Economic Foundations of Mayapán Project: Results of the 2001 Season

Research Year: 2001
Culture: Maya
Chronology: Post Classic
Location: México
Site: Mayapán

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Abstract

The Economic Foundations of Mayapán project was initiated in the summer of 2001 with the objective of beginning our research into the economic organization of the city of Mayapán, the capital of the most centralized state of the Late Postclassic Maya realm (Masson and Peraza 2002a, 2002b, Hare *et al.* 2002, Masson and Russell 2002, Peraza and Cruz 2002, Masson *et al.* 2002). Documentary sources suggest that this city was the nucleus of a thriving world of Postclassic Maya trade in which everyday items and luxury goods moved across the northern and southern lowlands, into the Guatemalan highlands, and into central México, yet the economy of this core center has not been investigated in detail using the archaeological record. Our research goals are to reconstruct the local, regional, and distant spheres of production and exchange in which the elites and commoners of Mayapán participated. The summer 2001 season, supported by FAMSI, launched this project. Three subsequent years of work (2002, 2003, 2004) will further pursue these goals, with the support of the National Science Foundation.

Although we only worked for six weeks during 2001, an immense amount of data has already been collected that can address our research questions. These data are of three different varieties, including mapped surface features (structures, walls, and concentrations), reconnaissance outside of the city walls, and artifact analysis. This report provides a brief summary of these three categories of data that reflect preliminary patterns of Mayapán's economy.

Resumen

El proyecto Bases económicas de Mayapán se inició en el verano del año 2001, con el objetivo de comenzar nuestra investigación sobre la organización económica de la ciudad de Mayapán, capital del estado más centralizado en el ámbito del Posclásico Tardío Maya (Masson y Peraza 2002a, 2002b, Hare et al. 2002, Masson y Russell 2002, Peraza y Cruz 2002, Masson *et al.* 2002). Las fuentes documentales sugieren que esta ciudad fue el núcleo de un mundo floreciente de comercio durante el Posclásico Maya, en el cual los artículos de la vida cotidiana y los objetos suntuarios pasaban por las tierras bajas del norte y del sur hacia las tierras altas de Guatemala y hacia el área central de México, a pesar de lo cual la economía de este centro medular no ha sido estudiada en detalle usando el registro arqueológico. Los objetivos de nuestra investigación apuntan a reconstruir las esferas de producción e intercambio locales, regionales y más lejanas, de las que participaban las élites y las gentes comunes de Mayapán. La temporada de verano del año 2001, con el apoyo de FAMSI, comenzó con este proyecto. Se seguirán persiguiendo dichos objetivos con tres años subsecuentes de trabajo (2002, 2003 y 2004), financiados por la National Science Foundation.

Si bien sólo trabajamos seis semanas durante el año 2001, ya se ha reunido una inmensa cantidad de datos que pueden responder a muchas de nuestras preguntas.

Estos datos son de tres tipos distintos, e incluyen los rasgos de superficie mapeados (estructuras, muros y concentraciones), un reconocimiento fuera de los muros de la ciudad, y el análisis de los artefactos. Este informe presenta un breve resumen de las tres categorías de datos, que reflejan modelos preliminares de la economía de Mayapán.

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Surface Survey

During the 2001 season, intensive surface survey, surface collection, and mapping of artifact concentrations, houselot boundary walls, structures, and other features took place in ten residential zones within the city wall and in one location outside of the city wall (Figure 1, Figure 2, Table 1). Three of these residential zones within the city (Milpas #9, 10, 11) were surveyed and surface collections were taken from them, but they were not mapped this season (Figure 1, Figure 2). As a result of these efforts, new maps exist for eight areas of the city (Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 9, Figure 10, Figure 11), and 56 dog leash surface collections from activity areas provide an initial data set for evaluating domestic economic activities (Table 2, Table 3).

As the Carnegie datum is no longer present, Hare established a new one from the top of the Castillo in the INAH monumental zone. We quickly learned that the accuracy of the Carnegie map (Jones 1962) falls short of that now attainable with an EDM. Structures are actually located in different 500m grid squares than the ones they are shown in on the Carnegie map, according to Hare's measurements (accurate to within a centimeter). These errors vary, and cannot be globally corrected. We retained all of the original Carnegie structure numbers, however, to avoid future confusion.

As Brown (1999) noted in his Mayapán houselot project, considerably more detail can be mapped in the surface of cleared areas than was possible on the Carnegie map, particularly additional structures, albarrada walls, and artifact concentrations (Figure 3, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 9, Figure 10, Figure 11). Albarradas have varying configurations. Some seem to define houselot boundaries and others define enclosures or alleyways running through the city (Brown 1999, Bullard 1952, 1953). Some albarradas also define the upper parameters of hill platforms where house structures are located, especially outside of the city walls (Figure 13). Examples of enclosures can be seen on Figure 12. A photograph of an alleyway is shown in Figure 9 that connects two of Mayapán's temples (S-33 and S-137) and Figure 14, shows an albarrada houselot wall. We hope to test stone enclosures to look for

evidence of special function superstructures, and much effort will be devoted to mapping the city's alleyways or streets.
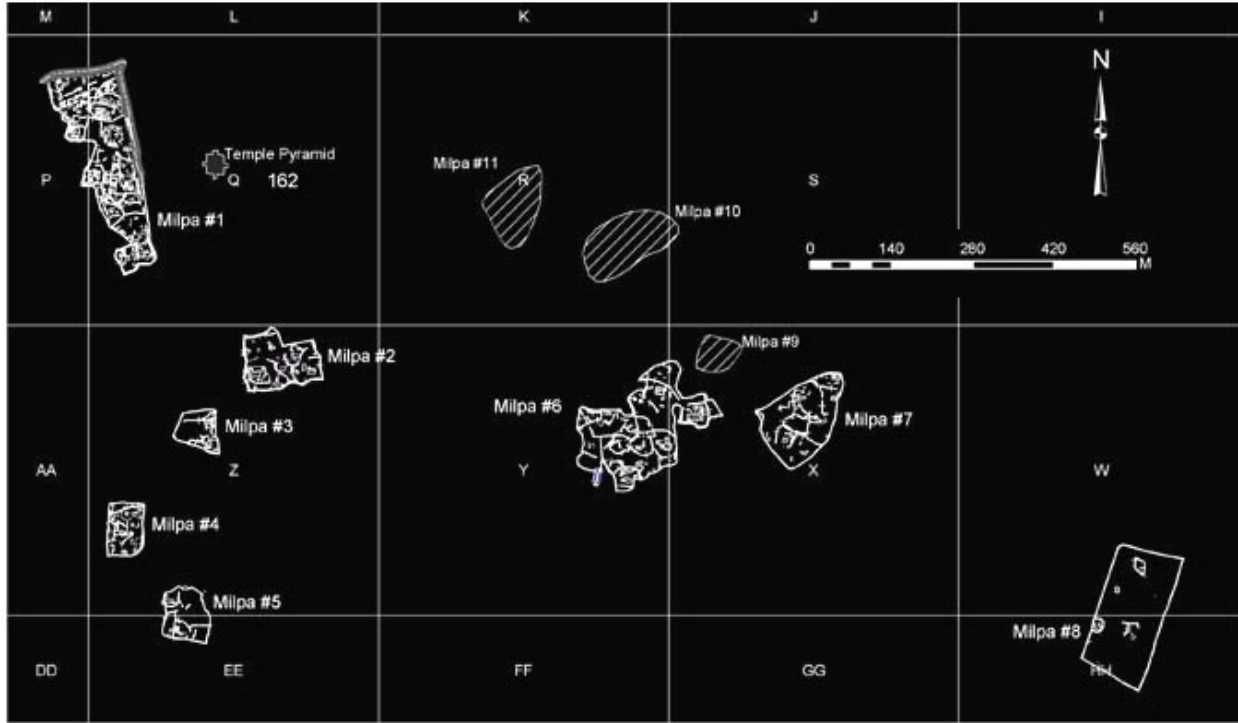

Figure 1. Mayapán EDM Base Map 2001.

Figure 2. Carnegie Grid, Milpas 2001.

Detailed variation in residential density of various milpas across the city was documented in our mapping efforts. Contending with this variation and finding appropriate ways to analyze it represents one of the project's greatest challenges. Milpa #1, to the west of the monumental zone, was by far the most dense occupation zone, and the largest and most elaborate structures were located here. Other milpas to the south, southeast, and southwest of the center were of more moderate density (for example, Figure 4, Figure 5, Figure 6, Figure 7, Figure 8). One, located adjacent to the wall (Milpa #7, Figure 10), had very few structures, as did another milpa located over half a kilometer outside of the wall (Milpa #8, Figure 11). In future testing and analysis, we will evaluate the function of these areas for the city. Were vacant areas used for farming or gardening as has been suggested for Sayil (Killion *et al.* 1989)? We have produced a preliminary ranking of the neighborhoods represented by these sampling areas, based on structure size and elaboration (Table 1). No clear correlation with distance from the center and structural complexity is observed, at least for areas that are not near the city walls. For example, Milpas #6, #9 have more dense, complex features than Milpas #3, #4, and #5.
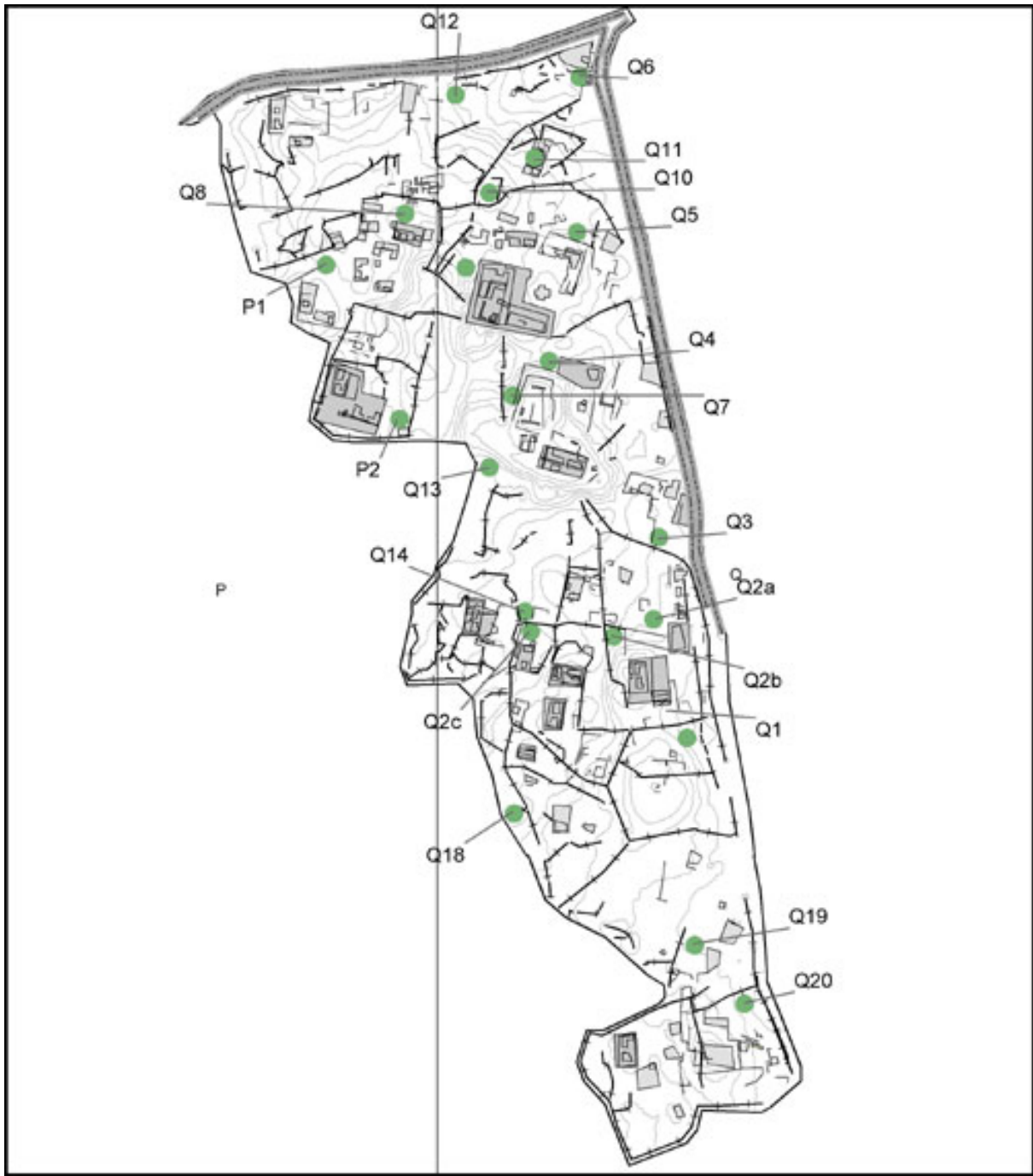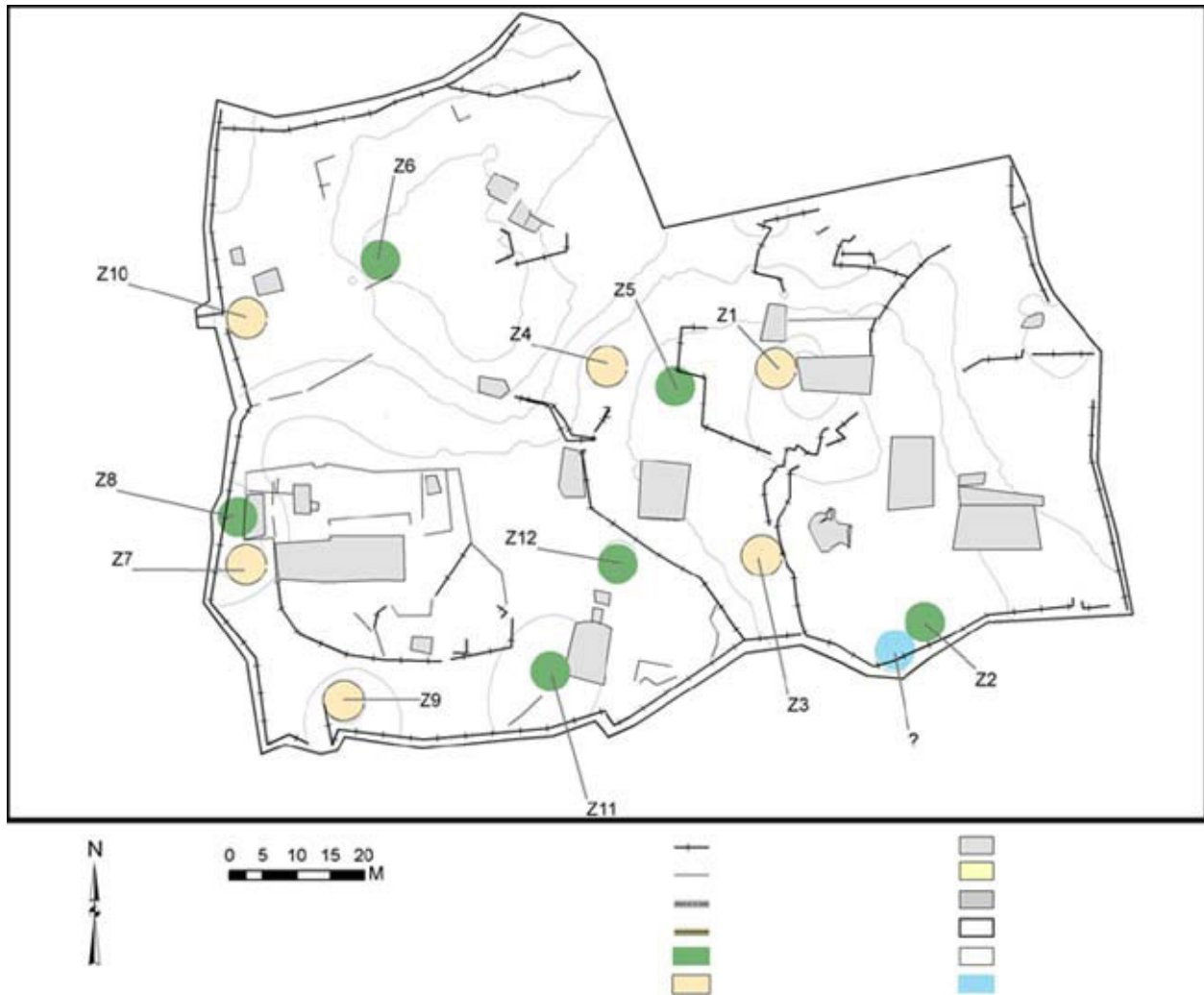
Figure 3. Mayapán 2001, Milpa 1.

Figure 4. Mayapán 2001, Milpa 2.

Surface collection areas were in the form of 3m dog leashes (28.26 square meters), in which 100% of the materials within each circle were collected. Collections were made for all concentrations of artifacts (except metates or cuerns, Figure 15 and Figure 16) identified in each milpa. Concentration density varies considerably, with Milpa #1 having far more material than other areas (Table 2). The types of material associated with different houselots and milpas also attests to occupational specialization at Mayapán, as Brown's earlier work indicates (1999). Concentrations were most often along the slopes or bases of buildings or hill platforms on which buildings were placed, along albarrada walls, adjacent to building walls, atop small structures, and in sascabera depressions. These represent middens, activity areas, dumps, and workshops (Table 3). Stone tool manufacture, shell ornament manufacture, and activity areas involving

stone tool concentrations were identified. Concentrations of metates and small pits into bedrock were also found.
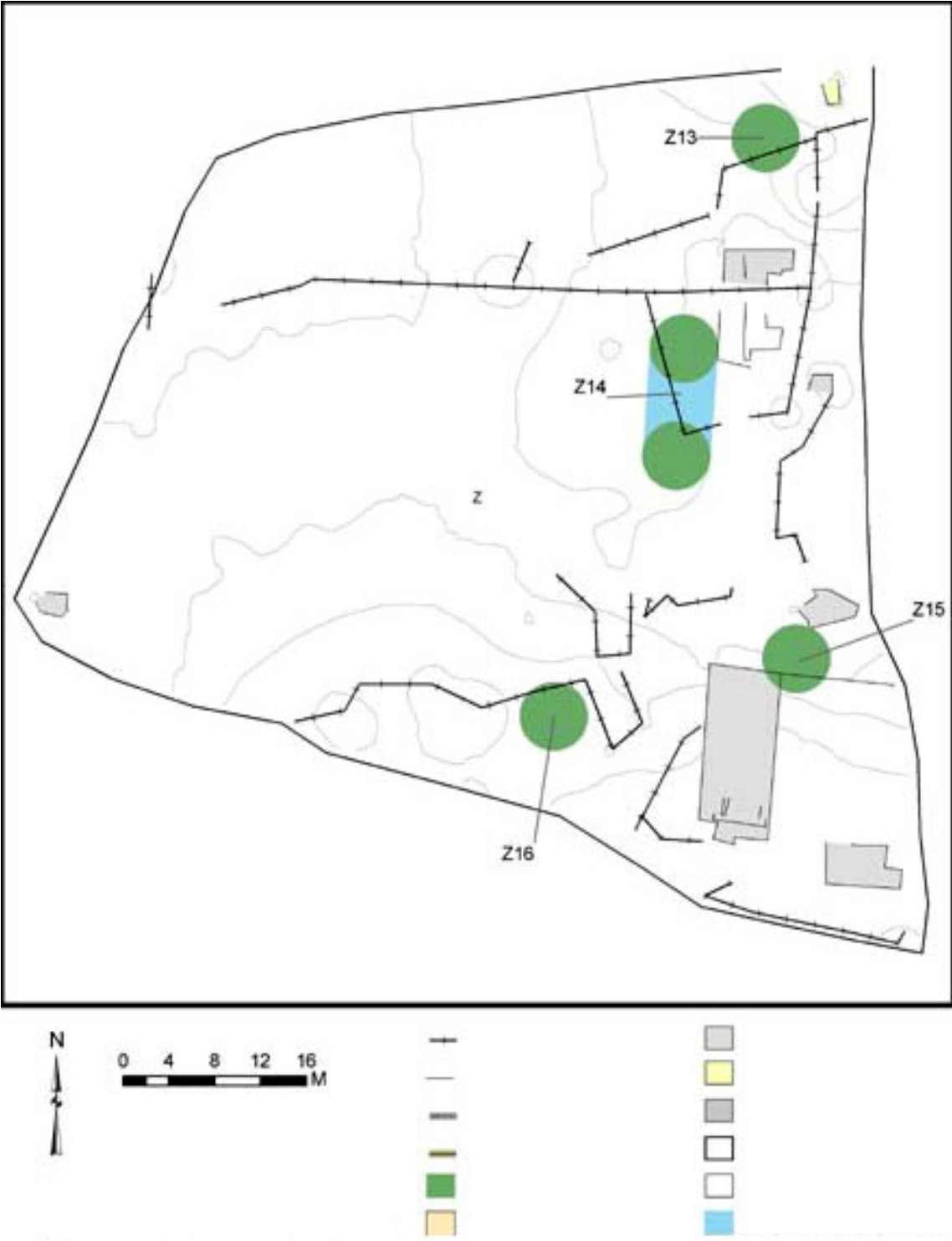

Figure 5. Mayapán 2001, Milpa 3.

Figure 6. Mayapán 2001, Milpa 4.
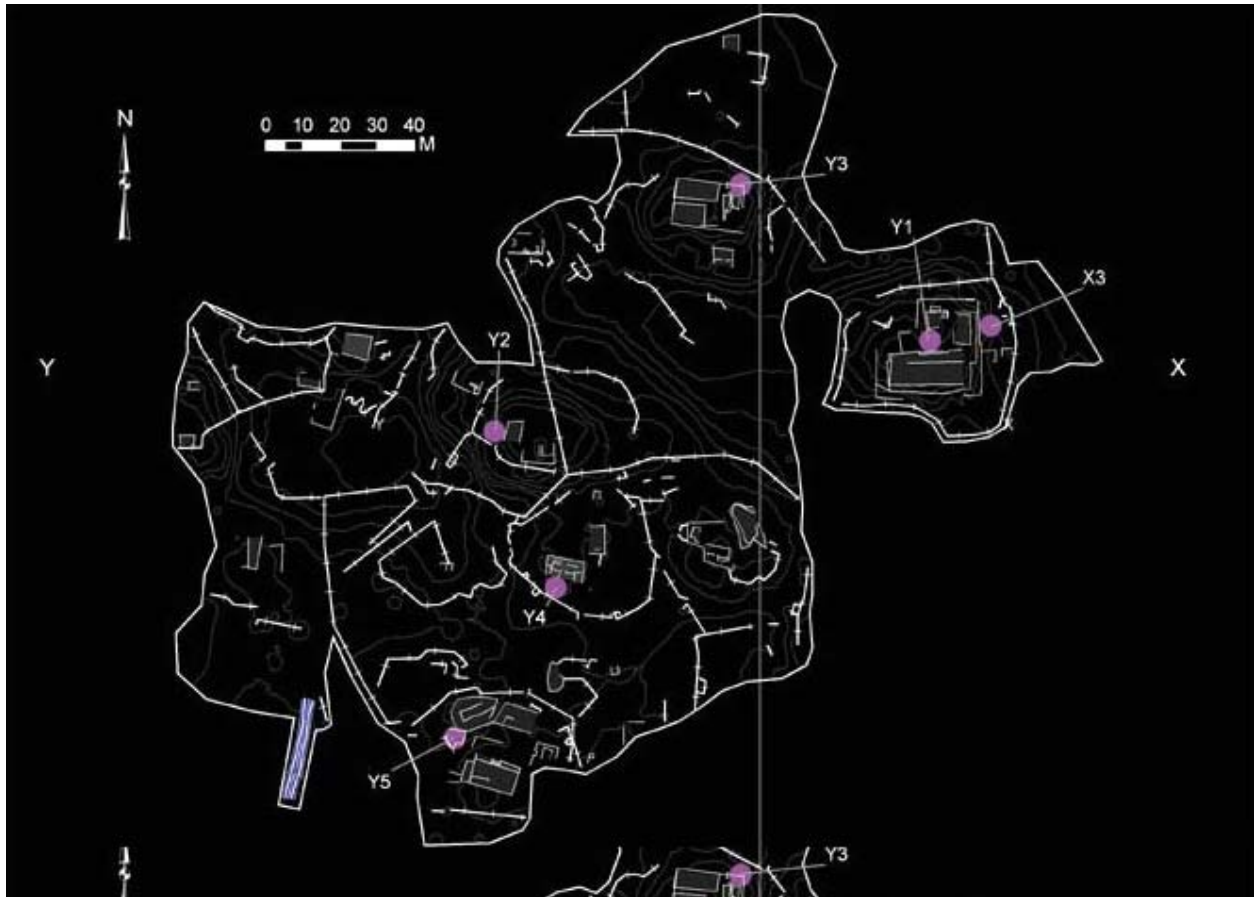
Figure 7. Mayapán 2001, Milpa 5.

Figure 8. Mayapán 2001, Milpa 6.

Figure 9. Albarrada Alleyway.
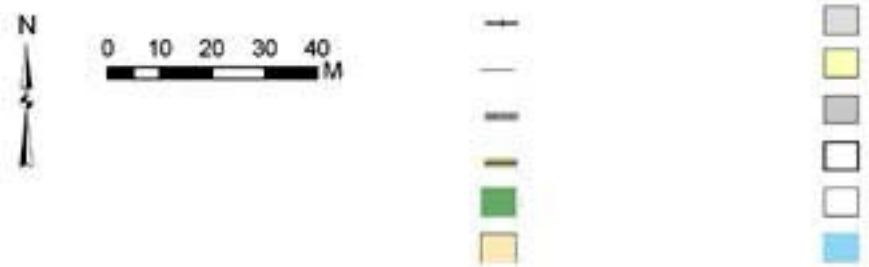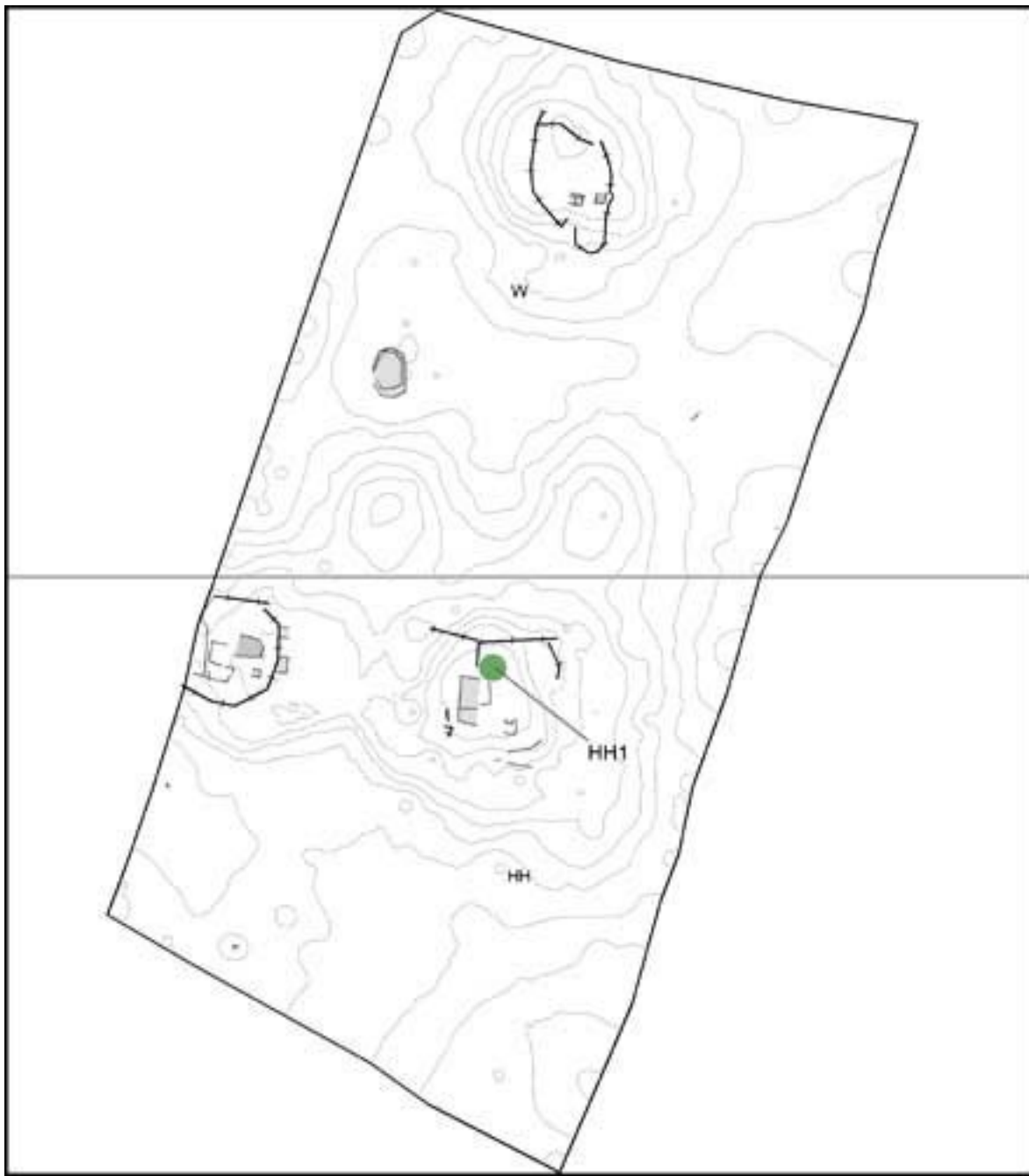
Figure 10. Mayapán 2001, Milpa 7.

Figure 11. Mayapán 2001, Milpa 8.
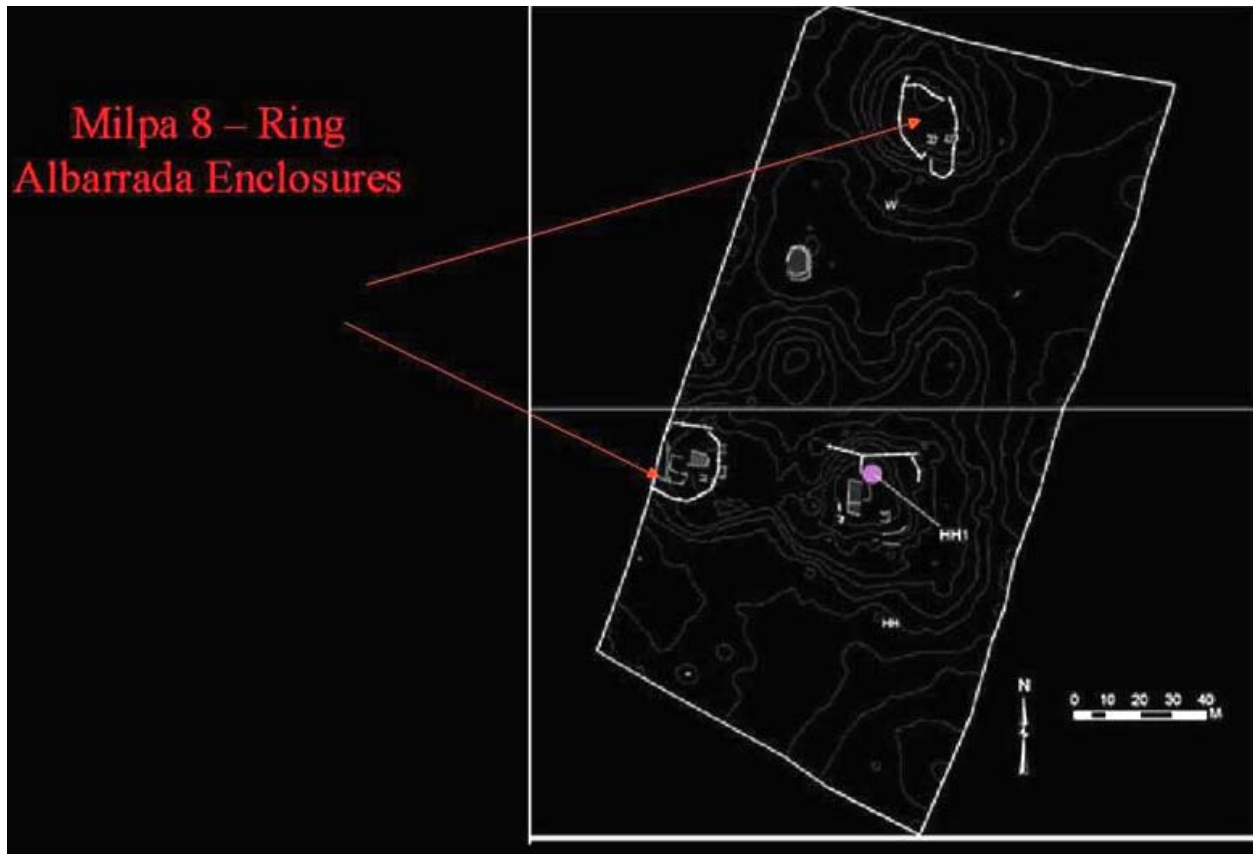
Figure 12. Albarrada Enclosures.

Figure 13. Milpa 8, Ring Albarrada Enclosures.

Artifact Analysis

We have performed a type:variety analysis of 28,422 sherds collected from surface survey (Peraza and Cruz 2002), and are planning more detailed functional classifications for these data. Ninety-three percent of the sample is comprised of the Postclassic types of Mama Red, Yuncú Unslipped, and Yacman Striated. Faunal bones from the 2001 surface collections have been analyzed, along with some samples from Clifford Brown's household excavations and Peraza's excavations in the monumental zone (Masson *et al.* 2002). Chert and chalcedony tools (N=250) and obsidian (N=466) have also been analyzed in a preliminary way. Distributions of artifact densities have been compared between individual concentrations associated with different houselots and between general areas represented by milpa sampling areas with which houselots are associated.

Milpa #1 had areas of incredibly dense ceramic sherds, with an average of 33.8 per square meter, compared to all other areas which did not even have half this amount. Variation is observed in individual concentration densities within milpas (Figure 17a, Figure 17b, Figure 17c, Figure 17d). Three Milpa #1 concentrations had over 2000

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sherds per dog leash unit (and one of these had 4,379), an amount unequalled elsewhere at the site. These data may signal occupational intensity or duration, and functional analysis is planned to determine if different activities are represented by sherd concentrations. Milpa #1 also had double the obsidian (.50 per square meter) than any other sampled area. Three milpas had .23-.25 pieces per square meter (#2, #4, #9) and all others had less than .09. Clearly, obsidian was not uniformly distributed across the site, as might be expected if this material were generally accessible through open market exchange. At Mayapán, obsidian forms 37.3% of the sample of obsidian and nonobsidian tools, compared to 2/3-3/4 of the tool sample of two Postclassic sites from northern Belize (Caye Coco and Laguna de On, Masson and Chaya 2000). Perhaps the Belize sites' closer proximity to the source was influential in making obsidian more accessible in this region. High proportions of marine shell debris (Figure 18a and Figure 18b) were found in Milpa #1 (.18 per square meter), and Milpa #4 had greater amounts of shell also (.12 per square meter) compared to the rest of the sample areas, which had less than .05 pieces per square meter.

Lithic artifacts show a different pattern. Lithic tools were more abundant in Milpa #2, particularly in one location that may have been an activity area for crafts involving the use of stone tools (utilized flakes). Other tool concentrations include small worked flake polished nubbins that seem to have been used for drilling materials or perhaps for working marine shell. Utilized flakes were the most common type of tool found, forming 50-85% of the samples from different milpas. Biface fragments were the second most common type, and the most common forms of diagnostic biface tools were pointed bifaces and arrow points (Figure 19). Unutilized lithic flakes were most common in Milpa #4, and most of these originate from a single workshop concentration that had 2,691 flakes in a 3m dog leash unit. Clearly, there was a burgeoning nonobsidian lithic industry at Mayapán that made tools that were part of the basic toolkit of many households. Such tools appear to have been made locally (Figure 20), and the majority of the material represented is a white patinated chert (20%) or a coffee brown chalcedony (20%). The source of these materials is not known, but is presumed to be nearby due to their frequent use.

Figure 14. Albarrada Houselot Wall.

Figure 15. Metate Concentration.

Figure 16. Cuerns.
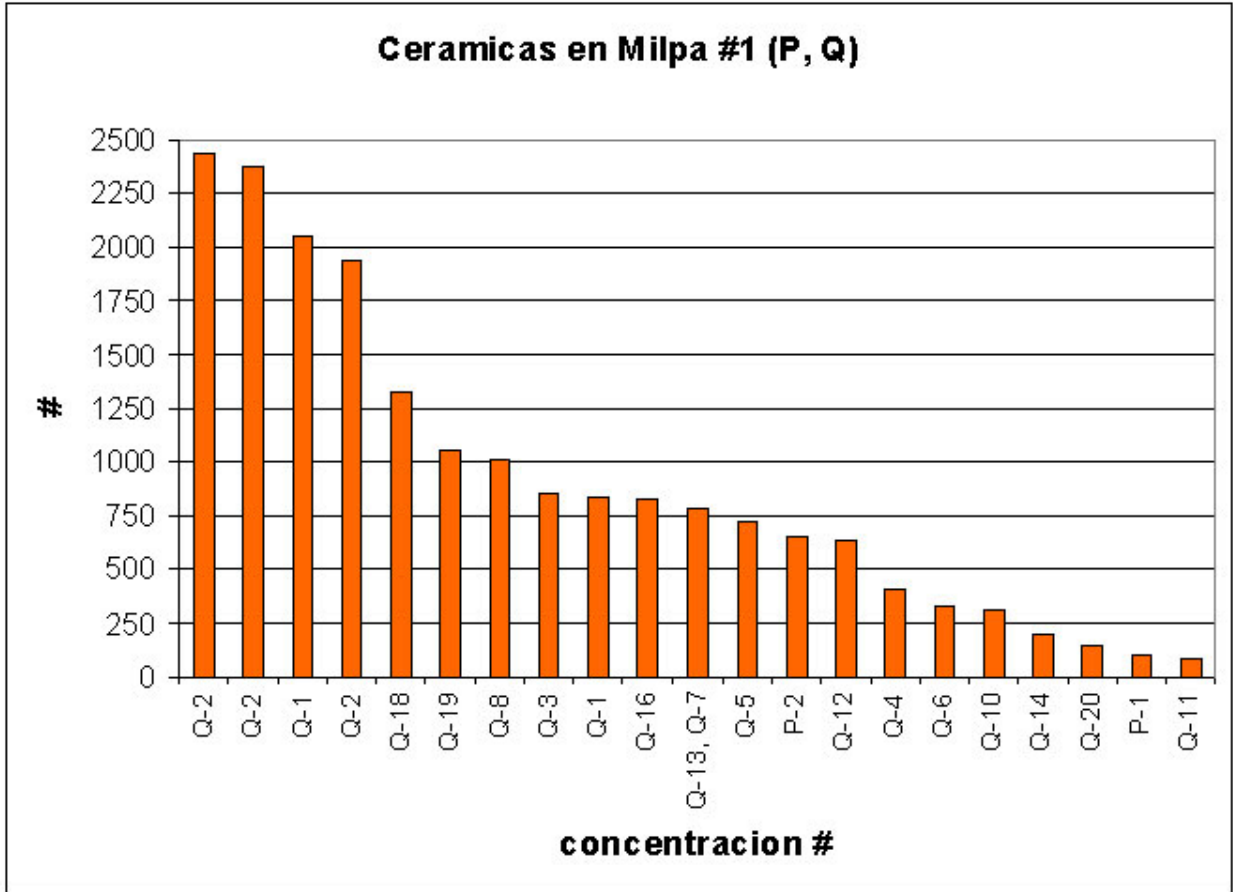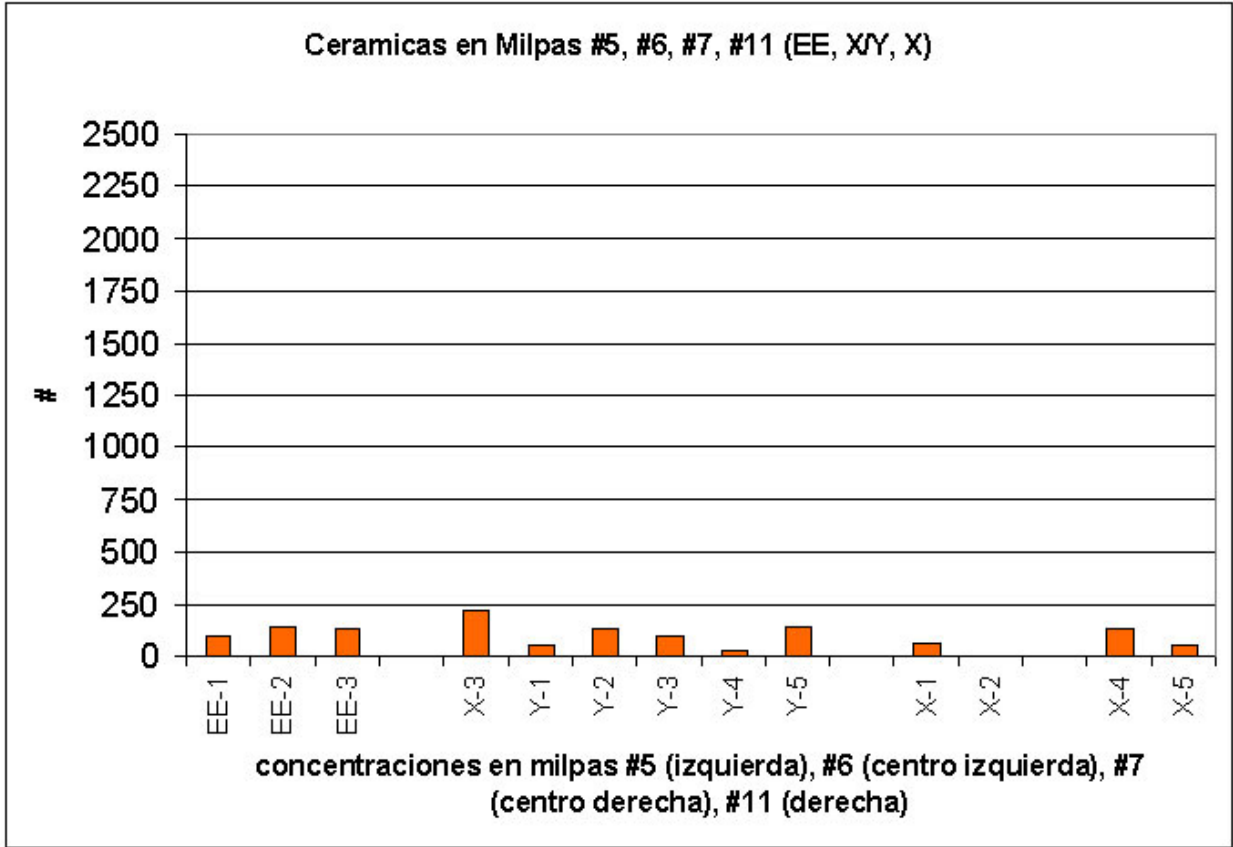
Figure 17a. Ceramic Densities.

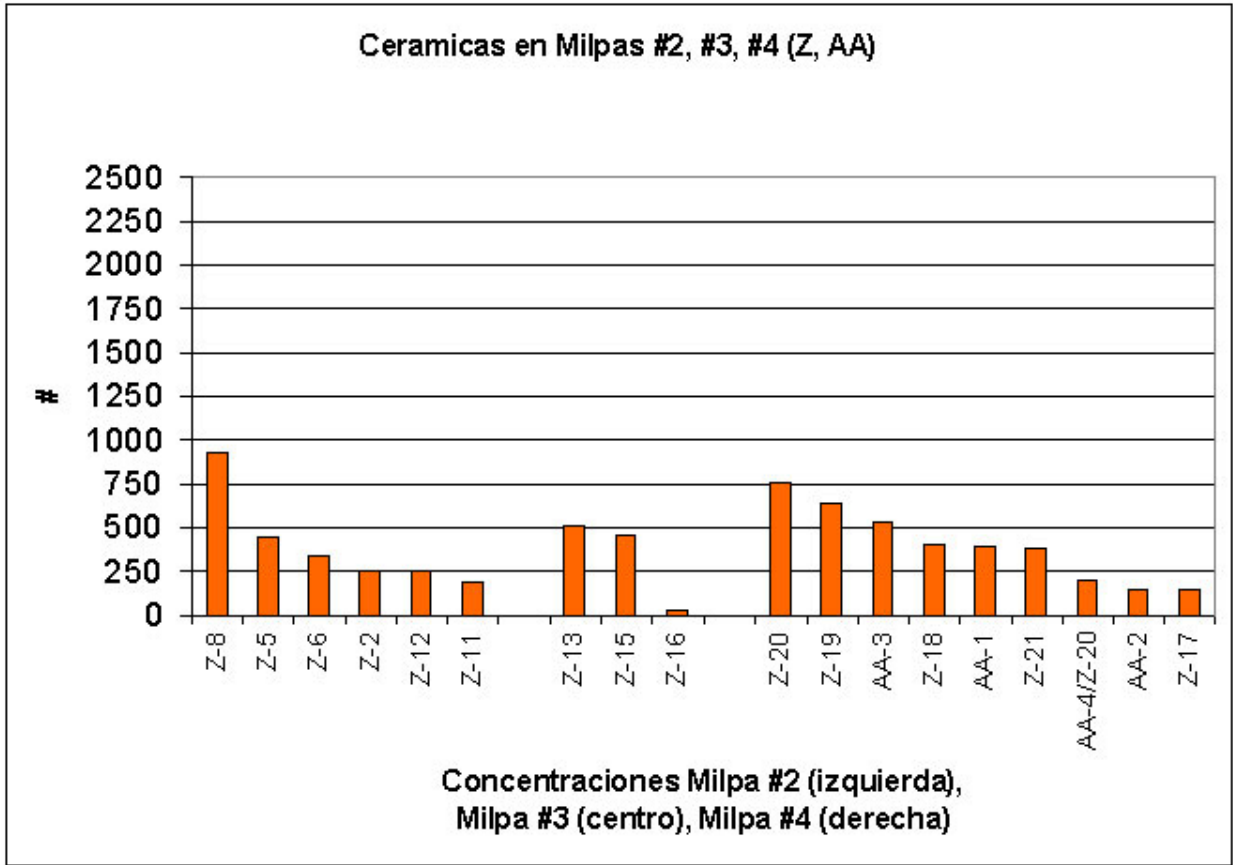**Figure 17b. Ceramic Densities.**
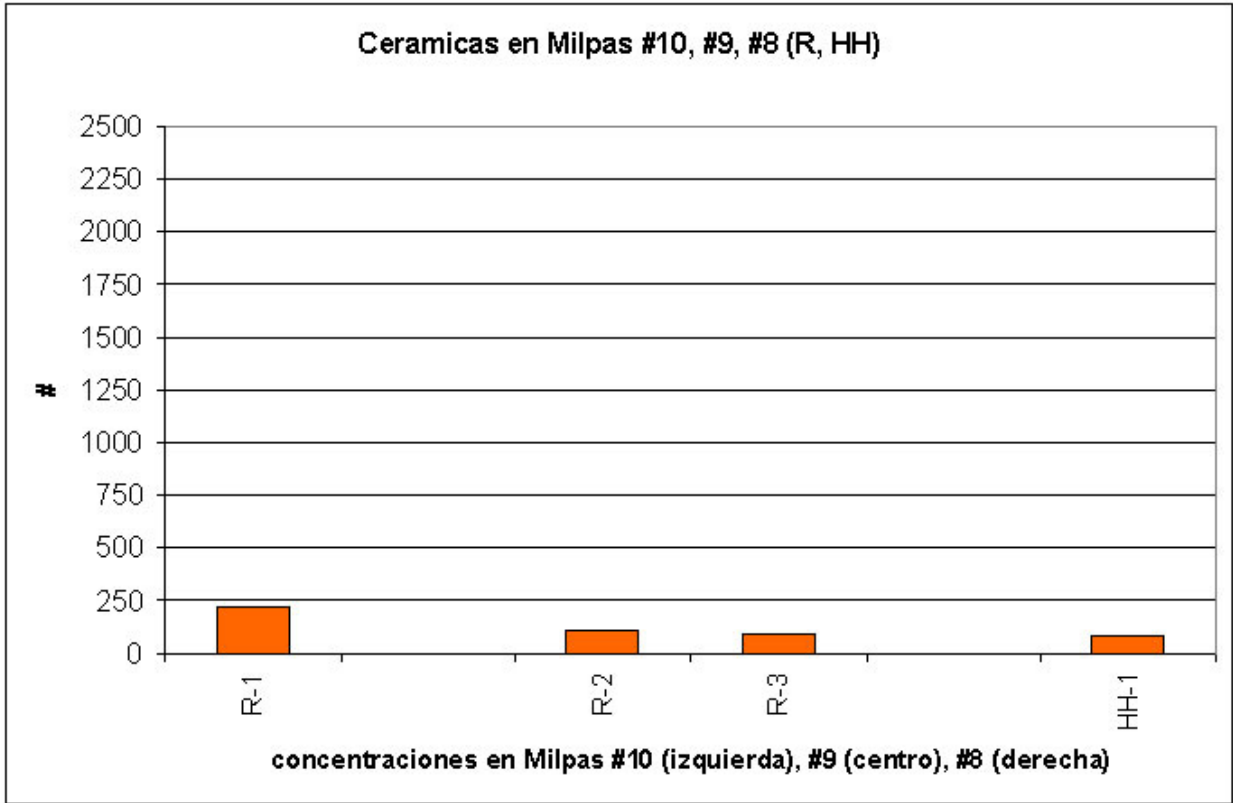
Figure 17c. Ceramic Densities.

Figure 17d. Ceramic Densities.

Figure 18a. Marine Shell.

Figure 18b. Marine Shell

Figure 19. Lithic Bifaces.

Figure 20. Lithic Flakes.

Faunal Analysis

A sideline project on the analysis of faunal remains was also initiated by Masson and Amanda Schreiner on all of animal bone from surface collections of 2001, a sample of the houselot excavations of Brown (1999), and a sample of the monumental zone excavations of Peraza (Masson *et al.* 2002). Some interesting preliminary results have emerged. For the site as a whole (Figure 21), mammals were the mainstay of the diet (43%), with birds (14%) representing the second most common category. At least half of these bird bones are turkey, although some parrot has also been identified. White tail deer and dog were the most common mammals consumed at Mayapán, with far fewer quantities of brocket deer and peccary represented (Figure 22). Comparisons of monumental zone fauna to that of outlying houselots tested by Brown (and our surface concentrations) reveals a striking contrast. Dog bones are scarce in houselot samples analyzed, suggesting that this species may have been a preferred ritual food. Birds also appear proportionately greater in the monumental zone compared to their distribution at the site as a whole (Figure 23).

Variation is also observed within monumental zone contexts ([Figure 24](#)). Dog was particularly important at the Caracol midden (Q-152), along with turkey/bird bone and iguana. Dog was also common near the Q-79 platform. Deer appears more common at the Cenote Ch'en Mul platform (Q-153) and at the Castillo (Q-162). Much of the dog and deer bone at the Caracol were those of nearly mature subadults or very young adults, based on scarce tooth wear and the presence of unfused long bone epiphyses ([Figure 25](#)). One context at Q-162 has eleven deer mandibles with smaller numbers of postcrania. At least five deer are represented, and four of these are young adults or juveniles. Many other contexts in the monumental zone also have primarily immature or very young adult dog and deer bones. These age profiles suggest these animals were not procured through random hunting activities, but were likely to have been yard-raised at Mayapán and killed at a young age for use in ritual and feasting. Game is thus another resource that we have identified at Mayapán, and this correlates nicely with ethnohistoric references that suggest this site harbored game resources for exchange with coastal sites (Landa 1941:40).
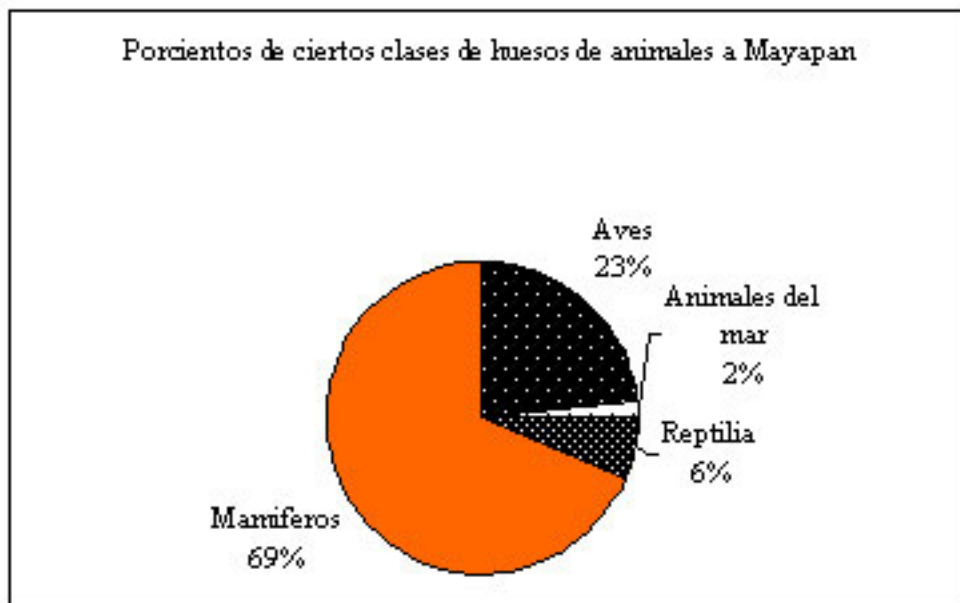

Figure 21. Faunal Trends, Mayapán Composite Sample.
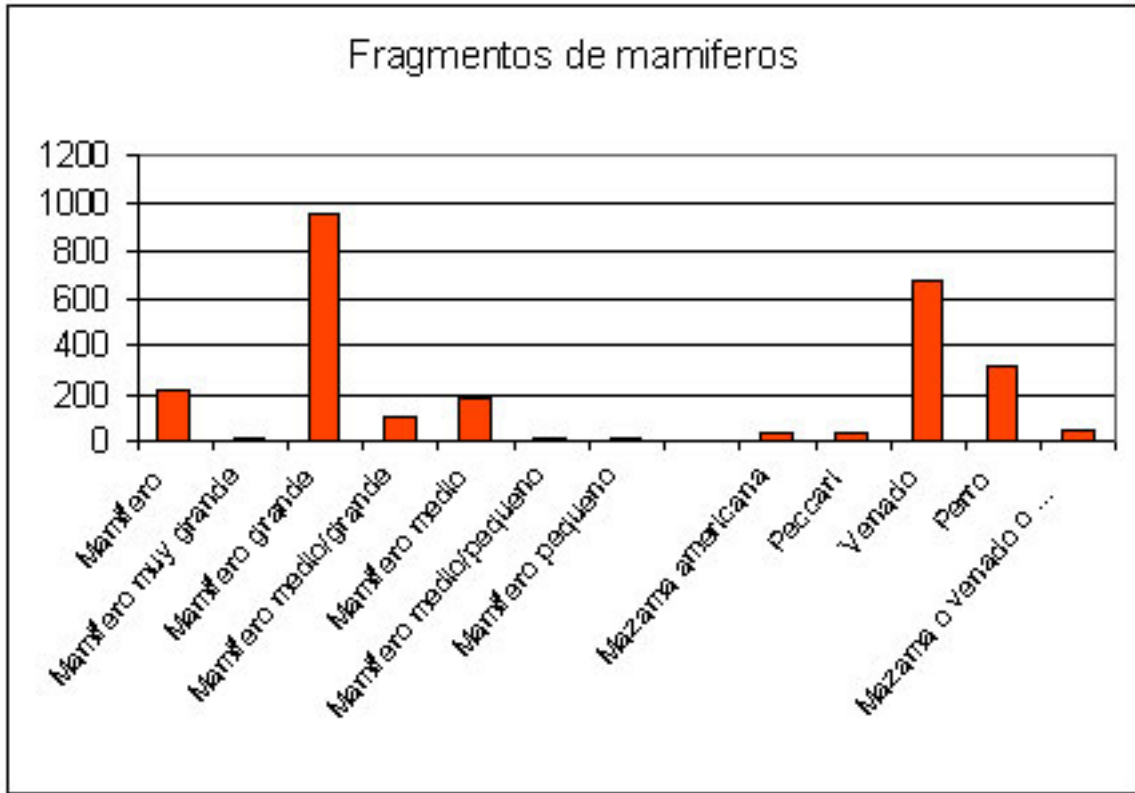
Figure 22. Mayapán Mammals.
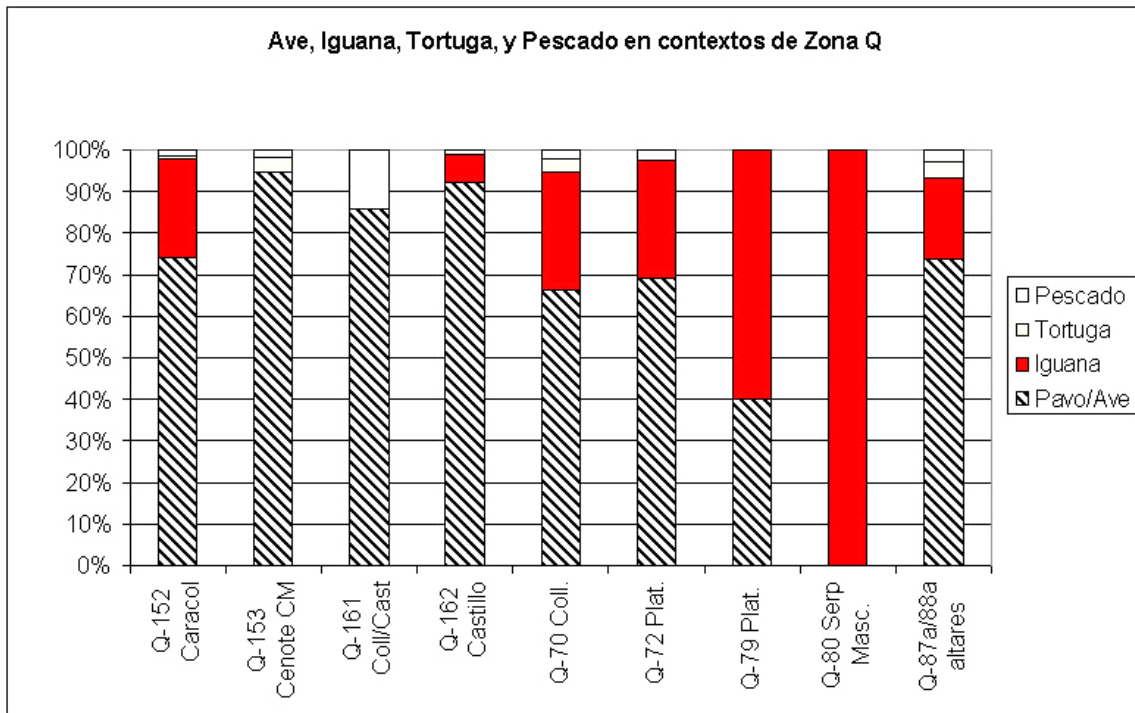
Figure 23. Mayapán Birds, Fish, Reptiles.
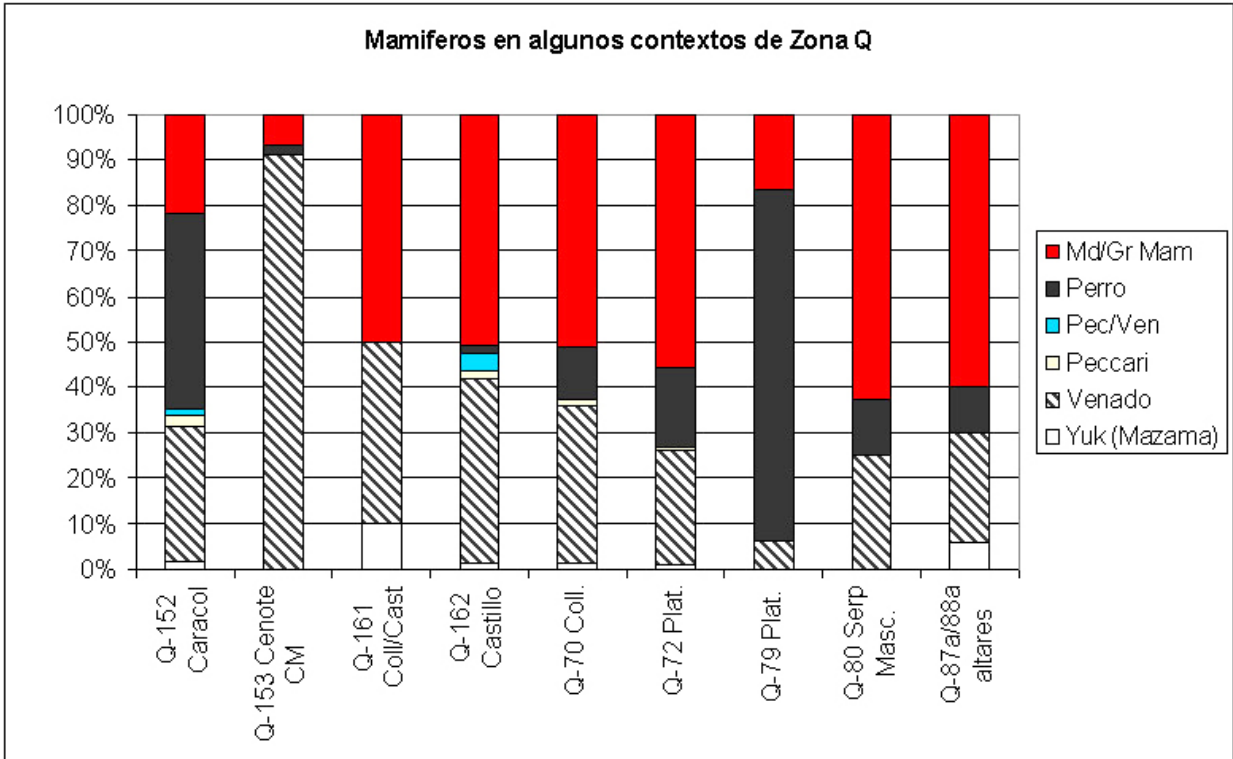
Figure 24. Monumental Zone Mammals, Various Contexts.

Figure 25. Immature Dog Epiphyses.

Survey Outside the City Walls

Additional work in the form of reconnaissance transects beyond the city wall determined that Mayapán's settlement continues for at least one kilometer outside of the wall to the east, west, and south, although structure density decreases with distance from the walls (Figure 26). These reconnaissance efforts imply that the city could be much larger (perhaps 30%) than currently documented. However, the chronology of structures outside of the walls is not known. The one milpa (#8) outside of the wall that we mapped and surface collected had a substantial portion of Late Preclassic ceramics and it may predate the Postclassic city. In two directions (south and west), temple cenote complexes were identified beyond a distance of 1km from the wall (after a settlement dropoff) which may represent satellite communities of Mayapán.

Figure 26. Transects Outside City Walls.

Figure 27. Surface Collection at Mayapán 2001.

Figure 28. Comparison of feature density in two milpas.

Summary

As our work at Mayapán has thus far been six weeks in duration ([Figure 27](#)), this challenge is a bit of a reach for us at this early stage in our research. The data we've described here does attest to certain aspects of the city's political economy in some interesting preliminary ways. On the local level, we have identified additional evidence for a lithic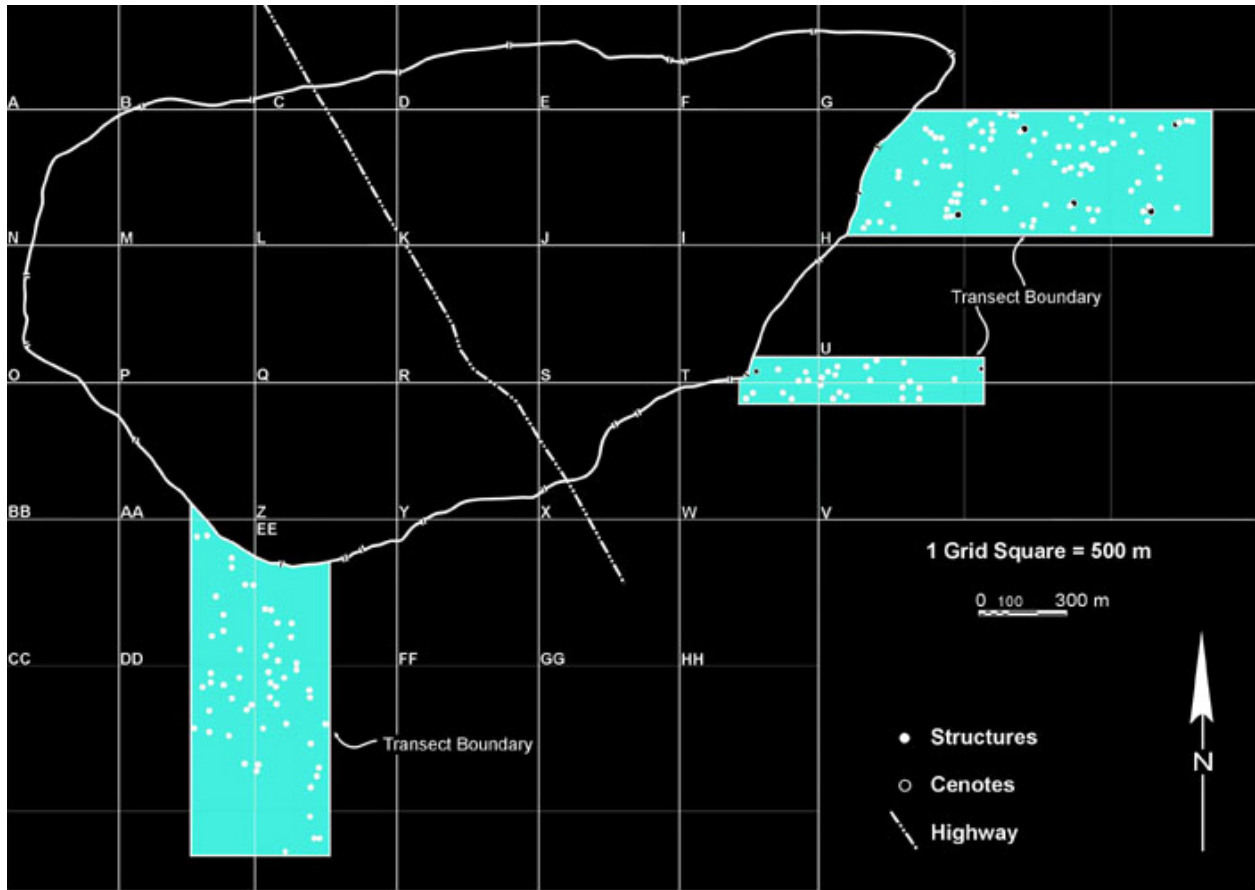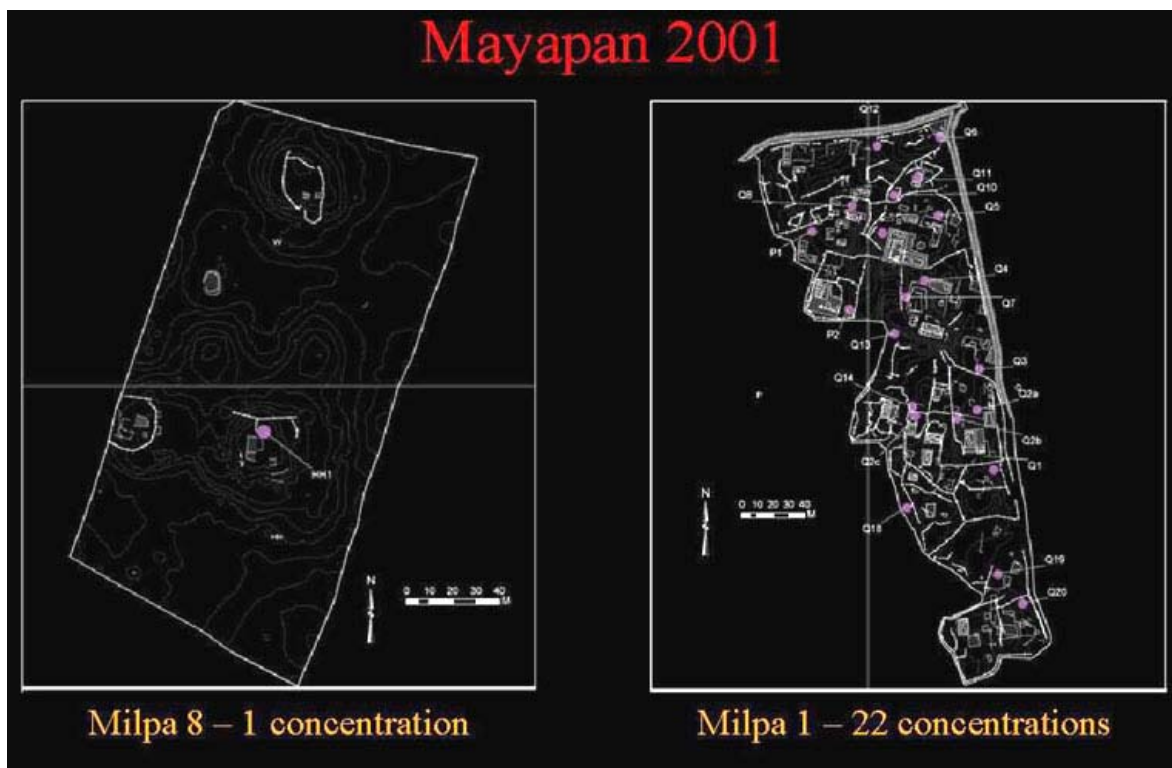 production and consumption industry in chert and chalcedony tools that was an important part of household maintenance activities, and probably craft and agricultural activities as well. Other household production industries at the site reflected in our surface collections include shell working and activities involving concentrations of lithic tools. Shell was one important currency for the marketplaces of the Late Postclassic Maya, and we see that manufacture of shell ornaments was an activity associated with some upper status houselots at the city. Metate concentrations, scarcely analyzed at this point, suggest collective houselot activities of food production. Animal age profiles in assemblages associated with elite rituals and feasting suggest that game was another resource that Mayapán occupants generated internally, especially deer, turkey, and dogs. Parrots were kept in at least one location. Clifford Brown's prior work at the site (1999) also suggests that pottery production was an important local industry at Mayapán and we hope, with his help, to further analyze this trend. We thus see in Mayapán's local industries a profile of a booming production economy, in which residents of the urban center made much of the materials essential for daily life. There is no evidence that households were independently self-sufficient, however, but rather, it appears that occupational specialists produced materials for exchange in the city's markets for local and perhaps regional consumption. Environmental investigations planned by Bruce Dahlin and his team at the city will investigate questions of agrarian production. We hypothesize that garden plots existed throughout the city's intermittent open spaces both inside and outside of the walls.

What of Mayapán's exchange relationships with the outside world? Differential distribution of obsidian provides an intriguing glimpse of an exchange economy that affected residents of Mayapán to varying degrees. At least one-third of the site's stone tools (based on our sample), were comprised of obsidian blades, and this reflects an aspect of long distance interdependency of the city's residents on trade. Braswell's (n.d.) sourcing work at the site identifies much of this obsidian to the Ixtepeque source, in a pattern that parallels that observed at sites along the east coast and in Belize (Masson and Chaya 2000). This shift to primary reliance on Ixtepeque obsidian in the Late Postclassic world temporally coincides with Mayapán's rise to power, and raises the question of this city's role in stimulating or negotiating long distance trading networks.

Other materials brought in from the outside include marine shell raw materials, which were converted to ornaments at the site. Fish, while present, is one coastal resource that is not abundant within the faunal assemblages examined thus far. This may be a preservation problem as otoliths were far more common than fish bone. Textiles, along with shell, were also important as exchange currencies in Postclassic marketplaces.

Spindle whorls, although known from the site, were not abundant in the areas collected this summer–especially in comparison to their frequency at northern Belize sites (Masson 2000). Textiles may have been another important commodity obtained through trade at Mayapán. Other valuable items such as greenstone axes and copper artifacts, are present at the site, and greenstone was more common at Milpa #1 near the monumental zone than elsewhere in our survey. Further work will assist us in quantifying these items that occur in lower numbers than everyday household materials so that we can better evaluate the full dimensions of Mayapán's exchange economy. We look forward to collecting additional data in the subsequent three years of survey, excavation, and analysis planned for the site.

Tables

Table 1. Surveyed Milpa Zones of the 2001 Season			
Milpa#	**Square**	**Position Social** (estimated) (1-3) (estimated according to size and architectural complexity)	**Sample Zones** Zone 1–Within the distance of 500m of the monumental zone. Zone 2–Within the city wall, but beyond 500m from the monumental zone. Zone 3–Outside of the wall.
Milpa #1	Square Q/P	1	Zone 1
Milpa #2	Square Z	2	Zone 1
Milpa #3	Square Z	3	Zone 1
Milpa #4	Square Z	3	Zone 1
Milpa #5	Square EE/Z	3	Zone 1, 2
Milpa #6	Square Y/X	2	Zone 1, 2
Milpa #7	Square X	3	Zone 2
Milpa #8	Square W/HH	3	Zone 3
Milpa #9 (surveyed, not mapped)	Square R	2	Zone 1
Milpa #10 (surveyed, not mapped)	Square R	3	Zone 1
Milpa #11	Square X	2	Zone 2

	Ceramicas	Lascas	Herramientos de Pedernal	Obsidiana	Concha Fragmentos	Herramientos de Conchas	# Concentraciones	Total Conc. Area (Metros Cuadrados)
Milpa 1	33.78	2.89	0.24	0.50	0.18	0.02	20	565.20
Milpa 2	14.18	2.16	3.03	0.25	0.04	0.01	6	169.56
Milpa 3	11.82	0.92	0.06	0.08	0.01	12.89	3	84.78
Milpa 9	3.47	0.71	0.04	0.23	0.02		10	282.60
Milpa 10	7.64						3	84.78
Milpa 4	12.73	10.95	0.09	0.23	0.12	0.01	6	169.56
Milpa 5	4.25	0.32	0.06	0.01		0.02	2	56.52
Milpa 6	3.83	1.26	0.08	0.05	0.01	0.01	1	28.26
Milpa 7	1.11	0.12		0.04			2	56.52
Milpa 11	3.15	0.30	0.18				1	28.26
Milpa 8	3.01						2	56.52

Table 2. Artifacts by Square Meter in the Concentrations of Milpas Surveyed at Mayapán in 2001

Milpa	Structure-Square	Str.-#	Conc-#	Collection#	Sherds	Flakes	Tools of Chert/Chalcedony	Obsidian	Fragments of Marine Shell	Tools of Marine Shell
Milpa 1	P	P-24 sascabera	P-1	1	104	17	6		2	2
Milpa 1	P	P-28b east	P-2	1	657	9	1	7	1	
Milpa 1	Q	Q-176 east side, south of the hill platform	Q-1	1	2051	47	5	1	36	
Milpa 1	Q	Q-176, east side	Q-1	2	833	29	12	29	3	
Milpa 1	Q	Q-184 south of Q-181	Q-2	3	2375	31	14	26	19	5
Milpa 1	Q	Q-176 northwest corner	Q-2	2	1942	27	4	42	3	1

Table 3

Milpa 1	Q	Q-176 patio north	Q-2	1	2437	55	9	27	17	2
Milpa 1	Q	Q-179	Q-3	1	850	46	1	30		
Milpa 1	Q	Q-42a north side	Q-4	1	407	2			1	
Milpa 1	Q	Q-41b northeast corner	Q-5	1	719	45	3	8		
Milpa 1	Q	Q-32 southwest corner	Q-6	1	331	1			1	
Milpa 1	Q	Q-41d northeast corner	Q-8	1	1009	4	14	2		
Milpa 1	Q	Q-38a east promontory	Q-10	1	315	27	4	4		
Milpa 1	Q	Q-39	Q-11	1	87	86	4	5	3	
Milpa 1	Q	Q-37 east	Q-12	1	638	510	6	6	1	1
Milpa 1	Q	Q-42c southwest corner	Q-13, Q-7	1	781	9	10	1		
Milpa 1	Q	Q-181 west	Q-14	1	193					
Milpa 1	Q	Q-38c north	Q-16	1	828	61	6	6	1	1
Milpa 1	Q	Q-188/189 west	Q-18	1	1330	556	21	21	7	
Milpa 1	Q	Q-194 northwest corner	Q-19	1	1057	29	5	20		
Milpa 1	Q	Q-196 north	Q-20	1	147	42	10	48	4	1
Milpa 2	Z	Z-42b west	Z-1	1	no collection					
Milpa 2	Z	albarrada south of Z-47	Z-2	1	252	110	2	4	4	2
Milpa 2	Z	Z-47a west	Z-3		no collection					
Milpa 2	Z	Z-42a east	Z-4		no collection					
Milpa 2	Z	Z-43 west	Z-5	1	451	46	11	2		
Milpa 2	Z	depression west of Z-41a	Z-6	1	342					

Milpa 2	Z	Z-39c west	Z-7		no collection					
Milpa 2	Z	Z-39b west	Z-8	1	927	11	494	25	2	
Milpa 2	Z	albarrada south of Z-39	Z-9		no collection					
Milpa 2	Z	Z-38a	Z-10	1	no collection					
Milpa 2	Z	Z-44 over structure & west	Z-11	1	185	17	2	4		
Milpa 2	Z	Z-44 depression to north	Z-12	1	247	183	5	8		
Milpa 3	Z	Z-101b north	Z-13	1	510	31	1	5		547
Milpa 3	Z	Z-101b over structure & al west	Z-14		no collection					
Milpa 3	Z	Cenote X te Tloloc, SW	Z-15	1	458	13	4	1		476
Milpa 3	Z	Z-103a east	Z-16	1	34	34		1	1	70
Milpa 4	AA	AA-81 east	AA-1	1	395					
Milpa 4	AA	AA-78 east	AA-2	1	149	36	9	3		
Milpa 4	AA	AA-75 west	AA-3	1	528	45	3	3	9	
Milpa 4	AA	Z-119, AA-75 northwest side	AA-4/Z-20	2	194					
Milpa 4	Z	AA-143 east, Z-121 southwest	Z-17	1	142	13				
Milpa 4	Z	Z-119, AA-75 east of sascabera	Z-18	1	406	150	11	19	3	
Milpa 4	Z	Z-119, AA-75 southeast	Z-19	1	640	2691	3	13	16	
Milpa 4	Z	Z-119, AA-75 north side	Z-20	1	756	92		20	6	2
Milpa 4	Z	Z-119, AA-75	Z-21	1	388	67		8		1

		sascabera								
Milpa 5	EE	EE-23a, b north	EE-1	1	92					
Milpa 5	EE	EE-26b west in alley	EE-2	1	138	27	5			2
Milpa 5	EE	EE-26c east	EE-3	1	130			1		
Milpa 6	X	Y-45b east	X-3	1	217	6	1	2		
Milpa 6	Y	Y-108 sascabera	Y-1	1	55			2		
Milpa 6	Y	Y-51a west and north	Y-2	1	127	179	9	3	1	
Milpa 6	Y	Y-46a, b north	Y-3	1	94	18	2			
Milpa 6	Y	Y-107 south	Y-4	1	25	2		1	1	1
Milpa 6	Y	Y-111c west	Y-5	1	132	9	2			
Milpa 7	X	X-45 west in sascabera	X-1	1	63					
Milpa 7	X	X-63 east	X-2	1		7		2		
Milpa 8	HH	unumbered structure	HH-1	1	85					
Milpa 9	R	R-135b northwest	R-2		105	17	1	5	1	
Milpa 9	R	R-135a east	R-3		91	23	1	8		
			R-4	no collection, cuerns						
Milpa 10	R	R-110 southeast side	R-1		216					
Milpa 11	X	X-23c northwest	X-4		124	13	3			
Milpa 11	X	X-16b southwest	X-5		54	4	7			1

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