Chapter 8. Hinterland Settlement Patterns within the Chunchucmil Economic Region

Published by

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Ancient Maya Commerce: Multidisciplinary Research at Chunchucmil.

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In 2001, Hixson initiated a regional survey to the west of Chunchucmil to test the fan-shaped distribution and to document settlement patterns in the various ecological zones between the coast and the semiarid plains. In 2002, Mazeau initiated a regional survey to the east of Chunchucmil to assess the density, chronology, and major features of occupation in this area and also to understand the dynamics of Chunchucmil’s relation with the well-known center of Oxkintok (Velázquez Morlet and López de la Rosa 1995), located 27 km to the east. Due to Yucatán’s scrubby vegetation, neither survey was able to implement the broad, systematic methods developed in places like the Valleys of Mexico and Oaxaca. Instead, both surveys relied on remote sensing and local informants to locate new sites. Hixson identified 15 new sites in an approximately 160-km² area, bringing the total number of known sites in that area up to 20 (figure 8.1). Mazeau’s survey area included two blocks, one immediately northeast of Chunchucmil, the other to the east/southeast of Chunchucmil, beginning about 7 km from the Chunchucmil site core. Mazeau identified 28 new sites in an area of approximately 100 km², bringing the total number of known sites in that area to 38 (figure 8.1).

The survey projects support a complex picture of Chunchucmil’s regional settlements, one that allows for both inter- and intraregional mechanisms of procuring subsistence goods and other commodities. The western seasonal wetlands have proven to be much more than just a barrier to cross for long-distance exchange, while the eastern hinterland is even more densely settled than previously thought.
With so many neighbors trying to live off the same land, Chunchucmil’s agricultural options were limited (see chapter 9).

The hinterland settlements documented by the Pakbeh project are best described alongside the regional ecological variation outlined in chapter 6, beginning at the coast with its trading ports and salt flats, through the perennial and seasonal wetlands, to the semiarid interior that ends at the edge of the Puuc hills. Each ecological zone contains a distinct set of settlement characteristics, emphasizing the notion that the denizens of Chunchucmil were not only crossing each zone for interregional trade, but also using the resources in each zone to diversify their subsistence base.

SETTLEMENTS OF THE COASTAL ZONE

In the mid-1990s, Bruce Dahlin, along with Anthony Andrews and a team of archaeologists, geologists, geographers, hydrologists, and other specialists, conducted archaeological and environmental studies of the coastal site of Punta Canbalam, located at the western edge of Chunchucmil’s hinterland (Dahlin et al. 1998). Previous coastal surveys (e.g., Eaton 1978) had written off the area between Celestún and its nearest neighbor to the south, Uaymil, as a nearly impenetrable wall of coastal mangrove, a “backwater” region (Dahlin et al. 1998:1) broken only by the natural and man-made canals that cut from east to west, draining the wetlands into the Gulf of Mexico. Punta Canbalam, however, lies at a potentially critical nexus of trade, production, and communication networks and therefore provides a notable exception to this categorization (see also chapter 12).

The exact location of the original prehispanic settlement of Canbalam is not fully known. All artifacts encountered during both surface surveys and test excavations were found in secondary contexts, having been pushed, pulled, rolled, and crushed by the tides over many centuries (Dahlin et al. 1998). Due to the prevailing southerly flow of ocean currents in this area (especially during the most tumultuous storms, known as nortes), combined with the project’s verification that a significant portion of the site is currently under water, it is possible that the modern distribution of artifacts along a 10-km stretch of onshore beach is entirely secondary in nature, and that its original location has been eroded by the tides, or was once farther offshore on one of the barrier sand bars that has since eroded and become submerged (snorkel surveys revealed artifacts up to 100 m offshore in very shallow waters). The lack of any architectural stones or metates makes the question of Canbalam’s original location that much more puzzling (Dahlin et al. 1998:6).

Regardless of its precise position, the ancient community of Canbalam commanded an important strategic location at the mouth of the Ría Celestún. This estuary, protected from the open ocean by the barrier beach of the Celestún...
Peninsula, was once the last major protected harbor for canoe-based merchants for approximately 80 km to the north (Dahlin et al. 1998:8). If satellite imagery and modern informants are correct, this estuary may have afforded long-distance traders an inland water route north from Canbalam to large seaports along the north coast of the Yucatán Peninsula, and south to the next major habitable shore at the location of modern Campeche City.

As documented by Dahlin et al. (1998), the site of Canbalam was relatively rich in imported items from distant Mesoamerican lands. Fine-paste ceramics (Fine Orange, Fine Gray), slatewares, and plumbates all indicate a participation in interregional trade from the Late to Terminal Classic and into the Postclassic periods (Dahlin et al. 1998:4). Obsidian blades abound on the surface (one must wear foot protection on this beach), while a few imported chert tools and even jade items were uncovered during the survey. None of these items was locally available, and many came from as far as 1000+ km away. When taken together, the imported ceramics, obsidian, chert, and jade, concentrated within a coastal community at the mouth of an important harbor and perfectly positioned to exploit, manage, or control the second-largest salt beds in Mesoamerica, paint a picture of a major coastal
port of trade that “should be accorded the same rank as Jaina and some north coast sites such as Isla Cerritos” (Dahlin et al. 1998:6).

The full chronology of Canbalam is less clear. Due to the secondary deposition of all artifacts, the lack of any stratigraphic integrity, and the water-rolled erosion of all ceramics, a detailed chronology would be nearly impossible to reconstruct. Between 66 and 81 percent of all ceramics were unidentifiable due to the complete lack of any slip or other surface treatment (Dahlin et al. 1998:4). Of the remaining 19 to 34 percent, most were identified due to their unique paste (e.g., Fine Orange and Fine Gray), while the very few with traces of identifiable slip were exclusively plumbate (which has a remarkably resilient slip). Thus, using the initial type-variety analysis conducted in the late 1990s, it is certain that Canbalam had a significant Late to Terminal Classic component. A more recent reanalysis of sherds from Canbalam indicate that many forms may date to the Late Preclassic and Early Classic.¹

SETTLEMENTS OF THE PERENNIALLY INUNDATED ZONE

While no comprehensive archaeological survey has ever been conducted in this area, the perennially inundated zone is perhaps one region that can be reasonably assumed devoid of widespread ancient occupation. That being said, small hunting or extraction camps, or sitios de paso (rest or relay stops along trade and communication routes), are possible throughout this perennially inundated zone. The most likely targets for future studies of archaeological remains in the perennial wetlands are the petenes or ojos de agua. Modern Maya hunters and traders utilize these oases as needed on their treks to and from the coast for sources of freshwater, wild game, and hardwoods.

One example of an archaeological site located upon a peten is Uaymil, located at the southern border of the Chunchucmil Economic Region (CER). Under the direction of Rafael Cobos Palma (INAH), Armando Francisco Inurreta Díaz (2004) described the site of Uaymil as a port of trade that likely funneled products from the coastal canoe routes to the interior at Siho (see figure 1.2) during the Late to Terminal Classic periods (much like the relationship proposed here between Canbalam and Chunchucmil during earlier times). Connected to the coast via a natural canal that springs from the petenes of the perennially inundated wetlands, it would have provided a safe harbor for canoes and an ideal starting point for the trek into the interior. Unlike Canbalam, it was better protected from the ocean currents by the intervening stands of mangrove. Therefore the architecture and artifacts were accordingly better preserved, allowing Cobos and his team to make direct comparisons to other known ports of trade from the Late to Terminal Classic times, such as Chichén Itzá’s port at Isla Cerritos.
Two possible peten sites were rumored to exist within the heart of the CER. The Canbalam project was repeatedly told that there was a small nucleated settlement called “Tres Iglesias” between Canbalam and Chunchucmil, yet no one could lead the project to its location (Dahlin et al. 1998; chapter 1, this volume). During his hinterland survey, Hixson was led on a two-day excursion to locate a site called “Trapiche,” which was known among the elders of the village of San Mateo as a small cluster of mounds near the interface of the perennially and seasonally inundated zones. One mound was estimated by these Maya villagers to stand approximately 5 m tall, composed of dark rich soil without any visible stones. We were never able to locate Trapiche. The truly remote location and difficult walking conditions through the perennial wetlands make these petenes a veritable frontier in Maya archaeology, remaining underexplored by the academic world.

SETTLEMENTS OF THE SEASONALLY INUNDATED
SAVANNAS AND TZEKELES

After several seasons of pedestrian and remote sensing surveys, the most drastic change to the Atlas project map of the regional settlement pattern was observed in the distribution of sites in the seasonal wetlands immediately west of Chunchucmil. The Atlas project (figure 6.1; Garza Tarazona de González and Kurjack 1980) had noted only two diminutive settlements in this particular ecological zone, both along a trajectory leading directly to Punta Canbalam from Chunchucmil. This had provided a deceptively clear template for Dahlin to envision the seasonal wetlands as a vacant uninhabitable and uncultivable zone with only two minor sites acting as sitios de paso along a direct trade route to the coast. Yet, the Atlas project had as its goal to plot the locations of every archaeological site in the entire state of Yucatán, and therefore performed limited ground surveys in this endeavor. The two Atlas sites leading to Canbalam were fortuitously found (Kurjack, personal communication, 2005) along the road between the modern village of Chunchucmil and a large cattle ranch called San Simón, a historic link in the transportation route to the coast created by the hacienda owners of this region in the late nineteenth century.

When PREP members explored the areas to the north and south of this historic road, 12 new savanna sites in the wetlands were recorded (figure 8.2): three stratified sites that likely acted as regional nodes (Múuli Mis, Josco, and Pochol Ch’en); one stratified site without any pyramidal architecture (Pacel); three non-stratified multifamily communities (Nah Cana, Chak Luuk, and Naranjo); one non-stratified isolated household compound (Bon); and four loci of ephemeral occupation that may represent field houses associated with wetland/tzekel resource extraction (Nah
Still others remain to be properly documented.

While a statistical analysis of settlement density is not possible (due to the methods used in the regional reconnaissance, which focused upon the efficacy of remote sensing to locate specific archaeological sites), settlements in the seasonal wetlands are generally restricted to the tzekeles (the fossilized beach ridges described in chapter 6). Nearly every tzekel encountered during our surveys contained some form of ancient settlement or landscape manipulation. These range from small domestic sites with a handful of houses, to relatively large communities with pyramids and plazas. A sample of these newly discovered sites is described below. The areas between the tzekeles are not free of archaeological features. The sac lu’um bajos contain dozens, if not hundreds of rock alignments that functioned as pathways through the inundation between communities and resources (figure 8.2; see chapter 12).

**Múuli Mis**

In 2004, our survey crew targeted a satellite signature that indicated ancient architecture approximately 3 km into the seasonal wetlands west of Rancho Sinkeuel, and 13.5 km north-northwest of Chunchucmil’s site center (figure 8.2). This particular site was also highlighted as a peak in the AIRSAR digital elevation model. Not only are these among the largest pyramidal structures found west of Chunchucmil, but the site’s ballcourt is one of only four encountered in the entire CER. The other three ballcourts include an oddly tall specimen at the epicenter of urban Chunchucmil, another immediately west of Chunchucmil at the Preclassic site of Ikmil, and a newly discovered ballcourt found by Daniel Mazeau at Grupo Abalá, east of Chunchucmil. These data stand in stark contrast to the results of the CostaYuc Project (A. P. Andrews and Robles Castellanos 2004), directly north of the Chunchucmil region, where dozens of Middle Preclassic ballcourts have been found.

The presence of a ballcourt was the first indication that this site was likely not from the same time period as the apogee of Chunchucmil (i.e., the late Early Classic and the early Late Classic). Ballcourts are typically seen as architectural markers of sociopolitical power in the Maya region, but they are underrepresented in Chunchucmil’s center and do not appear to have been integral to the sociopolitical development of that site’s elite. It is expected that regional occupation contemporaneous with Chunchucmil would result in the mimicry and/or adoption of the larger settlement’s symbols of social and political power by regional elites. Instead, at Múuli Mis we see the use and emphasis of an architectural symbol infrequently used at Chunchucmil, but found in abundance during the Middle Preclassic farther
north (A. P. Andrews and Robles Castellanos 2004), suggesting the likelihood of different occupational periods that conferred divergent symbolic value on various architectural features.

Ceramics encountered during the mapping operation and in subsequent test excavations support the proposition that Múuli Mis was instead occupied during the Preclassic period. Joventud Red sherds were plentiful in our ceramic sample and provided preliminary evidence that Múuli Mis was once one of the many Middle Preclassic ballcourt sites in northwest Yucatán, comparable to those recently discovered through the work of the CostaYuc project. Low platforms (likely house-mounds) were observed during treks to the west, north, and south of the central core of Múuli Mis, indicating that the site extends at least 100 m beyond the central core mapped by PREP. The presence of these ballcourt sites within and adjacent to the wetlands (including Ikmil) supports the point that wetlands were not a hindrance to early Maya civilization, but likely a challenging resource that helped in its development (Turner and Harrison 1983).

**Figure 8.2.** Map of regional sites and rock alignments between Chunchucmil and the Gulf Coast, overlaid upon a LANDSAT multispectral composite image.
Pochol Ch’én

Approximately 10 km west-northwest of Chunchucmil’s site center our survey crew encountered a very compact yet impressive settlement known locally as Pochol Ch’én. These ruins sit atop a narrow rise associated with the tzekel. Approximately 17 ha were mapped, containing approximately 140 structures. Although this rise is at times less than a meter above its surrounding terrain, it is sufficient to keep the site dry during the rainy season. The orientation of structures adheres to the landform (extending from the northeast to the southwest). For a site with such a small geographical footprint the number and density of structures is quite notable (figure 8.3).

At the center of the site stands a small pyramidal platform, its slopes containing fallen column drums and displaced wedge-shaped veneer stones. The veneer stones indicate that the final phase of this site was likely in the Late and/or Terminal Classic (G. Andrews 1995). However, test excavations alongside residential structures and within the main plaza indicate that Pochol Ch’én was occupied from the Middle Preclassic through the Terminal Classic. The central pyramidal structure is fronted by a relatively large artificially raised and leveled plaza, complete with a substantial range structure along its northern edge and a small central focal platform similar to the central platforms of Chunchucmil’s elite quadrangle groups. This architectural arrangement was certainly the site center of Pochol Ch’én, and was likely positioned to access and/or control the freshwater well of the same name that borders the east side of the plaza.

The dominant architectural form at Pochol Ch’én is referred to by some northern Maya researchers (J. G. Smith 2000) as an “eyeglass structure.” The prototypical eyeglass structure is composed of two circular or rectangular foundations connected by a single anterior wall, often with a chich mound (minor platform of chich [gravel], see chapter 2) between the lateral structures. This form, including variations with more than two rooms, was clearly preferred by the builders of Pochol Ch’én. Many of the anterior foundation walls are often quite well preserved at the site. They were formed of roughly cut flagstones, some nearly a meter tall, still anchored in their original upright positions. Several of these structures also displayed surprisingly clear room divisions, marked by smaller undisturbed foundation stones (as opposed to the more amorphous rubble foundations visible on the surface of unreconstructed mounds in the Chunchucmil region).

Pochol Ch’én is also notable for its eastern wall. This wall measures over 1 m high, and is slightly less than 1 m thick. It was constructed by planting two parallel lines of large flat boulders in the ground, and filling the space in between with dry core fill. In some sections, additional large flat stones were placed across the top as if to form a cap. This wall extends for the entire length of Pochol Ch’én, roughly half a kilometer
Figure 8.3. Map of Pochol Ch’en, upon a tzekel west of Chunchucmil.
north-south (figure 8.4), but stands approximately 300 m to the east of the site center. It has a gate near its center, forcing east-west traffic to funnel through this point.

Even though the wall is somewhat distant from the site center of Pochol Ch’en, additional reconnaissance found very sparse architecture between the previously mapped area and the wall, including a large circular enclosure that resembles those documented by Batún-Alpuche (2004) at Buena Vista (Cozumel island, Quintana Roo), which he demonstrated were used to protect apiaries. Other than the sparse architectural remains, the area enclosed by Pochol Ch’en’s wall appears to be prime agricultural land, since it sits relatively high above the water table and currently supports some of the more lush upland vegetation in the region. To the east of this wall, the landscape dips quickly into a seasonally inundated trough, as it likewise does to the north and south of its termini.

The wall does not completely enclose the site. It only runs along the east side and was not very tall. Thus, it would not have made a substantial defensive feature against violent attack. Therefore this wall may have functioned as a formal boundary marker and to funnel traffic along a preferred path into the settlement. It would have kept travelers from randomly wandering through private or valuable property (gardens and apiaries). This hypothesis assumes a certain amount of traffic through the western wetlands, which is supported by the number and orientation of ancient stone walkways, or andadores, through the wetlands (see chapter 12).

The gate in the center of Pochol Ch’en’s wall is also strikingly formal. It is not simply an opening or gap between sections to allow free passage. The shape, when viewed in plan, appears similar to a “Barbican” style gate, extending outside the main wall, similar to the main defensive gate at the Late Postclassic site of Mayapán (Russell 2008). However, the diminutive height of Pochol Ch’en’s wall and the fact that it only extends along the eastern portion of the tzekel argues against a military defensive function. There are also two extremely small parallel stone features immediately inside the gate oriented perpendicular to the wall’s axis (and almost appearing like a toy ballcourt) with space between them for only one or two persons to pass at a time. These features are oriented directly toward the central platform and freshwater well of Pochol Ch’en. It is likely that the gate, along with the parallel stone features, were again intended to lead travelers along a proscribed path into the site while the wall itself prevented visitors from wandering into valuable productive lands.

At this point it is worth noting that both the Pochol Ch’en wall and Chunchucmil’s barricade are open to the west. In the case of Chunchucmil, this may have been simply an incomplete defensive measure (Dahlin 2000). But it is telling that construction of the Chunchucmil barricade must therefore have begun on the east, indicating a vector for the greatest perceived threat. Likewise, the builders of the wall at Pochol Ch’en did not seem as concerned about interlopers from the west.
Not all sites in the seasonal wetlands were found to be as substantial as Múuli Mis or Pochol Ch’en. One multispectral satellite image provided a weak but present signature indicating a cultural landscape on a distant tzekel. There we found Poc Che Manuel Juárez. The people of San Mateo have given this land that name after

**Figure 8.4.** Map of Pochol Ch’en in relation to its eastern wall. Inset (below) shows details of the wall’s central gate.
the old man who lived there many generations ago (probably in the early twentieth century). It is said he would leave the town of Halacho (see figure 1.2) on foot at the end of every dry season to clear this portion of the *tzekeles*. He lived there by himself, perched upon the ancient low mounds throughout the rainy season, tending to his crops and collecting various resources from both the forest and wetlands. After harvest time, he would load all of the commodities he hadn’t consumed onto a large back-rack suspended on a tumpline, and he walked his load back to Halacho (a distance of roughly 30 km).

While Poc Che Manuel Juárez was one of the last of his kind for this region, during his youth this practice was apparently more common. His story shows that seasonal transhumance and the transportation of wild resources and agricultural surplus from the seasonal wetlands to the interior are all possible scenarios to consider when investigating the ancient functions of these remote archaeological sites (see also chapter 10). According to oral history, these activities were also economically profitable, at least at the household level (Hixson 2011).

The site consists of two clusters of architecture located 60 m apart (figure 8.5). Each cluster contains approximately 10 structures and covers an area of almost a hectare. The structures are connected to each other or to natural resources (such as a freshwater well) using linear rock alignments. Unlike the *albarradas* of downtown Chunchucmil, these do not appear to enclose any house lots. Instead they extend between structures and other features, or between one group of mounds and another, clearly serving a connective rather than divisive function. We call them *andadores*. The intrasite *andadores* at Poc Che Manuel Juárez are but one example of a larger network of *andadores* that connected the outskirts of Chunchucmil with wetland settlements and resources, and likely led travelers all the way to the coast at Canbalam (see chapter 12). The *andadores* to the west of Chunchucmil contrast with those found in the Yalahau region of Quintana Roo, which appear to have controlled water movement and soil accumulation for agricultural purposes (Fedick et al. 2000).

The seasonal wetlands were clearly not a barrier to settlement. Sites were found scattered throughout this ecological zone. In fact, some form of settlement (from *casas del campo* to substantial hamlets or villages) were found perched upon every *tzekel*, little more than a meter above the seasonally flooded savannas. Furthermore, *andadores* (rock alignments that functioned as stepping stones) criss-crossed the savannas, linking areas of habitation with localized resources such as *aguadas* and freshwater wells. Chunchucmil can no longer be considered the westernmost point in an asymmetrical fan-shaped regional settlement pattern, as was indicated in the Atlas maps. Instead, the ancient city appears as a central node in a settlement pattern that straddles the interface between the western seasonal wetlands and the semiarid plains to the east.
The epicenter of urban Chunchucmil was located approximately 5–6 km east of the seasonal inundation (assuming a relatively static sea level), allowing most residents to avoid the most severe annual floods. Yet, the western suburbs of Chunchucmil abut the very edge of seasonal inundation. The main plaza at the site of Yokop (see below) was even built using upturned flagstones to raise the plaza above the...
easily puddled kancab flats. Furthermore, sections of the urban residential zone of Chunchucmil appear to have had regular problems with flooding, as the callejuelas in certain parts of the city were transformed into minor causeways we call chichbes (callejuelas raised upon beds of gravel to traverse flooded terrain between house lots placed upon bedrock highs; see chapter 2). We present three sites located at the edge of the seasonally inundated savanna: Yokop, Kum and Chun Chen. These sites are physically connected to each other through intervening architecture that also links them with Chunchucmil. We liken this to a metropolitan center (such as Washington, DC) where it would be difficult to distinguish one suburb from another in the urban sprawl along its fringes. Rather than avoiding the wetlands west of Chunchucmil, the Maya appear to have embraced them, as we found nearly continuous occupation along the western edge of the semi-arid plains. Still, the most densely settled areas remain east of the site core of Chunchucmil.

**Yokop**

First registered by the Archaeological Atlas of Yucatán (Garza Tarazona de González and Kurjack 1980) as a separate site labeled 15Qf(9):39, the area of Yokop is located at the eastern edge of the seasonally inundated zone, 4 km from the site-center datum of Chunchucmil. The name is derived from the large depression at the center of the site (figure 8.6). This depression is a large rejollada (a dry karstic sinkhole with deeper soils relative to the surrounding terrain; see Kepecs and Boucher 1996), with a freshwater well (called Chen Yokop) at the base of the rejollada. The largest building at Yokop, measuring approximately 25-by-20 m, with an elevation of 5 m, stands adjacent to this depression. The 18 ha of the site that was mapped by Hixson contained 140 structures.

This rejollada appears to be the principal reason for the location of the peak in the size, volume, and density of structures at Yokop. The depression itself measures over 40 m in diameter (the largest rejollada documented by PREP researchers in the entire region). The well at its base appears to be an original feature created during the prehispanic era, but clearly was refortified during the historic ranching days and is still used today. Kepecs and Boucher (1996) noted the agricultural benefits of farming within rejolladas in the Emal district (a region also exhibiting albarradas).

While the center of Yokop was located adjacent to this rejollada, the eastern periphery of Yokop likely connects with the southwestern edges of Chunchucmil, and should be considered a connected suburb of the ancient city. Sizable mounds and albarrada groups were observed throughout the region between Yokop and the southwest portion of the Chunchucmil map. In addition, a salvage survey conducted by INAH for the widening of the Chunchucmil–San Mateo road found the greatest
density of structures in an area directly between Yokop and Chunchucmil’s southwestern periphery, indicating where one of the fingers extends out from the residential periphery and crosses the modern road (Hutson et al. 2008:figure 9; Hixson 2011). The 11 test excavations throughout the mapped area of Yokop demonstrated that the community was coeval with the rise and fall of Chunchucmil (late Early Classic to early Late Classic, with modest indications of earlier and later occupation).

The surface remains at Yokop are notable, as the site contains quadrangular architectural arrangements, column drums, basin-shaped metates, slab-vaulted
masonry, and *albarradas* that form enclosed *solares* (figure 8.6). These are the more common and salient features from Chunchucmil, with the largest difference being the size of *solar* and the density of architectural remains. Architectural density is slightly lower at Yokop when compared to downtown Chunchucmil. While enclosed *albarrada* groups are still common at the suburban site of Yokop, they exhibit some physical distance from other such groups, and have more of a “buffer zone” around each household. This is much like the elite residential district at Cobá (Fletcher 1983; Fletcher and Kintz 1983), where settlement density is lower and the “honeycomb” appearance of epicentral Chunchucmil is replaced by distinct walled house lots.

**Kum**

The suburban site of Yokop is in turn connected through intervening domestic architecture to the hinterland site of Kum (5 km west-southwest of Yokop). Kum was first registered by the Archaeological Atlas of Yucatán project (site 15Qf(9):66; Garza Tarazona de González and Kurjack 1980), and, like most sites in this region, takes its name from its well, which is currently used as a watering hole for a modern apiary. However, it also contains an *aguada* (*Ha’ Kum*) that must have provided not only freshwater but rich soils, mussels, reeds, and so on. Much like Yokop, Kum stands at the edge of the seasonally inundated zone, as close to the water’s edge as would be possible for a secondary center.

The site is focused upon a quadrangular pyramid-plaza arrangement with a 7-m-high pyramid and a 40-m-long, 4-m-high range structure (figure 8.7). Though only about 4 ha were mapped, the site contains several additional hectares of additional settlement. Completely enclosed *albarrada* groups are absent. This area (while physically connected to the urban center of Chunchucmil through Yokop) is no longer considered part of the city, nor the suburbs of “greater Chunchucmil.”

**Chun Chen**

Kum is then connected through intervening architecture to the site of Chun Chen, located 2 km to the south. This site boasts a double-pyramid group. These two pyramids, each measuring about 20-by-20-by-4 m, face each other across a broad plaza and a central circular altar (figure 8.8). A *sacbe* measuring 70 m long and 5 m wide connects the main group to a triadic group to the north while a 20-m-long *sacbe* connects the main group to a smaller architectural group to the east. The site of Chun Chen, like Kum and Yokop, sits as close as possible to the seasonal inundation without risk of flooding, and is also centered upon a freshwater well and an
aguada. This interconnected chain of sites that extends to the west-southwest of Chunchucmil’s periphery could be argued to represent the extreme western “suburbs” and suburban sprawl of Chunchucmil, edging up against the seasonally inundated zone and focused upon easily accessible freshwater resources.

**SETTLEMENTS OF THE SEMIARID PLAINS**

The soils of the semiarid plains are skeletal and the rainfall is low (see chapter 6) yet the barren rocky ground is filled with cultural mounds of the ancient Maya.
While the Atlas maps underestimated the occupation of the western seasonal wetlands, they appear to be correct that the settlement density is in fact greater east of Chunchucmil than in the western wetlands.

Mazeau’s survey in the eastern and northern periphery of Chunchucmil visited, mapped, and/or tested 38 sites. Of these, 10 sites were previously reported (but not detailed) in Garza Tarazona de González and Kurjack’s (1980) Atlas project, while the remaining 28 were newly identified sites. Regional sites varied in size and complexity, ranging from isolated structural arrangements to more complex stratified communities, several of which exhibit a central core surrounded by outlying settlement. Large-scale architecture, consisting of relatively tall pyramids, large platform complexes, and non-residential civic-ceremonial architecture was rare but documented at several sites. The majority of regional architecture consisted of low-lying residential platforms and small mounds. Five possible monument stones (stelae) were identified at three sites, one each at Oxpemul and Ya’ab K’i’ix, and three at Yaxkakap.

Four site types were identified during the survey of Chunchucmil’s northern and eastern hinterland. These types have minimal connection with the architectural group types presented in chapter 3 since those group types describe architectural compounds within a site whereas the four categories below are sites of their own. These types were based on number and types of structures, platforms, and platform complexes present, and whether social stratification, inferred from the presence or absence of large-scale domestic and/or monumental architecture or features, occurred at a particular settlement. Survey projects in Central Mexico, Oaxaca, and the Maya area (Millon et al. 1973; Blanton et al. 1982; Burgos Villanueva, Covarrubias Reyna, and Estrada Faisal 2004) have used between 100 and 300 m of empty space to identify the edges of sites. During the regional survey outside of Chunchucmil, a minimum distance of 250 m of empty space between occupations was used to distinguish them as distinct sites. The four site types, into which 36 of the 38 sites surveyed can be fitted (the remaining two were largely destroyed), are described below (numbers in parenthesis indicate the number of sites identified) and, following that, examples of each site type are provided.

*Isolated household* (9). Settlements containing a single platform complex that would have housed a single or extended familial unit.

*Non-stratified community* (11). A cluster or aggregation of platform complexes that indicate the presence of multiple family units but lack large-scale architecture that suggests the sociocultural prominence of any constituent family.
Stratified community (10). A cluster or aggregation of platform complexes that indicate the presence of multiple family units with at least one structural complex containing large-scale architecture, thereby suggesting the sociocultural prominence of at least one constituent family.
Stratified community (regional node) (6). A cluster or aggregation of structural complexes that contain both elite and non-elite residential complexes, as well as non-residential/non-domestic large-scale or monumental architecture, such as pyramids, narrow-top mounds or platforms, or ballcourts.

Albarradas. A defining component of Chunchucmil’s settlement pattern, present at 81 percent of the mapped sites in the northern and eastern hinterland. These walls, however, were not always used to enclose houselots or platform complexes, and often appeared fragmentary in nature (the possible result of repurposing stones for historic or modern construction). They do enclose houselots or platform complexes, much in the way seen at Chunchucmil, in 36 percent of the mapped sites.

Ya’ab K’i’ix

Ya’ab K’i’ix is an isolated household located 8.2 km east of the Chunchucmil site core in an area of dense vegetation. It is located 500 m east of Nahkol, a stratified community and the closest settlement mapped near Ya’ab K’i’ix during regional survey. The site consists of associated structures and platforms that are nearly completely enclosed by an albarrada (figure 8.9). The site has a core of four large platforms (ca. 1.5–2 m in height), and 10 additional structures range around the complex’s core, nearly all of which are either connected or enclosed by the albarrada.

A broad platform on the southern side contained a C-shaped suprastructural foundation and a possible monument stone. A single metate was observed in association with two broad platforms in the northeast part of the complex, possibly suggesting that area was used for food production. No additional structures were observed within 200 m of Ya’ab K’i’ix, and sascaber as or quarries were likewise not observed in association with the residential complex or within 200 m of it.

Based on ceramics collected during testing, the occupation of Ya’ab K’i’ix spanned from the Middle Preclassic until the end of the Late Classic, indicating its occupation was coterminous with that of the initial settlement and florescence of Chunchucmil. Ceramics from later periods were absent.

Kanan

Kanan is a non-stratified community consisting of three platform complexes, two of which are completely enclosed by albarradas, located 4.5 km north of Chunchucmil. The site is situated in a region of karst plain dominated by limestone.
pavement and occasional elevated bedrock outcroppings. The area burns annually, resulting in a lack of vegetation and, consequently, high visibility at the site. The cluster of platform complexes at Kanan was surrounded by 250 m of unoccupied space, a distance after which several somewhat isolated structures and complexes (Kanan 2, 3, and 4) were located to the north and east.

The three complexes at Kanan consist of Group A (the northeast), B (the northwest), and C (the southern group). Figure 8.10 depicts Groups A and B. All three are multitiered platform arrangements, and a prominent domestic expression indicated by a number of metates found at Kanan. Albarradas individually encircle both of the northern two groups, while the southern group is partially enclosed. A chichbe is located along the northern edge of Group B, and a callejuela approaches the southern group (C) from the west. Ceramic data obtained during the site’s testing indicate that it was primarily occupied during the late Early Classic and the early part of the Late Classic, an occupational time frame consistent with Chunchucmil’s apogee.

**Figure 8.9.** Map of Ya’ab K’i’ix, an example of an isolated household, east of Chunchucmil
Very similar in their general configuration, Groups A and B contain large central platform complexes with a number of smaller suprastructures and platforms. Both central platform complexes feature larger mounds on their east side, indicating potential loci of familial shrines. Such family shrines are common at Chunchucmil (see, for example, S2E1-G/Kaab and S4W8-F/Balam [chapter 5] and N2E2-N/Lool and S2E2-F/Aak [chapter 12]; see also Becker 1991). Small auxiliary structures are associated with Group A but are absent within Group B. Bedrock outcrops and pavements are interspersed throughout the site, and one such example was modified and architecturally incorporated into the northern side of Group B. One metate was located in association with Group A.

Group C differed from A and B in its configuration and likely occupation. First, Group C had a higher number of smaller suprastructures situated on top of the central base platform, including 10 small platforms and perishable structure foundations. Second, a large mound is noticeably absent from the platform complex. Third, most of the metates (three of four) identified at Kanan were located in Group C. These were directly associated with a structure foundation wall situated within the main platform’s central space, and suggest a primacy of domestic or economic activities.

Open and available space between the site and other nearby settlements, as well as immediately within the structural nucleus of Kanan, perhaps suggests that Kanan’s inhabitants were agrarian producers, consisting of up to three related (or unrelated but cooperating) lineages (one based at each group); alternatively, the southern group may have been non-residential, and might have served as a space shared by the inhabitants of Groups A and B for the performance of economic and/or domestic tasks. The site’s distance from Chunchucmil’s site center (ca. 4.5 km) is not particularly far, and would have provided them ready access to the central markets as well as the secondary and tertiary markets that likely existed on the outskirts of the city.

Puut

Puut is a stratified community located 9.6 km southeast of Chunchucmil’s site center. Situated near the modern-day village of Santo Domingo, Puut has been subjected to numerous disturbances, including the loss of albarrada and architectural stone for historic and modern-era construction, intensive agricultural production (papaya fields), and looting. Ceramic data obtained from testing at Puut indicate the site was primarily occupied during the later portion of the Early Classic and throughout the Late Classic.

The site’s settlement consists of numerous structures and platform complexes roughly organized into two clusters (northwest and southeast) separated by no
more than 100 m of unoccupied space (figure 8.11). Hallmarks of elite architecture are present in the southeast cluster, where a large basal platform roughly 2 m in height (Structure A) supported a number of additional platforms and possible perishable wall foundations. Additional platform complexes and structures are associated with Structure A, and with it they form a loosely defined central courtyard, the southwest corner of which is enclosed by an *albarrada*. Large auxiliary mounds and platforms are associated with this grouping, and a small *cenote* that opens into a small underground pond and a large quarry/sascabera is located on the eastern fringe of the cluster. *Metates* are present on top of Structure A and are incorporated into nearby historic features (*albarrada* and *tranvia* roads).

The northwest cluster of structures at Puut lacked large-scale construction, such as that seen at Structure A in the southeast cluster. Instead, the northwest portion consisted of scattered platforms, artificially modified bedrock rises or pavements,
and a grouping of associated platforms in the northern section. Metates are present among these buildings, as are intact portions of in situ, though fragmentary, albarradas (most stone was likely used for the construction of historic-period walls and roads).

The northern extent of Puut is approximately 300 m south of another site surveyed by this project, Santa Clara. Santa Clara, though not detailed here, was classified as a stratified community (regional node) due to the presence of several exceptionally large platforms, including a 5-m-tall narrow-topped structure roughly 25 m long and 10 m wide. Ceramic data obtained from Santa Clara indicate occupations occurred during the Middle Preclassic, the Late Preclassic, the later portion of the Early Classic, and throughout the Late Classic. If Puut, which postdates the initial settlement of Santa Clara, was not physically connected to the settlement sprawl of Santa Clara, it likely interacted with the larger settlement in some manner, be it economic, sociopolitical, or ideological.
YAXKAKAP

Yaxkakap is a relatively large site classified as a stratified community (regional node) located 10.7 km east of the Chunchucmil site core. Located within a dense vegetated secondary forest, Yaxkakap’s site center featured a very large raised platform complex containing numerous large and narrow-topped structures, multileveled platforms, and a broad elevated courtyard with two possible monument stones (figure 8.12). Testing at Yaxkakap yielded ceramics that suggest the site was occupied during the late portion of the Early Classic and during the early portion of the Late Classic.

Yaxkakap’s primary architectural complex consisted of a broad, artificially raised platform between 1.5 and 2 m in height with a footprint measuring approximately 40 by 50 m. Flanking the platform are several structures that bound and enclose the broad central plaza, which covers an area of over 650 m². The complex’s western structure (Structure A) is tall, physically and visually dominating the entirety of the complex. It is raised approximately 3 m above the raised platform and 4.5–5.0 m above the flat bedrock pavement and low-lying settlement west of the structure. Structure A’s upper surface has been extensively destroyed by numerous looter pits that, however, revealed intact dry-laid walls and a plaster floor. The looters likely sought burials and their associated grave goods, as their excavation went below the extant plaster floor and stopped shortly thereafter.

To the north of the central platform complex is an approximately 135-m-long crescent-shaped albarrada that encloses a broad and level space containing a number of small and low-lying platforms, three ancient wells, and another possible monument stone. To the west-southwest of the central complex is an area covered by bedrock pavement; within this area are three additional wells.
During mapping, it was clear that the site center of Yaxkakap was accompanied by settlement radiating outward from it. A 340-by-80-m transect was then mapped, radiating west from the central platform complex. Settlement within this transect consisted of 19 structures, two ancient wells, and three *metates*, though dense vegetation coverage may have obscured additional *metates*.

The transect dimensions resulted in a mapped arm with an area of .027 km$^2$. The 19 structures identified within the transect equates to a minimal structural density of 698/km$^2$. This density level is quite high, and falls just below the density of Chunchucmil’s urban residential areas. Minor walk-through survey to the north and northwest of the site led to the identification of additional low-lying platforms, though these were not mapped.

**DISCUSSION: REGIONAL SETTLEMENT PATTERNS AND ECOLOGICAL HETEROGENEITY IN THE CER**

Taken together, the survey work discussed in this chapter greatly increases the amount of known settlement and our knowledge of the kinds of settlement located to the east and west of Chunchucmil. Several large sites within 15 km both east and west of the Chunchucmil, such as Yaxkakap and Yokop, had hundreds of structures and populations perhaps surpassing a thousand. Most of this settlement dates to the time of peak population at Chunchucmil. Beyond these large sites, the landscape was dotted with dozens of villages.

One of the most important conclusions from this chapter regards the occupation to the west of the urban center. Fingers of settlement running southwest of Chunchucmil extended as far west as was physically possible for a major metropolitan area without the risk of major widespread flooding. Chun Ch’én, Kum, and Yokop appear to have purposefully hugged the edge of the seasonal wetlands, rather than avoided them. Furthermore, the seasonal wetlands themselves were not a no-man’s land, vacant of habitation and viewed only as an obstacle to transit between the coast and the interior. In fact, there were dozens of sites perched upon minor rises within the wetlands. While a few of the most remote minor settlements may have been seasonally occupied, others, such as Pochol Ch’én, appear to have been true secondary centers with pyramids and plazas, possibly located to service passing traders while extracting the bounty of resources available in the wetlands.

The entire network of *andadores* within the seasonally inundated savannas does indeed point along a vector between Chunchucmil and Canbalam, passing through the outskirts of Pochol Ch’én. But individual alignments of these stepping stones lead to dozens of minor spits of land within the wetlands that were not only
habitable, but likely exploited to support the concentration of urbanites living in the nearby semiarid plains where standard swidden agriculture could not have fed the masses who thronged to this mercantile center.

Occupation to the eastern interior is certainly more densely occupied than the western wetlands, and even more densely occupied than what the Atlas project suggested. Thus, while Chunchucmil’s population was not evenly distributed across the landscape of the CER, its location appears to be geographically central to its regional and extraregional resources. The eastern half of its immediate hinterland resided in the semiarid plains, its residents likely eking out a meager living from the parched and skeletal soils of the karstic plain, while more dispersed residents in the western half perched themselves upon the *tzekeles* of the seasonal wetlands, extracting resources unique to this more dynamic and diverse environment. Each portion of Chunchucmil’s immediate sustaining area contributed critical commodities for the sustenance of daily life in this challenging setting, its site center forming a natural and necessary nexus for intraregional trade.

Though the survey methods did not have the goal of recovering a representative sample of the ancient population, we can still propose some preliminary population estimates for the Chunchucmil’s hinterland. In the semiarid plains east of Chunchucmil, there are many areas where one cannot venture beyond a site without encountering a homestead—a cluster of four or five structures, perhaps housing 10 people—every two or three hundred meters. This converts to about 16 homesteads per square kilometer. Excavations and surface collections in this area as well as demographic considerations (see Rice and Culbert 1990) suggest that at least half of these homesteads would have been occupied contemporaneously during the time period when Chunchucmil was at its peak population. In other words, some of the area in the hinterlands east of Chunchucmil, would have had about 80 people per square kilometer, not counting dense clusters of settlement such as Yaxkakap (see above) and Kocholito (see chapter 5). For comparison, in approximately 18 km² of systematic hinterland survey conducted about 110 km to the northeast of Chunchucmil, in the vicinity of Ucí, settlement density ranged from 3.8 to 18.5 homesteads per square kilometer, with an average 13 homesteads per square kilometer. Systematic transect mapping in the hinterland immediately beyond Chunchucmil’s residential periphery (see chapter 5:figure 5.3) revealed settlement densities similar to that found by Mazeau in the semiarid plains east of Chunchucmil. These surveys located between 39 and 67 structures per square kilometer (Hutson et al. 2008). Such densities are similar to what has been found in hinterland surveys elsewhere in the Petén lakes area: Rice and Rice’s (1990) transect surveys located between 36 and 82 structures per square kilometer. Taking the low end of the Chunchucmil transect surveys (39 structures per square kilometer),
reducing this by two-thirds to account for contemporaneity and the fact that not all structures are houses, and then multiplying by five people per house yields an estimate of 65 people per square kilometer.

If we draw a Thiessen polygon around Chunchucmil (a polygon whose edges are found half the distance between Chunchucmil and Tzeme to the northeast, Oxkintok to the east, and Siho to the south), we find that about 400 km² within this polygon falls within the semiarid plains. Since Chunchucmil was much larger than Tzeme and Siho during the late facet of the Early Classic, Chunchucmil’s hinterlands probably extended beyond the Thiessen polygon, perhaps resulting in 600 km² of land in the semiarid plains (see also chapter 9). If population density of the semiarid plains is between 65 and 80 people per square kilometer, then Chunchucmil’s hinterland population in the semiarid plains was between 39,000 and 48,000. Adding the population from savanna sites as well as dense sites within the semiarid plains, such as Yokop and Kocholito, drives the hinterland population even higher. In sum, regional survey suggests that the total population in Chunchucmil’s hinterland was likely higher than the population of Chunchucmil itself. To be on the safe side, however, we conclude that hinterland population was about the same as that of Chunchucmil: 30,000.

In the context of subsistence resources, this means not only that some of Chunchucmil’s potential hinterland acreage was taken up by houses and house-lots, but that farmland around Chunchucmil had to help support both the city and its not insubstantial rural population. The next chapter presents the consequences that this relatively high regional population density had for feeding Chunchucmil’s populace.

NOTES

1. Future researchers may wish to study the statistical distribution of sources and blade-platform preparation techniques on the obsidian from the Canbalam collection in an effort to compare such ratios with Chunchucmil and other more securely dated sites.

2. The pyramidal structure located on the southern end of the main plaza at Múuli Mis measured approximately 20-by-12 m at its base, rising to 8 m in height. The western structure measured approximately 20-by-10 m at its base, rising to 6 m in height. These measurements are comparable to the more modest quadrangle groups located within the site core of Chunchucmil.