Quintana Roo Archaeology

Edited by Justine M. Shaw and Jennifer P. Mathews

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2 The Yalahau Regional Human Ecology Project

An Introduction and Summary of Recent Research

Scott L. Fedick and Jennifer P. Mathews

The Yalahau Regional Human Ecology Project was initiated in 1993 to investigate ancient Maya settlement patterns, land use, and political organization within a unique wetland-dominated environmental region of northern Quintana Roo, Mexico (see fig. 2.1). Although the Yucatán Peninsula has seen a great deal of archaeological research over the last several decades, the northeastern corner has been one of the least examined areas of the northern Maya lowlands. Prior to the initiation of the Yalahau project, little archaeological investigation had been conducted in the region beyond brief visits and preliminary investigations by Alberto Escalona Ramos in 1937 (1946), William Sanders in 1954 (1955a, 1960), and Karl Taube and Tomás Gallareta in 1988 (Taube and Gallareta Negrón 1989). The project was begun under the co-direction of Scott Fedick and Karl Taube, both of the Department of Anthropology, University of California, Riverside (UCR). Following the first season in 1993, the project has been directed by Fedick and, since 1998, has also been under the co-direction of Jennifer Mathews of the Department of Sociology and Anthropology, Trinity University, San Antonio, Texas. Mathews has participated in the Yalahau project since its inception in 1993. This chapter will introduce the Yalahau region and summarize research activities and findings from 1998 though 2001, with some observations based on our 2002–2003 investigations, which are still under analysis (Fedick 2004; Mathews 2003a).

Defining the Yalahau Region

We have defined the Yalahau region as a landscape unit or physiographic zone, following the approach of landscape ecology (Foreman and Godron 1986; see also Fedick 1996a). Two of the research goals of our project are to determine to what degree this physiographic region corresponds to a social, economic, and political unit, and to determine how the Yalahau

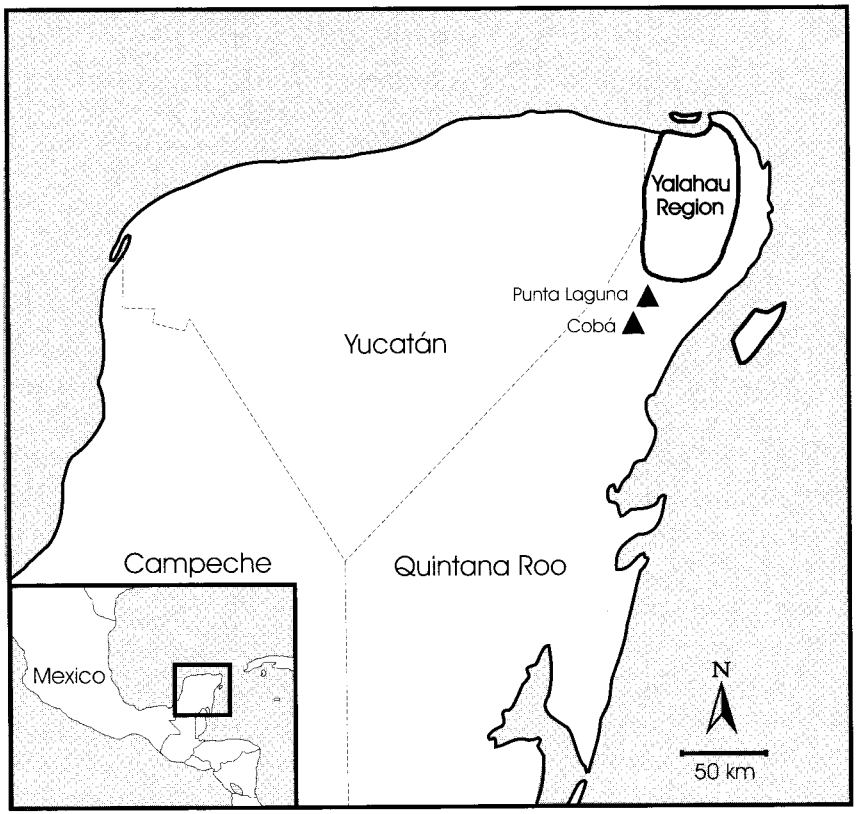

Fig. 2.1 The Yalahau region on the Yucatán Peninsula. (Map by Scott Fedick)

region may have been included at various times in larger Maya interaction spheres.

Landscape ecology defines landscape "as a heterogeneous land area composed of a cluster of interacting ecosystems that is repeated in similar form throughout" (Foreman and Godron 1986, 11). The Yalahau region is characterized by a landscape of repeating ecosystems of wetlands, transitional zones, and uplands within the bounds of a large, shallow basin, the boundary of which is marked by a change in vegetation structure. This boundary is located about 10 km beyond the margins of the larger wetlands (see fig. 2.2).

Northern Quintana Roo receives significantly more rainfall than the rest of the northern lowlands, with an average annual precipitation of up to 2,000 mm, an amount comparable with much of the southern lowlands (Isphording 1975, 244; Wilson 1980, 23–25). The abundant rainfall

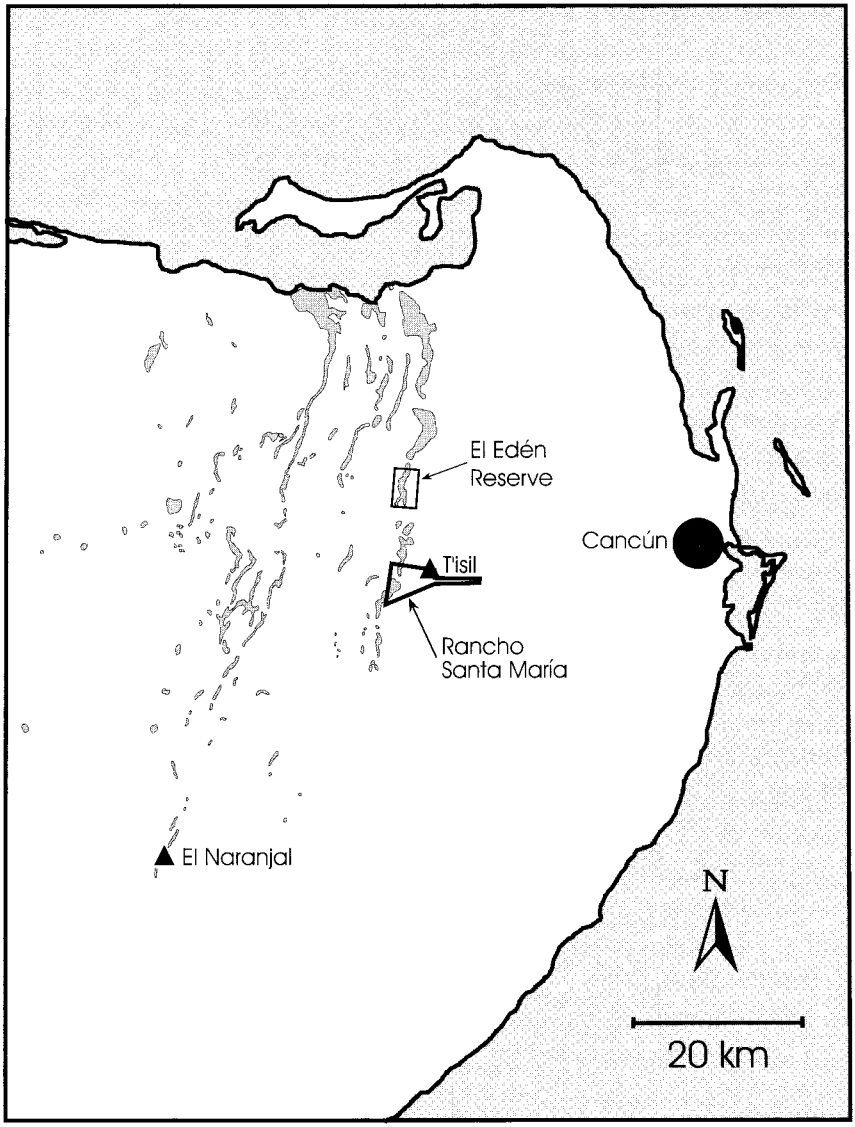

Fig. 2.2 Detail map of the Yalahau region. Wetlands in the region are indicated by shading. (Map by Scott Fedick)

of northern Quintana Roo has contributed to the formation of a series of elongated karst depressions, referred to geologically as the Holbox fracture zone (Tulaczyk 1993; Weidie 1985). The elongated depressions support a series of freshwater wetlands that were apparently formed when the descending karst solution features met the water table. Conse-

quently, the depth of water and duration of flooding within the wetlands are related to shifts in groundwater levels as well as seasonal rainfall accumulation (Tulaczyk 1993, 112–31). The region also contains a tremendous number of *cenotes* (sinkholes) that provide access to groundwater. Considering that the water table is rarely more than a few meters below the surface, and is easily accessible by excavating wells through the relatively soft limestone, the abundance of water in the region is even more striking.

The Holbox fracture zone extends in well-developed form about 50 km from the north coast to the south, and is approximately 40 km wide. The total area of wetlands within this zone covers about 134 sq km. Analysis of remote sensing data indicates that a less-pronounced section of the Holbox fracture zone extends an additional 50 km to the south, terminating just north of the ancient center of Cobá (see fig. 2.1; Southworth 1985). We refer to the northern half of the Holbox fracture zone, where wetlands predominate, as the Yalahau region (Fedick and Taube 1995b; see also Dunning et al. 1998).

The varied topography of the Yalahau region results in a complex mosaic of soil resources and vegetation associations. Environmental zones include seasonal to perennial wetlands, well-drained upland areas dominated by semi-deciduous tropical forest reaching a canopy height of about 15 m, and lower forests of secondary growth resulting as an aftermath of hurricanes and the consequential fires that are so frequent in northern Quintana Roo (Boose et al. 2003; Konrad 1985; Whigham et al. 2003; Wilson 1980, 21–23). Recent studies suggest that the Yalahau region has the highest biological diversity, and the largest number of endemic plant and animal species, in the Yucatán Peninsula (Lazcano Barrero 1995; Schultz 2001; Snedaker, Clark, and Olmstead 1991).

It is important to note that the environment of the Yalahau region has most likely not remained constant through the history of Maya occupation. Some studies suggest that the water table has risen steadily, with water standing about 1 m higher today than during the Preclassic, more than 1,700 years ago (Alcala-Herrera et al. 1994; Dunn and Mazzullo 1993; Fairbanks 1989; Folan, Kintz, and Fletcher 1983; McKillop 1995). This would have meant that during Preclassic times, water levels in the Yalahau wetlands would have been significantly lower than in later times. More recent studies of sea-level change conducted at Key Biscayne, Florida, and the gulf coast of Texas indicate a more complex pattern of sea-level fluctuation over the Holocene, suggesting that within

a general trend of sea-level rise, there may have been multiple highstands that brought water levels even higher than today (Froede 2002; Morton, Paine, and Blum 2000). Interestingly, oxygen isotope measurements from Punta Laguna, located a short distance south of the Yalahau region (see fig. 2.1), suggest that annual rainfall in the area may have been higher in the Preclassic than during the Classic period (Curtis, Hodell, and Brenner 1996). Consequently, the character of the seasonally inundated wetlands may have been different during ancient times than today, leaving them drier during the dry season and susceptible to significant flooding during the rainy season. As the vegetation pattern of the region appears to follow closely even slight variations in surface hydrology, we expect that these patterns have also been quite dynamic through time.

The combination of abundant fresh water, good (though localized) soils, and rich faunal and floral resources would appear to have made the Yalahau region an appealing setting for human habitation within the northern lowlands (Snedaker, Clark, and Olmstead 1991, 4). Our ongoing investigations of human-environmental relationships in the Yalahau region are greatly enhanced through collaboration with a binational team of biologists, ecologists, and botanists, coordinated through the efforts of the El Edén Ecological Reserve, established in 1990 in the east-central Yalahau region (see fig. 2.2; Gómez-Pompa and Dirzo 1994). A recent edited volume entitled *The Lowland Maya Area: Three Millennia at the Human-Wildland Interface* (Gómez-Pompa et al. 2003) includes many contributions by natural scientists and archaeologists working collaboratively in the Yalahau region.

Recent Research: 1998–2002

The Yalahau Regional Human Ecology Project has conducted field research since 1993; however, space does not permit us to address this extensive research here. Several publications elsewhere address work conducted between 1993 and 1997, including a 1995 monograph (Fedick and Taube 1995b) that summarizes the work of the first season, focusing on the major civic-ceremonial site of El Naranjal (see fig. 2.2), also referred to as Tumben-Naranjal. Publications have also summarized research conducted during 1996–1997 on ancient Maya use of wetlands at the El Edén Ecological Reserve (Andersen 2001; Fedick 1998, 2003; Fedick et al. 2000; Morrison 2000; Morrison and Cózatl-Manzano 2003).

In 1998, the Yalahau project entered a new phase of research. During

the previous season, we were fortunate in meeting Mr. Michael Baker, who had recently purchased Rancho Santa María (see fig. 2.2), a property located about 15 km south of the El Edén Ecological Reserve. Fedick had first identified a site at Rancho Santa María in 1993, although at the time only about 20 small rubble mounds were visible in cleared fields. During the 1997 field season, Mr. Baker invited project members to visit the rancho and see the ruins. A preliminary map was produced, allowing us to determine that the site was quite extensive and centered around a seasonally flooded cenote (Fedick 2000). Mr. Baker and the Baker Family Foundation provided generous funding to initiate research at the site now known as T'isil. *T'isil* is the Yucatec Mayan term for vanilla, reflecting the abundance of vanilla vines (*Vanilla* sp.) that grow within and immediately around the cenote, apparently thriving in the microclimate of increased humidity created by the natural sinkhole.

The Site of T'isil

Since 1998, we have focused much of our research on the site of T'isil. The goals of this research are to map the entire site, and to conduct a detailed investigation of the community layout and social-economic organization of this moderate-sized site. During a short season in the summer of 1998, we were able to produce a preliminary site map of the most obvious structures in cleared fields and along the equestrian trail that winds its way through much of the larger settlement of T'isil.

We returned from 1999 through 2001 for full seasons of work with a goal of producing a detailed map of all features at the site that were exposed by recent cutting and burning of vegetation within the northern half of the site. A 100 m interval grid was established, and 100 by 100 m grid sections served as the basic mapping units. Mapped features included architectural remains, stone walls (albarradas), small gravel piles often referred to by archaeologists as *chich* mounds, and any other feature that appeared to be of human construction. Natural features, such as small cenotes or cavities in the bedrock that may have provided access to the water table, were also recorded. Mapping in the cleared area of T'isil (60.43 ha) was completed in 2001, providing a full east-west cross section of the settlement (55.18 ha) and an additional block (5.25 ha) in the northwest periphery of the site (see fig. 2.3). In 2002 we began expanding our mapping into the forested areas of the site to the north and south, covering an additional 5.23 ha of formal mapping. Transects were extended north and south along grid lines into the forest during

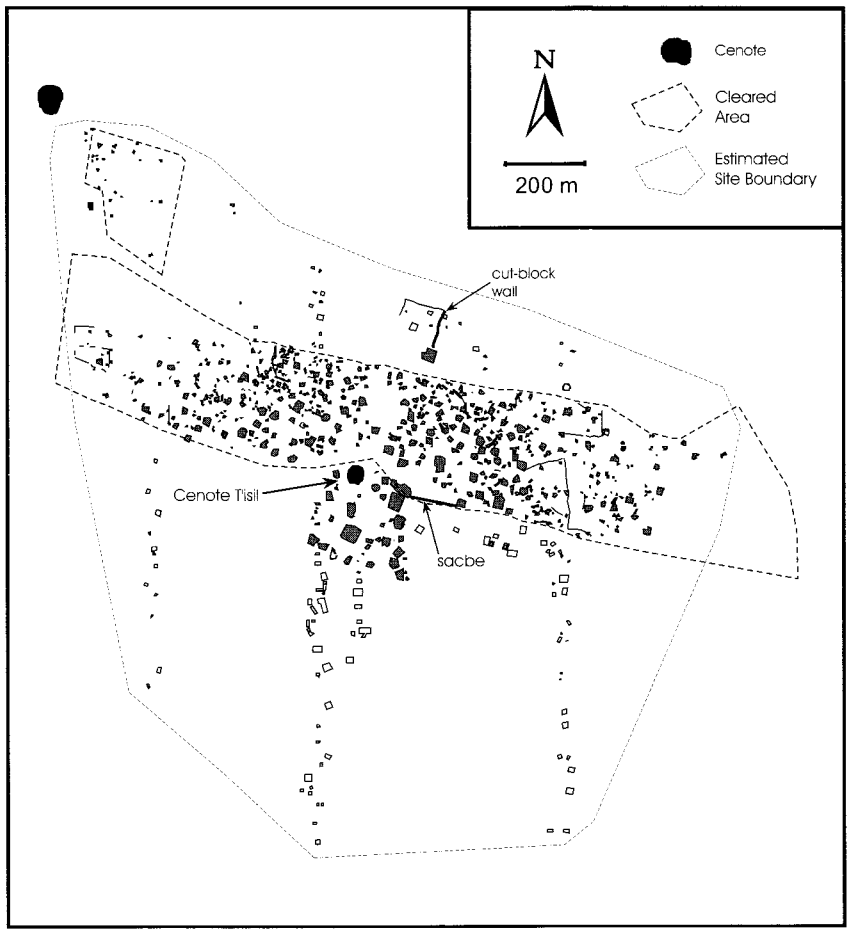

Fig. 2.3 T'isil, Quintana Roo, as of 2002. Diagram does not include chich mounds. Shaded structures are formally mapped; outlined structures are informally mapped. (Map by Kathryn Sorensen, Jeffrey Glover, and Scott Fedick)

2002 to better define the northern and southern boundaries of the site, which is now estimated to cover 2 sq km (see fig. 2.3). As of the 2002 field season, totals of 561 structures, 233 chich mounds, 27 stone walls, and 31 miscellaneous features have been formally mapped within 60.61 ha of the estimated site area of 2 sq km (Fedick 2000, 2001, 2002). Given the structure density of 926 per sq km in the formally mapped portion of the site (561 structures / 0.6061 sq km), we estimate that the entire site area of 2 sq km may contain a total of 1,852 structures.

The vast majority of architecture at the site of T'isil is the remains of raised stone platforms and foundations that once supported domestic structures constructed with walls of wooden poles and thatched roofs. Several platforms are quite large, measuring up to 50 m on a side and nearly 3 m in height. Three pyramidal structures have been mapped at T'isil, with the largest (Structure 12M-5) measuring 17.5 m by 20 m at the base and nearly 4 m in height (see fig. 2.4). These pyramidal structures do not represent dwellings and most likely served as funerary temples for members of elite families.

An extensive program of surface collection from structures, as well as test excavations adjacent to structures, was conducted during 1999–2002 (Amador and Fedick 2002; Fedick 2000, 2001, 2002). We carried out a stratified, randomized surface collection at 116 structures by randomly selecting one structure from each of three size classes in each of the 100 m grid sections within the cleared portion of the site. We placed test excavation units (1 by 1 m or 1 by 2 m), in areas where we expected to encounter midden deposits as suggested by surface artifact distributions and soil depth.

According to analysis of the 1999–2001 randomized surface collections by project ceramicist Jorge Ceja Acosta (3,189 typed sherds; see table 2.1), 93.9% of the ceramics date to the Late Preclassic period, from approximately 100 BC to AD 350/400, with small percentages of ceramics attributed to the Early Classic (1.4%), Terminal Classic (1.8%), and Late Postclassic periods (2.9%) (Ceja Acosta 2002). We should note that other ceramicists who have reviewed these findings suggest that most of the ceramic groups assigned to the Late Preclassic by Ceja (specifically the Carolina, Huachinango, Sierra, Tancah, and Xanaba groups) are likely to span the Late Preclassic–Early Classic transition and are therefore difficult to assign to one or the other period, especially in northern Quintana Roo (see chap. 4). We recognize this chronological ambiguity and hope that ongoing analysis by José Manuel Ochoa Rodríguez of ceramics from the 2002–2003 T'isil test excavations, along with radiocarbon dating of ample faunal remains that were recovered during those excavations, will clarify the settlement history of T'isil.

Ongoing analysis of ceramics recovered from the 2002–2003 expanded surface collection and test excavation program have now identified traces of Middle Preclassic occupation at T'isil, as indicated by the presence of ceramic groups Achiote, Chunhinta, Dzudzuquil, Joventud, and Kin, as identified by Ochoa Rodríguez (2004a, 2004b).

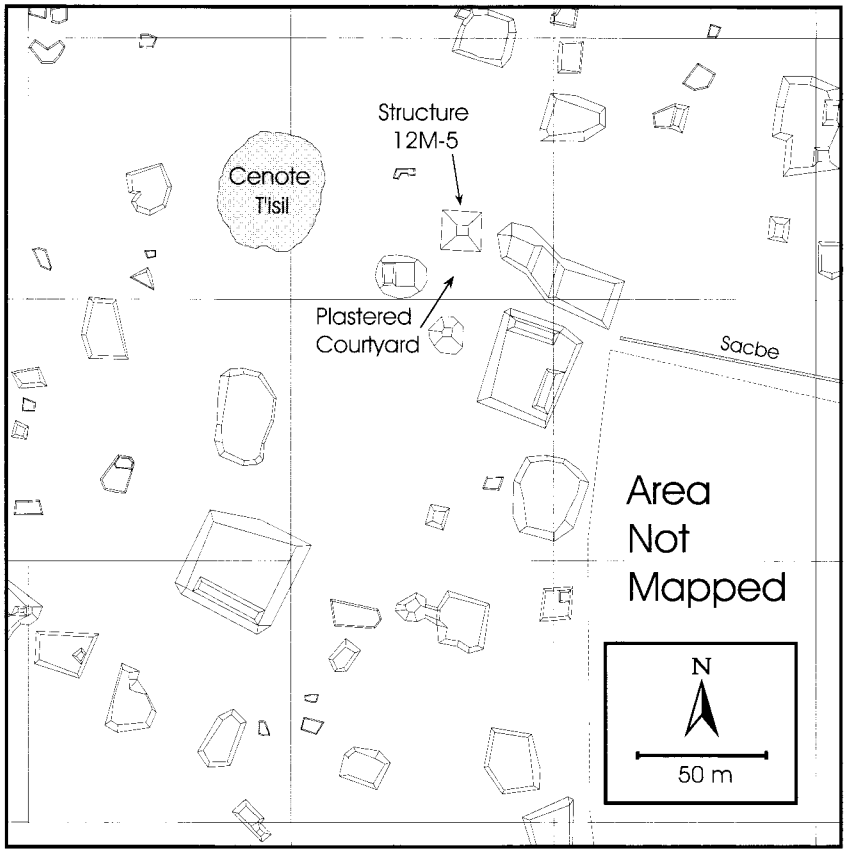

Fig. 2.4 Detail map of the central portion of T'isil. (Map by Scott Fedick and Kathryn Sorensen)

If the majority of occupation at T'isil proves to be Late Preclassic, or to span the Late Preclassic–Early Classic transition, it will be one of a small handful of known Preclassic sites (including Cerros and Komchén) in the Maya area to be preserved without substantial disturbance from later occupation (Robertson and Freidel 1986; Garber 1989; Scarborough 1991). Of these rare sites, we believe that T'isil may have the shortest span of occupation, giving us a unique opportunity to understand early lifeways and to gain insight into the settlement, politics, economics, and ideology of the Preclassic Maya.

One model we are using to evaluate the community layout at T'isil is that developed from ethnographic and ethnohistoric evidence by Michael Coe (1965; see also Bassie-Sweet 1991, 171–80; García-Zam-

Table 2.1 Identified ceramics from stratified, randomized surface collections at T'isil

Group	Number of Identified Sherds	Percentage of Identified Sherds
Late Preclassic		
Carolina	644	20.2
Flor	3	0.1
Huachinango	56	1.8
Polvero	27	0.8
Sierra	1,025	32.1
Tancah	1,237	38.8
Xanaba	3	0.1
Total Late Preclassic	2,995	93.9
Early Classic		
Aguila	1	0.03
Batres	2	0.1
Saban	43	1.3
Total Early Classic	46	1.4
Terminal Classic		
Dzibiac	2	0.1
Kukula	6	0.2
Muna	4	0.1
Vista Alegre	45	1.4
Total Terminal Classic	57	1.8
Late Postclassic		
Mama	17	0.5
Matillas	9	0.3
Navula	50	1.6
Payil	15	0.5
Total Late Postclassic	91	2.9
Total identified sherds	3,189	100.0

Note: 116 structures. Ceramic identifications and period assignments are by Jorge Ceja Acosta.

brano 1994). In this model, a quadripartite division of the community is physically marked in some way. Ideally, the town center contains the temples and houses of the community leaders, and roads lead out in the four cardinal directions (Coe 1965, 102). Each of the four divisions of the community was associated with a different lineage, and the office of community leader was rotated among the four divisions (Coe 1965, 106). Other ethnographic work in Yucatán by Redfield and Villa Rojas (1962) revealed that cenotes often marked town centers, and that the surrounding community was believed to reflect the four corners of the universe. Cenotes that serve as centers of modern Maya communities often have myths associated with them, telling of an ancestral deity who discovered the cenote and established rights over it for his descendants. It was around these cenotes that the residences of the elite families clustered (descendants of the founding ancestors), with houses of lesser families scattered around the margins of the community at greater distances from the cenote. The relationship of caves and cenotes with architecture is certainly exhibited in the layout of Maya communities in both the past and present. This is a prevalent pattern for the ancient Maya at major centers such as Chichén Itzá, Yaxuná, and Dos Pilas (see E. W. Andrews IV and E. W. Andrews V 1980; Brady 1997; Coggins 1992).

Although a final characterization of the community pattern at T'isil must await the results of ongoing analysis, initial impressions suggest that the layout of the ancient community may conform to the ethnographic model described here. If verified, this would establish the community plan as having originated more than 1,500 years ago. Cenote T'isil lies near the geographic center of the settlement and clearly serves as the focal point of the community (see fig. 2.4). There is also physical evidence of divisions between three of the four potential quarters. Three segments of a sacbe have been mapped within the site of T'isil, which apparently represent a single road that once led from the eastern outskirts of the site to the center of the settlement at the cenote (see fig. 2.4). This sacbe marks an eastern entry into the settlement and divides the northeastern from the southeastern quarter of the community. A recently discovered wall system of carefully laid, cut limestone blocks runs perpendicular to the sacbe, dividing the northeastern and northwestern quarters of the community.

Overlaying the quadripartite division of the community is evidence for a concentric zoning of architecture, as is suggested by the previously described model. Adjacent to the cenote, on the east side, is a small

courtyard that test excavations in 2001 indicate was once paved with a thick plaster floor (Amador and Fedick 2002). The north and south sides of this courtyard are flanked by two of the three pyramidal structures identified so far at the site (see fig. 2.4). Immediately to the south and east of the courtyard and the cenote are the largest platforms at the site.

Surrounding this central core of large architecture is a wide band of residential platforms that were likely occupied by the "middle-class" families of the community. Stone walls connect or surround many groups of these platforms, possibly delimiting extended family compounds. We have also noted several discernible styles of domestic architecture among the residential platforms with similarly styled houses clustering to form distinct neighborhoods within the community. Distributed among these residential compounds are many chich mounds that probably represent the former locations of cultivated trees (Fedick and Morrison 2004; see also Kepecs and Boucher 1996). In traditional Maya villages today, mounds of gravel and cobbles are often built up around the bases of trees to help retain moisture and to support them during heavy winds.

Moving farther out from the cenote, the residential platforms give way to small, single-house foundations and oval or round rings of stone that represent wall footings for small, simple structures that probably served for storage or temporary shelter. The remains of stone walls in this zone probably delimit larger agricultural fields on the outskirts of the community. It is also interesting that we have identified two additional small cenotes, each of which provides easy access to a permanent water supply. These functional equivalents of walk-in wells are found at the outskirts of the northeast and northwest quarters of the community.

From the mapping completed to date, it appears that the presence of two other large cenotes to the northwest of Cenote T'isil resulted in an extension of the ancient community in that direction (see fig. 2.3). A light scattering of structures is located between these outlying cenotes, and this residential area is likely to have been part of the larger community of T'isil. As our mapping at T'isil extends into the forest, and into what may be the southeast and southwest quarters of a quadripartite layout, we will continue to evaluate the community organization model that seems so far to be represented at T'isil.

The Yalahau Regional Cave Survey

Several project members continued ongoing studies outside of the center of T'isil during the years from 1998 to 2001. In 1998, Dominique Rissolo completed fieldwork for the first major phase of his regional cave study (Rissolo 2001, 2003, 2005). Since initiation of the project in 1996, Rissolo has documented twenty caves in the region, all of which exhibit evidence of ancient use ranging from ritual activities to the collection of resources. These caves contain permanent or seasonal pools of water, and almost all of the water-bearing caves possess a high degree of construction and modification, and an abundance of cultural material. In most cases, cleared paths or artificial stairways have facilitated access to the pools (Rissolo 2001, 2003). Rissolo believes that due to the many readily available sources of fresh water in the Yalahau region, including the wetlands and numerous ancient wells, and the difficult access to the interiors of many of the region's caves, a significant number of them were regarded as sacred environments and used for conducting ritual activities rather than for collecting drinking water (Rissolo 2001, 2003). Chapter 4 addresses chronological and settlement-history implications of ceramics recovered from the caves, particularly for the Middle Preclassic period.

Further Studies at El Naranjal

Additionally, during the 1998–2001 seasons, Karl Lorenzen expanded his study at El Naranjal to identify Late Postclassic alterations to structures originally built during the Preclassic–Early Classic occupation. Lorenzen postulates that these modifications were part of a resettlement strategy aimed at justifying the distribution of land and resources during a period characterized by migration, political factions, and boundary disputes. This reoccupation and recycling of landscape features allowed the Postclassic Maya to associate themselves with a once-powerful city and project an image of authority through cultural ties to the past. This activity was likely related to ancestor veneration, as it would have been especially important during the unstable time to show direct ties to past relations (Lorenzen 1999, 2003).

The Sacbe Project

Jennifer Mathews' sacbe and historic railroad project was continued during short seasons in 1999 and 2001 and a full season in 2002, turning up evidence for an ancient road system that headed from the eastern coast of Quintana Roo, near modern Puerto Morelos, toward the inland sites of El Naranjal and San Cosmé. The use of contact-period documents, historic maps, archaeological surveys, excavation, archival research, and ethnographic interviews with local peoples have all supported this argument. Although this roadway appears to have been incorporated into the construction of a historic rail line used by the *chicle* and lumber industries, the evidence points to an original prehistoric construction. Discoveries of prehistoric roadside structures as well as the nearby ancient site of Zazil (also known as El Cenote) are two especially important lines of evidence that warrant further investigation. Recent research focusing on the historic rail line is presented in this volume (see chap. 7). Considerable work remains to be done on this project, but we feel that it will be successful in documenting a long-distance Maya sacbe, potentially revealing the longest road system in the entire Maya region (Mathews 1998, 2000, 2001a, 2003a; see also Bolles and Folan 2001).

The Yalahau Regional Settlement Survey

Although reconnaissance throughout the Yalahau region has been undertaken on an occasional basis since the beginning of the project in 1993, the 2001 season marked the initiation of a systematic survey project (Glover and Amador 2002). Jeffrey Glover (University of California, Riverside) and Fabio Esteban Amador (State University of New York, Buffalo) are conducting the survey as dissertation projects. Glover is focusing on the pattern of settlement across the landscape, whereas Amador is working with ceramics from recorded sites to help define the settlement chronology for individual sites and the region, and to identify interactions between the Yalahau region and the surrounding areas through time. Chapter 3 in this volume summarizes the current status of the survey.

Conclusions and Future Research

The interior of northern Quintana Roo has long been a blank spot on the archaeological map of the northern lowlands, with very little research

having been conducted there prior to the initiation of our current project in 1993. Although the Yalahau Regional Human Ecology Project has been conducted as a relatively small-scale operation, we are now able to answer some of the basic questions about the area while developing new and refined questions that seek to link the region with what is known about the rest of the northern lowlands and beyond.

Settlement History

The current ceramic evidence from 12 regional settlements (out of 23 including T'isil) and 4 caves (out of 20) indicates that the Yalahau region was first occupied during the Middle Preclassic period, with recovered ceramics being most similar to the Early Nabanche materials from Komchén, with Mamom ceramic sphere affiliations dating from approximately 700 to 450 BC (see chap. 4; see also chap. 3; Ochoa Rodríguez 2004a, 2004b). At this time, ceramic evidence for Middle Preclassic presence in the Yalahau region is relatively scant, with no architecture that can be attributed to this period. This situation stands in sharp contrast to ongoing research by Robles Castellanos and Andrews (2003) in the northwestern area of the peninsula, where they have recorded 116 sites with Middle Preclassic ceramics, many of which apparently include substantial architecture, including ballcourts, assigned to the Middle Preclassic (Anderson 2003; Medina Castillo 2003).

The Late Preclassic, or a transitional period from the Late Preclassic to the Early Classic, appears to be a time of tremendous population growth in the Yalahau region, with all settlements from which surface collections have been made yielding high percentages of Sierra, Carolina, and Tancah ceramic groups (see chap. 3). At T'isil, the initial surface collection of 3,189 sherds (larger than the regional collection total of 2,152 sherds) is dominated by these three ceramic groups, comprising 91% of the T'isil collection. Ongoing analysis of 2002–2003 surface collection and excavation samples from T'isil are basically consistent with the 1999–2001 sample for these ceramic groups (Ochoa Rodríguez 2004a, 2004b).

Many of the larger sites recorded in the Yalahau region display the distinctive Megalithic style of architecture that we now know was widely distributed across the northern lowlands during Late Preclassic and Early Classic times (Mathews 1998, 2001b, 2003b; Mathews and Maldonado Cárdenas n.d.; Taube 1995). The Megalithic architectural style is

characterized by the use of large (more than 1 m in length), well-dressed stones with rounded edges used to retain interior rubble cores. We have suggested that the Yalahau region was incorporated into a larger political/ritual interaction sphere during that time, based perhaps at Izamal, the largest known Megalithic-style center (Fedick and Taube 1995B; Mathews 1998, 2003b; Mathews and Maldonado n.d.). We also have suggested that this large interaction sphere was integrated in part by a possible regional sacbe spanning the northern lowlands from east to west and functioning perhaps as both a ritual pilgrimage route and a means of political and economic integration (Fedick, Reid, and Mathews 1995; Mathews 1998). If an interaction sphere characterized by the distribution of Megalithic architecture did exist in the northern lowlands, it seems to have disintegrated during the earlier part of the Early Classic period. It appears that the population in the Yalahau region declined dramatically after about AD 350/400. However, radiocarbon dating of the later construction phases of monumental architecture at the Megalithic-style site of El Naranjal brackets a statistical time range (AD 263–545) that could extend construction activities until the later part of the Early Classic (Mathews 2001b, table 1; Mathews and Maldonado Cárdenas n.d.).

The regional ceramic data suggest some interaction with the Itzá sphere of influence during the Late Classic to Terminal Classic, as evidenced by the presence of Vista Alegre ceramics (see chap. 3; Ochoa Rodríguez 2004a, 2004b), although the extent and nature of this interaction, particularly in comparison to the neighboring Chikinchel region (Kepecs 1998; Kepecs, Feinman, and Boucher 1994), is currently in the early stages of investigation.

The ongoing settlement survey of the Yalahau region is adding substantially to the evidence for a widespread reoccupation of the region during the Late Postclassic (see chap. 3; Lorenzen 1999). Our ongoing work at T'isil may give us a good indication of the nature and timing of this reoccupation. A sediment core taken from Cenote T'isil in 2000 by Fedick and Dawn Mooney-Digrius included a lens of charcoal at about the midpoint of the deposit. An AMS-based radiocarbon age determination on this material (UCR-3925) provides a date of 810 +/- 40BP, with a calibrated 2 *sigma* (95.4%) range of AD 1160 to 1284. We hypothesize that this charcoal represents trees felled and burned at the center of the ancient site when it was reoccupied. Surface collections have produced Late Postclassic sherds from a cluster of large structures situated just northeast of the cenote (Hoover 2003). Several of the larger structures

around the cenote, including the largest pyramidal structure (12M-5), have Late Postclassic altars and shrines constructed on them, very reminiscent of the pattern at El Naranjal (Hoover 2003; Lorenzen 1995, 1999, 2003). The Late Postclassic occupation at T'isil appears as a veneer over the existing, much earlier architecture. It seems that a relatively small group of families resettled T'isil in the Late Postclassic and put considerable effort into incorporating the existing ruins into a sacred landscape. The ongoing regional survey (see chap. 3) suggests that Postclassic resettlement in the Yalahau region was restricted to sites that had originally been founded during Preclassic times. To date, no purely Postclassic sites have been identified in the Yalahau region.

Ancient Use of Wetlands

We now have good evidence that the Yalahau wetlands were managed in the past, most likely during the Late Preclassic–Early Classic transitional period when the regional population was at its maximum, although we cannot rule out use in later periods (Fedick 2003; Fedick et al. 2000). The full survey of the El Edén wetland has been supplemented since 1998 by observations of rock-alignment features in other wetlands of the Yalahau region similar to those at El Edén (Fedick, personal observations 1998–2002). We have also discussed the evidence for environmental change and how these changes may have altered the hydrology of the wetlands, perhaps leading to abandonment of management practices. Could the seemingly anomalous settlement history of the Yalahau region be related to the fate of wetland management? We still do not know what domestic crops or wetland resources were managed by the construction of rock-alignment features in the wetlands, and we do not know the details of hydrological changes in the wetlands through time; we will soon begin a program of paleoenvironmental reconstruction that will help to answer these questions.

In conclusion, the Yalahau region has proven to be a fascinating and challenging setting for research on the ancient Maya of Quintana Roo. The region has witnessed dramatic cycles of settlement growth and decline over the nearly 2,500 years of documented occupation, and faces new challenges from the spread of urban growth emanating out of Cancún. We hope that our ongoing research will continue to fill in the blank areas of the map and reveal the rich cultural and natural history of this unique landscape.

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