancient and a modern perspective to ethnobotanical data. Using an analytical means to study ancient sustainable forest modification, this research can contribute to conservation efforts in critically threatened tropical forest landscapes worldwide.

The methods employed in this research project will provide the basis for my dissertation research, which I will conduct over the spring and summer of 2012. Expanding on the methods and results presented above, through my dissertation research I seek to expand botanical sampling to the remaining 10 km of the Yalbac transect. Sampling the remaining portion of the transect will clearly depict botanical changes from the Yalbac center core, to the nearby and periphery house mounds, the forest and the pools. The daya I collect in this expanded survey will further be compared with additional modern home garden surveys, to create a diachronic picture of the Maya botanical landscape from ancient to modern times.

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APPENDIX I
Plant List by Collection Number

Col. #	Family Name	*Genus*	*Species*	English Common Name	Spanish Common Name	Maya Common Name	*My notes*	Cleofo notes	M (Med) /F (Food) / D (Deleterious) / O (Other use) / C (ceremony)
1	Apocynaceae	*Stemmadenia*	*donnell-smithii*	Horseballs		ton tzimin		Not used for food, it has a wide distribution. Used to make chewing gum	F
2	Moraceae	*Brosimim*	*alicastrum*	Ramòn		oox		Good for food, found on top of mounds. Wide distribution, edible.	F
3	Passifloraceae	*Passiflora*	*incarnata*	White Sasperilla		sumb'ul?			
4	Arecaceae	*Attalea*	*cohune*	Cohune Palm		tutz		Used for thatch in Maya houses.	O
5				Hardwood					
6	Burseraceae	*Protium*	*copal*	Copal		pom		Used for incense in Maya ceremonies.	C
7	Apocynaceae	*Aspidosperma*	*cruentum/megalocarpon*	White Malady (Mylady)		pemech-té	*NOTE: seeds are disc-shaped, ones we found on the ground*	Used for lumber.	O
8				Hardwood					
9	Cecropiaceae	*Cecropia*	*peltata*	Trumpet Tree		xk'o'och		No good for lumber, no good for food.	
10	Arecaceae	*Chamaedorea*	*tepejilote/elegans*	Pacaya		säk ch'ib'		Fruit for eating, palm, very widespread.	F
11	Anacardiaceae	*Spondias*	*radlkoferi*	Wild Plum (hog plum??)		pook'		Very good fruit.	F
12	Moraceae	*Castilla*	*elastica elastica*	Rubber Tree	hule	uule-che'		All over Cara Blanca, have sap when cut that is very sticky. Fruit is pink	
13	Arecaceae	*Cryosophila*	*stauracantha*	Broom Tree (give and take)		miis			
14	Rubiaceae	*Simira*	*salvadorensis*	Redwood		k'olay?			
	Bignoniac	*Arrabidae*		Pimienta					

16	Meliaceae	*Cedrela*	*odorata*	Cedar Tree		(k'u)k'u-che'			
17	Arecaceae	*Sabal*	*mauritiiformis/yapa*	Beer Leaf (Bayleaf Palm)		xa'an		Used for making houses. Looks the same as copal when it is growing.	O
18	Nyctaginaceae	*Pisonia*	*aculeata*	Cross Prickle Vine				Used for stomach ache, boil the tea into bark.	M
19				Unknown					
20				Unknown				Used for lumber.	O
21				La		laaj?		Grows next to paths, and sticks to skin.	
22	Piperaceae	*Piper*	*aduncum*	pu-chùch/pu-chu-ch/puchuuch		puchuch?		Grows under the canopy.	
23	Tectariaceae	*Tectaria*	*spp.*	Blackstick var. 1 (tectaria)		(b'o')b'ox-che'		Grows on rocks.	
24	Arecaceae	*Chamaedorea*	*graminifolia*	Xate				Grown in Belize and sold in Guatemala. Leaves are sold.	O
25	Verbenaceae/ Caesalpiniaceae	*Cornutia/Clerodentrum/Senna*	*pyramidata/chinense/occidentalis*	Stinkin' Bush		tu'uj pok-che'		Smells bad	
26	Fabaceae	*Acacia*	*spp.*	subin / zubin		sub'in		Ants bite and have long-lasting negative effects.	D
27	Arecaceae			Choobac		ch'uuy-b'ak?		Vine good for tying, large fruit when full grown. Used for tying- the roots are also used for tying.	O
28				Vine with a prickle					
29				Blackstick var. 2					
30				Flower				Red fruit, small.	
31				Spice Tree		nab'a'-ku'uk		Fruit like black pepper. Likes hills, not inland	F
32				Capicolo		xuyuuy?		Little kids like to chew, smell good.	F
33	Asteraceae	*Koanophyllon*	*galeottii*	Granny Walking Stick		xoopee ixuk?		Used to help old ladies walk, doesn't grow tall or straight. When it is dry, it is not very heavy.	O

34				Pulil				Used for firewoord, prickles on trunk.	O
35				Blackstick var. 3				Grows close to the groun, grows in open areas.	
36				Arichmuch		much?		Used for post. If you plant it in the ground, it will grow into a tree.	O
37	Simaroubaceae	*Simaroub a*	*glauca*	Negrito					
38	Vitaceae	*Vitis*	*tiliifolia*	Water tie-tie		aak' yaan u-ja' (lit. vine that has water)	water tie-tie	Small fruit that looks black.	
39	Sterculiaceae	*Sterculia*	*foetida*	Foul Cat Tree			*asia, skunk tree, peon, indian almond, etc*	grows ugly, and smells bad	
40				Grass					
41	Arecaceae	*Desmoncus*	*orthacanthos*	Basket Ti-Tie		b'äyäl		Used to make baskets, small red fruit.	O
42				Grass				Capsule seeds and flowery stamen	
43				White Ti-Tie		säk-'ak'		Bendable, doesn't break easily. Used for buildinga house. Cross visible in cross-section.	O
44				Pecary Vein (*Citam-ac)*				good for tying, square vine	O
45				Koonshonunc				Vine that is easy to break.	
46	Moraceae	*Ficus*	*obtusifolia*	Strangler Fig	Matapalo	le'ek 'aak'a walak 'ukimsaj che' (lit. it is the vine that kills trees)		Attach and kills another tree (vine).	
47	Rutaceae	*Zanthoxylum*	*spp.*	Prickly Yellow				used for furniture	O
48	Rhamnaceae	*Krugiodendron*	*ferreum*	quebracho		tzälam	black ironwood	Used to break soil, easy to break. Good lumber.	O
49	Sapotaceae	*Pouteria*	*spp.*	White Sapitillo		tz'ätz' ya'aj?			

50				Pulachooch		koch?		Vine with seeds in pods, used to make pots with	O
51				Vine with prickle					
52	Dioscoreaceae	*Dioscorea*	*bartlettii*	Wild Yam				fruit grows at the base	
53				Hardwood				Entire leaves, opposite.	
54				Flower in the jungle				White umbel flower, entire leaves, slightly wooden stem.	
55				Mooch		ixxib'?			
56				Tree easy to break				Tree is easy to break, small tree, forked roots out of the ground.	
57	Ganodermataceae	*Ganoderma*	*lucidum*	Mushroom				Mushroom grows on dead trees, medicine for babies, urine.	M
58	Olacaceae	*Schoepfia/ Ximenia*	*schreberi/americana*	copalche macho		kapul-che'		Tree forked at base, light bark.	
59				Harkstick		chi'ich' che'			
60				Unknown					
61				Sol		tzol?		Hardwood, used for firewood and lumber.	O
62	Anacardiaceae	*Metopium*	*brownei*	Poisonwood		ik'i-che'		Swells skin when you touch the milky sap.	D
63				Supwe/Webo tochuco		ma'h'äy?		Milk of the leaf kills the botfly.	M
64	Basellaceae	*Anredera*	*vesicaria*	Red tie		chäk-'ak'	*red vine*	Used to tie the house.	O
65	Burseraceae	*Bursera*	*simaruba*	Gumbolimbo		chäkaj? (chikaj)		Tall, grows next to Poisonwood. If you get poisonwood sap on you, chip off part of the bark and it will cure you.	M
66	Apocynaceae	*Aspidosperma*	*cruentum/megalocarpon*	Red Malady (Mylady)		sa'-yuk			
67				Sotsmas		tzo'otz mäs?		Used to prop the plants up.	O
68				Hardwood					
69	Papilionoideae/ Simaroubaceae	*Vatairea/Simarouba*	*lundellii/glauca*	Bitterwood		pa'-tzimin	*/paradise tree*	Eat the bark.	F?

70	Euphorbiaceae/Ulmaceae	*Drypetes/ Ampelocera*	*brownii/hottlei*	Bullyhob / bullhoof		luwin		Grows tall and is used for lumber.	O
71				Hardwood					
72				Small fern				Grows under the canopy.	
73	Boraginaceae	*Cordia*	*alliodora*	Samwood		so'oj-chaj?	*leaves in a whorl*		
74	Apocynaceae	*Plumeria*	*spp.*	Hardwood (Plumeria)				Hardwood	O
75	Clusiaceae	*Calophyllum*	*brasiliense rekoi*	Santa Maria				Used to make boards, lumber	O
76				Blackstick var. 4				Swamp-loving blackstick.	
77				Grass					
78				Huachump / Wahal leaf		le' che'		Used to wrap tomales. Grows in jungle	F
79	Sapotaceae	*Chrisophillum*	*caimito/mexicanum*	Siciya				Good fruit, kids use for chewing gum. Fruit like beans, sweet fruit.	F
80	Sapidaceae			Bolongyuck		b'olon yuk		Vine is used to kill fish.	O
81	Bixaceae	*Bixa*	*orellana*	Annatto		chimun	*In image- red, fuzzy pods with seeds inside*	Used for plywood. Milky sap, if dropped on your skin in the rain will peel it.	D/O
82	Costaceae	*Costus*	*guanaiensis*	w'eh-te		we'-te'	*spiral stem*	Bean good for eating. Grows in a circular stem. Birds like to eat the fruit.	F
83				Hardwood				Hardwood	O
84				Hardwood				Hardwood	O
85				Small plant				Small plant, doesn't grow high under canopy.	
86				Little tree				little tree, doesn't grow big	
87				Hardwood				Hardwood with a fruit, not good to eat.	O

88				Blackstick var. 5				Grows in swamps, fern-like leaves.	
89				Hardwood					
90	Asteraceae			Small vine				Small vine with black flowers, yellow when young	
91				Square vine				Fuzzy, square vine	
92	Melastomataceae	*Lygodium*	*spp.*	Wya Tie-Tie	alambre	alaab're-'ak'		Not easy to break.	O
93	Schizaeaceae	*Lygodium*	*spp.*	pa-sas		pasas?		Eat fruit when big, fuzzy vine.	F
94				Green Prickle					
95	Rubiaceae			Little flower vine				Orange flower, umbel, opposite entire leaves.	
96	Musaceae	*Musa*	*paradisiaca/sapientum*	Banana Tree	box haas	ja'as-che'	*Mayan: "haas"*	Little fruit like bananas.	F
97	Combretaceae	*Terminalia*	*amazonia*	white nargosta		k'än-xa'an	*also amarillo*	Use for lumber	O
98	Malvaceae	*Hampea*	*spp.*	moho		jool		When it is small, you use the bark to carry stuff on.	
99				Sol		tzol?		Use for lumber.	O
100	Fabaceae: Caesalpinioideae / Rubiaceae	*Senna / Uncaria*	*peralteana / tomentosa*	uea de gato / Uña de gato			*yellow flowers*	Unodigato (gato as in cat, has spines like a cat), use for medicine.	M
101	Areceae			Small plant				Small plant that grows under the canopy.	
102	Poaceae	*Guadua/Merostachys*	*longifolia/pauciflora*	Sanette (Bamboo)				bamboo	O
103				Small plant				Small plant, grows under the canopy.	
104				Hardwood with white flower				Hardwood with white flower.	O
105	Magnoliophyta: Liliopsida	*Dioscorea*	*bartletti*	cocolmeca		kokomeka		Vine with spines, tendrils.	
106				Vine with big prickles				Vine with big prickles, turns red/purple when worn.	
107	Maliaceae	*Swietenia*	*macrophylla*	Mahogany		chäkäl-te'		Dry, very large.	

108				Amaree	San Jwan			Tree grows large and is used for lumber.	O
109	Fabaceae: Papilionoideae	*Lonchocarpus*	*castilloi*	cabbage-bark		machich, k'änaab'		Used for lumber.	O
110	Cyperaceae	*Scleria*	*secans*	cutting-grass		weel		Cutting grass, can cut you.	D
111	Myrtceae	*Chamguava*	*schippii*	Guava tree		pätaj		Grows in the Cohune hole, little tree bears little fruit (guava)	F
112				Jungle plant				Bears fruit like a bean (red)	
113				Hardwood				Hardwood, birds eat the fruit	O
114	Sapindaceae/Basellaceae	*/Anredera*	*/vesicaria*	Red vine to kill fish with				Red vine to kill fish with.	O
115	Sapindaceae/Fabaceae	*/Inga*	*/spp.*	bri-bri		b'itz'		Bears long fruit that is sweet	F
116	Bombacaceae	*Pseudobombax*	*ellipticum*	cotton tree	pochote, clavellina, senorita	ya'ax-che'	*Mayan: "kuy-che" or "chulte"*	Tree grows big, easy to cut and used for plywood. Spines on tree.	O
117	Myristicaceae	*Virola*	*koschnyi*		Palo de sangre	b'ilix?	*red seed in pod*	When you cut the bark when it gets bigger, it looks like it is bleeding	
118				Flower in the jungle tree				Flower in the jungle tree. Leaves long and skinny like grass. Yellow flowers	
119				Asnic		ya'ax-nik?		Used to build a house	O
120				Hardwood				Hardwood	O
121				Pallood		palud?		Small plant grows under the canopy. Used to pull the door, when it grows long alternate leaves.	O
122	Nyctaginaceae			Vine with a prickle				Vine with a prickle, grows very big.	
123				Small plant				Heart-shaped leaves, grows under the canopy.	
124				Small plant				3-leaf cluster, small, grows under canopy.	
125				Small plant				Small leaves with accuminate apex	

126				Small plant				Small plant, leaves pinnately compound, grows under canopy.	
127				Vine				Vine, leaves accuminate apex	
128				Small plant				Small plant, entire leaves margins.	
129				Small plant				Small plant with spines on stem, mottled green leaves	
130				Small plant				Small plant, circular leaves, closed together on end, opposite leaf pair in center of stem	
131				Small plant				Small plant, accuminate apex, slightly mottled leaves.	
132				Small plant				2 opposite, circular leaves at the top of the stem.	
133				Small tree				Small tree with sennate leaves, simple leaves, fuzzy leaves.	
134				Small vine				Small vine, heart-shaped leaves.	
135				Little hardwood				Little hardwood, entire leaves, accuminate apex	O
136				Little forest flower				Little forest flower, purple stem with green leaves.	
137				Little plant				Little plant, tuberous root, long, thin, mottled leaves, grows frequently under forest canopy.	
138				Small vine				Small vine, fuzzy underside of leaves, entire leaf	
139				Small plant				Small plant, nearly circular leaf shape, entire margins, alternate leaf arrangement, light green leaves, thick root.	
140				Small tree				Leaf narrows to a point at both edges, small tree.	
141				Little tree				Little tree, leaves accuminate apex and slightly round at base, dark green leaves.	

142				Little tree				Little tree, narrow at both ends, light and dark green leaves.	
143				Small tree				Small tree, obovate leaves, acute apex, dark green leaves, somewhat crennate leaf venation.	
144				Small vine				Ovate leaves, dark green (poisonwood)	D
145	Anacardiaceae	*Metopium*	*brownei*	Poisonwood		ik'i-che'			
146				Small plant				Small plant, 2 pairs of 2 leaves together at the top of stem, fuzzy stem, smooth dark leaves	
147				Small plant				Completely heart-shaped, pointed ends at base, light green, small plant	
148				Small plant				Serrate leaf, venation, alternate leaves, dark and light green leaves, smooth surface.	
149				Small plant				3-leaf pairs, opposite attachment, serrated edges with spikes, smooth leaves	
150				Small plant				Obovate leaves, slightly macruminate at apex, smooth leaves	
151				Small plant				3-leaf cluster, leaves linked by stem	
152				Small plant		b'oob'		Leaves heart-shaped and sliced at end to almost form 2 leaves, stem reddish, has red flowers and green leaves, vine	
153				Small plant				3 leaves in combo, fuzzy stem, fuzzy on edges of leaf	
154				Small plant				5 leaves, broadest in center, fuzzy leaf and stem	
155				Small plant				3 leaf clusters, slightly mottled leaves, accuminate apex	

156				Small plant				Accuminate apex, mottled leaves, alternate arrangement.	
157				Little hardwood tree				Little hardwood tree, obovate leaves with accuminate apex, smooth, slightly mottled.	O
158				Small tree				Small tree, opposite attachement, green.	
159				Hardwood				Hardwood	O
160	Polygonaceae	*Coccoloba*	*belizensis*	Bob			*wild grape*	Large trunk, fuzzy fruit	F?
161	Myrtaceae	*Pimienta*	*dioica*	All Spice				Leaves for cooking in soup, bears fruit just like black pepper, used in seasoning like black pepper.	F
162				Epiphyte (telenzia)				Parasitic plant that grows on vines.	
163				Spice Tie-Tie	pimienta	pimienti-'ak'		Smells good.	
164				Hardwood				Hardwood, stays small	O
165				Hardwood				Hardwood, gray bark, grows in folds in the trunk. Ants like it.	O
166				Monach		säk-säk sa'-yuk		Firewood, doesn't grow big	O
167	Sapotaceae	*Manikara*	*zapota*	Sapodilla (Red)				Gets really big, used for house posts, cut bark and get milk that is used for chewing gum or rubber boots	O/F
168				Epiphyte				Parasite on vine.	
169	Piperaceae	*Piper*	*spp.*	puchùch (var. 2)				Big-leaves, large nodes	
170	Flacourtiaceae	*Zuelania*	*guidonia*	tamai/tamai/tamay		tamay?		Used for firewood, doesn't grow big	O
171				Small tree				Small tree, acute base, widest near apex, green leaves	
172				Large tie-tie				Tie-tie, pretty large	
173				Epiphyte (fern)				Parasitic plant on trees, grows on n13, red spongy roots, long green leaves.	

174				Little tree				Little tree, bears soft orange flowers, fuzzy leaves	
175				Little epiphytic vine				Little parasitic vine with long, green flower like a spathe	
176				Little hardwood				Little hardwood, fuzzy bark and stems, fuzzy underside of leaves	O
177				Little tree				Little tree, 3 leaves at each end, broadest near the apex. 1 vein in leaf, nodes	
178				Vine on a tree				Vine grows on tree, long and skinny leaves spaced far apart	
179				Hardwood				Hardwood, looks like cedar bark consistency, big green leaves, opposite.	O
180				Little tree				Little tree, opposite leaves, smooth leaves, acccuminate apex.	
181				Small plant				Slick leaves, mottled leaf color, alternate leaves.	
182				Vine				Vine, 5 leaves per stem, slternate attachement.	
183				Vine				Vine that we have collected before, ovate leaves with accuminate apex	
184				Vine					
185				Little tree				Little tree, fuzzy leaves, alternate attachment	
186				Little tree				Little tree, leaves stepped on ends, some in groups of 3, serrate	
187				Little tree				Little tree, leaves long and skinny and stepped on ends, serrate	
188				Little tree				Little tree, leaves start long and slender and widen at apex before coming to a point, serrate edges, slightly mottled color.	

189				Little tree				Little tree, doesn't grow very high, fuzzy leaves	
190				Little tree				Little tree, round leaves on base that get long with bulbous ends as the leaves get younger near the top.	
191				Little tree				Little tree, accuminate apex, looks like monach leafs but no white sap.	
192				Little tree				Little tree, widest near center, smooth leaves	
193				Small plant				Obovate leaves, alternate	
194				Small plant				Circular leaves, opposite	
195	Asclepiadaceae	*Marsdenia*	*coulteri*	Vine				Vine that has pods with hairy seeds, vine looks like spice-tie-tie, reddish-brown in color	
196	Asclepiadaceae			Vine				Vine with tendrils, green vine with brown raised spots on it. 2 leaves per "branch	
197				Hoyub-cheh		juyub'-che'		Boilstick, used to stir something in a pot	O
198	Marantaceae	*Thalia/Maranta*	*spp.*	huachump var. 2 (use as food)				Little tree, grows short, leaves on 1 vein, many branches (huachump variety)	
199				Tree easy to break				Tree easy to break, alternate leaves, pinnately veined	
200	Euphorbiaceae	*Cnidoscolus*	*aconitifolius/ souzae*	Chiche		chay-che'?	*Souzae: spines on branches, trunk, flower stalk*	Leaves and milk are bad for your skin, peels your skin	D
201				Vine				Vine, black, semi-square, red shoots with green pots on the end.	
202				Short plant				Like choobac except it doesn't go up on the tree (vine).	
203				Blackstick var. 6				Unknown variety	
204				Vine with a prickle (solanum)				Prickle with vine and fruit just like marbles. Use it for fishing	O

205	Selaginellaceae	*Selaginella*	*erythropus/longispicata*	Fern				Grows where machine pushes it, wild cilantro.	F?
206				Plant in the jungle				Plant in the jungle, green stem, purple stalk of leaf, serrate margins	
207				Little vine				Little vine, dark green semi-heart-shaped leaves	
208	Araceae			Plant with spithe and spadix				Plant with spithe and spadex, yellow spithe and green spadex like a leaf. Big green leaves, small plants have sheathing.	
209				Little tree				Little tree, big leaves, opposite, has little green fruit	
210	Cyrillaceae	*Cyrilla*	*racemiflora*	Black tie-tie		b'ox-'ak'	*titi family, florida*	Black tie-tie with large pods, alternate rings on base of stems of leaves.	
211	Anacardiaceae	*Astronium*	*graveolens*	Cobillo (Jobillo)		paap-'ich k'inam		Used to make furniture, tables, etc.	O
212	Rubiaceae/Sapotaceae	*Alseis/Pouteria*	*yucatanensis/sapota*	mame/ mamey/Mammee		chäkäl-ja'as		Fruit is sweet like mango, red fruit inside, brown outside, fruit bears red or white fruit, unknown variety until you can see the fruit	F
213				Vine with a prickle				Vine with a prickle, leaves subtended by prickles, 2 per leaf, alternate leaf arrangement	
214				Little plant				Little plant with tough leaves, very sturdy but smooth, light green color	
215				Talawala (white var.)				White one, lives on rotted cohune trees. There is also a black one used often for medicine (wider leaf)	
216				Little vine				Little vine, serrate leaf margins	
217	Arecaceae	*Cocos*	*nucifera*	Coconut Tree				Coconut tree, used to cook rice and beans, drink water, good fruit, make coconut oil and the water tastes good.	F

218				Edible Flower				Edible flower, mix with egg, flower comes out of the top, white blossoms	F
219	Arecaceae	*Acrocomia*	*mexicana*	Moop (*mop?)*				Bears fruit, leaves have a prickle, bears little fruit that you eat with sugar. Blooms in dry season.	F
220				Small plant				Bears red fruit, small and looks like a weed. Long and thin leaves	
221	Euphorbiaceae	*Acalypha*	*spp.*	Small plant (acalypha)				Bears green, fuzzy fruit. Leaves widest in the center	
222	Musaceae	*Musa*	*spp. (acuminata)*	Apple-banana tree				Apple-banana tree, long palm leaves, all together, bark peels and is blonde. Unknown origin, mainly Valley of Peru (?)	F
223				Blago				Bears big and sweet fruit, similar in structure to the apple-banana. Long leaves all together	F
224	Styracaceae/ Rutaceae	*Styrax/ Citrus*	*glaber/ aurantium*	Orange tree				Orange tree, 2m high, many branches, smooth leaves, widest at center, pinnately veined, alternate leaves	F
225	Anacardiaceae	*Mangifera*	*indica*	Mango tree				Mango tree, 5m high, low and high branches, long and relatively thin leaves- dark green, green to orange fruit,	
226	Asteraceae			Little yellow flower				Little yellow flower, have to chop with machete, composite	
227	Malvaceae	*Sida / Malvastrum*	*spp. / corowandelianum*	Che-che-bay (sida)				Bug plants, don't like	
228				Naranjo Happiness				Like apple, bears big red fruit	
229	Poaceae	*Saccharuum*	*pfficinarum*	Sugar Cane				Used to make sugar, make wine or rum, no sugar - no rum, got from plantation	F
230	Convolvulaceae	*Ipomoea*	*batata*	Sweet potato				Sweet potato	

231	Annonaceae	*Annona*	*glabra*	Mammon (mamain?? Mawon??)				Fruit like marbles, green	F
232				Chil-lel				Eat all fruit, eat all seed and fruit	F
233				Tree in the way				Chop down the tree- in the way, grow outside jungle	
234				Thin weed				Grows outside jungle, doesn't stay long, dies and gets dry, tall and thin	
235	Apocynaceae	*Asclepias*	*arassiviea*	Little red flower				Little red flower, not grown in the jungle, hood and horn flower	
236				Grass				Grows in plantation	
237				Mini-plum				mini-plum, compound leaves, light green	
238	Malvaceae	*Hibiscus*	*rosa-sinensis var. rosa-sinensis*	Red belle (hibiscus)				red bell, Malvaceae, monadelphous stamen, bush with red flower	
239	Convolvulaceae	*Ipomoea*	*pes-caprae*	Cowsup			*"cowslip"*	Bears big fruit, orange color inside fruit, bears fruit in August	F
240	Rosaceae	*Prunus*	*spp. (americana)*	August plum				Little plum, bears in August, not grow taller. From El Salvador	F
241	Euphorbiaceae	*Manihot*	*esculenta*	Cassava				Make chips, fried, small tree	F
242	Anacardiaceae	*Spondias*	*cytherea*	Golden Plum				Ready in August, different taste, grows taller	F
243	Myrtaceae	*Psidium*	*guajava*	Guava tree				guava tree, very small	F
244	Malpighiaceae	*Byrsonima /Malpichia*	*crassifolia*	Craboo				Small, in front	F
245	Guttiferae	*Calophyllum*	*antillanum*	Santa Maria				Wrap fish in it over the fire, long fruit like spithe	F
246	Lauraceae	*Persea*	*americana*	Alligator pear	aguacate		*Mayan: "on"*	Bears big fruit, young one- 3 years before fruit	F
247	Rutaceae	*Citrus*	*aurantitolia*	Lime tree	limon			Lime tree, small	
248	Poaceae	*Oplismenus*	*hirtellus spp. Setarius*	Running grass			*running mountain grass*	Running grass	
249	Annonaceae	*Annona*	*retuculata*	Custard apple				Custard apple, small	F

250				Papaya tree				Papaya	F
251				Silvero plum				Plum tree	F
252				Mapwee				Used to make soup	F
253				Yebrobrena				Grows in a pot	
254	Araceae	*Colocasia*	*esculenta*	Coco (taro/macal)				Small plant, fruits in January	F?
255				Kimeet				Kimeet (still to plant)	
256				Balenque				Big fruit, make coffee and drink like cacao	F
257				Cala				Palm, young- boil and eat, get older- make basket and straw hats	F/O
258				Allibamo				Different fruit than banana, big leaves	F
259				Cookeek				Medicine, looks like poochooch, Best medicine (Cleofo's dad was a bush doctor), put on hear, good for medicine, means blood test, good for blood	M
260				Challam				Kills fish, pinnately compound leaf	O
261	Anacardiaceae	*Rhus*	*radicans*	Chechmum (*chechem?)*				Catches you when you walk	
262	Apiaceae	*Eryngium/ Coriandrum*	*(vulgare/foetidum) / sativum*	Coolantro/culantro				Put on killed chicken and it will smell good	F
263	Sterculiaceae	*Theobroma*	*cacao*	Cacao				Cacao- make drink	F
264	Orchidaceae	*Prosthechea*	*cochleata*	Black orchid				Black orchid, national flower of Belize, brought from jungle. Can't take it out- illegal	
265	Annonaceae	*Annona*	*muricata*	Soursop				Little tree	F
266	Lamiaceae	*Origanum*	*vulgare*	Oregano				Oragano, used for seasoning	
267				Sesebogin				Onion	F
268	Fabaceae	*Gliricidia*	*sepium*	Madre cacao				Use for posts	O
269	Solanaceae	*Capsicum*	*chinense*	habenero chili pepper				Hot pepper, green fruit	F
270	Amaranthaceae	*Amaranthus*	*viridis/dubius*	Calaloo (amaranth				Cut leaf, eat young with tortillas	F

271	Solanaeae	*Solanum*	*spp.*	Bird pepper			*one of these is species americanum*	Bird pepper, birds like it. Red and small, smaller when old	F
272	Solanaeae	*Solanum*	*spp.*	Bird pepper var. 2				Bird pepper #2, smaller	F
273	Poaceae	*Zea*	*mays*	Corn (maize)				Corn, maize	F
	Adiantaceae	*Adiantum*	*tenerum*	blackstick? Var					

APPENDIX II
Plant List by Genus

Col. #	Family Name	*Genus*	*Species*	English Common Name	Spanish Common Name	Maya Common Name	*My notes*	Cleofo notes	M (Med) /F (Food) / D (Deleterious) / O (Other use) / C (ceremony)
114	Sapindaceae /Basellaceae	*/Anredera*	*/vesicaria*	Red vine to kill fish with				Red vine to kill fish with.	O
115	Sapindaceae /Fabaceae	*/Inga*	*/spp.*	bri-bri		b'itz'		Bears long fruit that is sweet	F
26	Fabaceae	*Acacia*	*spp.*	subin / zubin		sub'in		Ants bite and have long-lasting negative effects.	D
221	Euphorbiaceae	*Acalypha*	*spp.*	Small plant (acalypha)				Bears green, fuzzy fruit. Leaves widest in the center	
219	Arecaceae	*Acrocomia*	*mexicana*	Moop (*mop?)*				Bears fruit, leaves have a prickle, bears little fruit that you eat with sugar. Blooms in dry season.	F
	Adiantaceae	*Adiantum*	*tenerum*	blackstick? Var					
212	Rubiaceae/Sapotaceae	*Alseis/Pouteria*	*yucatanensis/sapota*	mame/ mamey/Mammee		chäkäl-ja'as		Fruit is sweet like mango, red fruit inside, brown outside, fruit bears red or white fruit, unknown variety until you can see the fruit	F
270	Amaranthaceae	*Amaranthus*	*viridis/dubius*	Calaloo (amaranth				Cut leaf, eat young with tortillas	F
231	Annonaceae	*Annona*	*glabra*	Mammon (mamain?? Mawon??)				Fruit like marbles, green	F
265	Annonaceae	*Annona*	*muricata*	Soursop				Little tree	F
249	Annonaceae	*Annona*	*retuculata*	Custard apple				Custard apple, small	F
64	Basellaceae	*Anredera*	*vesicaria*	Red tie		chäk-'ak'	*red vine*	Used to tie the house.	O
15	Bignoniaceae	*Arrabidaea*	*floribunda*	Pimienta Vine	pimienta	pimienta-'ak'	*bejuco pimienta*	Used for building houses, like tough string.	O
235	Apocynaceae	*Asclepias*	*arassiviea*	Little red flower				Little red flower, not grown in the jungle, hood and horn flower	

7	Apocynaceae	*Aspidosperma*	*cruentum/ megalocarpon*	White Malady (Mylady)		pemech-té	*NOTE: seeds are disc-shaped, ones we found on the ground*	Used for lumber.	O
66	Apocynaceae	*Aspidosperma*	*cruentum/ megalocarpon*	Red Malady (Mylady)		sa'-yuk			
211	Anacardiaceae	*Astronium*	*graveolens*	Cobillo (Jobillo)		paap-'ich k'inam		Used to make furniture, tables, etc.	O
4	Arecaceae	*Attalea*	*cohune*	Cohune Palm		tutz		Used for thatch in Maya houses.	O
81	Bixaceae	*Bixa*	*orellana*	Annatto		chimun	*In image- red, fuzzy pods with seeds inside*	Used for plywood. Milky sap, if dropped on your skin in the rain will peel it.	D/O
2	Moraceae	*Brosimim*	*alicastrum*	Ramòn		oox		Good for food, found on top of mounds. Wide distribution, edible.	F
65	Burseraceae	*Bursera*	*simaruba*	Gumbolimbo		chäkaj? (chikaj)		Tall, grows next to Poisonwood. If you get poisonwood sap on you, chip off part of the bark and it will cure you.	M
244	Malpighiaceae	*Byrsonima/ Malpichia*	*crassifolia*	Craboo				Small, in front	F
245	Guttiferae	*Calophyllum*	*antillanum*	Santa Maria				Wrap fish in it over the fire, long fruit like spithe	F
75	Clusiaceae	*Calophyllum*	*brasiliense rekoi*	Santa Maria				Used to make boards, lumber	O
269	Solanaceae	*Capsicum*	*chinense*	habenero chili pepper				Hot pepper, green fruit	F
12	Moraceae	*Castilla*	*elastica elastica*	Rubber Tree	hule	uule-che'		All over Cara Blanca, have sap when cut that is very sticky. Fruit is pink	
9	Cecropiaceae	*Cecropia*	*peltata*	Trumpet Tree		xk'o'och		No good for lumber, no good for food.	
16	Meliaceae	*Cedrela*	*odorata*	Cedar Tree		(k'u)k'u-che'			
24	Arecaceae	*Chamaedorea*	*graminifolia*	Xate				Grown in Belize and sold in Guatemala. Leaves are sold.	O

10	Arecaceae	*Chamaedorea*	*tepejilote/elegans*	Pacaya		säk ch'ib'		Fruit for eating, palm, very widespread.	F
111	Myrtceae	*Chamguava*	*schippii*	Guava tree		pätaj		Grows in the Cohune hole, little tree bears little fruit (guava)	F
79	Sapotaceae	*Chrisophillum*	*caimito/mexicanum*	Siciya				Good fruit, kids use for chewing gum. Fruit like beans, sweet fruit.	F
247	Rutaceae	*Citrus*	*aurantitolia*	Lime tree	limon			Lime tree, small	F
200	Euphorbiaceae	*Cnidoscolus*	*aconitifolius/souzae*	Chiche		chay-che'?	*Souzae: spines on branches, trunk, flower stalk*	Leaves and milk are bad for your skin, peels your skin	D
160	Polygonaceae	*Coccoloba*	*belizensis*	Bob			*wild grape*	Large trunk, fuzzy fruit	F?
217	Arecaceae	*Cocos*	*nucifera*	Coconut Tree				Coconut tree, used to cook rice and beans, drink water, good fruit, make coconut oil and the water tastes good.	F
254	Araceae	*Colocasia*	*esculenta*	Coco (taro/macal)				Small plant, fruits in January	F?
73	Boraginaceae	*Cordia*	*alliodora*	Samwood		so'oj-chaj?	*leaves in a whorl*		
25	Verbenaceae/ Caesalpinaceae	*Cornutia/Clerodentrum/ Senna*	*pyramidata/chinense/occidentalis*	Stinkin' Bush		tu'uj pok-che'		Smells bad	
82	Costaceae	*Costus*	*guanaiensis*	w'eh-te		we'-te'	*spiral stem*	Bean good for eating. Grows in a circular stem. Birds like to eat the fruit.	F
13	Arecaceae	*Cryosophila*	*stauracantha*	Broom Tree (give and take)		miis			
210	Cyrillaceae	*Cyrilla*	*racemiflora*	Black tie-tie		b'ox-'ak'	*titi family, florida*	Black tie-tie with large pods, alternate rings on base of stems of leaves.	
41	Arecaceae	*Desmoncus*	*orthacanthos*	Basket Ti-Tie		b'äyäl		Used to make baskets, small red fruit.	O
105	Magnoliophyta: Liliopsida	*Dioscorea*	*bartletti*	cocolmeca		kokomeka		Vine with spines, tendrils.	
52	Dioscoreaceae	*Dioscorea*	*bartlettii*	Wild Yam				fruit grows at the base	

70	Euphorbiaceae/Ulmaceae	*Drypetes/Ampelocera*	*brownii/hottlei*	Bullyhob / bullhoof		luwin		Grows tall and is used for lumber.	O
262	Apiaceae	*Eryngium/ Coriandrum*	*(vulgare/foetidum) / sativum*	Coolantro/culantro				Put on killed chicken and it will smell good	F
46	Moraceae	*Ficus*	*obtusifolia*	Strangler Fig	Matapalo	le'ek 'aak'a walak 'ukimsaj che' (lit. it is the vine that kills trees)		Attach and kills another tree (vine).	
57	Ganodermataceae	*Ganoderma*	*lucidum*	Mushroom				Mushroom grows on dead trees, medicine for babies, urine.	M
268	Fabaceae	*Gliricidia*	*sepium*	Madre cacao				Use for posts	O
102	Poaceae	*Guadua/Merostachys*	*longifolia/pauciflora*	Sanette (Bamboo)				bamboo	O
98	Malvaceae	*Hampea*	*spp.*	moho		jool		When it is small, you use the bark to carry stuff on.	
238	Malvaceae	*Hibiscus*	*rosa-sinensis var. rosa-sinensis*	Red belle (hibiscus)				red bell, Malvaceae, monadelphous stamen, bush with red flower	
230	Convolvulaceae	*Ipomoea*	*batata*	Sweet potato				Sweet potato	F
239	Convolvulaceae	*Ipomoea*	*pes-caprae*	Cowsup			*"cowslip"*	Bears big fruit, orange color inside fruit, bears fruit in August	F
33	Asteraceae	*Koanophyllon*	*galeottii*	Granny Walking Stick		xoopee ixuk?		Used to help old ladies walk, doesn't grow tall or straight. When it is dry, it is not very heavy.	O
48	Rhamnaceae	*Krugiodendron*	*ferreum*	quebracho		tzälam	black ironwood	Used to break soil, easy to break. Good lumber.	O
109	Fabaceae: Papilionoideae	*Lonchocarpus*	*castilloi*	cabbage-bark		machich, k'änaab'		Used for lumber.	O
92	Melastomataceae	*Lygodium*	*spp.*	Wya Tie-Tie	alambre	alaab're-'ak'		Not easy to break.	O
93	Schizaeaceae	*Lygodium*	*spp.*	pa-sas		pasas?		Eat fruit when big, fuzzy vine.	F

225	Anacardiaceae	*Mangifera*	*indica*	Mango tree				Mango tree, 5m high, low and high branches, long and relatively thin leaves- dark green, green to orange fruit,	F
241	Euphorbiaceae	*Manihot*	*esculenta*	Cassava				Make chips, fried, small tree	F
167	Sapotaceae	*Manikara*	*zapota*	Sapodilla (Red)				Gets really big, used for house posts, cut bark and get milk that is used for chewing gum or rubber boots	O/F
195	Asclepiadaceae	*Marsdenia*	*coulteri*	Vine				Vine that has pods with hairy seeds, vine looks like spice-tie-tie, reddish-brown in color	
62	Anacardiaceae	*Metopium*	*brownei*	Poisonwood		ik'i-che'		Swells skin when you touch the milky sap.	D
145	Anacardiaceae	*Metopium*	*brownei*	Poisonwood		ik'i-che'			
96	Musaceae	*Musa*	*paradisiaca/sapientum*	Banana Tree	box haas	ja'as-che'	*Mayan: "haas"*	Little fruit like bananas.	F
222	Musaceae	*Musa*	*spp. (acuminata)*	Apple-banana tree				Apple-banana tree, long palm leaves, all together, bark peels and is blonde. Unknown origin, mainly Valley of Peru (?)	F
248	Poaceae	*Oplismenus*	*hirtellus spp. Setarius*	Running grass			*running mountain grass*	Running grass	
266	Lamiaceae	*Origanum*	*vulgare*	Oregano				Oragano, used for seasoning	F
3	Passifloraceae	*Passiflora*	*incarnata*	White Sasperilla		sumb'ul?			
246	Lauraceae	*Persea*	*americana*	Alligator pear	aguacate		*Mayan: "on"*	Bears big fruit, young one- 3 years before fruit	F
161	Myrtaceae	*Pimienta*	*dioica*	All Spice				Leaves for cooking in soup, bears fruit just like black pepper, used in seasoning like black pepper.	F
22	Piperaceae	*Piper*	*aduncum*	pu-chùch/pu-chu-ch/puchuuch		puchuch?		Grows under the canopy.	

169	Piperaceae	*Piper*	*spp.*	puchùch (var. 2)				Big-leaves, large nodes	
18	Nyctaginaceae	*Pisonia*	*aculeata*	Cross Prickle Vine				Used for stomach ache, boil the tea into bark.	M
74	Apocynaceae	*Plumeria*	*spp.*	Hardwood (Plumeria)				Hardwood	O
49	Sapotaceae	*Pouteria*	*spp.*	White Sapitillo		tz'ätz' ya'aj?			
264	Orchidaceae	*Prosthechea*	*cochleata*	Black orchid				Black orchid, national flower of Belize, brought from jungle. Can't take it out-illegal	
6	Burseraceae	*Protium*	*copal*	Copal		pom		Used for incense in Maya ceremonies.	C
240	Rosaceae	*Prunus*	*spp. (americana)*	August plum				Little plum, bears in August, not grow taller. From El Salvador	F
116	Bombacaceae	*Pseudobombax*	*ellipticum*	cotton tree	pochote, clavellina, senorita	ya'ax-che'	*Mayan: "kuy-che" or "chulte"*	Tree grows big, easy to cut and used for plywood. Spines on tree.	O
243	Myrtaceae	*Psidium*	*guajava*	Guava tree				guava tree, very small	F
261	Anacardiaceae	*Rhus*	*radicans*	Chechmum (*chechem?)*				Catches you when you walk	
17	Arecaceae	*Sabal*	*mauritiiformis/yapa*	Beer Leaf (Bayleaf Palm)		xa'an		Used for making houses. Looks the same as copal when it is growing.	O
229	Poaceae	*Saccharuum*	*pfficinarum*	Sugar Cane				Used to make sugar, make wine or rum, no sugar - no rum, got from plantation	F
58	Olacaceae	*Schoepfia/Ximenia*	*schreberi/ americana*	copalche macho		kapul-che'		Tree forked at base, light bark.	
110	Cyperaceae	*Scleria*	*secans*	cutting-grass		weel		Cutting grass, can cut you.	D
205	Selaginellaceae	*Selaginella*	*erythropus /longispicata*	Fern				Grows where machine pushes it, wild cilantro.	F?
100	Fabaceae: Caesalpinoideae / Rubiaceae	*Senna / Uncaria*	*peralteana / tomentosa*	uea de gato / Uña de gato			*yellow flowers*	Unodigato (gato as in cat, has spines like a cat), use for medicine.	M
227	Malvaceae	*Sida / Malvastrum*	*spp. / corowandelianum*	Che-che-bay (sida)				Bug plants, don't like	
37	Simaroubaceae	*Simarouba*	*glauca*	Negrito					

14	Rubiaceae	*Simira*	*salvadorensis*	Redwood		k'olay?			
271	Solanaeae	*Solanum*	*spp.*	Bird pepper			*one of these is species americanum*	Bird pepper, birds like it. Red and small, smaller when old	F
272	Solanaeae	*Solanum*	*spp.*	Bird pepper var. 2				Bird pepper #2, smaller	F
242	Anacardiaceae	*Spondias*	*cytherea*	Golden Plum				Ready in August, different taste, grows taller	F
11	Anacardiaceae	*Spondias*	*radlkoferi*	Wild Plum (hog plum??)		pook'		Very good fruit.	F
1	Apocynaceae	*Stemmadenia*	*donnell-smithii*	Horseballs		ton tzimin		Not used for food, it has a wide distribution. Used to make chewing gum	F
39	Sterculiaceae	*Sterculia*	*foetida*	Foul Cat Tree			*asia, skunk tree, peon, indian almond, etc*	grows ugly, and smells bad	
224	Styracaceae/ Rutaceae	*Styrax/ Citrus*	*glaber/ aurantium*	Orange tree				Orange tree, 2m high, many branches, smooth leaves, widest at center, pinnately veined, alternate leaves	F
107	Maliaceae	*Swietenia*	*macrophylla*	Mahogany		chäkäl-te'		Dry, very large.	
23	Tectariaceae	*Tectaria*	*spp.*	Blackstick var. 1 (tectaria)		(b'o')b'ox-che'		Grows on rocks.	
97	Combretaceae	*Terminalia*	*amazonia*	white nargosta		k'än-xa'an	*also amarillo*	Use for lumber	O
198	Marantaceae	*Thalia/Maranta*	*spp.*	huachump var. 2 (use as food)				Little tree, grows short, leaves on 1 vein, many branches (huachump variety)	
263	Sterculiaceae	*Theobroma*	*cacao*	Cacao				Cacao- make drink	F
69	Papilionoideae/ Simaroubac	*Vatairea/Simarouba*	*lundellii/glauca*	Bitterwood		pa'-tzimin	*/paradise tree*	Eat the bark.	F?

	eae								
117	Myristicaceae	*Virola*	*koschnyi*		Palo de sangre	b'ilix?	*red seed in pod*	When you cut the bark when it gets bigger, it looks like it is bleeding	
38	Vitaceae	*Vitis*	*tiliifolia*	Water tie-tie		aak' yaan u-ja' (lit. vine that has water)	water tie-tie	Small fruit that looks black.	
47	Rutaceae	*Zanthoxylum*	*spp.*	Prickly Yellow				used for furniture	O
273	Poaceae	*Zea*	*mays*	Corn (maize)				Corn, maize	F
170	Flacourtiaceae	*Zuelania*	*guidonia*	tamai/tamai mai/tamay		tamay?		Used for firewood, doesn't grow big	O
208	Araceae			Plant with spithe and spadix				Plant with spithe and spadex, yellow spithe and green spadex like a leaf. Big green leaves, small plants have sheathing.	
27	Arecaceae			Choobac		ch'uuy-b'ak?		Vine good for tying, large fruit when full grown. Used for tying- the roots are also used for tying.	O
101	Areceae			Small plant				Small plant that grows under the canopy.	
196	Asclepiadaceae			Vine				Vine with tendrils, green vine with brown raised spots on it. 2 leaves per "branch	
90	Asteraceae			Small vine				Small vine with black flowers, yellow when young	
226	Asteraceae			Little yellow flower				Little yellow flower, have to chop with machete, composite	
122	Nyctaginaceae			Vine with a prickle				Vine with a prickle, grows very big.	
95	Rubiaceae			Little flower vine				Orange flower, umbel, opposite entire leaves.	
80	Sapidaceae			Bolongyuck		b'olon yuk		Vine is used to kill fish.	O
5				Hardwood					

8				Hardwood					
19				Unknown					
20				Unknown				Used for lumber.	O
21				La		laaj?		Grows next to paths, and sticks to skin.	
28				Vine with a prickle					
29				Blackstick var. 2					
30				Flower				Red fruit, small.	
31				Spice Tree		nab'a'-ku'uk		Fruit like black pepper. Likes hills, not inland	F
32				Capicolo		xuyuuy?		Little kids like to chew, smell good.	F
34				Pulil				Used for firewoord, prickles on trunk.	O
35				Blackstick var. 3				Grows close to the groun, grows in open areas.	
36				Arichmuch		much?		Used for post. If you plant it in the ground, it will grow into a tree.	O
40				Grass					
42				Grass				Capsule seeds and flowery stamen	
43				White Ti-Tie		säk-'ak'		Bendable, doesn't break easily. Used for buildinga house. Cross visible in cross-section.	O
44				Pecary Vein (*Citam-ac)*				good for tying, square vine	O
45				Koonshonunc				Vine that is easy to break.	
50				Pulachooch		koch?		Vine with seeds in pods, used to make pots with	O
51				Vine with prickle					
53				Hardwood				Entire leaves, opposite.	
54				Flower in the jungle				White umbel flower, entire leaves, slightly wooden stem.	
55				Mooch		ixxib'?			

56				Tree easy to break				Tree is easy to break, small tree, forked roots out of the ground.	
59				Harkstick		chi'ich' che'			
60				Unknown					
61				Sol		tzol?		Hardwood, used for firewood and lumber.	O
63				Supwe/We botochuco		ma'h'äy?		Milk of the leaf kills the botfly.	M
67				Sotsmas		tzo'otz mäs?		Used to prop the plants up.	O
68				Hardwood					
71				Hardwood					
72				Small fern				Grows under the canopy.	
76				Blackstick var. 4				Swamp-loving blackstick.	
77				Grass					
78				Huachump / Wahal leaf		le' che'		Used to wrap tomales. Grows in jungle	F
83				Hardwood				Hardwood	O
84				Hardwood				Hardwood	O
85				Small plant				Small plant, doesn't grow high under canopy.	
86				Little tree				little tree, doesn't grow big	
87				Hardwood				Hardwood with a fruit, not good to eat.	O
88				Blackstick var. 5				Grows in swamps, fern-like leaves.	
89				Hardwood					
91				Square vine				Fuzzy, square vine	
94				Green Prickle					
99				Sol		tzol?		Use for lumber.	O
103				Small plant				Small plant, grows under the canopy.	
104				Hardwood with white flower				Hardwood with white flower.	O
106				Vine with big prickles				Vine with big prickles, turns red/purple when worn.	

108				Amaree	San Jwan			Tree grows large and is used for lumber.	O
112				Jungle plant				Bears fruit like a bean (red)	
113				Hardwood				Hardwood, birds eat the fruit	O
118				Flower in the jungle tree				Flower in the jungle tree. Leaves long and skinny like grass. Yellow flowers	
119				Asnic		ya'ax-nik?		Used to build a house	O
120				Hardwood				Hardwood	O
121				Pallood		palud?		Small plant grows under the canopy. Used to pull the door, when it grows long alternate leaves.	O
123				Small plant				Heart-shaped leaves, grows under the canopy.	
124				Small plant				3-leaf cluster, small, grows under canopy.	
125				Small plant				Small leaves with accuminate apex	
126				Small plant				Small plant, leaves pinnately compound, grows under canopy.	
127				Vine				Vine, leaves accuminate apex	
128				Small plant				Small plant, entire leaves margins.	
129				Small plant				Small plant with spines on stem, mottled green leaves	
130				Small plant				Small plant, circular leaves, closed together on end, opposite leaf pair in center of stem	
131				Small plant				Small plant, accuminate apex, slightly mottled leaves.	
132				Small plant				2 opposite, circular leaves at the top of the stem.	

133				Small tree				Small tree with sennate leaves, simple leaves, fuzzy leaves.	
134				Small vine				Small vine, heart-shaped leaves.	
135				Little hardwood				Little hardwood, entire leaves, accuminate apex	O
136				Little forest flower				Little forest flower, purple stem with green leaves.	
137				Little plant				Little plant, tuberous root, long, thin, mottled leaves, grows frequently under forest canopy.	
138				Small vine				Small vine, fuzzy underside of leaves, entire leaf	
139				Small plant				Small plant, nearly circular leaf shape, entire margins, alternate leaf arrangement, light green leaves, thick root.	
140				Small tree				Leaf narrows to a point at both edges, small tree.	
141				Little tree				Little tree, leaves accuminate apex and slightly round at base, dark green leaves.	
142				Little tree				Little tree, narrow at both ends, light and dark green leaves.	
143				Small tree				Small tree, obovate leaves, acute apex, dark green leaves, somewhat crennate leaf venation.	
144				Small vine				Ovate leaves, dark green (poisonwood)	D
146				Small plant				Small plant, 2 pairs of 2 leaves together at the top of stem, fuzzy stem, smooth dark leaves	
147				Small plant				Completely heart-shaped, pointed ends at base, light green, small plant	

148				Small plant				Serrate leaf, venation, alternate leaves, dark and light green leaves, smooth surface.	
149				Small plant				3-leaf pairs, opposite attachment, serrated edges with spikes, smooth leaves	
150				Small plant				Obovate leaves, slightly macruminate at apex, smooth leaves	
151				Small plant				3-leaf cluster, leaves linked by stem	
152				Small plant		b'oob'		Leaves heart-shaped and sliced at end to almost form 2 leaves, stem reddish, has red flowers and green leaves, vine	
153				Small plant				3 leaves in combo, fuzzy stem, fuzzy on edges of leaf	
154				Small plant				5 leaves, broadest in center, fuzzy leaf and stem	
155				Small plant				3 leaf clusters, slightly mottled leaves, accuminate apex	
156				Small plant				Accuminate apex, mottled leaves, alternate arrangement.	
157				Little hardwood tree				Little hardwood tree, obovate leaves with accuminate apex, smooth, slightly mottled.	O
158				Small tree				Small tree, opposite attachement, green.	
159				Hardwood				Hardwood	O
162				Epiphyte (telenzia)				Parasitic plant that grows on vines.	
163				Spice Tie-Tie	pimienta	pimienti-'ak'		Smells good.	
164				Hardwood				Hardwood, stays small	O

165				Hardwood				Hardwood, gray bark, grows in folds in the trunk. Ants like it.	O
166				Monach		säk-säk sa'-yuk		Firewood, doesn't grow big	O
168				Epiphyte				Parasite on vine.	
171				Small tree				Small tree, acute base, widest near apex, green leaves	
172				Large tie-tie				Tie-tie, pretty large	
173				Epiphyte (fern)				Parasitic plant on trees, grows on n13, red spongy roots, long green leaves.	
174				Little tree				Little tree, bears soft orange flowers, fuzzy leaves	
175				Little epiphytic vine				Little parasitic vine with long, green flower like a spathe	
176				Little hardwood				Little hardwood, fuzzy bark and stems, fuzzy underside of leaves	O
177				Little tree				Little tree, 3 leaves at each end, broadest near the apex. 1 vein in leaf, nodes	
178				Vine on a tree				Vine grows on tree, long and skinny leaves spaced far apart	
179				Hardwood				Hardwood, looks like cedar bark consistency, big green leaves, opposite.	O
180				Little tree				Little tree, opposite leaves, smooth leaves, acccuminate apex.	
181				Small plant				Slick leaves, mottled leaf color, alternate leaves.	
182				Vine				Vine, 5 leaves per stem, slternate attachement.	
183				Vine				Vine that we have collected before, ovate leaves with accuminate apex	

184				Vine					
185				Little tree				Little tree, fuzzy leaves, alternate attachment	
186				Little tree				Little tree, leaves stepped on ends, some in groups of 3, serrate	
187				Little tree				Little tree, leaves long and skinny and stepped on ends, serrate	
188				Little tree				Little tree, leaves start long and slender and widen at apex before coming to a point, serrate edges, slightly mottled color.	
189				Little tree				Little tree, doesn't grow very high, fuzzy leaves	
190				Little tree				Little tree, round leaves on base that get long with bulbous ends as the leaves get younger near the top.	
191				Little tree				Little tree, accuminate apex, looks like monach leafs but no white sap.	
192				Little tree				Little tree, widest near center, smooth leaves	
193				Small plant				Obovate leaves, alternate	
194				Small plant				Circular leaves, opposite	
197				Hoyub-cheh		juyub'-che'		Boilstick, used to stir something in a pot	O
199				Tree easy to break				Tree easy to break, alternate leaves, pinnately veined	
201				Vine				Vine, black, semi-square, red shoots with green pots on the end.	
202				Short plant				Like choobac except it doesn't go up on the tree (vine).	
203				Blackstick var. 6				Unknown variety	

204				Vine with a prickle (solanum)				Prickle with vine and fruit just like marbles. Use it for fishing	O
206				Plant in the jungle				Plant in the jungle, green stem, purple stalk of leaf, serrate margins	
207				Little vine				Little vine, dark green semi-heart-shaped leaves	
209				Little tree				Little tree, big leaves, opposite, has little green fruit	
213				Vine with a prickle				Vine with a prickle, leaves subtended by prickles, 2 per leaf, alternate leaf arrangement	
214				Little plant				Little plant with tough leaves, very sturdy but smooth, light green color	
215				Talawala (white var.)				White one, lives on rotted cohune trees. There is also a black one used often for medicine (wider leaf)	
216				Little vine				Little vine, serrate leaf margins	
218				Edible Flower				Edible flower, mix with egg, flower comes out of the top, white blossoms	F
220				Small plant				Bears red fruit, small and looks like a weed. Long and thin leaves	
223				Blago				Bears big and sweet fruit, similar in structure to the apple-banana. Long leaves all together	F
228				Naranjo Happiness				Like apple, bears big red fruit	
232				Chil-lel				Eat all fruit, eat all seed and fruit	F
233				Tree in the way				Chop down the tree- in the way, grow outside jungle	

234				Thin weed				Grows outside jungle, doesn't stay long, dies and gets dry, tall and thin	
236				Grass				Grows in plantation	
237				Mini-plum				mini-plum, compound leaves, light green	
250				Papaya tree				Papaya	F
251				Silvero plum				Plum tree	F
252				Mapwee				Used to make soup	F
253				Yebrobrena				Grows in a pot	
255				Kimeet				Kimeet (still to plant)	
256				Balenque				Big fruit, make coffee and drink like cacao	F
257				Cala				Palm, young- boil and eat, get older- make basket and straw hats	F/O
258				Allibamo				Different fruit than banana, big leaves	F
259				Cookeek				Medicine, looks like poochooch, Best medicine (Cleofo's dad was a bush doctor), put on hear, good for medicine, means blood test, good for blood	M
260				Challam				Kills fish, pinnately compound leaf	O
267				Sesebogin				Onion	F

APPENDIX III
Plant List by Use

Col. #	Family Name	*Genus*	*Species*	English Common Name	Spanish Common Name	Maya Common Name	*My notes*	Cleofo notes	M (Med) /F (Food) / D (Deleterious) / O (Other use) / C (ceremony)
6	Burseraceae	*Protium*	*copal*	Copal		pom		Used for incense in Maya ceremonies.	C
62	Anacardiaceae	*Metopium*	*brownei*	Poisonwood		ik'i-che'		Swells skin when you touch the milky sap.	D
110	Cyperaceae	*Scleria*	*secans*	cutting-grass		weel		Cutting grass, can cut you.	D
200	Euphorbiaceae	*Cnidoscolus*	*aconitifolius/souzae*	Chiche		chay-che'?	*Souzae: spines on branches, trunk, flower stalk*	Leaves and milk are bad for your skin, peels your skin	D
26	Fabaceae	*Acacia*	*spp.*	subin / zubin		sub'in		Ants bite and have long-lasting negative effects.	D
144				Small vine				Ovate leaves, dark green (poisonwood)	D
81	Bixaceae	*Bixa*	*orellana*	Annatto		chimun	*In image- red, fuzzy pods with seeds inside*	Used for plywood. Milky sap, if dropped on your skin in the rain will peel it.	D/O
270	Amaranthaceae	*Amaranthus*	*viridis/dubius*	Calaloo (amaranth				Cut leaf, eat young with tortillas	F
225	Anacardiaceae	*Mangifera*	*indica*	Mango tree				Mango tree, 5m high, low and high branches, long and relatively thin leaves- dark green, green to orange fruit,	F
242	Anacardiaceae	*Spondias*	*cytherea*	Golden Plum				Ready in August, different taste, grows taller	F
11	Anacardiaceae	*Spondias*	*radlkoferi*	Wild Plum (hog plum??)		pook'		Very good fruit.	F
231	Annonaceae	*Annona*	*glabra*	Mammon (mamain?? Mawon??)				Fruit like marbles, green	F
265	Annonaceae	*Annona*	*muricata*	Soursop				Little tree	F
249	Annonaceae	*Annona*	*reticulata*	Custard apple				Custard apple, small	F

262	Apiaceae	*Eryngium/ Coriandrum*	*(vulgare/foetidum) / sativum*	Coolantro/culantro				Put on killed chicken and it will smell good	F
1	Apocynaceae	*Stemmadenia*	*donnell-smithii*	Horseballs		ton tzimin		Not used for food, it has a wide distribution. Used to make chewing gum	F
219	Arecaceae	*Acrocomia*	*mexicana*	Moop (*mop?)*				Bears fruit, leaves have a prickle, bears little fruit that you eat with sugar. Blooms in dry season.	F
10	Arecaceae	*Chamaedorea*	*tepejilote /elegans*	Pacaya		säk ch'ib'		Fruit for eating, palm, very widespread.	F
217	Arecaceae	*Cocos*	*nucifera*	Coconut Tree				Coconut tree, used to cook rice and beans, drink water, good fruit, make coconut oil and the water tastes good.	F
230	Convolvulaceae	*Ipomoea*	*batata*	Sweet potato				Sweet potato	F
239	Convolvulaceae	*Ipomoea*	*pes-caprae*	Cowsup			*"cowslip"*	Bears big fruit, orange color inside fruit, bears fruit in August	F
82	Costaceae	*Costus*	*guanaiensis*	w'eh-te		we'-te'	*spiral stem*	Bean good for eating. Grows in a circular stem. Birds like to eat the fruit.	F
241	Euphorbiaceae	*Manihot*	*esculenta*	Cassava				Make chips, fried, small tree	F
245	Guttiferae	*Calophyllum*	*antillanum*	Santa Maria				Wrap fish in it over the fire, long fruit like spithe	F
266	Lamiaceae	*Origanum*	*vulgare*	Oregano				Oragano, used for seasoning	F
246	Lauraceae	*Persea*	*americana*	Alligator pear	aguacate		*Mayan: "on"*	Bears big fruit, young one- 3 years before fruit	F
244	Malpighiaceae	*Byrsonima/Malpichia*	*crassifolia*	Craboo				Small, in front	F
2	Moraceae	*Brosimim*	*alicastrum*	Ramòn		oox		Good for food, found on top of mounds. Wide distribution, edible.	F
96	Musaceae	*Musa*	*paradisiaca/sapientum*	Banana Tree	box haas	ja'as-che'	*Mayan: "haas"*	Little fruit like bananas.	F
222	Musaceae	*Musa*	*spp. (acuminata)*	Apple-banana tree				Apple-banana tree, long palm leaves, all together, bark peels and is blonde. Unknown origin, mainly Valley of Peru (?)	F

161	Myrtaceae	*Pimienta*	*dioica*	All Spice				Leaves for cooking in soup, bears fruit just like black pepper, used in seasoning like black pepper.	F
243	Myrtaceae	*Psidium*	*guajava*	Guava tree				guava tree, very small	F
111	Myrtceae	*Chamguava*	*schippii*	Guava tree		pätaj		Grows in the Cohune hole, little tree bears little fruit (guava)	F
229	Poaceae	*Saccharuum*	*pfficinarum*	Sugar Cane				Used to make sugar, make wine or rum, no sugar - no rum, got from plantation	F
273	Poaceae	*Zea*	*mays*	Corn (maize)				Corn, maize	F
240	Rosaceae	*Prunus*	*spp. (americana)*	August plum				Little plum, bears in August, not grow taller. From El Salvador	F
212	Rubiaceae/Sapotaceae	*Alseis/Pouteria*	*yucatanensis/sapota*	mame/ mamey/Mammee		chäkäl-ja'as		Fruit is sweet like mango, red fruit inside, brown outside, fruit bears red or white fruit, unknown variety until you can see the fruit	F
247	Rutaceae	*Citrus*	*aurantitolia*	Lime tree	limon			Lime tree, small	F
115	Sapindaceae /Fabaceae	*/Inga*	*/spp.*	bri-bri		b'itz'		Bears long fruit that is sweet	F
79	Sapotaceae	*Chrisophillum*	*caimito/ mexicanum*	Siciya				Good fruit, kids use for chewing gum. Fruit like beans, sweet fruit.	F
93	Schizaeaceae	*Lygodium*	*spp.*	pa-sas		pasas?		Eat fruit when big, fuzzy vine.	F
269	Solanaceae	*Capsicum*	*chinense*	habenero chili pepper				Hot pepper, green fruit	F
271	Solanaeae	*Solanum*	*spp.*	Bird pepper			*one of these is species americanum*	Bird pepper, birds like it. Red and small, smaller when old	F
272	Solanaeae	*Solanum*	*spp.*	Bird pepper var. 2				Bird pepper #2, smaller	F
263	Sterculiaceae	*Theobroma*	*cacao*	Cacao				Cacao- make drink	F
224	Styracaceae/ Rutaceae	*Styrax/ Citrus*	*glaber/ aurantium*	Orange tree				Orange tree, 2m high, many branches, smooth leaves, widest at center, pinnately veined, alternate leaves	F

31				Spice Tree		nab'a'-ku'uk		Fruit like black pepper. Likes hills, not inland	F
32				Capicolo		xuyuuy?		Little kids like to chew, smell good.	F
78				Huachump / Wahal leaf		le' che'		Used to wrap tomales. Grows in jungle	F
218				Edible Flower				Edible flower, mix with egg, flower comes out of the top, white blossoms	F
223				Blago				Bears big and sweet fruit, similar in structure to the apple-banana. Long leaves all together	F
232				Chil-lel				Eat all fruit, eat all seed and fruit	F
250				Papaya tree				Papaya	F
251				Silvero plum				Plum tree	F
252				Mapwee				Used to make soup	F
256				Balenque				Big fruit, make coffee and drink like cacao	F
258				Allibamo				Different fruit than banana, big leaves	F
267				Sesebogin				Onion	F
254	Araceae	*Colocasia*	*esculenta*	Coco (taro/macal)				Small plant, fruits in January	F?
69	Papilionoideae/ Simaroubaceae	*Vatairea/Simarouba*	*lundellii/glauca*	Bitterwood		pa'-tzimin	*/paradise tree*	Eat the bark.	F?
160	Polygonaceae	*Coccoloba*	*belizensis*	Bob			*wild grape*	Large trunk, fuzzy fruit	F?
205	Selaginellaceae	*Selaginella*	*erythropus/longispicata*	Fern				Grows where machine pushes it, wild cilantro.	F?
257				Cala				Palm, young- boil and eat, get older- make basket and straw hats	F/O
65	Burseraceae	*Bursera*	*simaruba*	Gumbolimbo		chäkaj? (chikaj)		Tall, grows next to Poisonwood. If you get poisonwood sap on you, chip off part of the bark and it will cure you.	M

100	Fabaceae: Caesalpinoideae / Rubiaceae	*Senna / Uncaria*	*peraltean a / tomentos a*	uea de gato / Uña de gato			*yellow flowers*	Unodigato (gato as in cat, has spines like a cat), use for medicine.	M
57	Ganodermataceae	*Ganoderma*	*lucidum*	Mushroom				Mushroom grows on dead trees, medicine for babies, urine.	M
18	Nyctaginaceae	*Pisonia*	*aculeata*	Cross Prickle Vine				Used for stomach ache, boil the tea into bark.	M
63				Supwe/Webot ochuco		ma'h'äy?		Milk of the leaf kills the botfly.	M
259				Cookeek				Medicine, looks like poochooch, Best medicine (Cleofo's dad was a bush doctor), put on hear, good for medicine, means blood test, good for blood	M
211	Anacardiaceae	*Astronium*	*graveole ns*	Cobillo (Jobillo)		paap-'ich k'inam		Used to make furniture, tables, etc.	O
7	Apocynaceae	*Aspidosperma*	*cruentum /megaloc arpon*	White Malady (Mylady)		pemech-té	*NOTE: seeds are disc-shaped, ones we found on the ground*	Used for lumber.	O
74	Apocynaceae	*Plumeria*	*spp.*	Hardwood (Plumeria)				Hardwood	O
4	Arecaceae	*Attalea*	*cohune*	Cohune Palm		tutz		Used for thatch in Maya houses.	O
24	Arecaceae	*Chamaedorea*	*graminifo lia*	Xate				Grown in Belize and sold in Guatemala. Leaves are sold.	O
41	Arecaceae	*Desmoncus*	*orthacant hos*	Basket Ti-Tie		b'äyäl		Used to make baskets, small red fruit.	O
17	Arecaceae	*Sabal*	*mauritiifo rmis/yap a*	Beer Leaf (Bayleaf Palm)		xa'an		Used for making houses. Looks the same as copal when it is growing.	O
27	Arecaceae			Choobac		ch'uuy-b'ak?		Vine good for tying, large fruit when full grown. Used for tying- the roots are also used for tying.	O

33	Asteraceae	*Koanophyllon*	*galeottii*	Granny Walking Stick		xoopee ixuk?		Used to help old ladies walk, doesn't grow tall or straight. When it is dry, it is not very heavy.	O
64	Basellaceae	*Anredera*	*vesicaria*	Red tie		chäk-'ak'	*red vine*	Used to tie the house.	O
15	Bignoniaceae	*Arrabidaea*	*floribunda*	Pimienta Vine	pimienta	pimienta-'ak'	*bejuco pimienta*	Used for building houses, like tough string.	O
116	Bombacaceae	*Pseudobombax*	*ellipticum*	cotton tree	pochote, clavellina, senorita	ya'ax-che'	*Mayan: "kuy-che" or "chulte"*	Tree grows big, easy to cut and used for plywood. Spines on tree.	O
75	Clusiaceae	*Calophyllum*	*brasiliense rekoi*	Santa Maria				Used to make boards, lumber	O
97	Combretaceae	*Terminalia*	*amazonia*	white nargosta		k'än-xa'an	*also amarillo*	Use for lumber	O
70	Euphorbiaceae/Ulmaceae	*Drypetes/Ampelocera*	*brownii/hottlei*	Bullyhob / bullhoof		luwin		Grows tall and is used for lumber.	O
268	Fabaceae	*Gliricidia*	*sepium*	Madre cacao				Use for posts	O
109	Fabaceae: Papilionoideae	*Lonchocarpus*	*castilloi*	cabbage-bark		machich, k'änaab'		Used for lumber.	O
170	Flacourtiaceae	*Zuelania*	*guidonia*	tamai/tamai/tamay		tamay?		Used for firewood, doesn't grow big	O
92	Melastomataceae	*Lygodium*	*spp.*	Wya Tie-Tie	alambre	alaab're-'ak'		Not easy to break.	O
102	Poaceae	*Guadua/Merostachys*	*longifolia/pauciflora*	Sanette (Bamboo)				bamboo	O
48	Rhamnaceae	*Krugiodendron*	*ferreum*	quebracho		tzälam	black ironwood	Used to break soil, easy to break. Good lumber.	O
47	Rutaceae	*Zanthoxylum*	*spp.*	Prickly Yellow				used for furniture	O
80	Sapidaceae			Bolongyuck		b'olon yuk		Vine is used to kill fish.	O
114	Sapindaceae /Basellaceae	*/Anredera*	*/vesicaria*	Red vine to kill fish with				Red vine to kill fish with.	O
20				Unknown				Used for lumber.	O
34				Pulil				Used for firewoord, prickles on trunk.	O
36				Arichmuch		much?		Used for post. If you plant it in the ground, it will grow into a tree.	O
43				White Ti-Tie		säk-'ak'		Bendable, doesn't break easily. Used for buildinga house. Cross visible in cross-section.	O

44				Pecary Vein (*Citam-ac)*				good for tying, square vine	O
50				Pulachooch		koch?		Vine with seeds in pods, used to make pots with	O
61				Sol		tzol?		Hardwood, used for firewood and lumber.	O
67				Sotsmas		tzo'otz mäs?		Used to prop the plants up.	O
83				Hardwood				Hardwood	O
84				Hardwood				Hardwood	O
87				Hardwood				Hardwood with a fruit, not good to eat.	O
99				Sol		tzol?		Use for lumber.	O
104				Hardwood with white flower				Hardwood with white flower.	O
108				Amaree	San Jwan			Tree grows large and is used for lumber.	O
113				Hardwood				Hardwood, birds eat the fruit	O
119				Asnic		ya'ax-nik?		Used to build a house	O
120				Hardwood				Hardwood	O
121				Pallood		palud?		Small plant grows under the canopy. Used to pull the door, when it grows long alternate leaves.	O
135				Little hardwood				Little hardwood, entire leaves, accuminate apex	O
157				Little hardwood tree				Little hardwood tree, obovate leaves with accuminate apex, smooth, slightly mottled.	O
159				Hardwood				Hardwood	O
164				Hardwood				Hardwood, stays small	O
165				Hardwood				Hardwood, gray bark, grows in folds in the trunk. Ants like it.	O
166				Monach		säk-säk sa'-yuk		Firewood, doesn't grow big	O
176				Little hardwood				Little hardwood, fuzzy bark and stems, fuzzy underside of leaves	O

179				Hardwood				Hardwood, looks like cedar bark consistency, big green leaves, opposite.	O
197				Hoyub-cheh		juyub'-che'		Boilstick, used to stir something in a pot	O
204				Vine with a prickle (solanum)				Prickle with vine and fruit just like marbles. Use it for fishing	O
260				Challam				Kills fish, pinnately compound leaf	O
167	Sapotaceae	*Manikara*	*zapota*	Sapodilla (Red)				Gets really big, used for house posts, cut bark and get milk that is used for chewing gum or rubber boots	O/F
	Adiantaceae	*Adiantum*	*tenerum*	blackstick? Var					
145	Anacardiaceae	*Metopium*	*brownei*	Poisonwood		ik'i-che'			
261	Anacardiaceae	*Rhus*	*radicans*	Chechmum (*chechem?)*				Catches you when you walk	
235	Apocynaceae	*Asclepias*	*arassivie a*	Little red flower				Little red flower, not grown in the jungle, hood and horn flower	
66	Apocynaceae	*Aspidosperma*	*cruentum /megaloc arpon*	Red Malady (Mylady)		sa'-yuk			
208	Araceae			Plant with spithe and spadix				Plant with spithe and spadex, yellow spithe and green spadex like a leaf. Big green leaves, small plants have sheathing.	
13	Arecaceae	*Cryosophila*	*stauraca ntha*	Broom Tree (give and take)		miis			
101	Areceae			Small plant				Small plant that grows under the canopy.	
195	Asclepiadaceae	*Marsdenia*	*coulteri*	Vine				Vine that has pods with hairy seeds, vine looks like spice-tie-tie, reddish-brown in color	
196	Asclepiadaceae			Vine				Vine with tendrils, green vine with brown raised spots on it. 2 leaves per "branch	
90	Asteraceae			Small vine				Small vine with black flowers, yellow when young	

226	Asteraceae			Little yellow flower				Little yellow flower, have to chop with machete, composite	
73	Boraginaceae	*Cordia*	*alliodora*	Samwood		so'oj-chaj?	*leaves in a whorl*		
9	Cecropiaceae	*Cecropia*	*peltata*	Trumpet Tree		xk'o'och		No good for lumber, no good for food.	
210	Cyrillaceae	*Cyrilla*	*racemiflora*	Black tie-tie		b'ox-'ak'	*titi family, florida*	Black tie-tie with large pods, alternate rings on base of stems of leaves.	
52	Dioscoreaceae	*Dioscorea*	*bartlettii*	Wild Yam				fruit grows at the base	
221	Euphorbiaceae	*Acalypha*	*spp.*	Small plant (acalypha)				Bears green, fuzzy fruit. Leaves widest in the center	
105	Magnoliophyta: Liliopsida	*Dioscorea*	*bartletti*	cocolmeca		kokomeka		Vine with spines, tendrils.	
107	Maliaceae	*Swietenia*	*macrophylla*	Mahogany		chäkäl-te'		Dry, very large.	
98	Malvaceae	*Hampea*	*spp.*	moho		jool		When it is small, you use the bark to carry stuff on.	
238	Malvaceae	*Hibiscus*	*rosa-sinensis var. rosa-sinensis*	Red belle (hibiscus)				red bell, Malvaceae, monadelphous stamen, bush with red flower	
227	Malvaceae	*Sida / Malvastrum*	*spp. / corowan delianum*	Che-che-bay (sida)				Bug plants, don't like	
198	Marantaceae	*Thalia/Marant a*	*spp.*	huachump var. 2 (use as food)				Little tree, grows short, leaves on 1 vein, many branches (huachump variety)	
16	Meliaceae	*Cedrela*	*odorata*	Cedar Tree		(k'u)k'u-che'			
12	Moraceae	*Castilla*	*elastica elastica*	Rubber Tree	hule	uule-che'		All over Cara Blanca, have sap when cut that is very sticky. Fruit is pink	
46	Moraceae	*Ficus*	*obtusifolia*	Strangler Fig	Matapalo	le'ek 'aak'a walak 'ukimsaj che' (lit. it is the vine that kills trees)		Attach and kills another tree (vine).	
117	Myristicaceae	*Virola*	*koschnyi*		Palo de sangre	b'ilix?	*red seed in pod*	When you cut the bark when it gets bigger, it looks like it is bleeding	

122	Nyctaginaceae			Vine with a prickle				Vine with a prickle, grows very big.	
58	Olacaceae	*Schoepfia/Ximenia*	*schreberi/americana*	copalche macho		kapul-che'		Tree forked at base, light bark.	
264	Orchidaceae	*Prosthechea*	*cochleata*	Black orchid				Black orchid, national flower of Belize, brought from jungle. Can't take it out- illegal	
3	Passifloraceae	*Passiflora*	*incarnata*	White Sasperilla		sumb'ul?			
22	Piperaceae	*Piper*	*aduncum*	pu-chùch/pu-chu-ch/puchuuch		puchuch?		Grows under the canopy.	
169	Piperaceae	*Piper*	*spp.*	puchùch (var. 2)				Big-leaves, large nodes	
248	Poaceae	*Oplismenus*	*hirtellus spp. Setarius*	Running grass			*running mountain grass*	Running grass	
14	Rubiaceae	*Simira*	*salvadorensis*	Redwood		k'olay?			
95	Rubiaceae			Little flower vine				Orange flower, umbel, opposite entire leaves.	
49	Sapotaceae	*Pouteria*	*spp.*	White Sapitillo		tz'ätz' ya'aj?			
37	Simaroubaceae	*Simarouba*	*glauca*	Negrito					
39	Sterculiaceae	*Sterculia*	*foetida*	Foul Cat Tree			*asia, skunk tree, peon, indian almond, etc*	grows ugly, and smells bad	
23	Tectariaceae	*Tectaria*	*spp.*	Blackstick var. 1 (tectaria)		(b'o')b'ox-che'		Grows on rocks.	
25	Verbenaceae/ Caesalpinaceae	*Cornutia/Clerodentrum/Senna*	*pyramidata/chinense/occidentalis*	Stinkin' Bush		tu'uj pok-che'		Smells bad	
38	Vitaceae	*Vitis*	*tiliifolia*	Water tie-tie		aak' yaan u-ja' (lit. vine that has water)	water tie-tie	Small fruit that looks black.	
5				Hardwood					
8				Hardwood					

19				Unknown					
21				La		laaj?		Grows next to paths, and sticks to skin.	
28				Vine with a prickle					
29				Blackstick var. 2					
30				Flower				Red fruit, small.	
35				Blackstick var. 3				Grows close to the groun, grows in open areas.	
40				Grass					
42				Grass				Capsule seeds and flowery stamen	
45				Koonshonunc				Vine that is easy to break.	
51				Vine with prickle					
53				Hardwood				Entire leaves, opposite.	
54				Flower in the jungle				White umbel flower, entire leaves, slightly wooden stem.	
55				Mooch		ixxib'?			
56				Tree easy to break				Tree is easy to break, small tree, forked roots out of the ground.	
59				Harkstick		chi'ich' che'			
60				Unknown					
68				Hardwood					
71				Hardwood					
72				Small fern				Grows under the canopy.	
76				Blackstick var. 4				Swamp-loving blackstick.	
77				Grass					
85				Small plant				Small plant, doesn't grow high under canopy.	
86				Little tree				little tree, doesn't grow big	
88				Blackstick var. 5				Grows in swamps, fern-like leaves.	
89				Hardwood					
91				Square vine				Fuzzy, square vine	
94				Green Prickle					
103				Small plant				Small plant, grows under the canopy.	

106				Vine with big prickles				Vine with big prickles, turns red/purple when worn.	
112				Jungle plant				Bears fruit like a bean (red)	
118				Flower in the jungle tree				Flower in the jungle tree. Leaves long and skinny like grass. Yellow flowers	
123				Small plant				Heart-shaped leaves, grows under the canopy.	
124				Small plant				3-leaf cluster, small, grows under canopy.	
125				Small plant				Small leaves with accuminate apex	
126				Small plant				Small plant, leaves pinnately compound, grows under canopy.	
127				Vine				Vine, leaves accuminate apex	
128				Small plant				Small plant, entire leaves margins.	
129				Small plant				Small plant with spines on stem, mottled green leaves	
130				Small plant				Small plant, circular leaves, closed together on end, opposite leaf pair in center of stem	
131				Small plant				Small plant, accuminate apex, slightly mottled leaves.	
132				Small plant				2 opposite, circular leaves at the top of the stem.	
133				Small tree				Small tree with sennate leaves, simple leaves, fuzzy leaves.	
134				Small vine				Small vine, heart-shaped leaves.	
136				Little forest flower				Little forest flower, purple stem with green leaves.	
137				Little plant				Little plant, tuberous root, long, thin, mottled leaves, grows frequently under forest canopy.	
138				Small vine				Small vine, fuzzy underside of leaves, entire leaf	

139				Small plant				Small plant, nearly circular leaf shape, entire margins, alternate leaf arrangement, light green leaves, thick root.	
140				Small tree				Leaf narrows to a point at both edges, small tree.	
141				Little tree				Little tree, leaves accuminate apex and slightly round at base, dark green leaves.	
142				Little tree				Little tree, narrow at both ends, light and dark green leaves.	
143				Small tree				Small tree, obovate leaves, acute apex, dark green leaves, somewhat crennate leaf venation.	
146				Small plant				Small plant, 2 pairs of 2 leaves together at the top of stem, fuzzy stem, smooth dark leaves	
147				Small plant				Completely heart-shaped, pointed ends at base, light green, small plant	
148				Small plant				Serrate leaf, venation, alternate leaves, dark and light green leaves, smooth surface.	
149				Small plant				3-leaf pairs, opposite attachment, serrated edges with spikes, smooth leaves	
150				Small plant				Obovate leaves, slightly macruminate at apex, smooth leaves	
151				Small plant				3-leaf cluster, leaves linked by stem	
152				Small plant		b'oob'		Leaves heart-shaped and sliced at end to almost form 2 leaves, stem reddish, has red flowers and green leaves, vine	
153				Small plant				3 leaves in combo, fuzzy stem, fuzzy on edges of leaf	
154				Small plant				5 leaves, broadest in center, fuzzy leaf and stem	

155				Small plant				3 leaf clusters, slightly mottled leaves, accuminate apex	
156				Small plant				Accuminate apex, mottled leaves, alternate arrangement.	
158				Small tree				Small tree, opposite attachement, green.	
162				Epiphyte (telenzia)				Parasitic plant that grows on vines.	
163				Spice Tie-Tie	pimienta	pimienti-'ak'		Smells good.	
168				Epiphyte				Parasite on vine.	
171				Small tree				Small tree, acute base, widest near apex, green leaves	
172				Large tie-tie				Tie-tie, pretty large	
173				Epiphyte (fern)				Parasitic plant on trees, grows on n13, red spongy roots, long green leaves.	
174				Little tree				Little tree, bears soft orange flowers, fuzzy leaves	
175				Little epiphytic vine				Little parasitic vine with long, green flower like a spathe	
177				Little tree				Little tree, 3 leaves at each end, broadest near the apex. 1 vein in leaf, nodes	
178				Vine on a tree				Vine grows on tree, long and skinny leaves spaced far apart	
180				Little tree				Little tree, opposite leaves, smooth leaves, acccuminate apex.	
181				Small plant				Slick leaves, mottled leaf color, alternate leaves.	
182				Vine				Vine, 5 leaves per stem, slternate attachement.	
183				Vine				Vine that we have collected before, ovate leaves with accuminate apex	
184				Vine					
185				Little tree				Little tree, fuzzy leaves, alternate attachment	

186				Little tree				Little tree, leaves stepped on ends, some in groups of 3, serrate	
187				Little tree				Little tree, leaves long and skinny and stepped on ends, serrate	
188				Little tree				Little tree, leaves start long and slender and widen at apex before coming to a point, serrate edges, slightly mottled color.	
189				Little tree				Little tree, doesn't grow very high, fuzzy leaves	
190				Little tree				Little tree, round leaves on base that get long with bulbous ends as the leaves get younger near the top.	
191				Little tree				Little tree, accuminate apex, looks like monach leafs but no white sap.	
192				Little tree				Little tree, widest near center, smooth leaves	
193				Small plant				Obovate leaves, alternate	
194				Small plant				Circular leaves, opposite	
199				Tree easy to break				Tree easy to break, alternate leaves, pinnately veined	
201				Vine				Vine, black, semi-square, red shoots with green pots on the end.	
202				Short plant				Like choobac except it doesn't go up on the tree (vine).	
203				Blackstick var. 6				Unknown variety	
206				Plant in the jungle				Plant in the jungle, green stem, purple stalk of leaf, serrate margins	
207				Little vine				Little vine, dark green semi-heart-shaped leaves	
209				Little tree				Little tree, big leaves, opposite, has little green fruit	

213				Vine with a prickle				Vine with a prickle, leaves subtended by prickles, 2 per leaf, alternate leaf arrangement	
214				Little plant				Little plant with tough leaves, very sturdy but smooth, light green color	
215				Talawala (white var.)				White one, lives on rotted cohune trees. There is also a black one used often for medicine (wider leaf)	
216				Little vine				Little vine, serrate leaf margins	
220				Small plant				Bears red fruit, small and looks like a weed. Long and thin leaves	
228				Naranjo Happiness				Like apple, bears big red fruit	
233				Tree in the way				Chop down the tree- in the way, grow outside jungle	
234				Thin weed				Grows outside jungle, doesn't stay long, dies and gets dry, tall and thin	
236				Grass				Grows in plantation	
237				Mini-plum				mini-plum, compound leaves, light green	
253				Yebrobrena				Grows in a pot	
255				Kimeet				Kimeet (still to plant)	