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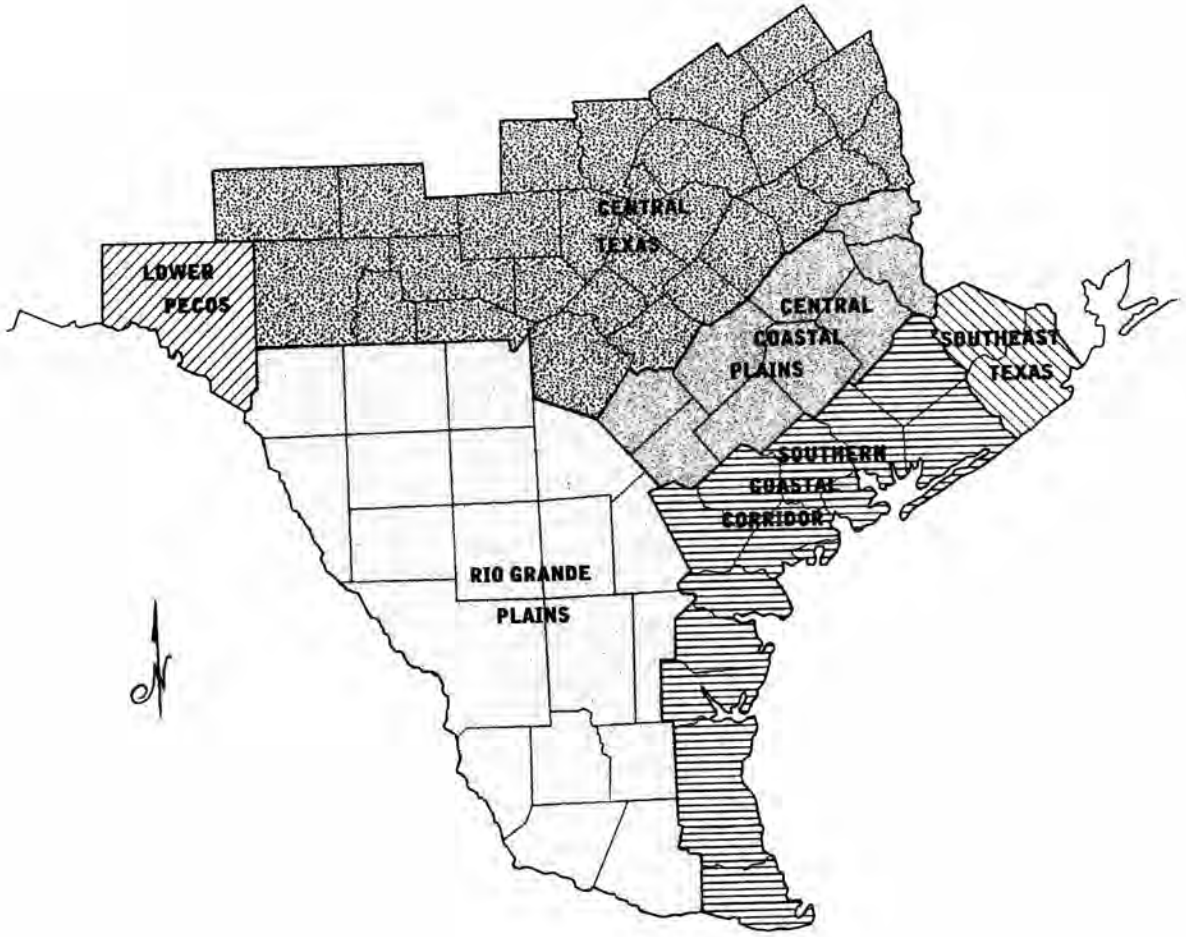

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Thomas R. Hester
Editor

About the cover: Map showing areas of discussion in the article by Timothy K. Perttula, this issue.

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NOTES ON SOUTH TEXAS ARCHAEOLOGY: 2001-3 and 4
An Introduction to Mortuary Studies in South Texas Archaeology

Thomas R. Hester

This issue of *La Tierra* combines Nos. 3 and 4 of Volume 28, providing enough pages under one cover to publish Dr. Tim Perttula's synthesis of ancient mortuary patterns in southern Texas. His research has pulled together widely scattered data on burials and burial practices in the region. It will be of continuing value to archaeologists carrying research in southern Texas and adjacent areas.

The political, emotional and legal issues affecting the study of prehistoric burials are constantly in the news. Unfortunately, the picture is usually one of Native Americans against archaeologists (or vice versa) over the excavation and analysis of ancient remains. The contentious nature of the debate in North America often portrays professional and avocational archaeologists as "grave robbers." Nothing could be further from the truth; most archaeologists work very hard to avoid burials. However, most of what Perttula reports here are burials and cemeteries that were excavated as rescue or salvage efforts prior to their destruction by highways or dams, or of burials that were exposed by farming, by erosion, and other accidental discoveries. If a prehistoric cemetery is in the route of an interstate highway, as in the case of Loma Sandia, archaeologists are contracted by State or Federal agencies to excavate and salvage it. If human remains are eroding and falling into the edge of an erosional cut, it is often appropriate to remove the *in situ* remains; indeed, as seen at the Silo site, the landowner usually requests such action.

In 1969, in a much shorter synthesis of South Texas mortuary patterns, written as part of a study of two cemetery sites in the Rio Grande Valley, I offered the hypothesis that the "interior groups [in South Texas], always ranging over large areas, disposed of their dead at random, without elaborate burial goods" (reference cited in Perttula). Fortunately, there has been a lot more archaeology done in South Texas since then, and I have been proved wrong in this view. While isolated burials without grave goods (or with very few inclusions) are still the most common burial form found in the interior, cemetery sites have also been found, at least from late Middle Archaic through Transitional Archaic times, and in some cases, such as Blue Bayou in Victoria County, or the Rio Grande Valley's Brownsville Complex, into the Late Prehistoric. It is very fortunate that Dr. Perttula has reviewed and summarized the data obtained over the past 30 years. Much information is to be found in *La Tierra*, including reports on isolated burials, cremations, and cemeteries. Other papers on South Texas and northeast Mexico mortuary sites, authored by Southern Texas Archaeological Association members, have also appeared in the *Bulletin of the Texas Archeological Society* and other publication venues. Without the commitment of the STAA to the publication of all types of archaeological data from southern Texas, there would be much less available for a synthesis of this sort.

The anthropology of the dead is of utmost importance in providing an accurate chronicle of the prehistoric peoples of southern Texas. Little is recorded in the historic records about the many Indian groups, of various languages and geographical derivation. As I have written in an earlier paper, we as archaeologists and anthropologists have greatly simplified a complex situation by simply lumping these groups under the meaningless "Coahuiltecan" label. Thus, regardless of the ongoing debates about the analysis of human remains, the careful excavation, analysis and publication of mortuary data remains critical to the definition of prehistoric cultural patterns in southern Texas. Because of the unclear ancestral links between contemporary Native American peoples in South Texas and the very ancient, pre-mission skeletal remains it is of even greater importance that archaeologists fully report human remains and associated grave goods. While we should accord due respect to these remains and to the American Indian individuals and groups who may be related to them, it is our foremost responsibility as scholars to fully publish our studies. Whether the remains, the associated artifacts, or other related materials are eventually reburied is beyond our control. The scope of the implementation of the Native American Graves Protection and Repatriation Act (NAGPRA) is applicable in some cases, and the rights and responsibilities of private landowners have to be considered in others.

HUNTER-GATHERER MORTUARY PRACTICES IN THE RIO GRANDE PLAINS AND CENTRAL COASTAL PLAINS ARCHEOLOGICAL REGIONS OF TEXAS

Timothy K. Perttula

ABSTRACT

I discuss the mortuary practices of the Native American hunter-gatherer groups living in the Rio Grande Plains and the Central Coastal Plains of Texas in prehistoric and early historic times. Sites with burials, although rare throughout the area, are a notable cultural feature of the prehistoric archeological record along the major rivers of the region that drain into the Gulf of Mexico, such as the Brazos, Colorado, Guadalupe, and Nueces rivers, as well as the Rio Grande. The study of the prehistoric mortuary practices in these two regions is a significant means by which to better illuminate the cultural diversity, structure, and organizational character of the hunter-gatherer groups who lived there over many millennia.

INTRODUCTION

This paper concerns the mortuary practices of the Native American hunter-gatherer groups living in the Rio Grande Plains and the Central Coastal Plains of Texas in prehistoric and early historic times. Sites with burials, although rare throughout this area, are a notable cultural feature of the prehistoric archeological record along the major rivers of the region that drain into the Gulf of Mexico, such as the Brazos, Colorado, Guadalupe, and Nueces rivers, as well as the Rio Grande. Large Middle Archaic to Late Archaic cemeteries (see Hester 1980:69-83, 1999a; Hall 1995a, 1995b, 1998; McWhorter 2000; Taylor 1995a, 1998) characterize certain parts of this large region.

The consideration of prehistoric mortuary practices in North American archeology has led to considerable insights into past "cultural, behavioral, ecological, and historical phenomena" (Carr 1995:105) of Native American groups. In particular, these studies have contributed in recent years to better understandings of prehistoric social organization, social interaction and cultural affiliations, trade and alliances, territoriality, ideology, warfare, philosophical-religious beliefs and worldviews, demography, health, and diet. The work of Hester (1969a, 1980, 1999a), Story (1985), Hall (1981, 1995a, 1995b, 1998), Bement (1994), Cox and deFrance (1997), Johnson and Goode (1994), Patterson (1995, 1996), Taylor (1995a, 1995b, 1998; also see Taylor et al. 1995), and others, have taken up these subjects for Central, Southern, and Southeast Texas burial sites, of which the Rio Grande and Central Coastal Plains archeological regions are a part. This focus on the prehistoric mortuary practices in these two regions—as well as insights into rituals and beliefs expressed at death, and the evidence of disease, pathologies, and chronic stress seen in burial populations—have proved to be a significant means by which to better illuminate the cultural diversity, structure, and organizational character of the hunter-gatherer groups who lived there over many millennia.

Geographic Area

The geographic area under consideration here is the 29 counties of the Rio Grande Plains and Central Coastal Plains archeological regions as defined in the Texas Historical Commission's planning document for the Central and Southern Planning Region of Texas (Mercado-Allinger et al. 1996:Figure 1.1.4). The South Texas brush country of the Rio Grande Plains stretches from the Rio Grande on the south (and on into Tamaulipas and Coahuila, Mexico) and west to the Edwards Plateau on the north. It meets the Southern Coastal Corridor Archeological Region one or two counties west of the coastal prairies and marshes and the Gulf of Mexico. The Central Coastal Plains is a two or three county wide strip of Oak Woodlands, tall and mid-grass prairie, and coastal prairie between the lower Brazos River on the east and the San Antonio River basin on the west.

For the purposes of this study of prehistoric mortuary practices, a broader geographic focus is warranted than simply the Rio Grande Plains and Central Coastal Plains regions (Figure 1). This is the case because it is clear that shared mortuary practices (as well as extensive interaction and exchange), and the extent of recognizable group territories, in certain parts of these two regions extend into other defined archeological regions in Texas. This is particularly the case for the western part of Southeast Texas (e.g., for Late Archaic cemeteries in the lower Colorado-Brazos [Hall 1981; Story 1990; Patterson et al. 1993a, 1993b, 1998]), and Central Texas and the Lower Pecos (e.g., the occurrence of sinkhole and rockshelter burial sites [Turpin et al. 1986; Turpin 1988, 1991; Bement 1994]. Indeed, in the case of prehistoric mortuary practices along the lower Rio Grande, archeological sites in Tamaulipas and Coahuila (e.g. Aveleyra et al. 1956; Del Rio 1953; Boyd et al. 1997) also appear to have relevance for the present study.

Time Periods

The time periods of direct concern are from about 5000 B.C. to A.D. 1600. Prehistoric Native American burials dating to the Late Paleoindian period (ca. 9500-10,000 years B.P.) have been found in Central Texas (Steele and Powell 1994; Powell and Steele 1994) at the Wilson-Leonard and Horn Shelter sites. However, in the Rio Grande Plains and the Central Coastal Plains (and in immediately adjacent counties in the Lower Pecos, Central Texas, and Southern Coastal Corridor archeological regions), sites with burials appear to date no earlier than ca. 7000 years ago, the Early Archaic period, and there are few such sites of this age presently known in either region (cf. Bement 1994; Bousman et al. 1990; Turpin and Bement 1988; Ricklis 1995). As discussed in greater depth below, most of the sites with burials date to the Middle and Late Archaic periods—spanning the period from ca. 2500/2000 B.C. to A.D. 700 (Table 1 provides relevant radiocarbon dates from mortuary contexts)—with the notable exception of Late Prehistoric cemeteries along the inland and coastal sections of the lower Rio Grande (Boyd et al. 1997; Hester 1969a), in the Blackland Prairie in Central Texas below the Edwards Plateau (Prewitt 1974b, 1982), and along the coastal prairie between the Guadalupe River and the lower Brazos river (Hall 1981, 1998; Huebner and Comuzzie 1992; Hester 1996a).

Theme

The archeological and bioarcheological study of prehistoric mortuary practices offer unique opportunities through the analysis of the material culture remains (i.e., associated grave goods) and burial rituals to better understand the social and cultural belief systems and patterns of ritual behavior held by the aboriginal peoples who lived in the Rio Grande and the Central Coastal Plains between about 7000 years ago (when burials are first known archeologically) and some 300 years ago. For hunter-gatherers, the grave goods left with the dead probably are most informative about the social position of the deceased within a related community or group of people, as well as that group's beliefs about the nature of the soul (see Carr 1995:Tables III, IV, and VI).

The bioarcheological evidence of human health and diet preserved in the skeletal remains of the dead attest directly and plainly about health conditions and dietary stress in prehistoric Indian populations. As Larsen et al. (1996:150) note: "Skeletal and dental tissues are remarkably sensitive indicators of human interaction with the environment, providing a cumulative biological history or 'memory' of an individual's lifetime, including dietary stress, nutritional quality, disease history, mobility pattern, and physical activity." Assessments of health and well-being speak to the quality and pattern of past lifeways among prehistoric groups in this part of Texas, and the overall success and adaptive fitness of the different past Native American groups that lived across the bountiful, but sometimes harsh, lands of the Rio Grande and Central Coastal Plains.

The study of aboriginal human skeletal remains from Rio Grande and Central Coastal Plains burial and cemetery sites also allows for a better and fuller understanding of changes through time and between peoples in prehistoric demography, health, and diet from these burial population, as well as age and sex information for different groups. As such, they represent an important and unique body of archeological information on the paleodemography and paleopathology of the Native American inhabitants of the two archeological regions through prehistory.

From general ethnographic studies of hunter-gatherer groups, it is suspected that the burial goods placed with the individuals at death primarily represent a sampling of utilitarian and ornamental items used and possessed in life by those individuals, hinting at the social status and personae of the deceased (cf. Binford

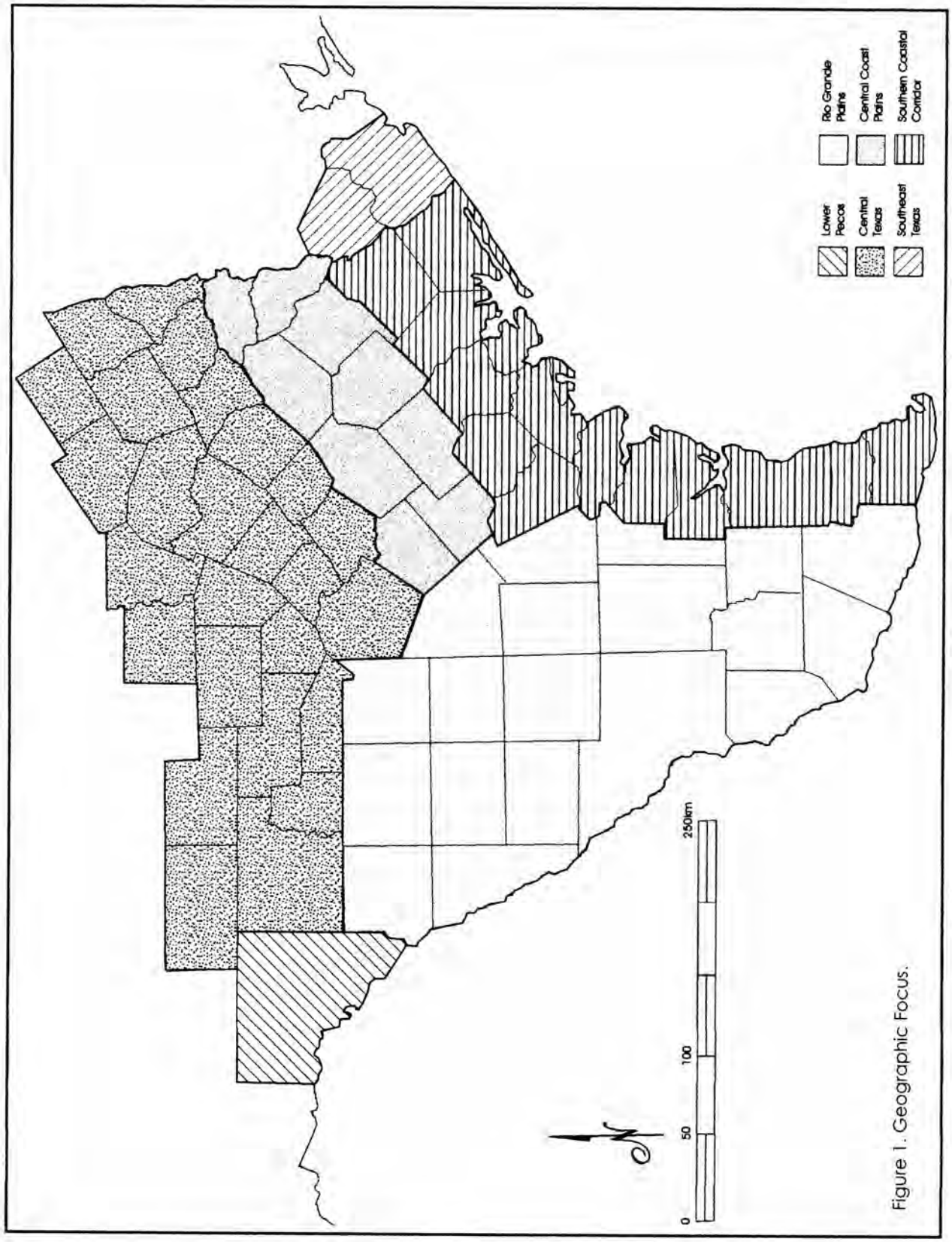

Figure 1. Geographic Focus.

Table 1. Radiocarbon Dates from Relevant Mortuary Contexts in and near the Rio Grande Plains and the Central Coastal Plains

Site	Lab No.	Feature No.	Uncorrected/ Uncalibrated Date*	Date Range*
Bering Sinkhole				
	Tx- 6525	Unit I-19	990 ± 140	1130-850
	Pitt-0073	Unit I-19	1085 ± 60	1145-1025
	Tx-6921	Unit I-22	2130 ± 80	2210-2050
	Tx-5877	Unit I-24	2560 ± 80	2640-2480
	Tx-6167	Unit I-24	2610 ± 280	2890-2330
	Tx-6135	Unit II-26	3420 ± 100	3520-3320
	Tx-6282	Unit III-37	5840 ± 190	6030-5650
	Tx-6831	Unit III-40	6660 ± 110	6770-6550
	Tx-6526	Unit III-40	6860 ± 170	7030-6690
Blue Bayou				
	Tx-4895	B. 24	1120 ± 80	1200-1040
	Tx-5865	B. 1	1240 ± 280	1520-960
	Tx-4972	B. 16	1490 ± 90	1580-1400
	Tx-4894	B. 20	1590 ± 210	1800-1380
Bowser				
	I-16513	B. 3-7	2580 ± 130	2710-2450
	I-17333	B. 13	3230 ± 170	3400-3060
Callo de Oso				
	Beta-99305	TU 5	2720 ± 50**	2770-2670
Ernest Witte				
	Tx-2452	B. 89	1650 ± 70	1720-1580
	Tx-2451	B. 14	2460 ± 70	2530-2390
	Tx-2127	B. 127	3270 ± 70	3340-3200
	Tx-2453	B. 155	4120 ± 100	4220-4020
Hitzfelder Cave				
	Tx-334	--	1000 ± 190	1190-810
Frisch Auf!	Tx-5986	B. 1	1070 ± 90	1160-980
Goat Cave	SI-1119	Burial	1650 ± 45	1695-1605
Hinds Cave	Tx-5897	Infant burial	1230 ± 90	1320-1140
	Tx-5987	Infant burial	2710 ± 50	2760-2660
Loeve-Fox				
	Tx-1925	Pit	870 ± 60	930-810
	Tx-1923	Pit	940 ± 60	1000-880
	Tx-3402	--	1250 ± 60	1310-1190

(Continued)

Table 1. Radiocarbon Dates from Relevant Mortuary Contexts in and near the Rio Grande Plains and the Central Coastal Plains

Site	Lab No.	Feature No.	Uncorrected/ Uncalibrated Date*	Date Range*
Loma Sandia				
	Beta-13072	11-G	2420 ± 90	2510-2330
	Beta-20420	13-O	2550 ± 90	2640-2460
	Beta-13071	134	2570 ± 60	2630-2510
	Beta-20421	13-O	2640 ± 90	2730-2550
	Beta-20419	12-R	2640 ± 100	2740-2540
	Beta-13070	11-G	2680 ± 80	2760-2600
	Beta-13073	10	2710 ± 90	2800-2620
Moorehead Cave				
	SI-1131	Double burial	1700 ± 70	1770-1630
	SI-1130	Possible disturbed burial	2230 ± 50	2280-2180
Morhiss				
	Beta-92359	B. 159	2410 ± 50**	2460-2360
Mummy Shelter				
	Tx-980	Mummified burial	1150 ± 70	1220-1080
Olmos Dam				
	Tx-3993	2	1920 ± 160	2080-1760
	Tx-3989	Zone 2	2200 ± 70	2270-2130
Schulze Cave				
	--	Bone stratum+	3826 ± 280	4106-3546
Seminole Sink				
	Beta-10472	cremation	390 ± 80	470-310
	AA-946	cremation	470 ± 150	620-320
	AA-1315	skeletal deposit	5750 ± 140**	5890-5610
	AA-1313	skeletal deposit	5590 ± 180**	5770-5410
	AA-1314	skeletal deposit	4671 ± 64**	4735-4607
Southern Island***		3	840 ± 70	910-770

(Continued)

Table 1. Radiocarbon Dates from Relevant Mortuary Contexts in and near the Rio Grande Plains and the Central Coastal Plains

Site	Lab No.	Feature No.	Uncorrected/ Uncalibrated Date*	Date Range*
Wroe Ranch	Tx-5430	Mummified burial	570 ± 70	640-500
	Tx-5431	Mummified burial	630 ± 110	740-520
41BX917	Beta-67731	Burial	380 ± 60**	440-320
41CF29	GX-17779	Fea. 1	1375 ± 58***	1433-1317
41NU266	Beta-53198	--	4430 ± 60***	4490-4370
41WY50	GX-15124-G	--	1415 ± 140**	1555-1275
41WY67	GX-15254-A	--	4495 ± 350**	4825-4145
41WY113	GX-15123-G	--	1088 ± 90**	1178-998
41ZP7***		Boyd	620 ± 70	690-550
41ZP144	Beta-51889	Fea. 1	650 ± 60	710-590
Unknown Pecos River site	Tx-6166	Bundle burial	2270 ± 50	2320-2220

* Years B.P.
** Delta-13C corrected
*** AMS date on bone; Lawrence Livermore Laboratory, Livermore, California
\+ From Dalquest et al. 1969; Turpin and Bement 1988

1971), and a recognition that such burial goods would be needed in the deceased's next life. Highley et al. (1995:440) note this relationship for the late Middle Archaic burials at the Loma Sandia cemetery when they comment that "the tool assemblages found in the burial zone contain the functional tool forms that a hunter/gatherer would need on a day-to-day basis." In an archeological sense, therefore, the grave goods found in Rio Grande and Central Coastal Plains burials document small and discrete slices of time and thought, powerfully capturing the essence of the individual as well as the group's view on dying, death, and ritual beliefs.

On a more mundane level, these burial goods provide evidence of contemporaneity for various kinds of objects and artifacts that are also found in other contexts (usually habitational) at sites where they may have become mixed with artifacts from many separate occupations. Features that are the result of single or short-term activities—like burial pits—also represent key sources of information that are building blocks for numerous other studies of the prehistory of the two regions, particularly the development, maintenance, and control of group territories in the past (cf. Story 1985); mobility patterns; intra- and inter-group violence; the extent of trade and exchange between different groups; and past religious and social beliefs.

Discussion of Known Burial Sites

At present, there are 115 archeological sites with burials known in the Central Coastal and Rio Grande Plains archeological regions (Tables 2 and 3), 30 in the Central Coastal Plains and 85 in the Rio Grande Plains (including 17 burial sites along the Rio Grande at Falcon Reservoir in Tamaulipas, Mexico (see Boyd et al. [1997]). These cemeteries and burial sites include an estimated 831-853+ individuals, an average of 7.2-7.4 burials per burial site, but with a very wide range of between only 1 individual at a number of burial sites to as many as 242 individuals at Ernest Witte (Hall 1981).

Cemeteries in open settings (regardless of habitation context) are the most notable burial site in the two regions. They represent the locations of multiple interments that were purposefully buried in open terrain in the same location for a considerable span of time (in some cases for millennia, and in other cases for perhaps only a generation or two). The location and use of the larger cemeteries are believed to be the result of the same cultural group using a place on the landscape to repeatedly reaffirm their rights of descent and control/access to critical resources (see discussion in Taylor et al. 1995:627-631 and Taylor 1998). For example, the Loma Sandia cemetery site, containing more than 200 burials, appears to have been used for a maximum of 300 years during the latter part of the Middle Archaic period (Highley 1995; Taylor and Highley 1995; Taylor 1998), while the Ernest Witte cemetery was used periodically for at least two millennia (Hall 1981) beginning in the latter part of the Middle Archaic period; based on radiocarbon dates, the use of these cemeteries overlapped between about 2500 B.P. and 2300 B.P. Interestingly, a recently obtained corrected radiocarbon date of 2410 ± 50 B.P. from a double burial at the large Morhiss cemetery site (Dockall 1997a, 1997b) falls into this period of intensive use of large cemeteries in the region.

For the purposes of this paper, cemeteries include burial sites where at least two individuals were buried in proximity, implying repeated use of space for the burial of a group of people's dead. Cemeteries sometimes occur in association with habitation areas, but more often they are prominently situated as well as spatially separated (sometimes at a considerable distance) from habitation archeological deposits. The largest cemeteries (with burial populations ranging from 42 to 242 individuals) in the Central Coastal and Rio Grande Plains regions include the Ernest Witte (41AU36) and Goebel (41AU1) sites on the lower Brazos River, Loma Sandia (41LK28) on the Frio River (but near the confluence of the Nueces, Frio, and Atascosa rivers), Deadman's Tank (41AT9) on the Atascosa River, and the Ayala site (41HG1) on Arroyo Colorado in the Rio Grande delta. Other large cemeteries have been reported, but available information is limited on the size and characteristics of the burial populations (e.g., Taylor 1995a; Hester 1995a).

Cemeteries in sinkholes and rockshelters also represent locations of multiple interments, but in these cases, the burials were interred in confined and usually inaccessible settings (cf. Hester et al. 1998). At the Bering Sinkhole in Kerr County, for example, at least 62 individuals were either dumped or laid out in the sinkhole over a period of at least 5000 years (Bement 1991, 1994), beginning in the Early Archaic period. Sinkholes and rockshelters are characteristic of the Edwards Plateau and Lower Pecos areas, where erosion of the limestone bedrock has created overhangs below canyon rims, or the dissolution of limestone on the plateau itself has created karst-related sinkholes.

Cemeteries and burials in sinkholes do not occur in association with habitation debris, while burials in

Table 2. Archeological Sites with Burials in the Central Coastal Plains

Site Name	Trinomial	Drainage	MNI	Reference
Goebel	41AU1	Brazos	42	Duke 1981
--	41AU18			Steele and Olive 1990
--	41AU35	Brazos	?	Hall 1981
Ernest Witte	41AU36	Brazos	242	Hall 1981
Leonard K	41AU37	Brazos	9	Hall 1981
Little Bethelem	41AU38	Brazos	?	Hall 1981
Wallis #5	41AU46	Brazos	?	Steele and Olive 1990,
Brandes	41AU55	Brazos	3	Highley et al. 1988
Mill Creek #3	--	Brazos	3	Steele and Olive 1990
Hugh Wilson	41CD37	Colorado	15	Woolsey 1932
Leyendecker	41CD62	Colorado	1	Howard 1986
--	41CD130	Colorado	1	Miller, K.A. 1996
Smith Creek	41DW3	Guadalupe	?	Steele and Olive 1990
--	41DW104	Guadalupe	1	Steele and Olive 1990
--	41DW222	Guadalupe	1	Steele and Olive 1990
Pat Dunn	41DW234	Guadalupe	1	Hudgeons and Hester 1977
Snake Pit	41DW242	Guadalupe	?	Schmiedlin 1981
Creek	41DW244	Guadalupe	1	Schmiedlin 1981
Frisch Auf!	41FY42	Colorado	8	Hester and Collins 1969
Rudy Haiduk	41KA23	San Antonio	5	Mitchell et al.1984, Harrison 1985
--	41KA89	San Antonio	1	Huebner et al. 1996
Silo	41KA102	San Antonio	25	Lovata 1996, 1997
Gus Hemmi Place	41LC1	Lavaca	?	Steele and Olive 1990
Supplejack Creek	41LC2	Lavaca	1	Steele and Olive 1990
Rocky Creek	41LC4	Lavaca	3	Hester 1994
--	41WN23	San Antonio	3	Steele and Olive 1989
Moy	41WN29	San Antonio	15-18	Labadie 1988
Shrew	41WN73	San Antonio	9+	Labadie 1988
Quarry	41WN75	San Antonio	3+	Labadie 1988
Unknown	41WT7	Brazos	1	Steele and Olive 1990

Total Sites n=30
Total Burials n=393-396+

Table 3. Archeological Sites with Burials in the Rio Grande Plain

Site Name	Trinomial	Drainage	MNI	Reference
Deadman's Tank	41AT9	Atascosa	62	Taylor 1995a
Arthur Turner	—	Atascosa	1	Jackson 1940
Don Sullivan Ranch	41BK1	Nueces	?	Steele and Olive 1989
Harry N. Speys	41DM1	Nueces	?	Jackson 1932; Nunley and Hester 1966; Taylor 1995a
Minus	41DM12	Nueces	1	Hester 1965
Patterson	41DM28	Nueces	1	Hester 1965
Indian Hill	41DM40	Nueces	1	Steele and Olive 1989
Johnson Ranch	41DM60	Nueces	1	Hester 1966
Walker	—	Nueces	1	Hester 1965
Catarina	—		?	Hester 1995b
Williams	—(Frio)		3	Taylor 1995a
Bigfoot	—(Frio)	San Miguel Creek	1	Hester et al. 1993
Ayala	41HG1	Arroyo Colorado	44	Hester and Ruecking 1969
McAllen	41HG27	Arroyo Colorado	1	Hester and Rodgers 1971
Schwartz Farm	41HG28	Arroyo Colorado	1	Steele and Olive 1989
—	41HG29	Arroyo Colorado	?	Steele and Olive 1989
—	41HG173	Arroyo Coloardo	1	Boyd et al. 1997; Hester n.d.
Hygea Dairy	41HG174	Arroyo Colorado	8	Boyd 1997 pers. comm.
Matthews	—	Arroyo Colorado	2	Campbell and Frizzell 1949
Hart Farm	—	Arroyo Colorado	4-5	Campbell and Frizzell 1949
—	41JW9	Nueces	?	TARL files
Paul Edwards No. 1	41KY1		?	Steele and Olive 1989
Silver Lake #2	41KY8		2	Steele and Olive 1989
Wheat	41KY12		?	Steele and Olive 1989
Leona Ranch	41KY25		1+	Turpin and Bement 1998
—	41KY26		1	Bement 1989; Taylor 1995a
Fuller Shelter	41KY27		2	Bement 1987
Lake Vista	41LK21	Nueces	2	Davis 1961
Loma Sandia	41LK28	Frio	205	Taylor and Highley 1995
R. B. Valentine	41LK42		1	Steele and Olive 1989
H. D. House	41LK43		?	Steele and Olive 1989
Ester	41LK47		1	Steele and Olive 1989
—	41ME2		1	Steele and Olive 1989
Weynand Cave	41ME30		3	Turpin and Bement 1988
Miles	41MC150	Nueces	2-3	Hester et al. 1974
—	(McMullen)	Nueces	?	Steele and Olive 1989

(Continued)

Table 3. Archeological Sites with Burials in the Rio Grande Plain

Site Name	Trinomial	Drainage	MNI	Reference
---	41SR207	Rio Grande	1	Davis 1994
Mason Ranch Burial Cave	41UV4		8-25	Benfer and Benfer 1981
Loose Midden #3	41UV20	Sabinal	1	Hester 1970a
Aldine Cave	41UV126		2+	Turpin and Bement 1988
Chalk Bluff Sinkhole	—		?	Taylor 1995a
Briscoe Cave	—		?	Turpin and Bement 1988
Briscoe Bone Cave	—			Turpin and Bement 1988
—	41UV131	Frio	1	TARL Records
—	41UV318	Sabinal	?	Masylk 1993
---	41WB20	Rio Grande	2	McGraw 1983
Chupedera #3	41WB58	Rio Grande	1	Steele and Olive 1989
---	41WB356	Rio Grande	1	Boyd 1997, pers. comm.
Mato/Oso Garbage Dump	41ZV152	Nueces	1	Steele and Olive 1989; Hester 1980
Castillo	41ZP2	Rio Grande	1	Cason 1952; Hester 1997
Beacon Harbor Lodge	41ZP7	Rio Grande	6+	Boyd n.d.; Wilson and Hester 1996
Hayne's Point	41ZP8	Rio Grande	3+	Boyd 1996c
---	41ZP10	Rio Grande	1	Steele and Olive 1989
Garcia	41ZP61	Rio Grande	2	Cason 1952
---	41ZP67	Rio Grande	3	Steele and Olive 1989
Old Zapata	41ZP85	Rio Grande	1	Boyd 1996b
Benevides Ranch	41ZP110	Rio Grande	2	Boyd 1997 pers. comm.
—	41ZP144	Rio Grande	1	Warren 1992
Arroyo Dolores	41ZP150	Rio Grande	1	Boyd 1997 pers. comm.
Arroyo San Bartolo North	41ZP254	Rio Grande	3+	Boyd 1996c
—	41ZP278	Rio Grande	3+	Perttula et al. 1996
—	41ZP280	Rio Grande	1	Perttula et al. 1996
---	41ZP281	Rio Grande	1	Perttula et al. 1996
—	41ZP316	Rio Grande	3+	Perttula et al. 1996
—	41ZP318	Rio Grande	1	Perttula et al. 1996
---	41ZP330	Rio Grande	1	Perttula et al. 1996
Arroyo Leon	—	Rio Grande	1	Perttula et al. 1996; Boyd 1997 pers. comm.
Near 41ZP86	—	Rio Grande	1	Boyd 1997 pers. comm.

(Continued)

Table 3. Archeological Sites with Burials in the Rio Grande Plain

Site Name	Trinomial	Drainage	MNI	Reference
1FR-N112	TAMP.	Rio Grande	1	Boyd 1997 pers. comm.
Arroyo Diablo	TAMP.	Rio Grande	1	Boyd 1996 a
Arroyo Golondrinas	TAMP.	Rio Grande	?	Boyd 1997 pers.comm
Arroyo la Hedionda	TAMP.	Rio Grande	1	Boyd 1977 pers.comm.
Gull Island	TAMP.	Rio Grande	1	Boyd 1977 pers.comm.
Infierno	TAMP.	Rio Grande	2	Boyd 1977 pers.comm.
La Plaga	TAMP	Rio Grande	2	Boyd 1997 pers.comm.
Lower Pt. Comfort	TAMP	Rio Grande	1	Boyd 1997 pers.comm.
Rio Alamo	TAMP	Rio Grande	1	Boyd 1997
Rio Salado	TAMP	Rio Grande	1	Taylor 1995a; Hester 2000
Quien Sabe	TAMP	Rio Grande	1	Boyd 1997 pers.comm.
Scissors Island	TAMP	Rio Grande	3	Boyd 1977 pers.comm.; Boyd 2000
Shumla Camp	TAMP	Rio Grande	1	Boyd 1997 pers.comm.
Southern Island	TAMP	Rio Grande	10+	Boyd et al. 1997
Toyah I	TAMP	Rio Grande	4	Boyd and Wilson 1996
#16	TAMP	Rio Grande	1	Boyd 1997 pers. comm.
#17	TAMP	Rio Grande	1	Boyd 1997 pers. comm.

Total Sites n = 85
Total Burials n = 438-457+

rockshelters (except for small rockshelters or alcoves solely used as places of burial) are found associated with repeated shelter occupation and use. Sinkhole and rock shelter burial sites occur only in Kinney, Medina, and Uvalde counties in the Rio Grande Plains region, but sinkhole burial sites also have a much broader distribution north and northwest of this region (see Turpin and Bement 1988:Figure 5) in Central Texas and the Lower Pecos areas. Large burial populations (> 25 individuals) have been found in several sinkhole burial sites (Bement 1994; Benfer and Benfer 1981; Givens 1968; Collins 1970; Scruggs et al. 1978; Turpin 1988).

Isolated single or multiple burials occur throughout both the Central Coastal and Rio Grande Plains regions (see Tables 2 and 3). Isolated burials are found in habitation deposits (for example, in burned rock middens), as well as in contexts separate from campsites and other habitation areas. Isolated burials seem more prevalent in non-riverine settings in the South Texas brush country, namely in the western part of the Rio Grande Plains (e.g., Hester 1964a, 1964b, 1965, 1966, 1969a, 1975, 1980:69-71).

This examination of specific characteristics of prehistoric burial sites will focus on the wide diversity in mortuary practices evident across the two archeological regions (and adjacent portions of other regions), but will do so within a sub-regional framework. Analysis of key or defining characteristics of the mortuary practices within Central and Southern Texas (discussed further below) indicate basic differences in burial treatment, the occurrence of cemeteries, the kinds of grave goods associated with individual burials, and evidence of violence for a number of different sub-regions. These differences appear to signify, at least in part and between certain sub-regions, the existence of different cultural traditions (and mortuary practices) of long-standing that cross-cut the different archeological regions defined by Mercado-Allinger et al. (1996). These sub-regions comprise the following:

- Rio Grande delta;
- inland Rio Grande;
- Loma Sandia, South Texas;
- South Texas;
- Karnes and Wilson counties in South Texas;
- the inland central coast;
- lands along and south of the Edwards Plateau, including the Blackland Prairie;
- Southern Edwards Plateau sinkholes;
- the Southern Edwards Plateau in general;
- the Central Coastal Plain;
- the South Central Coast or the central part of the Southern Coastal Corridor;
- and the lower Brazos and Colorado rivers.

Table 4 lists key mortuary attributes—principally associated grave goods—for the 12 different sub-regions within this broad area of Texas.

Rio Grande Delta

Burial sites in the Rio Grande delta (Cameron County and portions of Hidalgo and Willacy counties) are known that date as early as about 5000 years B.P. (Bousman et al. 1990), and this is an isolated burial found on a clay dune near the coast. Other isolated burial sites on lomas in the delta have been reported by Mallouf and Zavaleta (1979), Howard (1981), Day et al. (1981), and Eling et al. (1993). In most cases, burials and burial sites of recognizable character in this sub-region are affiliated with the Late Prehistoric Brownsville complex, dating around A.D. 1000-1600 (Hester 1969a, 1995b). Burial sites of this complex are found mainly along levees and higher topographic landforms on both sides of (see Prewitt 1974a), and adjacent to, the Arroyo Colorado, a relict distributary channel of the Rio Grande; they typically are not found in association with habitation sites (Collins et al. 1969; Hester 1969a, 1981). The distribution of Huastecan ceramics, marine shell artifacts, and obsidian (see Bousman et al. 1990:Figure 49b-d) closely correlate with the known locations of the Brownsville complex burial sites (see discussion in Hester 1995b), which includes the area from the mouth of the Rio Grande (and south into northeastern Tamaulipas) across the Holocene Rio Grande delta to Arroyo Colorado, and then just north of Arroyo Colorado.

Rio Grande delta cemetery and burial sites contain bundle, flexed, and multiple burials, along with cremations. Ocher pigments are frequently rubbed on the bones prior to their interment, and pieces of ocher and asphaltum have been noted as grave good offerings (Table 5). Large numbers of grave goods are characteristic of Brownsville complex burials, though the proportion of burials in the larger cemeteries that have associated grave goods is relatively low (Table 6) by comparison with other sub-region cemeteries. Grave goods include tubular bone beads (some made of human bone), perforated canine teeth (mainly *Canis latrans*), and a wide assortment of marine shell ornaments. Particularly notable among the marine objects are *Busycon* columella disc-shaped beads, Olive shell (*Oliva sayana*) beads,

Table 4. Key Mortuary Attributes in Central and Southern Texas Sub-regions

Attributes (in mortuary context)	Sub-regions 1*	2	3	4	5	6	7	8	9	10	11	12
Human bone artifacts	x	x									x	
Bone beads	x	x						x			x	
Perforated canine teeth	x	x										
O. sayana beads/tinklers	x	x										
Disc-shaped columella beads	x	x				x						x
Stone Pipes		x	x								x	
Biface caches		x	x					x				
Tortugas points		x	x								x	
Stemmed dart points			x		x	x	x	x			x	x
Antler racks			x	x		x	x	x	x			x
Evidence of violence	x	x		x	x		x				x	x
Large thin bifaces					x	x					x	x
Corner-tanged knives					x							x
Incised bone implements						x	x	x			x	x
Marginella beads							x					
Busycon pendants		x	x				x	x				x
Scallorn arrowpoint						x	x			x		
Mussel shell pendant							x					
Boatstone												x
Columella beads												x
Stone beads												x

x = abundant and/or regular grave good association

* 1= Rio Grande delta; 2 = inland Rio Grande; 3 = Loma Sandia, South Texas; 4 = South Texas; 5 = Karnes and Wilson counties in South Texas; 6 = Inland central coast; 7 = along and south of the Edwards Plateau, including Blackland Prairie; 8 = Southern Edwards Plateau sinkholes; 9 = Southern Edwards Plateau; 10 = Central Coastal Plain; 11 = South Central Coast; 12 = lower Brazos and Colorado rivers.

Table 5. Coastal Rio Grande Delta Burials and Sites

Graves/ Grave Goods	CF2	CF29	CF74	CF111	HG1+	HG1*	WY50	Anderson	HG 173	HG27
Bundle burial	x			x						
Flexed burial	x	x		x	x	x	x	x		
Multiple burial		x			x	x				
Cremation								x		
Human distal radii, severed	4									
Arrowpoints				5				x		
Ocher pigment	x	x	x		x	x				
Asphaltum	x									
Modified pebble		x								
Disc-shaped stone bead	x									
Huastecan pottery								x		
Bone beads	301				55	98			x	14
Bone pin				1			1			
Bone pendant						5				
Deer antler beam						1				
Perforated canine teeth	18					13			x	
Canine incisors (not perforated)							x			
Modified turtle carapace				2		?				
Conch pendant							1			x
Columella disc-shaped bead	2				12	11		x		38
Marginella beads	18							x		
Noetia shell beads	85									
Oliva sayana tinkler	3					2			x	5
Oliva sayana tinkler with perforated canine teeth	2									
Oliva sayana bead					60	7				36
Oliva sayana ornament		x								2

+ = Campbell and Frizzell 1949
* = Hester 1969a, 1969b

Table 6. Frequency of Grave Goods at Large Cemeteries

Region	Burials with Grave Goods/No. of Graves (Percent)
Inland Central Coast	
41VT94	5/30 (16.7%)
41VT1	64/234 (27.4%)
41VT12	0/13 (0%)
Central Coast	
41NU173	4/34 (11.8%)
41NU2	27-30/93 (29-32.2%)
Lower Colorado-Brazos	
41AU36, Group 1	7/61 (11.5%)
41AU36, Group 2	70/145 (48.3%)
41AU36, Group 3	1/10 (10%)
41AU36, Group 4	0/13 (0%)
41FB3	5/16 (31.9%)
41WH14	2/11 (18.2%)
41WH39	21/39 (53.8%)
Blackland Prairie, Central Texas	
41WM230	4/35 (11.4%)
41ML56	2/12 (16.7%)
41TV88	3/17-20 (15-17.6%)
41CM25	5/19 (26.3%)
41BX1	11/13 (84.6%)
South Texass	
41LK28	99/191 (51.8%)
Rio Grande Inland	
Southern Island	3/8 (37.5%)
Rio Grande Delta	
41HG1	2/15 (13.3%)*
41HG1	3/7 (42.9%)+
[41HG1	5/22 (22.7%)]
41CF2	4/18 (22.2%)

* Campbell and Frizzell 1949
\+ Hester and Ruecking 1969

Olive shell tinklers (usually found in association with the perforated canine teeth), as well as perforated *Marginella apicina* shell beads. *Olivella* beads and Olive shell beads and tinklers are found in quantities in mortuary contexts only in the Rio Grande delta and the inland Rio Grande sub-regions (Figure 2). Tools of bone and stone are not common in coastal Rio Grande delta burial sites.

Inland Rio Grande

A large number of prehistoric burial sites are known on the Rio Grande at the confluence with the Rio Salado, more than 100 miles inland from the Gulf of Mexico, in the Falcon Reservoir area (see Table 3). As presently known, the burial sites do not contain large numbers of individuals (generally less than 10 minimum number of individuals), and in many cases the human remains appear to be from burial sites scattered along the river terraces of the Rio Grande and its tributaries. The density of burial sites is in part a product of the extensive erosion of archeological sites at Falcon Reservoir, and the considerable looting and collecting activities that have occurred there (see discussion in Hester 1996b; Perttula et al. 1996; Boyd et al. 1997; Perttula and Boyd 1998). Nevertheless, the density of burial sites in the Falcon Reservoir area is consistent with an inland high-resource riverine setting at the confluence of two major river systems, while the scattered and small sizes of the burial sites seem congruent with ethnographically described foraging groups (see Larson et al. 1996:155). Comparable kinds of burials (probably Late Prehistoric in age) have been noted along the Rio Grande in the Laredo area, 50+ km upstream (see McGraw 1983).

Cemeteries and burial sites occur on Holocene-aged alluvial terraces and interfluvial ridges near the confluence of major arroyos with the Rio Grande, as do more isolated burials (Perttula et al. 1996:67; Boyd et al. 1997). The latter tend to occur in conjunction with extensive habitation deposits and features of Late Archaic to Late Prehistoric age once buried in Late Holocene alluvial deposits of the Zapata terrace, while the known cemetery sites are located away from the occupation sites. Burials are generally tightly flexed or bundled, sometimes with rocks placed over the body, and occasionally the burial pit fill will be marked by an ochre stain (Table 7). Several cairn burials have also been reported in the Falcon Reservoir area, including the Arroyo Golondrinas site with three cairns (James Boyd, 1997 personal communication), and one Late Prehistoric site on Arroyo Salinillas (Shumla Camp) had a cremated burial of at least one young to middle-aged adult (James Boyd, 1997 personal communication).

Burials and burial sites in the inland Rio Grande sub-region date to two major periods of time: ca. 850-550 B.C. and after A.D. 1000. The late Middle Archaic burials at sites such as 41ZP2 (Hester 1997), Toyah 1, and Rio Salado (see Table 7) have an assortment of lithic tools and bifaces—including triangular Tortugas points, Clear Fork gouges, and biface caches of Edwards chert (see Hester 1995b:Figure 20)—along with tubular stone pipes (Chandler 1996), and a variety of bone and marine shell beads and ornaments. These grave good associations closely parallel those from the contemporaneous Loma Sandia cemetery on the lower Frio River (Taylor 1995a; Taylor and Highley 1995) in the northern part of the Rio Grande Plains region, and support Hall's (1995b:645) suggestion that there were strong relationships between the peoples using the Loma Sandia site for burial purposes and peoples elsewhere to the south in the Rio Grande Plains. Burials and cemeteries of the Late Prehistoric period are apparently also quite common in the inland Rio Grande sub-region (see Boyd et al. 1997), and burial sites of this period have been identified at 41ZP7, 41ZP85 (Boyd 1997), and Southern Island (in Tamaulipas). The Southern Island site has a small cemetery (>10 individuals) dating to this period. Other possible Late Prehistoric burial sites in the Falcon Reservoir area include 1FR-N112 and Shumla Camp (James Boyd, 1997 personal communication).

The Late Prehistoric burial sites in inland Rio Grande settings were placed on the same sort of topographic landforms as the late Middle Archaic period burial locations. Burials were sometimes accompanied by quantities of tubular bone beads (see Table 7), perforated canine and human (at 41ZP7) teeth, bone tools, marine shell beads and pendants, Olive shell beads, and Caracara or Matamoros and Catan arrowpoints. In at least two cases, the Caracara arrowpoints may have been the cause of death for one burial at 41ZP7 (see Wilson and Hester 1996) and Burial 3 at Southern Island (Boyd et al. 1997). The rectangular shell pendants from Burial 1 at Southern Island (Boyd et al. 1997; see also Chandler and Kumpe 1995) had been found previously only in Brownsville complex sites in the Rio Grande delta and in coastal Tamaulipan sites (see MacNeish 1947, 1958). There are a number of additional similarities in the kinds of associated grave goods placed with the inland Rio Grande Late Prehistoric burial populations and the Brownsville complex groups at the mouth of the Rio Grande (see Table 4),

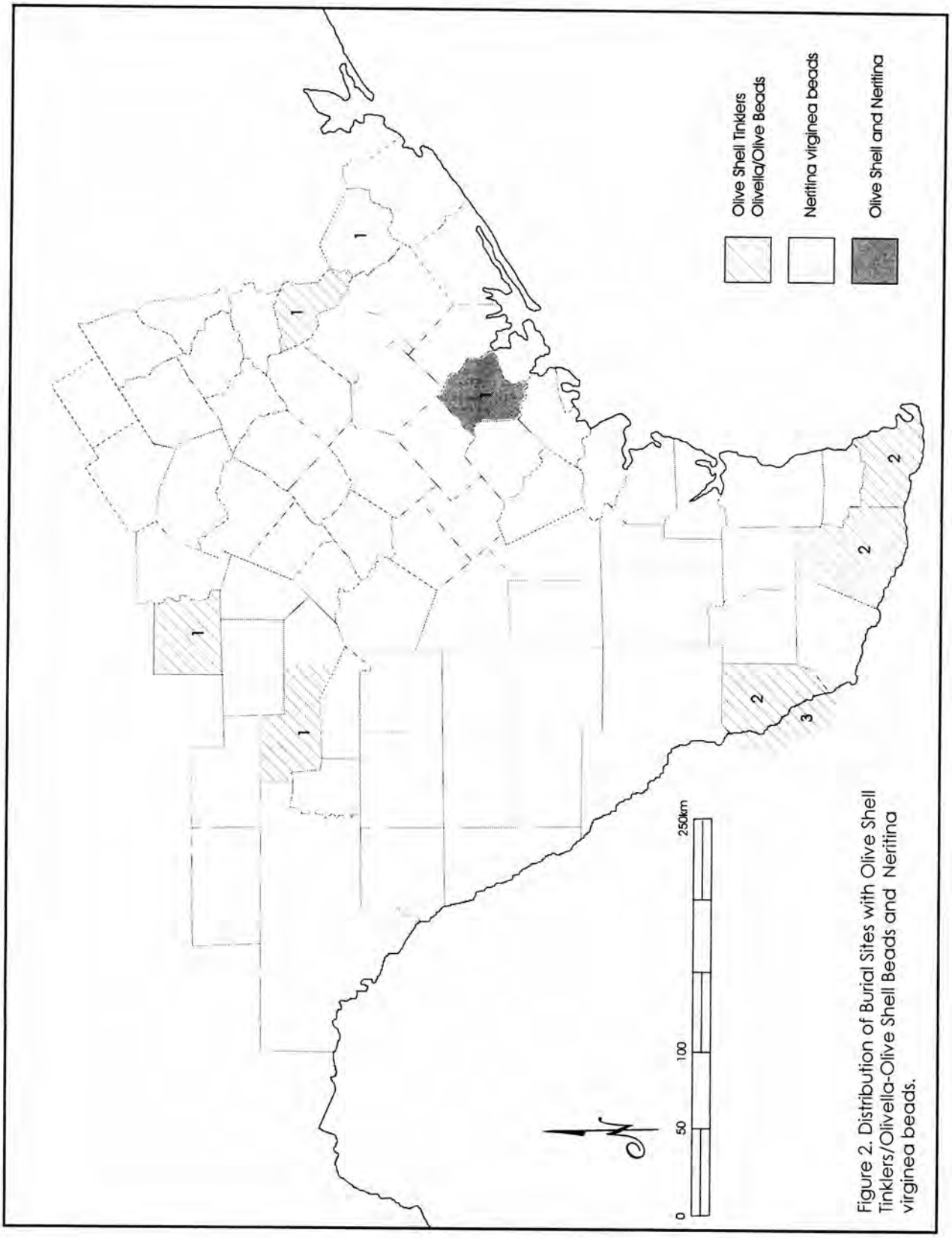

Figure 2. Distribution of Burial Sites with Olive Shell Tinklers/Olivella-Olive Shell Beads and Neritina virginea beads.

Table 7. Inland Rio Grande Burials and Sites

Graves/ Grave Goods	ZP2	ZP61	ZP254	ZP7-B*	ZP7-W/H**	ZP8	ZP85
Flexed			x		x	x	
Rocks over body							
Ochre Stain							
Dart Points							
Biface Cache				1			
DB Tool							
Clear Fork gouge	3						
Matamoros Point							
Abasolo Point							
Tortugas Point	5						
Caracara Point				3			13
Stone Pipe						?	
Stone Pendant						?	
Bone Beads	94	x		288			
Bone rasp (?)							
Antler billet							
Bone Awl							
Bone Tube (human)	1						
Bone Tube						1	
Perforated human teeth				7			
Perforated canine teeth							
Animal claws							
Mussel shell ornament							
Mussel shell beads						?	
Oliva sayana beads							
Oliva sayana pendant							1
Marine shell beads				8			
Rectangular shell pendant							

* Boyd n.d.
**Wilson and Hester 1996

(Continued)

Table 7. Inland Rio Grande Burials and Sites

Graves/		Toyah 1			Southern Island				
Grave Goods	B2	B3	B4	B1	B2	B3	B4	B5	B6
Flexed			x			x			
Rocks over body			x						
Ochre Stain			x						
Dart Points				1					
Biface Cache	27		50						
DB Tool				1					
Clear Fork gouge						1			
Matamoros Point				5					
Catan Point				1					
Tortugas Point									
Caracara Point					2	1*			
Other Arrowpoints					2				
Stone Pipe	1			1					
Bone Beads		79		516	1045				
Bone rasp (?)				5					
Antler billet				1					
Bone Awl				1					
Bone Tube (human)				1					
Perforated human teeth									
Perforated canine teeth				3	140+				
Animal claws				4					
Mussel shell ornament		1							
Oliva sayana beads	3			8					
Oliva sayana pendant									
Marine shell beads				20					
Marine shell pendant									
Rectangular shell pendant				4					

* embedded in vertebra

(Continued)

Table 7. Inland Rio Grande Burials and Sites

Graves/ Grave Goods	Southern B7	Island B8	Arroyo Diablo	Scissors Island	41WB20	Rio Salado
Flexed		x			x	
Semiflexed					x	
Cairn				x		
Rocks over body						
Ochre Stain						
Dart Points		1				
Biface Cache						
Large Biface						5
DB Tool						
Clear Fork gouge						
Matamoros Point						
Abasolo Point						
Tortugas Point						22
Caracara Point						
Stone Pipe						1
Bone Beads		550+		271	719	
Bone rasp (?)						
Antler billet						
Bone Awl						
Bone Tube (human)						
Perforated human teeth						
Perforated canine teeth						x
Animal claws						
Perforated mussel shell					80	
Mussel shell ornament						2
Oliva sayana beads						
Oliva sayana pendant						
Oliva sayana tinkler					x	
Marine shell beads	x		5			
Marine shell pendant	?					
Rectangular shell pendant						

and I suggest that the coastal and inland populations had regular interaction during the Late Prehistoric period, and probably also shared some religious practices and beliefs.

Bioarcheological studies of this population by Diane Wilson (see Wilson and Hester 1996; Boyd et al. 1997) indicate that their health was generally good, with a relatively diverse and high protein diet, as evidence for enamel hypoplasia and porotic hyperostosis was low or absent, and caries rates were also low. Some individuals were also relatively long-lived, compared to mean age of death figures compiled by Reinhard et al. (1989) for South Texas prehistoric populations, further implying a successful hunting-gathering subsistence adaptation.

Loma Sandia Cemetery

The Loma Sandia cemetery site (41LK28), near the confluence of the Frio, Atascosa, and Nueces rivers in a riverine setting in the northern Rio Grande Plains, is one of the more distinctive mortuary populations in either the Rio Grande Plains or the Central Coastal Plains (see the thorough descriptions of mortuary features and associated grave goods in Taylor and Highley 1995). With a burial population of more than 200 individuals, a formalized cemetery was used for the interred in a 144 m^2 area over at most a 300-year period in the late Middle Archaic (ca. 850-550 B.C.). The burials were primarily flexed, but also included individuals in semi-flexed and extended positions, as well as three cremations (Table 8), and were regularly accompanied by clusters of grave goods. Both males and females of all ages had accompanying grave goods, with similar sorts of items, although males exclusively had thin bifaces, antler racks, modified mussel shells, unifaces, and smoothed flakes, while females only had sharks teeth, asphaltum, Morhiss, Abasolo, and Pedernales points (Highley 1995:Table 89). These grave goods included a wide assortment of stone, bone, and shell objects, some of local origin, but others acquired from coastal South Texas and Central Texas Archaic groups (Highley et al. 1995:519; Highley 1995:659-660).

Certainly the most distinctive aspect of the grave good associations from the Loma Sandia site compared to almost all other Rio Grande Plains and Central Coastal Plains burial sites is the large number of stone tools associated with the burial features (see Table 8). These include cores, stemmed and triangular-shaped dart points, thin and thick bifaces, biface caches (found only with male burials), distally-beveled tools, grinding stones and slabs, abraders, along with smoothed/ rounded flakes from rattles (?), and unmodified chert, silicifed wood, sandstone, and tuff. Also among the grave goods are tubular stone pipes—found as well in late Middle Archaic mortuary contexts along the south central Coast and in inland Rio Grande (Figure 3)—antler racks and bone tools, mussel shell, and a few marine shell pendants, discs, and columella segments and shells (see Table 8).

South Texas

Elsewhere in the Rio Grande Plains outside of the Nueces and Rio Grande settings, burials are apparently widely scattered and usually not accompanied by a wide assortment of grave goods (Table 9; see also Hester 1980, 1999a). Two large cemeteries have also been reported in this part of South Texas, however, namely the Deadman's Tank site (41AT9) in the Atascosa River drainage and an unnamed and poorly recorded hilltop cemetery in the upper Nueces River drainage in southern Dimmit County (Hester 1995a; Taylor 1995a). Information on burial and grave good characteristics is not available, unfortunately, from these two cemeteries.

A variety of burial positions have been documented in the South Texas Late Archaic and Late Prehistoric burial sites, principally flexed and extended, although a cremation was documented at 41DM12 (see Table 9 and Hester 1989b). One notable characteristic of burial sites in the northern and western portions of the Rio Grande Plains (as well as in burial sites on the southern Edwards Plateau and a few burials at Loma Sandia, see Taylor 1995b:402) is that some burials had flat rocks or grinding slabs placed over or near the skull of the interment, and in two possible cases the individual may have been buried in a rock-lined pit. Similar burial treatment is documented principally in the Central Texas sub-region (Figure 4). The few grave goods that have been reported include projectile points, grinding stones, mussel shell ornaments, and a cache of land snails (see Table 9). Small, tubular bone beads were among the grave goods at 41ZV152 on Palo Blanco creek in southwestern Zavala County (Hester 1980:Figure 4.7a-h).

Wilson and Karnes County cemeteries

A distinctive Late Archaic period mortuary tradition existed in the western portions of the Central Coastal Plains along the San Antonio River (see Mitchell et al. 1984; Huebner et al. 1996; Lovata 1996, 1997). Here, relatively small cemeteries with flexed and extended burials have been documented from five sites, and

Table 8. South Texas: Loma Sandia Burials and Grave Goods+

Burial Position and Type (n=97)

Extended (n=1)
Semi-flexed (n=4)
Flexed (n=62)
Flexed (?) (n=20)
Burned (n=7)
Cremation (n=3)

Artifacts Associated with Burial Features

Cores	27	Unmod. chert cobbles	7	Whole conch shell	2
Thick Biface	7	Unmod. petrified wood	3	Shell pendant	6
Abasolo point	8	Unmod. sandstone	6	Shell disc	2
Andice point	1	Unmod. tuff	1	Bipointed columella	2
Lange point	16	Gypsum crystal	1	Columella segments	2
Morhiss point	4	Red jasper pebble	1		
Pedernales	1	Quartzite fragments	2		
Tortugas	78	Ocher/Ocher stains	x*		
Thin biface	35	Kaolin	x		
Distally-beveled tool	48	Asphaltum	x		
Uniface	5	Antler tine	x		
Trimmed flake	18	Antler rack	x		
Smoothed/rounded		Shark teeth	72+		
flakes (rattles?)	2	Stingray teeth	3		
Biface cache	3	Bone rasp	1		
Hammerstone	21	Incised bone tool	1		
Grinding slab	14	Pointed bone tool	11		
Mano	37	Deer ulna tool	1		
Ground stone	4	Tubular pipe mouthpiece	1		
Grooved abrader	1	Modified mussel shell	4		
Tubular pipe	8-10	Unmodified mussel shell	15+		

+ From Taylor 1995b
* x=present

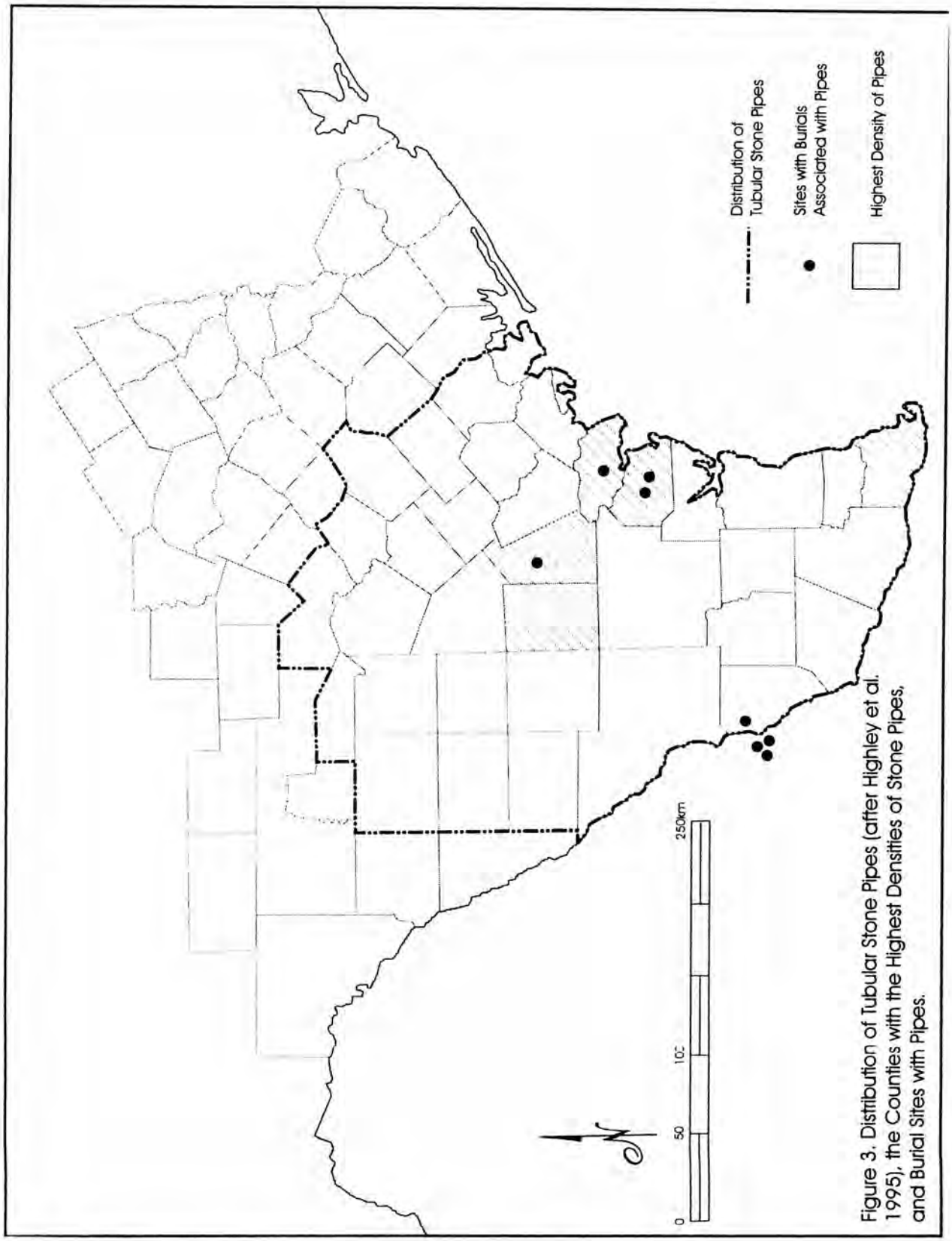

Figure 3. Distribution of Tubular Stone Pipes (after Highley et al. 1995), the Counties with the Highest Densities of Stone Pipes, and Burial Sites with Pipes.

Table 9. South Texas Burials and Sites

Graves/ Grave Goods	UV20	JW9	LK21	MC150	DM12	DM1	DM28	DM60	Buckhorn Ranch	Light Ranch	Asherton	Riley
Flexed	x		x	?				x		?	x	x
Sitting position												
Semi-flexed												
Extended							?		x			
Cremation					x							
Flat rock near skull							x					
Metate over skull											x	
In rock-lined pit						?					x	
Dart point			3*				?					
Large thin biface												
Scallorn point												1
Arrow point						?						
Corner tanged knife												
Drill												
Biface	2											
Preform												
Mano												
Abrader												
Paint pallette												
Quartz crystal												
Polished pebble								x				
Stone gorget												
Stone bead					1							
Bone awl	1											
Deer skull and antler												
Antler tine												
Conch shell tool		1										
Mussel shell ornament		x			x							
Land snail cache	x											
Snail shells	?											
Asphaltum												

* = points were the apparent cause of death (Hester 1989a)

(Continued)

Table 9. South Texas Burials and Sites

Graves/ Grave Goods	WN29	WN73	KA23	KA89	KA102	41AT9	Walker (Dimmit County)
Flexed			x	x	x	x	
Sitting position		x					
Semi-flexed					x		
Extended			x				
Cremation							
Flat rock near skull							
Metate over skull							
In rock-lined pit							x
Dart point	x		13	1*	3		
Large thin biface		x	5		x		
Arrowpoint							
Scallorn							
Corner-tanged knife			5		3		
Drill			2				
Biface							
Preform			9				
Mano				1			x
Abrader			2				
Paint Pallette			7				
Quartz crystal			1				
Polished pebble			2				
Stone gorget			1				
Stone bead							
Bone awl							
Deer skull and antler						x	
Antler tine			x				
Conch shell tool							
Mussell shell Ornament							
Snail shells							
Land snail cache							
Asphaltum			x				

* Points were the apparent cause of death

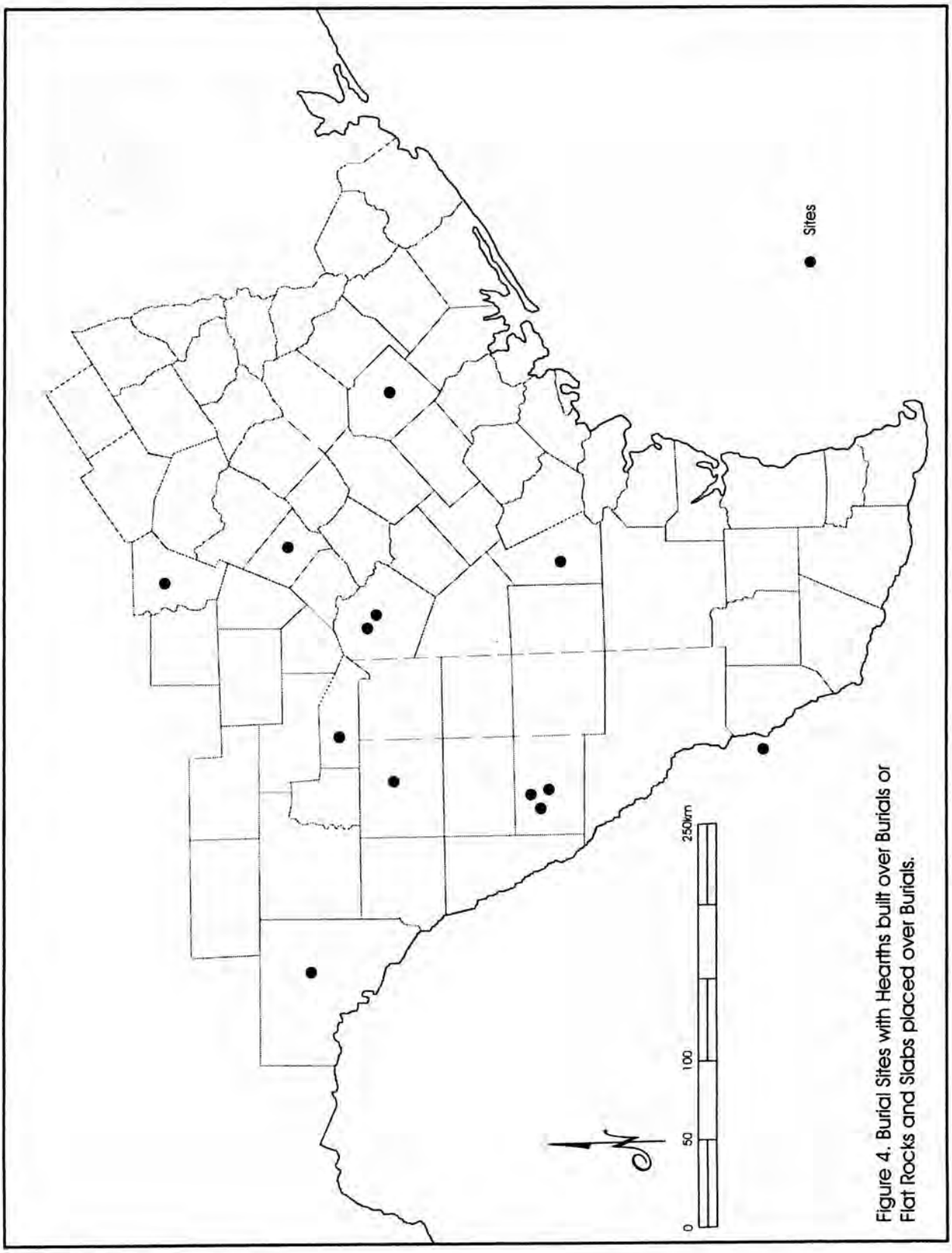

Figure 4. Burial Sites with Hearths built over Burials or Flat Rocks and Slabs placed over Burials.

burials in two of the sites (41KA23 and 41KA89) have evidence of violence. Noteworthy grave good associations in these cemeteries include numbers of Ensor and Marcos dart points, large thin bifaces of Edwards chert, and corner-tanged knives of the same material. A juvenile and an adult at the Silo site (41KA102) had corner-tanged knives; the juvenile also had large triangular bifaces as grave goods (Lovata 1996, 1997). Elsewhere in Central and Southern Texas, the corner-tanged knives are found in mortuary context only in Late Archaic contexts at the Ernest Witte site along the lower Brazos River (see Table 4). One adult male burial at the Rudy Haiduk site (41KA23) contained a wide assortment of stone tools, along with paint palettes, a quartz crystal, a stone gorget, and polished pebbles (see Table 9), possibly signifying this individual's special position or status within this Late Archaic group as a flintknapper.

Stable carbon and nitrogen isotope analyses of the Late Archaic burial from 41KA89 indicate that this individual's diet was terrestrially based with more C4/CAM plant foods (such as prickly pear and other carbohydrate-rich plant foods) than was the case for contemporaneous populations on the lower Guadalupe or lower Brazos rivers (Huebner et al. 1996:19; see also Huebner and Comuzzie 1992; Huebner and Boutton 1992; Dockall 1997a). Huebner et al. (1996:19) go on to suggest on the basis of these isotope samples that "subsistence patterns in the Late Archaic of South Texas were different from those of hunter-gatherers of the Central Coastal Plain and the Gulf Coast." The burials at the Shrew site (41WN73) had considerable tooth wear from a coarse diet of plant foods, but no significant skeletal pathologies (Steele and Searles 1988:101).

Inland Central Coastal Plain

A number of burial sites are known along the inland central Coastal Plain, principally on the lower reaches of the Guadalupe River. Certainly the most important burial site is Morhiss (41VT1), which contained approximately 250 burials placed in a large midden mound occupied about the same time in the Archaic as the Loma Sandia and Ernest Witte cemeteries (Hester 1996a). A single date of 2410 ± 50 B.P. has been obtained from a flexed burial at the Morhiss site (Dockall 1997a, 1997b). Burials in this cemetery were bundle, flexed, and extended, with multiple burials, and Taylor (1995a:680-681) suggests that secondary bundled burials were the earliest kind at Morhiss (possibly predating any of the interments at Loma Sandia), followed temporally by flexed (either fully or partially flexed), and extended position burials. Flexed burials were most common (Dockall 1997a:Table 2). Birmingham and Huebner (1991), however, argue that extended burials were most common in Late Archaic contexts in the inland central Coastal Plain, and predominantly flexed in Late Prehistoric times, although this is contradicted by the radiocarbon date from Morhiss. Late Archaic and Late Prehistoric burials on the lower Guadalupe river—including the Vic Urban, Texas West Indies, and Blue Bayou cemeteries (Table 10)—were primarily flexed or extended (either supine or prone).

A substantial proportion (27 percent) of the burials at the Morhiss site had associated grave goods (see Table 6), primarily including marine shell beads and pendants (see Campbell 1976; Dockall and Dockall 1994, 1996), and an assortment of bone and stone tools (Dockall and Dockall 1999; see Table 10). Although the proportion of individuals with marine shell grave goods is low in comparison to contemporaneous cemeteries on the lower Colorado-Brazos rivers and at Loma Sandia (Table 11), particularly abundant and well-represented were *Marginella* beads (n=2910), *Oliva sayana* shells, *Busycon* pendants, and disc-shaped columella beads. Nerite shell beads have been found in mortuary contexts only at Morhiss and the Ferguson site (41FB42) on the lower Brazos river.

Stone and bone tools were also relatively common grave good associations, as were deer antler and bone ornaments (bone and snake vertebra beads, see McClure 1990). Boatstones were among the Morhiss grave goods (Dockall 1997a:50). One individual, probably a flintknapper, had five antler billets, an antler tine flaker, an antler tip, a uniface, an abrader, long bone pins, a needle, and tool fragment, a lump of asphaltum, and a chert knife (Dockall 1997a:26-27; Dockall and Dockall 1999). Incised bone pins at Morhiss, as well as the Texas West Indies site (41VT9), share decorative styles/pin designs (and presumably social relationships) with similar bone pins found in Late Archaic graves along the lower Brazos-Colorado rivers and the Corpus Christi Bay area of the southern coastal corridor (see discussion in Birmingham and Huebner 1991; Hall 1989:170; Hester and Corbin 1975). At the later (ca. 2000-700 B.P.) Blue Bayou and Vic Urban (41VT12) cemeteries in the inland Central Coastal Plain subregion, grave good associations are infrequent (see Table 6). These include Scallorn arrow points, deer antler, bone tools, unmodified cockle shells, and a few freshwater mussel shell pendants (see Table 6).

Stable isotope analyses of Late Archaic and early

Table 10. Inland Central Burials and Sites

Graves/ Grave Goods	DW242	DW244	TWI	VT12	Pat Dunn	LC4	Morhiss	Blue Bayou
Flexed			x	x			x	x
Semi-flexed			x				x	x
Bundle			x	x			x	x
Extended			x				x	x
Multiple Burial				x			x	x
Fire built above							x	
Ochre							x	
Scallorn points								5
Other arrow point								2
Dart point			x				x	
Large biface			x			x		
Utilized flake								4
Knife							12	
Drill							2	
Scraper							13	
Chopper							1	
Gouge							10	
Mano							2	
Bone beads		x					x	
Snake vertebra beads						x		
Incised bone Implements			7				x	
Deer antler	x						x	3
Bone tools							14	3
Busycon pendant							6	
Nerite bead							19	
Marginella bead							2910	
Columella disc-shaped beads			10		5		35	
Oliva sayana shells							80	
Oliva sayana bead							2	
Periwinkle shell			1					
Cockle shell			1					12
Mussel shell pendant								2
Unmodified Mussel shell						x	7	
Asphaltum							x	x

Table 11. Association of Shell Grave Goods with Burials

Region	Graves with Shell Artifacts/ No. of Graves (percent)
Rio Grande Delta	
41HG1	2/15 (13.3%) *
41HG1	3/7 (42.9%) +
[41HG1	5/22 (22.7%)]
41CF2	4/18 (22.2%)
Ayala	5/22 (22.7%)
Floyd Morris	3/18 (16.7%)
Rio Grande, inland	
Southern Island	2/8 (25%)
Central Coast	
Berryman	2/34 (5.9%)
inland central Coast	
Morhiss	22/250 (8.8%)
Vic Urban	0/13 (0%)
Blue Bayou	2/30 (6.7%)
Lower Colorado-Brazos	
Ernest Witte	45/145 (31.0%)
Crestmont	13/39 (33.3%)
Bowser	4/16 (25%)
Central Texas, Blackland Prairie	
Loeve-Fox	4/35 (11.4%)
Asa Warner	0/12 (0 %)
Pat Parker	1/17-20 (5-5.8 %)
South Texas	
Loma Sandia	26/191 (13.7%)
Edwards Plateau	
Olmos Dam	6/13 (46.2 %)

* Campbell and Frizzell 1949
+ Hester and Ruecking 1969

Late Prehistoric burials at the Blue Bayou site (Table 12) indicate these populations had terrestrial diets with a high reliance on C3 plant and animal foods, and although close to the coast, relied little on marine foods (Huebner and Comuzzie 1992:122). Ricklis (1996:139) accordingly suggests that the effective exploitation areas for southern coastal corridor groups at these periods "were confined to a narrow coastal zone as they were during later Rockport times."

Dockall's (1997a:iv) analyses of skeletal disorders, demography, and body size dimorphism in the Morhiss and Ernest Witte populations "indicate that these populations along the inland portion of the coastal plain of Texas during the Archaic Period were well-adapted to their environment." At Morhiss, the Late Archaic populations had good health, with low amounts of infectious diseases, degenerative joint diseases (mainly affecting the hands and feet), and metabolic disorders. Only one individual had endemic treponematosis, and other stress-related disorders (i.e., porotic hyperostosis and cribra orbitalia; see discussion in Dockall 1997a: 190, 278), including linear enamel hypoplasias, were uncommon. Dental disorders suggest that the Morhiss population had a relatively low carbohydrate diet, this being based on the low caries rates, moderate tooth wear, and low abscess rates. Slightly higher decayed-and-missing indices and antemortem tooth loss rates at Morhiss when compared to the Ernest Witte population suggests that the Archaic people buried at Morhiss consumed more prickly pears or other foods with significant amounts of sugar-rich carbohydrates (Dockall 1997a:224). However, these dental disorders are much higher in the Lower Pecos region during Late Archaic times, where the diet is thought to have based primarily on the consumption of succulent desert plants (Hartnady and Rose 1991).

Three of the individuals at the Morhiss site had suprainion lesions of the occipital, which are usually associated with cradleboarding or other kinds of cranial modification of children. Dockall (1997a:119-120) notes the rarity of any form of cranial modification among hunter-gatherer groups; examples from sites other than Morhiss include only the Lower Rockwall site in North Texas and the Caplen site on Galveston Island. Another interesting bioarcheological characteristic of the Morhiss population is the presence among three individuals of lingual surface attrition of the maxillary anterior teeth (Dockall 1997a:258). According to Dockall, Morhiss and the nearby Blue Bayou population are the only two sites currently known in North America that have this dental attrition; this form of attrition is common in coastal populations in Central and South America, where it is associated with the processing of certain plant roots by drawing them across the surface of the teeth.

Bioarcheological analyses of the skeletal remains from the Blue Bayou cemetery further indicate the people buried there had "good overall health and quality of subsistence," with low levels of "both skeletal and dental pathologies" (Huebner and Comuzzie 1992:127; see also Colby 1997). These conditions are generally consistent with the findings of Powell (1988) for Coastal Plain burial samples (mainly Late Archaic and Late Prehistoric burials from the lower Colorado-Brazos rivers), although the Native Americans comprising the Blue Bayou cemetery population on the lower Guadalupe river apparently experienced lower rates of stress and chronic infection. A further comparison by Powell (1994:347-361) of paleopathologies between upper Texas Coast burial populations and the Blue Bayou site also affirms the good health conditions of the Blue Bayou population, who experienced much lower frequencies of anemic responses, abnormal bone loss and lesions, degenerative joint diseases, incidences of trauma, and treponemal infections than the upper Texas Coastal groups.

South Central Coast

Late Archaic and Late Prehistoric burial sites and large prehistoric cemeteries are common along the south central Coast or southern coastal corridor, particularly in the Baffin/Oso subarea between Baffin Bay and Aransas Bay (Mercado-Allinger et al. 1996:65; Cox and de-France 1997; Ricklis 1997:10). The Oso Creek area on the south side of Corpus Christi Bay has a notable concentration of large cemetery sites, including the Callo del Oso site (41NU2) with at least 173 burials, and the Oso Dune site (41NU37). Most of the burials at these sites were flexed, although extended burials and cremations have also been reported (Taylor 1995a:680). A Late Archaic-age flexed adult female burial recently excavated at the Callo del Oso site had two liters of a yellow sandy sediment placed on the upper torso, and a small fire was then built immediately above or on the burial, scorching the skull and upper arm and leg bones (Ricklis 1997:46 and Figure 25). Both activities are interpreted by Ricklis (1997) as evidence of rituals associated with the interment of the adult female.

Grave good associations include a variety of stone, bone, and marine shell artifacts, such as tubular stone pipes, incised bone pins similar to those found in

Table 12. Stable Isotope Analyses from the Study Area, and Comparative Samples from Other Regions

Area	Stable Carbon	Stable Nitrogen	Reference
Lower Brazos			
41AU36	-19.2 ± 0.7	--	Huebner and Boutton 1992
Lower Guadalupe			
41VT94	-18.7 ± 0.81 (11)*	+10.5 ± 1.04 (11)	Huebner and Comuzzie 1992
Central Texas Coast			
Corpus Christi sites	-13.0 ± 1.78	+10.4 ± 1.08	Huebner 1994
41NU173	-13.9 ± 0.62 (5)	--	Huebner et al. 1996
South Texas			
41KA89	-16.9 (1)	+8.5	Huebner et al. 1996
41BX917	-12.1 (1)	--	Tennis 1994
Edwards Plateau			
41KR241	-15.8 ± 0.97 (16)	+8.1 ± 0.85 (16)	Bement 1994
22	-16.9 ± 0.4 (3)	+8.67 ± 0.69	
24	-15.9 (1)	+7.5	
25	-16.1 (1)	+7.1	
26	-16.2 ± 0.3 (2)	+7.75 ± 0.3	
29	-16.2 (1)	+6.9	
31	-15.9 ± 0.5 (3)	+7.7 ± 0.4	
35	-15.2 (1)	+9.0	
36	-14.75 ± 0.55 (2)	+7.95 ± 0.55	
38	-14.3 ± 0.6 (2)	+9.2 ± 0.4	
Lower Pecos			
Various sites	-14.0 ± 1.23 (6)	+11.1 ± 2.8 (6)	Huebner 1991
Seminole Sink	-16.8 ± 3.3 (8)	--	Turpin 1988

(Continued)

Table 12. Stable Isotope Analyses from the Study Area, and Comparative Samples from other regions

Area	Stable Carbon	Stable Nitrogen	Reference
Rio Grande			
41WY50 (coastal)	-9.7 (1)	+9.6	Bousman 1990
41WY113 (inland)	-15.7 (1), -6.1 (apatite)	+7.6	Bousman 1990
41WY67 (inland)	-23.0 (1), -5.8 (apatite)	+6.2	Bousman 1990
41CF29 (coastal)	-15.9 (1)	--	Eling et al. 1993
COMPARATIVE SAMPLES			
Caddoan Area			Perttula 1996
Late Archaic-Early Caddoan	-21.95 to -19.78 (25)	--	
A.D. 1100-1300	-13.56 ± 0.73 (2) and -11.57 ± 1.42 (3)	--	
A.D. 1300-1450	-14.4 ± 1.23 (6)	--	
A.D. 1450-1650	-14.8 ± 1.35 (28)	--	
post-A.D. 1650	-14.2 ± 1.17 (18)	--	
Upper Texas Coast			
41GV66			Huebner 1994
Late Preceramic/Early Ceramic	-11.4 (1)	+10.6	
Initial Late Prehistoric	-11.17 ± 0.63 (3)	+10.4 ± 0.3 (3)	
Final Late Prehistoric	-13.7 (1)	+9.5	
Protohistoric	-15.2 ± 0.5 (2)	+10.2 ± 0.4 (2)	
Early Historic	-14.2 ± 1.6 (3)	+10.6 ± 0.6 (3)	
Southern Jornada			Hard et al. 1996
Archaic	-16.5 (1)	--	
A.D. 300-1100	-9.5 (1)	--	
A.D. 1200-1400	-7.8 ± 0.48 (6)	--	

* Sample size

mortuary contexts on the lower Colorado-Brazos and Guadalupe rivers (see Hester and Corbin 1975:Figure 2k-l), and marine shell ornaments and beads (Table 13). A series of T-shaped shell pendants have been recovered in Late Archaic contexts in Area 5 at the Oso Dune site (Cox and deFrance 1997:Figure 8). Other bone artifacts included as grave goods in Late Archaic contexts are large triangular pieces made from bison scapula that were decorated with incised lines and drilled pits (Hester 1980:Figure 4.15). Interestingly, the decorated bone example from 41NU29 has the same shape and decoration as the *Busycon* pendants in burial sites along the lower Brazos-Colorado rivers (Hall 1981; Black et al. 1992), in the Blackland Prairie (Lukowski 1988; Vereen 1993) below the Edwards Plateau, at Morhiss on the lower Guadalupe (Dockall and Dockall 1996), and at the Loma Sandia site in the Nueces River basin (Dreiss 1995).

Cemetery sites along Baffin Bay to the south (41KL14 and 41KL39) also had tubular bone beads and human bone artifacts, including bone tubes from severed long bone shafts (some covered with ocher pigment) and stone pipe bone mouthpieces (Hester 1969b). Several of the bone tubes from 41KL39 had horizontal and diagonal incised lines on them that have stylistic parallels with the incised bone pins found in many Late Archaic burial sites (see Hester 1969b:Figure 2c-d). Hester (1969b: 328) further notes that human bone artifacts in South Texas sites are mainly found on the large cemetery sites in the region.

Central Coastal Plain

In the central coastal plain north of the coastal prairie, along the middle reaches of the Colorado and Brazos rivers, burial sites of either Late Archaic or Late Prehistoric age are not particularly common. Those that are known generally include flexed and bundle burials, although Late Archaic cremations are known (e.g., Bowman 1991), with few associated grave goods. Burial populations may range as large as 8-15 individuals (Table 14). Bioarcheological data from the Frisch Auf! cemetery (41FY42) indicates that the Late Prehistoric population buried there experienced periodic episodes of stress and infection (Huebner and Powell 1989; see also Wesolowsky and Ellzey 1969).

Along and South of the Edwards Plateau

By contrast with the central Coastal Plain, Late Archaic and Late Prehistoric burial sites are well-represented in the archeological record for the area along and south of the Edwards Plateau, including the Blackland Prairie (Table 15; see also Figure 5). In particular, Late Prehistoric Austin phase cemeteries in the Central Texas Prairie are a distinctive feature of the sub-regional archeological record (e.g., Prewitt 1981). Individuals were buried primarily in flexed positions, but semi-flexed burials and cremations are also known. Several burial sites had graves where individuals were covered with rock slabs, which is a form of burial treatment noted principally on burial sites in the southern Edwards Plateau and the western part of the Rio Grande Plains (see Figure 4). Rates of metabolic and infectious diseases were relatively low among burial populations in the Central Texas prairie compared to surrounding regions, implying good health, although the mean age of death (28.9 years) was lower in the Central Texas sub-region (Reinhard et al. 1989:Tables 20-24).

With the exception of the Late Archaic Olmos Dam (41BX1) burials, where 85 percent of the individuals had associated grave goods (Lukowski 1988; see also Table 6)— especially numerous were antlers and antler racks—grave goods were not otherwise commonly found with prehistoric interments in Central Texas Blackland Prairie settings. The kinds of grave goods noted in this sub-region range from various utilitarian stone tools to bone and shell ornaments. *Busycon* pendants were well represented, as were freshwater mussel shell pendants (see Table 15). Burials at the Olmos Dam and Loeve-Fox (41WM230) cemeteries have evidence of violence, including a small dart point (possibly a Godley or a Palmillas) found within the skull of an adult male at Olmos Dam (Lukowski 1988:29 and Figure 18c), and Scallorn arrowpoints with six separate flexed burials at Loeve-Fox (Prewitt 1974b, 1982).

Southern Edwards Plateau

Sinkhole sites in the southern extremes of the Edwards Plateau (and the lower Pecos area) were used throughout much of the Archaic as cemetery sites for adults, juveniles, and children. The oldest known sinkhole cemetery site, Bering Sinkhole (41KR241), was used for burial disposal as early as 7000 years ago (utilizing uncorrected and uncalibrated radiocarbon dates, see Table 1). Sinkhole cemeteries containing a few individuals to more than 60 individuals have been documented in Kerr, Uvalde, Medina, Val Verde, Edwards, Kendall, Real, Williamson, and Kinney counties (Table 16 and Figure 6). Many of the sinkholes are in relatively inaccessible vertical shafts (see Turpin

Table 13. South Central Coast Burials and Sites

Graves/Grave Goods	NU29	NU37	KL14	KL30	SP78
Extended					x
Cremation		x			
Tortugas point		x			
Dart points	5	x			
Ensor point					1
Biface	2				
Large biface					1
Utilized flake	3				
Hammerstone	1				
Stone pipe	x		2	1	
Human bone artifacts			x	x	
Bone beads		x		100	
Bone incised pin					2
Bone ornaments	3	x			
Marine shell ornaments	x	x			
Marginella beads					x
Bivalve stack*					x
Conch shell objects					1
Shark's tooth		1			

* Bivalves with worn edges, believed to have been used as a burial pit scoop (Hester and Corbin 1975).

Table 14. Central Coastal Plain Burials and Sites

Graves/ Grave Goods	41FY42	41CD37	41CD62	41BU17*
Flexed	x	x	x	x
Bundle		x		x
Dog burial over body		x		
Multiple burial		x		x
Burned human bone				x
Isolated skull				x
Scallorn point	2			
Antler tine	1			
Unmodified mussel shell	1			
Polished silicified wood pebble	1			

* Bowman 1985

Table 15. Burials and Sites Along and South of the Edwards Plateau, including Blackland Prairie

Graves/ Grave Goods	Cibolo Creek*	Granberg+	Olmos Dam	41CM25	41TV88	Loeve Fox	41HY29**	41BT1
Flexed	x	x	x (8)	x	x	x	x	x
Semi-flexed			x (2)	x	x	x		
Multiple burials		x					x	
Bundle						x		
Cremation						x		
Ochre/Ochre stains			x (8)	x				
Slabs over body	x						x	x
Hearth over body							x	x
Dart Point			1#		x			
Scallorn arrowpoint					x	x++		
Bifaces			2	x				
Core			1					
Chert cobbles			6					
Groundstone slab			1					x
Stone gorget		1		x				
Boatstone				x				
Quartz crystal							x	
Hematite pebble							x	
Antler beams & rack			67+		x			
Bone beads	x		5					
Bone tools			1					
Incised bone tool								x
Incised bone pendant								4
Mussell shell pendant			33+	x				
Unmodified mussell shell			x			x		
Tortoise shell rattles								2-5
Conch pendant	1	?	6	x	x	x		
Columella beads				x		3		
Columella dangles			4					

\# Found in braincase
\+ Schuetz 1966
++ Associated with the death of 6 individuals
* Vereen 1993
** Weir 1979

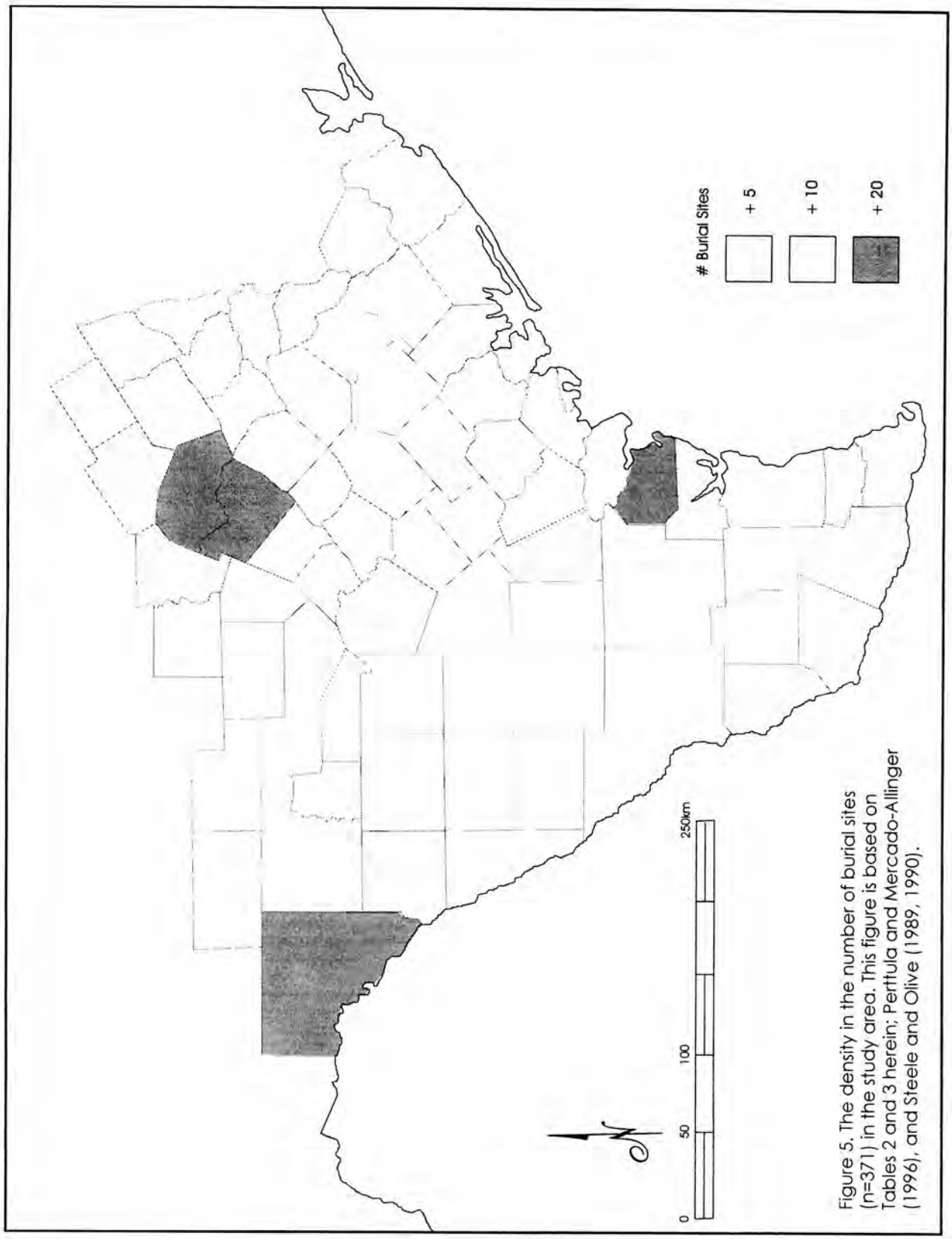

Figure 5. The density in the number of burial sites (n=371) in the study area. This figure is based on Tables 2 and 3 herein; Perttula and Mercado-Allinger (1996), and Steele and Olive (1989, 1990).

Table 16. Southern Edwards Plateau Burials and Sites, including sinkholes and rockshelters

Graves/ Grave Goods	KR241 I	KR241 II	KR241 III	UV4	KY25	KY26	KY27	BX26	ME30	BN63
Dropped	x	x	x	x	x			x		
Laid-out	x	x	x	x				x	x	
Cremation	x	x	x							
Bundle			x							
Overlain by grinding slab										x
Dart Points	x	x	x	x				x	x	
Biface cache		x								
Bifaces			x							
Stone pendant								x		
Bone beads	x	x						x		
Incised bone implement		x								
Bone awl		x	x							
Bone needle			x							
Deer antler		x				x	x			
Turtle carapace			x							
Mussel shell		x	x				x			
Olivella shell beads		x								
Conch pendant			x							

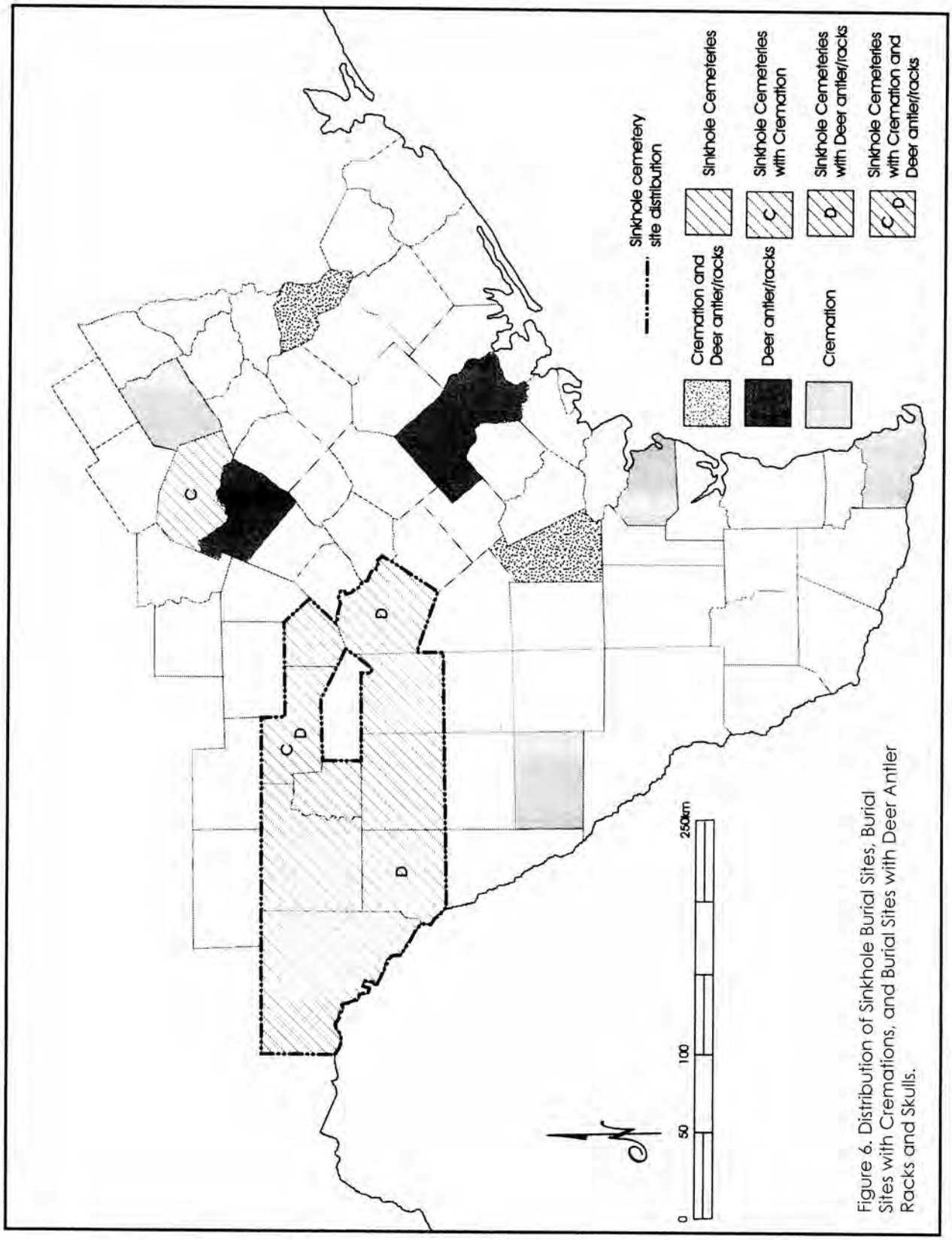

Figure 6. Distribution of Sinkhole Burial Sites, Burial Sites with Cremations, and Burial Sites with Deer Antler Racks and Skulls.

and Bement 1988), and the burials were dropped through an opening into the shaft. Others had accessible walls or ledges where burials were laid out. As Bement (1994) notes, most of the sinkholes used for mortuary purposes were isolated from habitation sites.

At the Bering Sinkhole in Early Archaic contexts (Unit III deposits), burials of adults and subadults were dropped into the sinkhole as well as apparently laid out; cremations and bundle burials were also documented (Bement 1994). In addition to stemmed dart points, a biface, and a few bone tools included with the mortuary deposit, freshwater mussel shells and two *Busycon* shell pendants were also burial goods; the *Busycon* pendants represent the earliest evidence in a mortuary context for contact and trade between coastal populations and Central Texas groups. Bioarcheological evidence suggests relatively low levels of stress among the Bering Sinkhole population at this time, and caries rates and stable isotope and nitrogen values point to a diet of desert succulent CAM plants (such as *Yucca* and *Agave*) and C3 meats.

Between about 5000 and 2500 years B.P. (primarily including Unit II deposits), the mortuary use of the Bering Sinkhole is characterized by significant amounts of shed antler, antlered deer skulls, and burned antler offerings (Bement 1994:45), along with the burial and cremation of adults and subadults. In the same context were dart points, incised bone pins, bone bead concentrations (particularly in deposits estimated to date from ca. 2300-4000 B.P.), a biface cache, freshwater mussel shell, and *Olivella* shell beads (see Table 16). Although ritual use of the sinkhole apparently intensified during this period—and contacts were wide-ranging with groups along the Rio Grande, the central coast, and the lower Colorado-Brazos rivers—the bioarcheological information suggests the people using the Bering Sinkhole at this time were suffering from chronic stress, had a less healthy diet, and were consuming more carbohydrate- or sugar-rich C4 plant foods. In particular, Bement (1994:90) points to high frequencies of enamel hypoplasias as indicating increased chronic stress after about 4000 B.P. to about 2000 B.P.

After ca. 2000 B.P., there was a greater reliance on C3 plants and meats in the diet of the Bering Sinkhole individuals, and burial rituals were less elaborate, with fewer burials being placed or dumped in the sinkhole. Few grave goods were included with the mortuary deposit dropped or laid out in the sinkhole, namely a dart point and bone bead concentrations.

Other sinkhole cemetery sites known in the southern Edwards Plateau were not apparently accompanied by many grave goods (see Table 16 and Turpin and Bement 1988:Tables 1 and 2). If the trends in mortuary use at Bering Sinkhole are any indication, it is suspected that most of the other known sinkhole cemetery sites only began to be used during and after the latter part of the Late Archaic period. Rockshelters were also used as burial sites in the southern Edwards Plateau about this time as well (see Table 16). For instance, at 41KY27, early Late Prehistoric burials in this rockshelter had distinctive patterns of tooth loss and resorption that have been related to high caries rates associated with a diet of desert succulents rich in sugar-laden carbohydrates (Bement 1987:20; Marks et al. 1988; Hartnady and Rose 1991).

Lower Colorado-Brazos rivers

There is a recognizable cluster of burial and cemetery sites in the coastal prairie along the lower Colorado-Brazos rivers in Austin, Fort Bend, and Wharton counties (Table 17). Certainly the best known and largest cemetery site is Ernest Witte (41AU36) (Hall 1981), but other large cemeteries—mainly Late Archaic in age—include, among others, Goebel (41AU1), Big Creek (41FB2), Crestmont (41WH39), and Bowser (41FB3) (Duke 1981; Fleming and Fleming 1959; Fleming 1960; Hall 1981; Patterson 1995, 1996; Patterson et al. 1993b, 1998; Vernon 1989). While efforts to date these cemeteries has not been extensive (see Table 1), radiocarbon dates from Bowser and Ernest Witte suggest that the establishment of cemeteries in this sub-region began at the onset of the Late Holocene period—around 4000 years B.P.—with the most intensive use of cemeteries occurring mainly between ca. 3000-1500 years B.P.

The earliest burials at Ernest Witte (Group 1) were primarily extended interments (some with multiple individuals) with few grave goods, mainly pointed bone tools (see Table 17). The most elaborate period of mortuary ritual at Ernest Witte, and indeed at burial sites throughout the lower Colorado-Brazos river area, was during the latter part of the Late Archaic period. Here, many (about 48 percent) of the extended and semi-flexed Group 2 burials were accompanied by large numbers of grave goods (see Tables 6 and 17), particularly pointed and incised bone tools, *Busycon* pendants and columella beads, *Olivella* beads, unmodified antler and antler racks, corner-tanged knives of Edwards chert, biotite schist powder from the Llano Uplift in Central Texas, and finished boatstones and gorgets of Arkansas Ouachita Mountains raw materials (see Rolingson and

Table 17. Lower Brazos-Colorado Burials and Sites

Graves/ Grave Goods	Ernest Witte Group 1	Group 2	Group 3	Group 4	WH39
Extended	25	61			x
Semi-flexed	2	17	6	3	x
Flexed	1	1	1	8	x
Bundle		2			
Cremation	1	3			
Multiple burial	x	x	x	x	
Ensor point		2#			
Fairland point		2#			
Kent point		2#			
Dart points	1	5 (3#)	7		3 (1#)
Corner-tang biface		2			
Large Biface					1
Groundstone gorget		1			
Jasper pebbles		4			
biotite schist		x			
Boatstone		6			
Perforated rock			1		
Abrader		1			2
Red Ocher stain		x			x
Deer antler		1			8
Perforated deer antler					1
Unmodified antler and antler racks/skulls		x (8)			
Bone bead		8			
Pointed bone tools	13	54	1		10
Incised bone tools		34			6
Triangular-shaped bone pendant		9			5
Buyscon pendant		86			17
Conch whorl					1
Busycon columella					3
Columella beads		199			84
Columella disc-shaped beads		13			1
Columella atlatl weight		1			
Olivella beads		62			
Marine shell beads					4
Marine shell ornaments ornaments					2
Lithospermum seed bead					45
Spiny pen shell pendant		1			
Washboard mussel tool		1			
Stingray spines		2			
Fossil bone		x			

Point thought to be the cause of death

(Continued)

Table 17. Lower Brazos-Colorado Burials and Sites

Graves/ Grave Goods	AU1	AU37	AU55	WH14	WH44	FB2	FB3	FB13	FB42
Extended	x	x			x		x	x	x
Semi-flexed	x	x	x	x	x			x	x
Flexed	x	x		x					
Bundle							x		x
Ensor point			x						
Fairland point									
Kent point									
Dart points	x#			x#				x	1#
Corner-tanged biface									
Large biface			2						
Core			1						
Biface			1						
Groundstone gorget									
Jasper pebbles									
Biotite schist									
Boatstone					x		x		
Stone bead			x						14
Perforated rock									
Abrader	x								
Red Ocher stain	x			x			x		
Deer antler			1						
Perforated deer antler					x				
Unmodified antler and antler racks/skulls									
Bone bead	x			1					
Pointed bone tools	x	1	1						
Bone point		1							
Incised bone tools	x		1				3	x	
Triangular-shaped bone pendant				x					
Busycon pendant	x	1	1		x	x	3	x	
Conch whirl									
Busycon columella									
Columella beads	x		1	4			1		
Columella disc-shaped beads					x				210
Columella atlatl weight									
Conch columella tools			2						
Olivella beads									
Oliva sayana ornament		1							
Neritina beads									40
Marine shell beads									
Marine shell ornaments									
Lithospermum seed beads									
Spiny pen shell pendant									
Washboard mussel tool									
Stingray spines									
Fossil bone									

Point thought to be the cause of death

Howard 1997).[1] Grave goods from contemporaneous lower Colorado-Brazos river sites not seen in the Group 2 burials at Ernest Witte include *Lithospermum* seed beads, large thin bifaces, conch columella tools (cf. Highley et al. 1988), stone beads and Neritina shell beads (Patterson et al. 1993a); the latter have also been found in a mortuary context at the Morhiss site (Dockall and Dockall 1996).

The differences in styles of incised bone pins from Ernest Witte and other lower Colorado-Brazos river burial sites have been suggested by Hall (1989:170) to be informative about "social relationships among the individuals or bands responsible for their manufacture," as well as the "movements and social structure of the band." If this is the case, the close similarities in stylistic designs of the incised bone pins between Late Archaic burial sites on the lower Colorado-Brazos rivers and the lower Guadalupe, as well as with burial and habitation sites on Corpus Christi Bay (Walley 1955; Wingate and Hester 1972; Hester and Corbin 1975; Hall 1989:Figure 8; Ricklis 1990, 1997; Birmingham and Huebner 1991), hint at the scope of these social relationships among hunter-gatherer groups in the Central Coastal Plains and southern coastal corridor.

The acquisition of finished groundstone artifacts of exotic raw material, other items of non-local cherts, and the large size of the *Busycon* pendants (perhaps larger than could be obtained along the Texas coast, being obtained instead from the eastern Gulf of Mexico), from the Ernest Witte cemetery site led Hall (1981:290-309) to propose the participation of this population in long-distance trade (described as an import-export system) relationships with aboriginal groups in the eastern U.S. The long-distance trade relationship ended about ca. A.D. 500/600, after which the small burial populations at Ernest Witte were interred with few grave goods of any kind. Johnson and Goode (1994:38), and Johnson (1983:207-208) before them, further speculate that this long-distance trade reflects the spread of religious cults or ideas from aboriginal populations in the midwest and eastern U.S.

Bioarcheological data from Group 2 at the Ernest Witte site suggest that the Late Archaic population was well adapted and had good health, particularly compared to coastal populations or Archaic groups living along and on the southern Edwards Plateau (Dockall 1997a). They had low rates of chronic infectious diseases or endemic treponemal infections (4 or 5 MNI), and only 12 percent of the individuals at Ernest Witte evidenced stress indicators or anemic disorders. By comparison, 9.8 percent of the population at the Morhiss site had anemic disorders, but coastal strand populations had much higher rates ranging between 22-48 percent. Dockall's (1997a) analysis of the dentition (low number of caries and rates of abscesses, along with moderate wear) further indicates that the individuals buried at the Ernest Witte site had a low carbohydrate diet (also confirmed by stable carbon analyses; see Table 12). Linear enamel hypoplasia (LEH) rates of 25 percent at Ernest Witte are comparable to the Morhiss population, but much lower than noted in the Lower Pecos area in Archaic times (Marks et al. 1988; Reinhard et al. 1989) or at the Bering Sinkhole site, where LEH rates indicate that between 45-66 percent of the people experienced episodes of severe stress during childhood (Dockall 1997a:253). In general, the LEH data from Ernest Witte and Morhiss "suggest that the coastal prairie environment occupied by the people [of the two sites] provided a better source of diet and reduced disease" (Dockall 1997a:254).

Evidence of pathologies and infections in the Late Archaic Crestmont site (41WH39) cemetery population suggests that this group suffered from iron deficiency anemia and osteomyeletis, as well as periods of nutritional stress in infancy and early childhood (Vernon 1989:55). The Peikert (41WH14) burials (Kindall 1980; Hudgins and Kindall 1984) also had a high degree of skeletal pathologies (Copas 1984). Isotope data from Ernest Witte site indicates they had a terrestrial diet based on C3 plant and animal foods (Huebner and Comuzzie 1992:198). Powell (1988:261) has also posited that these lower Colorado-Brazos river groups in general had moderate stress levels and very high rates of chronic infection (see also the discussion in Reinhard et al. 1989:423 and Table 129)—although this is contradicted by Dockall's (1997a) analyses of the Group 2 skeletal remains from Ernest Witte. Powell inferred this bioarcheological evidence as perhaps the product of a seasonal aggregation of a number of smaller hunter-gatherer groups living in these riverine settings. Levels of stress and general stress were much lower, however, when compared to individuals buried in sites along the Edwards Plateau and Central Texas prairie, but higher than aboriginal populations living along the Texas coast in Late Archaic and Late Prehistoric times. Dockall's (1997a:265) broader consideration of inland coastal and coastal strand (Galveston Island and vicinity) populations suggests that coastal strand populations had higher rates of anemia and stress, which she attributes to higher parasite loads, and less mobile, more population-dense groups along the coastal strand. With respect to the Ernest Witte population living on the lower Brazos,

"they probably did not occupy a region long enough for poor sanitation or contaminated water to result in parasitic infections and/or high rates of diarrhea that affected large portions of the group [on the coastal strand]" (Dockall 1997a:265).

At least five of the burial sites on the lower Colorado-Brazos rivers have individuals (both male and female) that died a violent death from dart point wounds: Ernest Witte, Peikert, Crestmont, Goebel, and Ferguson (see Tables 17 and 18). The dart points include Ensor, Fairland, Kent, and Gary types. The overall frequency of violent death, however, in these lower Colorado-Brazos river groups was apparently roughly comparable to that seen in several other sub-regions within Central and Southern Texas, except along the Blackland Prairie of Central Texas (Reinhard et al. 1989, 1990), where evidence of violence was significantly higher (in Late Prehistoric times).

Review of Archeological Sites and Patterns

The appearance of prehistoric cemeteries in Central and South Texas has been suggested by many archeologists to relate closely to increases in population sizes and population packing within the region in the Middle and Late Archaic periods (after ca. 900 B.C.), and to the establishment of group territories and territorial boundaries (Hester 1969a, 1981; Prewitt 1985; Story 1985; Collins 1995; Hall 1995a, 1995b, 1998; Taylor 1995a, 1995b, 1998; Patterson 1996; Ricklis 1996). With the establishment of territories, we may expect permanent settlements within them, beginning with a partition of space for habitation, foraging ranges, and the placement of long-term ritual facilities (i.e., cemeteries) as territorial markers (Charles and Buikstra 1983; Zedeno 1997). Territorial consolidation, the securing of land controlled and being used by a group (or groups) of related and/or allied individuals, should also see increased ritual activities as a form of group maintenance and integration, and thus the intensive use of cemeteries would be expected to occur during periods of territorial consolidation.

These suggestions about territories and territory-specific groups have in turn been related to variability in the resource structure of the archeological regions in Central and Southern Texas, specifically to the contrast between low-density and high-density plant and animal resource areas within the regions, perhaps best stated by Hall (1995b:634):

> ...it is hypothesized that prehistoric cemeteries concentrate in the areas of highly aggregated food resources and that these exceptionally well-endowed resource areas are embedded within broader areas of lower primary productivity.

Such contrasts in resource structure are compelling, because as will be discussed below, burial sites and cemeteries are not evenly spread across the two regions, and burial practices are quite diverse from one area to another at the same times (cf. Taylor 1995a). Furthermore, burial sites and cemetery sites do not continue to be used for the same periods of time within each of the different sub-regions. Thus, the temporal and spatial distributions of cemeteries and burial sites, and the sizes and general character of the burial populations, provide a means to evaluate expectations about resource structure (cf. Hall 1998), prehistoric Native American land use, and the appearance and continued use of burial sites in the Rio Grande Plains and Central Coastal Plains.

Of basic concern, then, is to consider the resource structure of the two regions (see Tomka et al. 1997), with the presumption, following Hall (1995b:634), that cemeteries were established in those areas of high-density resource areas, and with the well-endowed resource areas constituting the core of broad group territories. This consideration of the character and variability in resource structure in the Rio Grande Plains and the Central Coastal Plains is based on modern conditions, but constitutes a reasonable proxy for prehistoric conditions since available paleoenvironmental evidence for Central and Southern Texas suggests that essentially modern conditions were established about 4000 years ago (Tomka et al. 1997). The analysis of resource structure—focusing on primary productivity, predictable and perennial water sources, and the heterogeneity of habitats—clearly partitions the two archeological regions into three broad resource zones: (a) the western and southern parts of the Rio Grande Plains (see also discussion in Kibler 1994:60); (b) the eastern and northern Rio Grande Plains; and (c) the Central Coastal Plains. Ranking these areas by primary productivity, predictable perennial water, and vegetation habitat heterogeneity shows that the western and southern parts of the Rio Grande Plains has the lowest primary productivity of resources, unpredictable perennial water (outside of the Rio Grande valley), and a relatively homogeneous vegetation habitat, while conversely, the Central Coastal Plain has the highest

Table 18. Sites with Evidence of Violence in and adjacent to the Study Area*

Late Prehistoric

1. 41NU173 (1 MNI with arrowpoint)
2. 41WM230 (6 MNI with Scallorn arrowpoints)
3. 41ML46 (2 MNI, 1 with 7 Perdiz arrowpoints, 1 with Perdiz and Darl (?) points) (Wright et al. 1997; Watt 1956)
4. Southern Island (1 MNI with Caracara arrowpoint)
5. Mass Burial (Meroney 1936) (1 MNI with Perdiz point lodged between vertebrae)
6. Sheep Shelter (Stephenson 1970) (1 MNI with arrowpoint between vertebrae; Austin phase)
7. Greenwade Shelter (Stephenson 1970) (1 MNI with Scallorn arrowpoint)
8. Shackleford County (Forrester 1951) (1 MNI with Scallorn arrowpoint in right humerus)
9. Harrell (multiple interments with Scallorn arrowpoints)
10. Fall Creek (1 MNI with 2 untyped arrowpoints in chest cavity)
11. 41MM19 (1 MNI with Scallorn arrowpoint)
12. 41VT94 (1 MNI with Scallorn arrowpoint in contact with thoracic vertebra)
13. 41SP1 (1 MNI (?), Scallorn arrowpoint)
14. 41ZP7 (1 MNI, Caracara arrowpoint)
15. 41GV66 (1 MNI, Scallorn arrowpoint)

Archaic

1. 41VT1 (3 MNI with dart points)
2. 41WH14 (2 MNI with dart points)
3. 41WH39 (1 MNI with dart point)
4. 41AU36, group 2 (5 MNI with dart point wounds)
5. 41AU1 (1 MNI, Gary point in ribs)
6. 41AT9 (1 MNI, dart point in skull)
7. 41FB42 (1 MNI with dart point)
8. 41KA23 (1 MNI?, dart point reported in skull)
9. 41KA89 (1MNI, Fairland point in chest cavity)
10. 41BX1 (1MNI, dart point in brain case)
11. 41LK21 (1 MNI, 3 Ensor in rib cage)
12. 41WM7 (1 MNI, Darl and Ensor points in skull and ribs, respectively)
13. 41HG1 (2 MNI, 1 with dart point embedded in vertebra, 1 with fracture on frontal bone)
14. Bee Cave (2 MNI, see Turpin and Bement 1988:Table 3)
15. Iraan Museum (2 MNI, Frio point embedded in pelvis)
16. 41TV128 (Dart point)
17. 41NU29 (Dart point)
18. 41KR241 (1 MNI, Travis point)

* Compilation from Prewitt 1974b; Turpin and Bement 1988; Hester 1989a; Huebner and Comuzzie 1992; Patterson et al. 1993a; Bement 1994; Powell 1994; Boyd et al. 1997; and McWhorter 1997, 2000.

primary productivity, predictable and abundant perennial water resources, and a heterogeneous vegetation habitat of woodlands and prairies; the eastern and northern Rio Grande Plains is intermediate.

Within these three areas, finer distinctions can be made based on the occurrence of highly productive resource patches and ready sources of water. River bottomlands and bordering valley and upland habitats are the most productive and reliable plant and animal food resource areas within the two archeological regions, with exploitable resources distributed in broad linear bands (see the discussion in Potter and Black [1995:35]). This is followed by ecotonal areas in the Central Coastal Plains where the major river valleys (including the Guadalupe, San Marcos, Lavaca, Navidad, and Colorado) cross the Fayette prairie and stretches of Oak-hickory woodlands. Inland non-riverine areas are drier, lacking ready sources of surface water, and are devoid of perennial riverine resources. Instead, they are characterized by clumped or patchy seasonal food resources (i.e., prickly pear fruits). From the most predictable and most productive, to the least predictable and least productive, we may rank habitats within the Central Coastal and Rio Grande Plains as follows:

- Riverine settings, Central Coastal Plains (Brazos, Colorado, and Guadalupe rivers);
- Riverine settings, Wilson and Karnes counties (San Antonio River);
- Riverine settings, northern Rio Grande Plains (Nueces River);
- Riverine settings in the Lower Rio Grande valley, southern Rio Grande Plains;
- Mixed Woodlands and Prairies, central and eastern Central Coastal Plains;
- inland, non-riverine settings (southern Rio Grande Plains away from the Rio Grande), and upland settings in the northern Rio Grande Plains and the northern portions of the Central Coastal Plains

Although outside the Rio Grande Plains and Central Coastal Plains regions considered herein, littoral/offshore habitats along the Southern Coastal Corridor are also considered highly productive resource areas (e.g., Ricklis 1996). They are comparable to riverine settings in both archeological regions.

The working assumption is that the areas ranked highest in primary productivity, perennial water sources, and habitat heterogeneity, would be those where prehistoric population growth and population densities were the most substantial. Linking this to territorial establishment and consolidation, cemeteries would be expected to appear with regularity in these areas before any others, and to continue in use longer and more intensively. As populations in these settings reached thresholds of growth and overall size difficult to sustain without definable and controllable territories, "group claims to resources should begin to emerge" (Story 1985:44).

Distributional and Locational Patterns of Archeological sites

I recognize 12 sub-regions within Central and Southern Texas that apparently have distinct (although closely affiliated in some instances) prehistoric mortuary practices, including the: Rio Grande delta; inland Rio Grande; Loma Sandia, South Texas; South Texas; Karnes and Wilson counties in South Texas; the inland central coast; lands along and south of the Edwards Plateau, including the Blackland Prairie; Southern Edwards Plateau sinkholes; the Southern Edwards Plateau in general; the Central Coastal Plain; the South Central Coast or the central part of the Southern Coastal Corridor; and the lower Brazos and Colorado rivers. No presumption is made here that these sub-regions necessarily represent group territory areas, or have any direct relationship to any single group of Native Americans. Rather, these sub-regions are meant to illustrate, under less than ideal circumstances and with an incomplete data set, both the apparent and considerable variability and diversity in prehistoric mortuary practices that characterizes the broader region, as well as convey the geographic (if not territorial) associations between and among these different mortuary practices. These geographic associations ultimately can then be related back to the consideration of prehistoric resource structure discussed above.

Burial sites are widely dispersed across much of Central and Southern Texas (see Figure 5), with notable clusters of cemeteries and burial sites along the south central Coast (between Baffin Bay and Copano Bay, particularly along the lower Nueces River and Corpus Christi Bay), the lower Pecos River, the Blackland Prairie and Edwards Plateau in the Colorado and Brazos river basins, the inland central Coastal Plain (along the

lower Guadalupe River), and along the Rio Grande near its confluence with the Rio Salado, draining the mountains of northeastern Mexico. Burial sites occur in each of the sub-regions discussed above, but are relatively uncommon in only three of the sub-regions: (1) South Texas outside of the Nueces and Rio Grande valleys; (2) the Southern Edwards Plateau; and (3) the central Coastal Plain (see Figure 5).

Looking at the number of prehistoric Native American burials recorded and/or reported (n=2709) from the 371 burial sites in this area of Central and Southern Texas (see Tables 2 and 3; data in Perttula and Mercado-Allinger 1996; Steele and Olive 1989, 1990; Steele et al. 1999), the densest concentrations of burials occur in the following sub-regions (Figure 7):

(1) the south central Coast;
(2) the lower Brazos and Colorado rivers;
(3) the inland central Coastal Plain;
(4) the Nueces, Atascosa, and San Antonio river valley areas of South Texas (including Live Oak, Atascosa, and Bexar counties); and
(5) along and south of the Edwards Plateau, including the Blackland Prairie.

Other notable areas with relatively high numbers of prehistoric burials include the Lower Pecos, the lower Rio Grande, and a sinkhole cemetery in the southern Edwards Plateau.

With the exception of the sinkhole cemetery at Bering Sinkhole (Bement 1994), and rockshelters in the eastern part of the Edwards Plateau (Bell County), each of the dense clusters of burials are found in those riverine settings in the Central Coastal Plains and the northern and eastern parts of the Rio Grande Plains (see Figure 7) that are considered to be high- or super-abundant resource areas. Moreover, in the inland central coastal Plain and the southern coastal corridor, burial sites and large cemeteries were present in both Late Archaic and Late Prehistoric times, implying that these sub-regions were able to sustain considerable hunter-gatherer populations, and that "the people continued to operate in fixed territories" (Hall 1995b:647). In other sub-regions, large cemeteries characterize either the Late Archaic (Loma Sandia, Southern Edwards Plateau sinkholes) or the Late Prehistoric (inland Rio Grande and the Rio Grande delta) period, but not both periods.

On the other hand, substantial portions of the inland or brush country sections of the northern and western Rio Grande Plains, and much of the Central Coastal Plains archeological region itself, do not have archeological sites with many (or indeed any) burials. Specifically in the Central Coastal Plains, it is the Oak Woodlands and Blackland Prairie (i.e., the Fayette prairie) vegetation communities that have few sites with burials, while the Central Texas Blackland Prairie had numerous cemeteries dating to the Late Prehistoric period. This does not correlate with estimated resource potentials discussed above. Instead, it appears to be the case on the basis of the distribution of burial sites that the ecotonal character of this sub-region was better suited to exploitation by groups to the north and south, rather than specifically included within the boundaries of territorially-specific groups.

This distributional information, when assessed in conjunction with shared key mortuary attributes such as burial sites with evidence of violence; burial sites with quantities of bone beads; burials with human bone artifacts (see Hester 1969b); or incised bone tools as grave goods (see Hall 1981, 1989; see also Table 4) for each of the sub-regions of Central and Southern Texas examined here, supports the ready spatial partitioning of this broad area into four or five (if the Lower Pecos area is included) different mortuary traditions (Figure 8). The highest density of burials on archeological sites occurs along the general axis of Bexar, Atascosa, Live Oak, and Nueces counties, essentially separating sites found in the northern riverine settings of the northern Rio Grande Plains and the south central Coast from those in the Rio Grande delta and inland Rio Grande to the south, and two other clusters of riverine burial sites in the inland coastal plain (along the lower Guadalupe and the lower Colorado-Brazos rivers) (Figure 9).

There is good reason to consider the Nueces River, then, as the primary recognizable boundary, zone, or territorial limit between aboriginal groups in this part of Central and Southern Texas. This was a boundary that probably existed as early as about 3000 years ago, when cemeteries began to be established in riverine settings. Given its primacy, and relationships of trade and exchange between groups both north and south of the Nueces River, this helps account for much of the considerable assortment and diversity of grave goods seen in the burials at the Loma Sandia site that originated throughout the broader region (cf. Highley 1995).

The final mortuary tradition area, referred to in Figure 9 as the Central Texas area or sub-region, refers primarily to Late Archaic and Late Prehistoric burials in

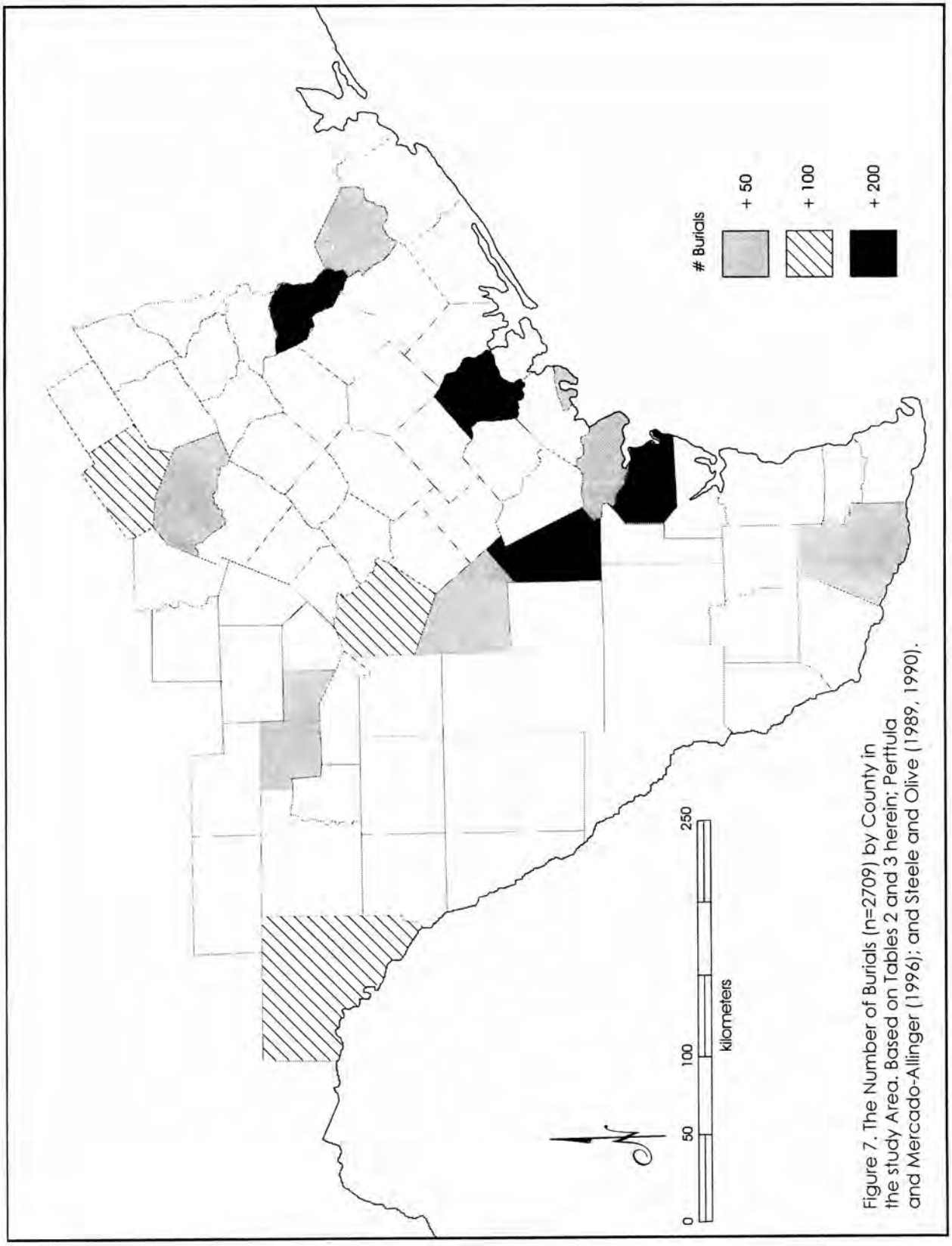

Figure 7. The Number of Burials (n=2709) by County in the study Area. Based on Tables 2 and 3 herein; Perttula and Mercado-Allinger (1996); and Steele and Olive (1989, 1990).

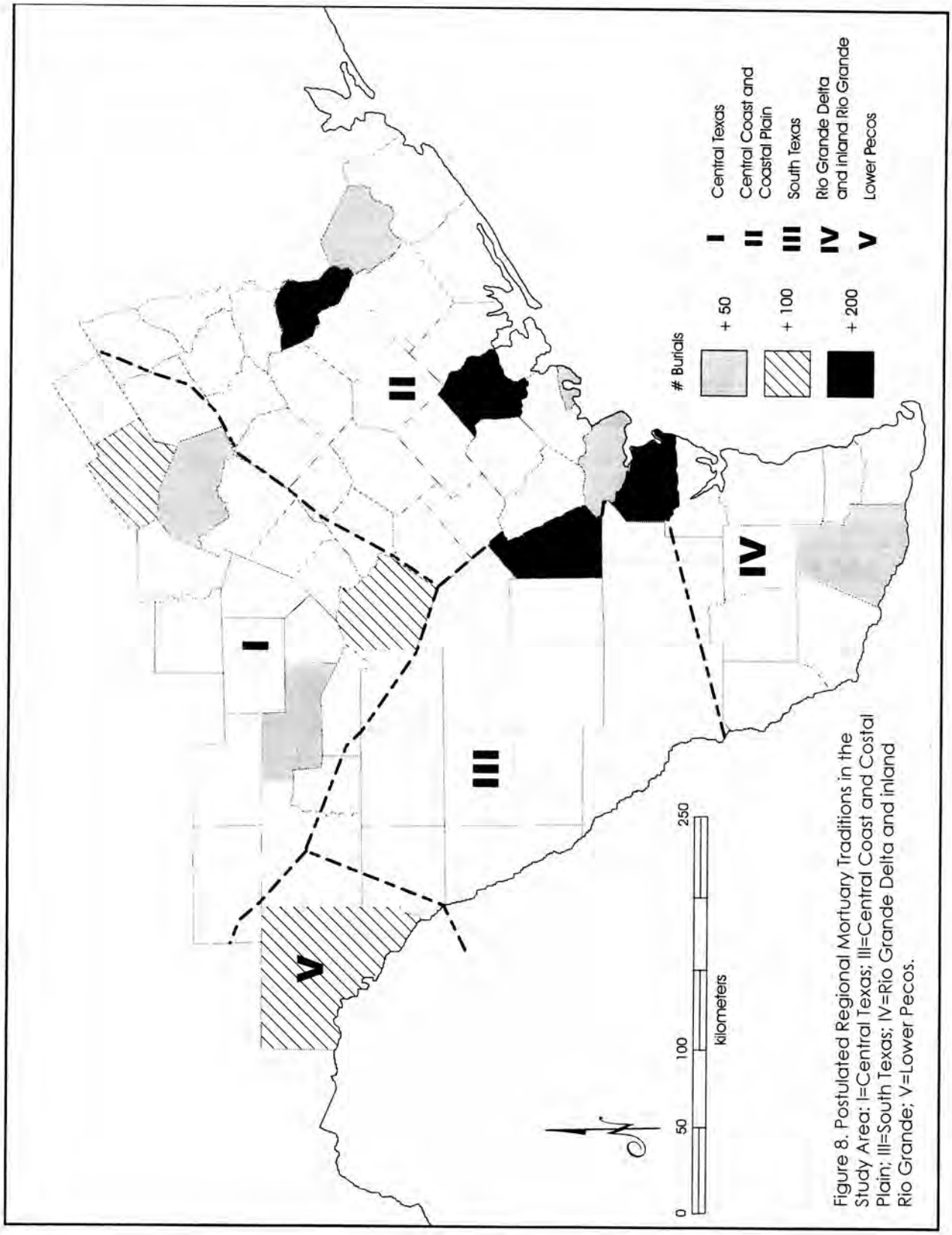

Figure 8. Postulated Regional Mortuary Traditions in the Study Area: I=Central Texas; III=Central Coast and Costal Plain; III=South Texas; IV=Rio Grande Delta and inland Rio Grande; V=Lower Pecos.

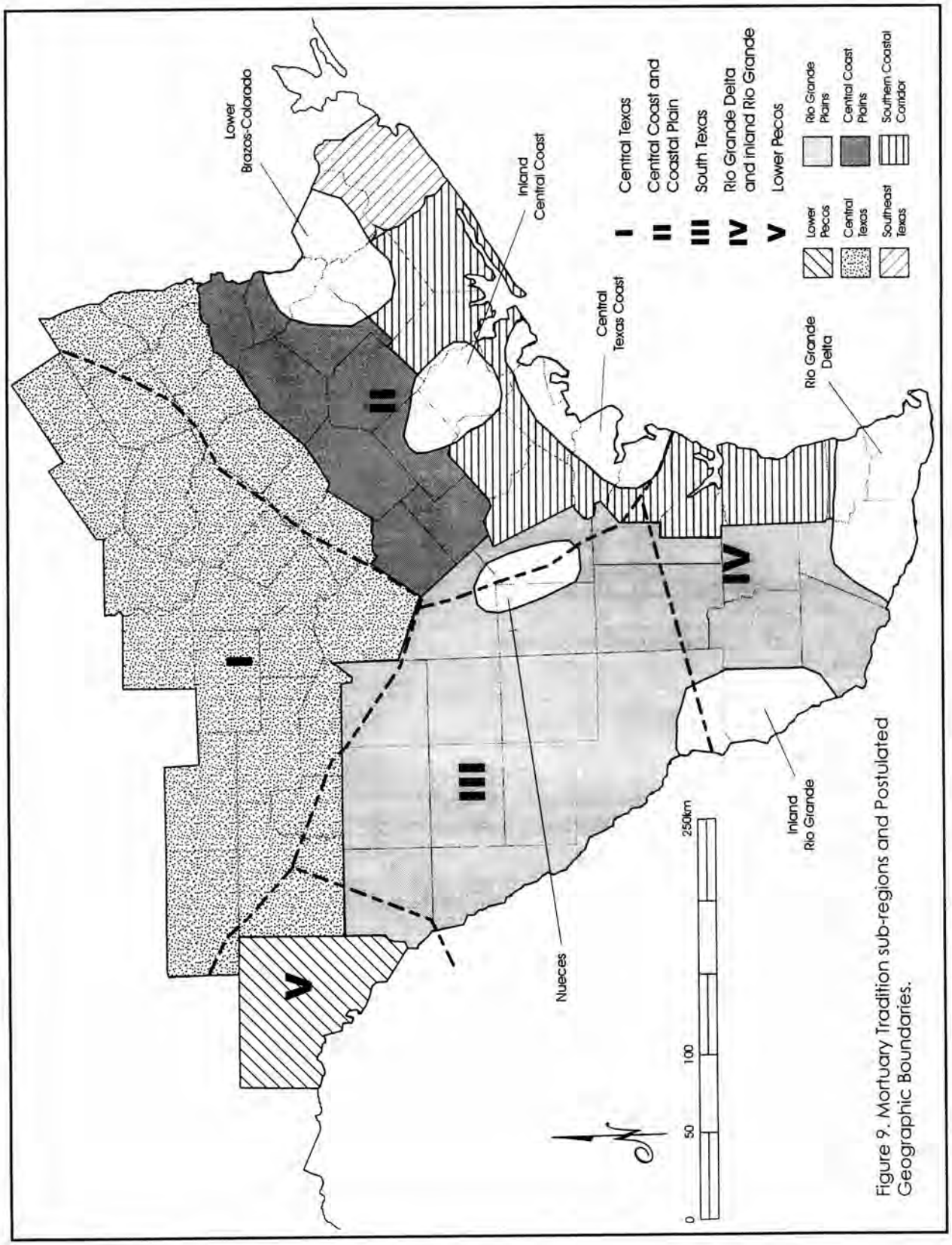

Figure 9. Mortuary Tradition sub-regions and Postulated Geographic Boundaries.

sites along and south of the Edwards Plateau on the Blackland Prairie. It also includes sinkhole and rockshelter burials in the Edwards Plateau itself that began to be used as mortuary sites in the Early and Middle Archaic periods (Bement 1994; Benfer and Benfer 1962, 1981).

During the Late Archaic, burial sites with evidence of violence (see Table 18) occur near the Edwards Plateau escarpment in the Blackland Prairie of Central Texas[2], in some numbers along the lower Colorado-Brazos rivers, in the inland central Coastal plain, on Corpus Christi Bay, and in riverine settings along the San Antonio and Nueces rivers (Figure 10). Such sites (whether dating to the Late Archaic or Late Prehistoric periods) are notably absent west and south of the Nueces River, and in the Oak Woodlands and Blackland Prairie strips well south of the Edwards Plateau, and north of the coastal prairies (see Figure 10). As Helen Dockall (1997a:158, 273) noted, Late Archaic and Late Prehistoric sites with evidence for violence appear to cluster along river valleys, especially the Brazos, Colorado, and Nueces rivers. The notable frequencies of burial sites with violence are on the lower Brazos-Colorado rivers and along the middle sections of the Nueces-San Antonio rivers, suggesting that these areas mark "zones of competition and conflict" (Story 1990: 241) during the Late Archaic period. It is unclear whether that conflict was between or within groups (Hall 1988; Patterson 1988). Hall (1988:16) also considers the possibility that the intensity of violence may have been the result of aggregation during times of maximum population density, when social institutions were not capable of handling tensions between or within groups. Dockall (1997a:16; see also Dockall and Baker 1995) suggests that violence was "triggered by territorial disputes over food resources."

Being shot with Fairland and Kent dart points as one means of death in the Ernest Witte cemetery indicated to Hall (1981, 1988) that during the Late Archaic, there was competition with peoples to the west in Central Texas, as Fairland and Kent points were thought to be most commonly made there. Prewitt's (1995: Figures 18 and 26) projectile point distributional data are consistent with this assertion for Fairland points, but not for Kent points, which are well distributed to the north and east of the lower Colorado-Brazos river groups.

Late Prehistoric burial sites with evidence of violence are not as common as they were during the Late Archaic (see Table 18 and Figure 10), indicating a general and fairly successful accommodation between groups across much of the region relative to competition for food and resources. The 1530s narratives of Cabeza de Vaca (Pupo-Walker 1993) do suggest, however, that feuds and small-scale warfare were still prevalent, and quarrels were always ready to erupt (Pupo-Walker 1993:82; Hickerson n.d.). Cabeza de Vaca commented that the tribes in this area were "the readiest to use arms of any I have seen in the world" (Pupo-Walker 1993:82). Nevertheless, based on the archeological evidence, the extent of feuding and warfare in Central and Southern Texas was probably much more intensive and long-standing 1000-1500 years earlier than it was during Cabeza de Vaca's time.

Conflicts between groups during the early part of the Late Prehistoric period (ca. 1200 to 700 years ago) were widespread in the Central Texas sub-region, particularly in sites along and immediately south of the Edwards Plateau (see Figure 10), as several burial sites have bodies pierced with Scallorn arrowpoints. Johnson and Goode (1994) suggest that the violence was the result of competing communities battling each other for resources that were becoming scarce, as does Story (1985:52), while Prewitt (1985) argues for violent changes between groups brought on by population or cultural expansion in the region.

Other Late Prehistoric burial sites with evidence of violence have been documented in the Corpus Christi Bay area, on the lower Guadalupe River, and near the confluence of the Rio Salado and the Rio Grande in the Falcon Reservoir area (see Table 18). As discussed above, each of these places are areas with highly productive plant, animal, and water resources, and different groups had begun to compete over them. Significantly, neither of these areas had been characterized by violence during the Late Archaic period, although Late Archaic cemeteries were present in each. This suggests significant differences across the region in the timing and sustaining of population growth, resource competition, and territorial conflicts.

Bone beads in quantity as grave goods and human bone artifacts (beads and tubes) clearly characterize Late Archaic and Late Prehistoric mortuary traditions only in the Rio Grande delta, the inland Rio Grande (in Zapata County as well as Tamaulipas, Mexico), and in burial sites along Baffin Bay (Figure 11). With the exception of the Bering Sinkhole cemetery in the southern Edwards Plateau (see Table 16), where tubular bone beads were common grave goods after ca. 4000 B.P., and

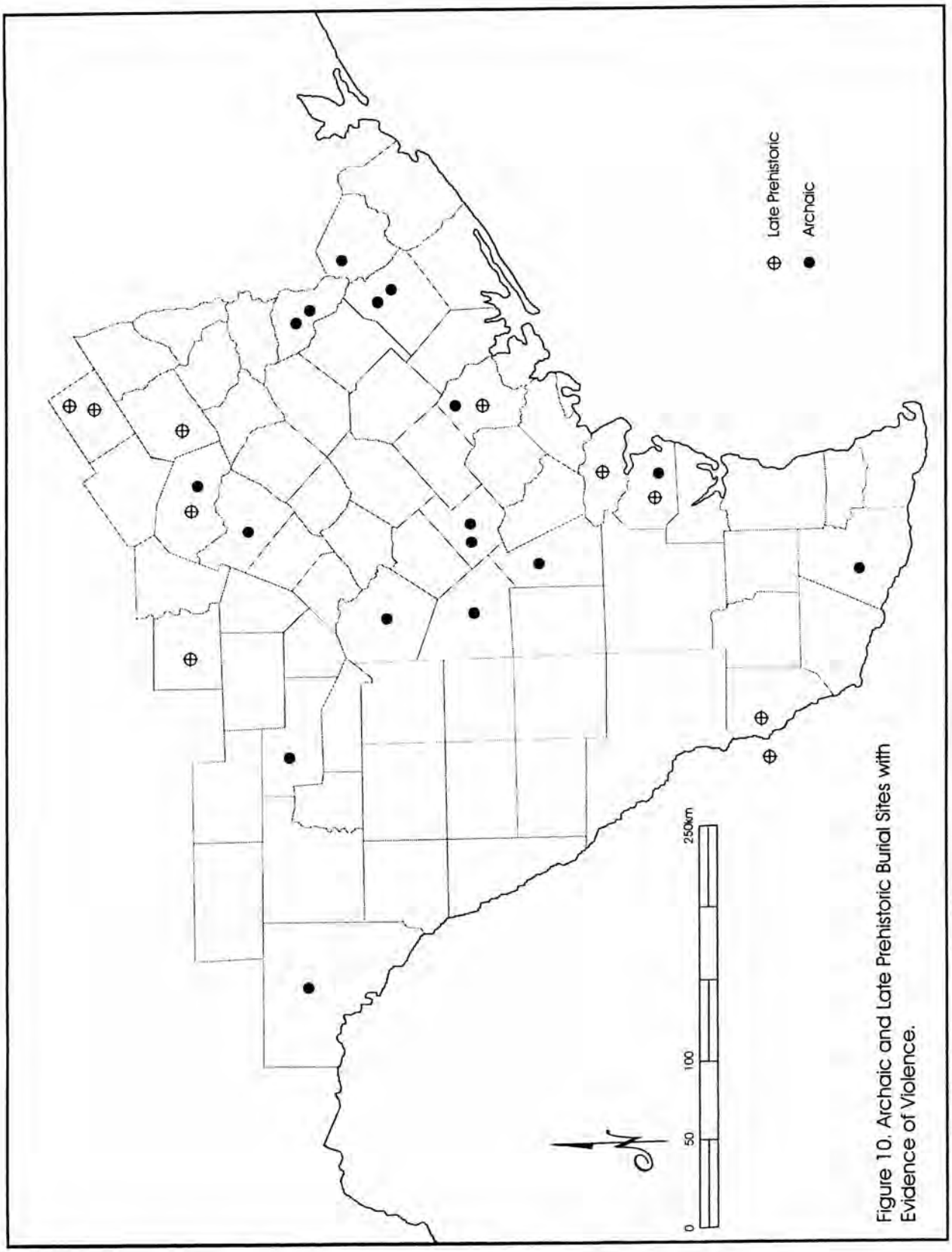

Figure 10. Archaic and Late Prehistoric Burial Sites with Evidence of Violence.

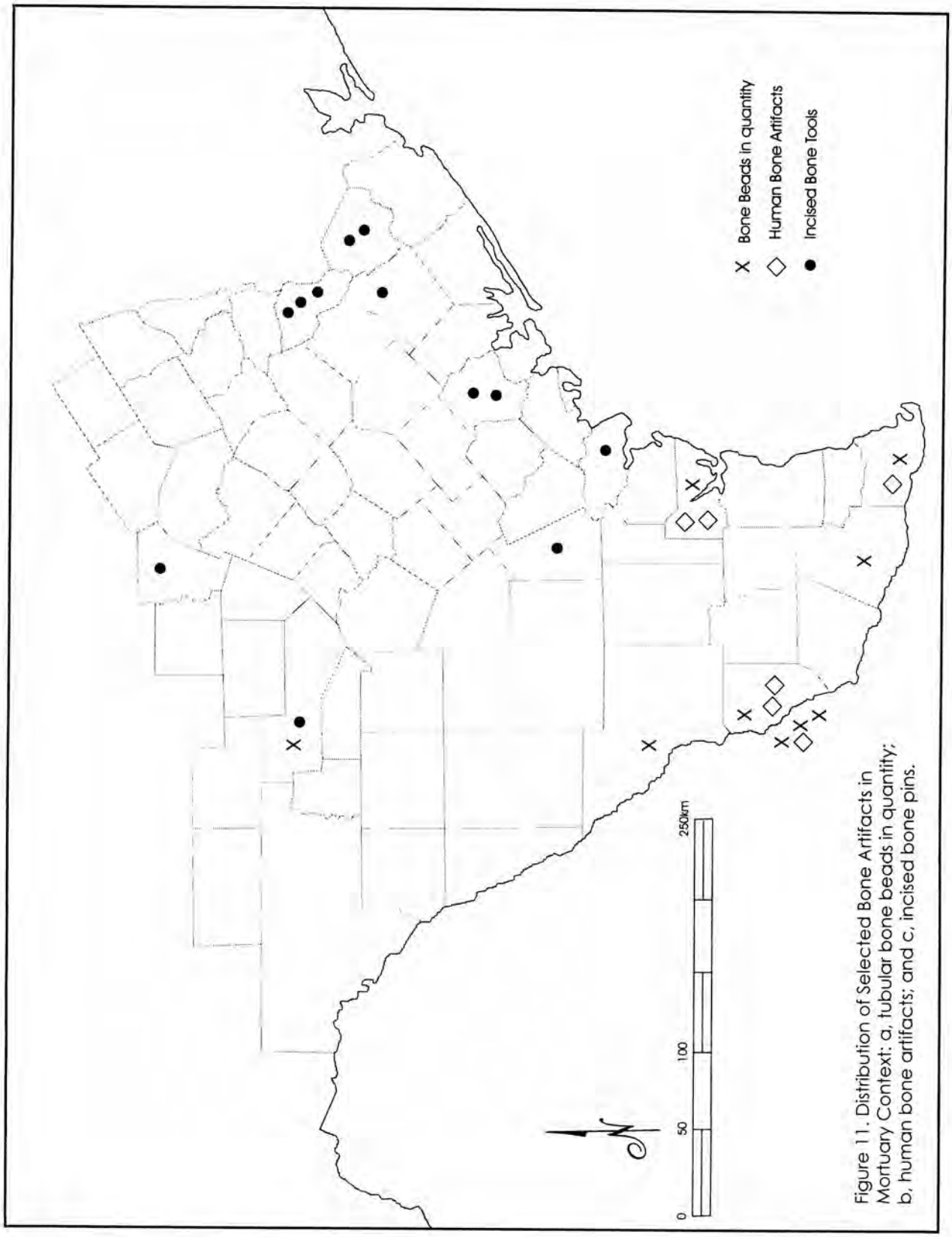

Figure 11. Distribution of Selected Bone Artifacts in Mortuary Context: a, tubular bone beads in quantity; b, human bone artifacts; and c, incised bone pins.

41ZV152 (Hester 1980), bone beads are sparsely represented at best in mortuary contexts across Central and Southern Texas. Conversely, incised bone pins are found in late Middle Archaic and Late Archaic burial sites on the Frio River (Taylor and Highley 1995), Corpus Christi Bay, the lower Guadalupe river, and in great quantities in a number of cemeteries along the lower Brazos-Colorado rivers (see Figure 11); they are absent in burial sites south of the Nueces River. Interestingly, burial sites with grave goods including bone beads and/or incised bone pins are noticeably absent in the northern and western part of the Rio Grande Plains and the Oak Woodlands-Blackland Prairie ecotone in the Central Coastal Plains.

Further affirming the broad regional differences in mortuary practices and mortuary traditions within Central and Southern Texas is the inclusion of stemmed or triangular dart points as grave goods with burials. Triangular dart points—particularly the Tortugas type—are distributed in mortuary contexts along the lower Rio Grande and at the Loma Sandia site (Figure 12) in the Rio Grande Plains, while stemmed Middle and Late Archaic dart points of several different types are found in mortuary contexts from the Nueces River north to the Edwards Plateau and east to the lower Brazos-Colorado rivers. This restricted distribution of unstemmed triangular dart points is largely matched by the high densities of Tortugas points in habitation contexts in South Texas (although the distribution extends across both riverine and non-riverine settings in the Rio Grande Plains), and the lower Pecos area (Prewitt 1995:Figure 46).

Closely corresponding to the distributions of stemmed dart points in mortuary contexts is the occurrence of large thin bifaces (see Hester 1999b; Hester and Barber 1990), corner-tanged knives, and biface caches (Figure 13) across the coastal plain. The latter stone artifacts, usually made of Edwards chert, are found as grave goods mainly in late Middle Archaic and Late Archaic (between ca. 2800-1500 years B.P.) burials on the Nueces River on the south to the lower Colorado-Brazos river on the east, with two notable exceptions. First, biface caches were present at the Bering Sinkhole site in the Edwards Plateau in mortuary deposits marked by the increased elaboration of mortuary rituals associated with use of the sinkhole as a communal cemetery (Bement 1991, 1994); Bement (1994:83) speculates that the biface caches represent part of a group sanctification of exchange networks with other Central Texas groups, as well as an indication of the importance of the network for the group(s) using Bering Sinkhole as a mortuary site. Large thin bifaces and Edwards chert biface caches have also been found in Late Archaic contexts on the Rio Grande in the Falcon Reservoir area (see Figure 13), along with stone pipes and marine shell ornaments.

The association of deer antler and deer antler racks in late Middle Archaic and Late Archaic mortuary contexts is also quite comparable to the distribution of stemmed dart points, large thin bifaces, biface caches, and corner-tanged knives. As Figure 6 shows, deer antler and racks have primarily been recovered from large burial sites in riverine settings at Loma Sandia, at Olmos Dam (41BX1) in the Blackland Prairie below the Edwards Plateau escarpment (Lukowski 1988), along the lower Guadalupe River, and at the Ernest Witte site along the lower Brazos river. They are also reported in Late Prehistoric contexts in the southern Edwards Plateau (Bement 1987) and along the Colorado River in the Blackland Prairie (Greer and Benfer 1975).

Marine shell artifacts are one of the more important goods placed in burials in Central and Southern Texas, because they clearly constitute convincing evidence for trade and interaction between prehistoric groups (cf. Hester 1970b, 1971). As Hester (1999b) has recently pointed out, marine conch and conch columella pieces, and other kinds of marine shells, were Cabeza de Vaca's main goods for trade between coastal and inland Texas groups, and he used the marine shell to trade for deer skins, red ochre ("red dirt with which they grease and paint their faces and hair" [Hester 1999b: 20]), chert points, hard cane, glue, and deer tassels. Marine shell artifacts in mortuary contexts are clearly concentrated in several sub-regions within both the Rio Grande Plains and Central Coastal Plains, namely: the Rio Grande delta; inland Rio Grande; Corpus Christi Bay; the inland central coastal plain; the lower Brazos-Colorado rivers; and along and south of the Edwards Plateau (Figure 14). While there is some similarity or sharing of a number of the kinds of marine shell artifacts included as grave goods in burials across the regions (particularly *Busycon* pendants and columella beads), each sub-region has a distinctive character in the selection and use of different kinds of marine shell artifacts.

Along the Rio Grande, *Olivella* beads and Olive shell beads and tinklers are well-represented (Table 19) in the delta and in inland Rio Grande burial sites, along with *Marginella* beads, disc-shaped beads, and *Busycon* pendants in the delta and freshwater mussel shell

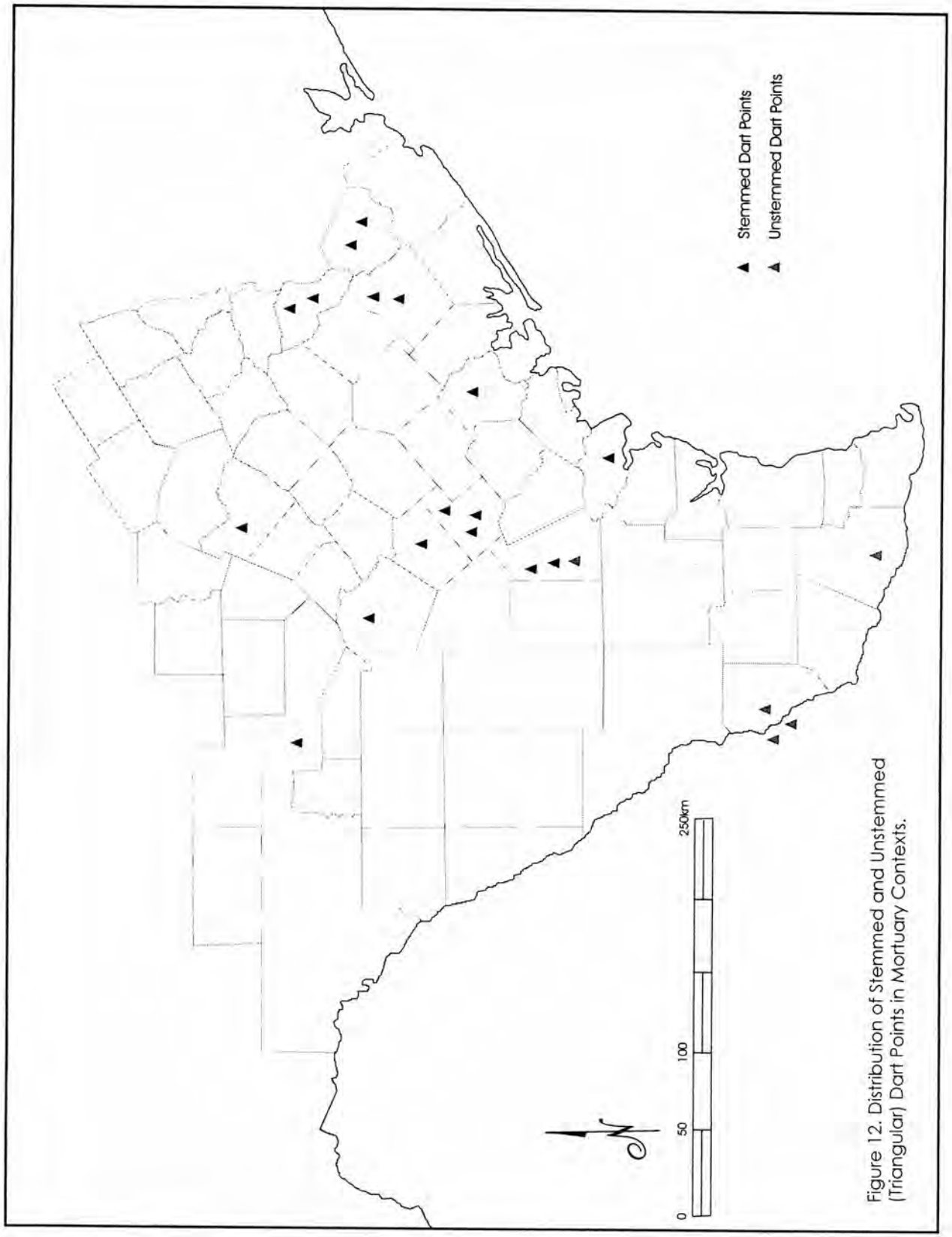

Figure 12. Distribution of Stemmed and Unstemmed (Triangular) Dart Points in Mortuary Contexts.

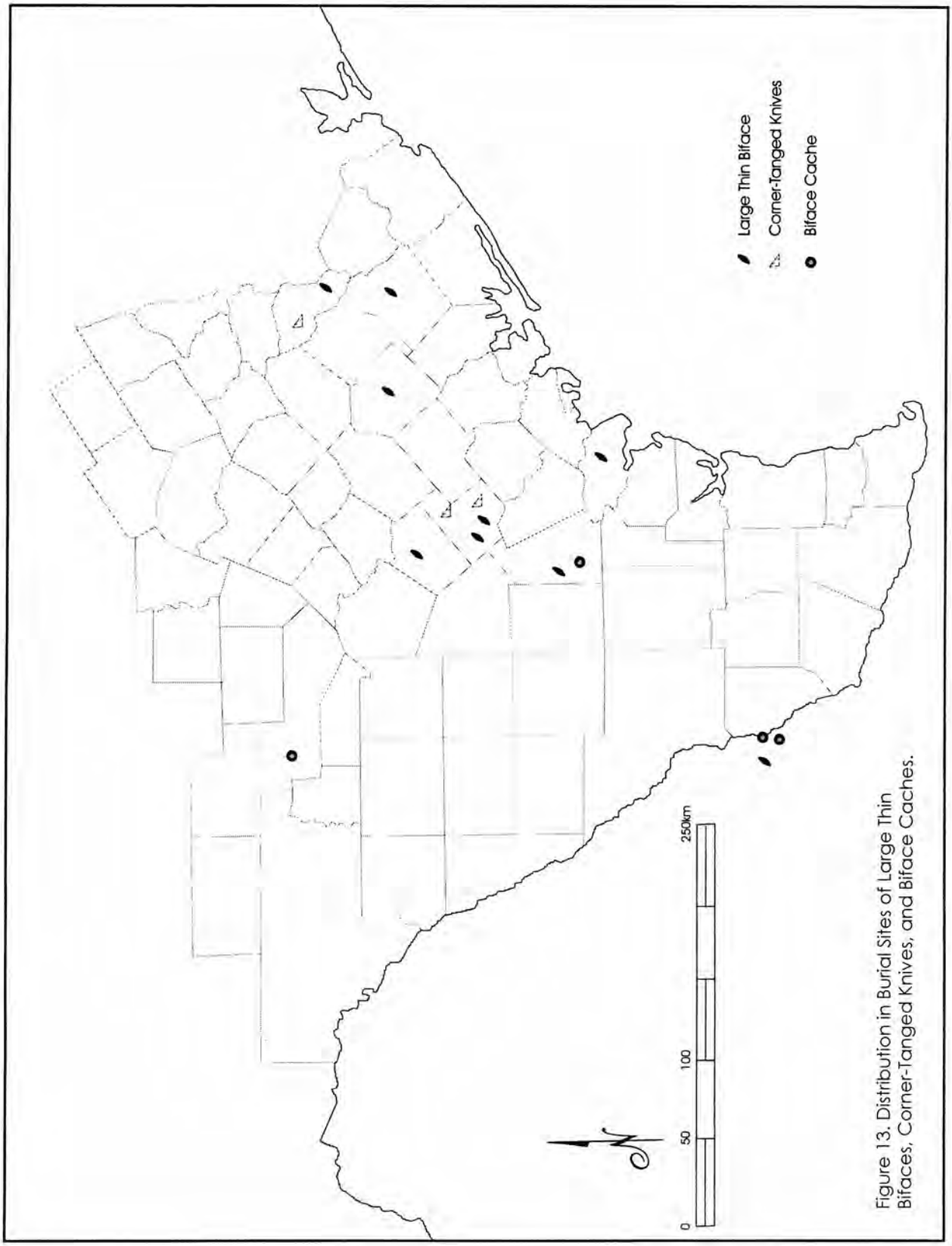

Figure 13. Distribution in Burial Sites of Large Thin Bifaces, Corner-Tanged Knives, and Biface Caches.

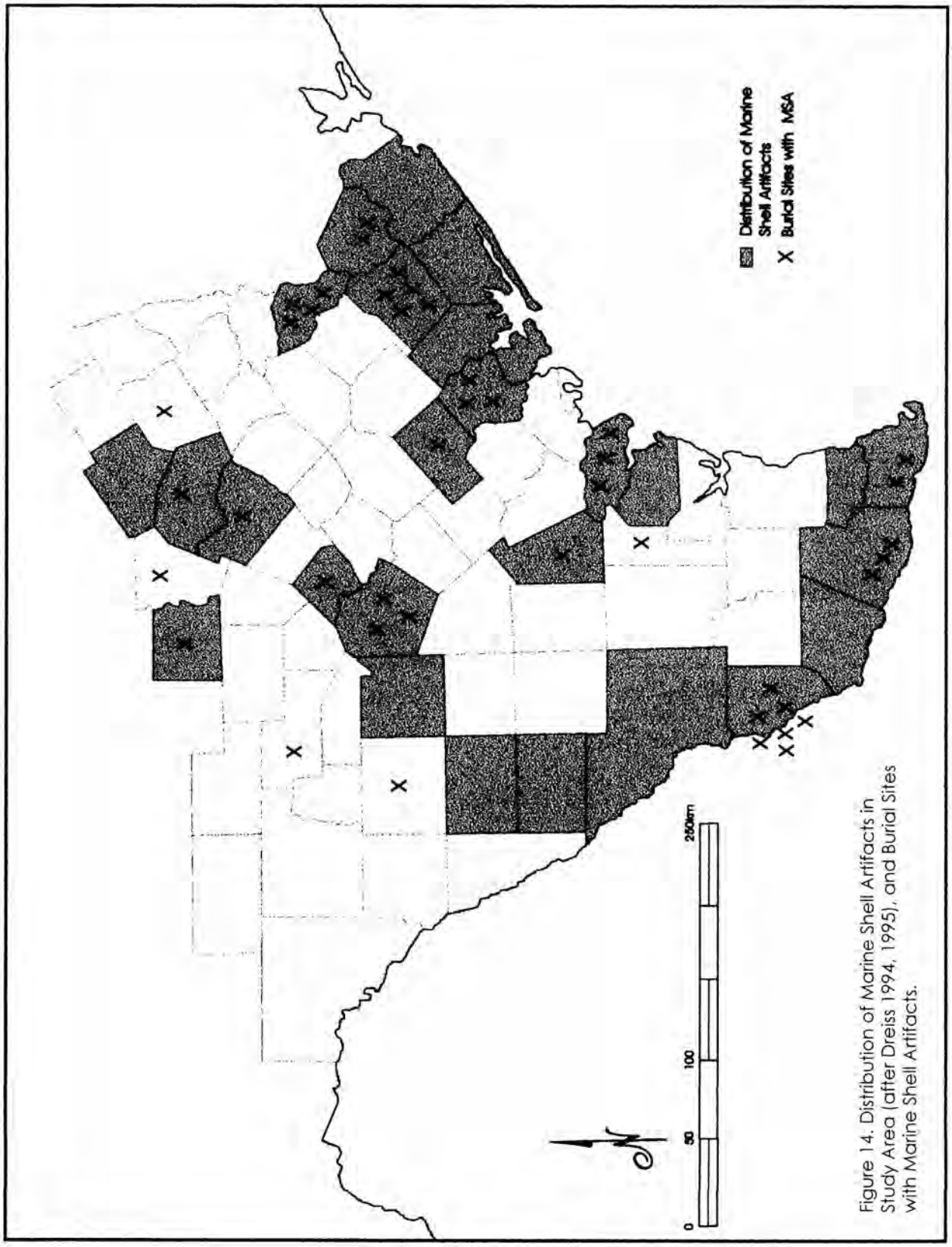

Figure 14. Distribution of Marine Shell Artifacts in Study Area (after Dreiss 1994, 1995), and Burial Sites with Marine Shell Artifacts.

Table 19. Marine and Freshwater Shell Artifacts in Mortuary Context

Area	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lower Brazos/Colorado Basins																
41WH39	x	x								x						
41WH44										x	x					
Ferguson										x						x
Bowser		x									x					
Piekert		x														
41FB2											x					
41FB13		x									x					
41AU36	x	x			x	x	x (np)^	x		x	x				x	
41AU1		x									x					
41AU55	x	x									x					
41AU37					x						x					
Central Texas Coast and Coastal Prairie																
41VT1	x	x			x	x					x				x	x
41VT9		x								x		x				
Pat Dunn		x														
41VT94						x (o)**			x							
Oso	x					x (o)										
41NU173							x									
41NU29																
41LC4						x										
41SP78									x						x	

(Continued)

Table 19. Marine and Freshwater Shell Artifacts in Mortuary Context

Area	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Central Texas Coastal Plain and Blackland Prairie																
41BX1			x			x (o)**					x					
Frisch Auf!						x										
41WM230		x				x (o)					x					
41WM7														x		
41BL3		x				x					x					
Fall Creek		x			x											
41TV88								x								
41MM19											x					
Cibolo Creek#											x					
Granberg											x (?)					
41CM25	x									x						
Southwestern Edwards Plateau																
41KY27						x										
41KR241					x	x				x						
Nueces River Canyon											x+					
South Texas Brush Country																
41DM12													x			
41JW9	x					x (o)										
41LK28	x					x (o)			x	x	x					

(Continued)

Table 19. Marine and Freshwater Shell Artifacts in Mortuary Context

Area	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Rio Grande, Delta Area																
Anderson Coll.										x	x				x	
41HG27				x	x					x	x					
Floyd Morris***				x			x			x					x	
Ayala				x	x					x	x					
41CF29					x (?)											
41HG173				x												
Rio Grande, inland																
41ZP7		x									x					
41ZP8						x (o)										
41ZP85				x												
Toyah 1					x	(o)										
Southern Island		x			x						x					
Arroyo Diablo		x														
41WB20							x (o)									
Scissors Island						x (o)										
Rio Salado				x	x											

*1=Columella tools; 2=Columella Beads; 3=Columella Dangles; 4=Olive Shell Tinklers; 5=*Olivella*/Olive Beads; 6=Freshwater Mussels; 7=Perforated Oyster & Marine Bivalves; 8=Modified Marine Bivalves; 9=Whole Marine Bivalves; 10=Shell Columella Disc [Bead]; 11=Conch Pendant and Gorget; 12=Periwinkle Shell; 13=Engraved Mussel Shell; 14=Snail shell necklace; 15=*Marginella* beads; 16=Virgin Nerite beads
** X (o)=mussel shell ornament; ^ X (np)= not perforated; *** Also has Noetia shell beads; + An unnamed site described in Huskey (1935)
# Unnamed site in northern Bexar County (Vereen 1993).

ornaments and pendants (see McGraw 1983:Figure 35) in inland riverine burial settings. On the lower Brazos-Colorado rivers, columella beads and *Busycon* pendants were abundant grave goods, particularly in the Late Archaic Burial Group 2 at the Ernest Witte site (see Table 17). On the Blackland Prairie and the southern reaches of the Edwards Plateau, it is *Busycon* pendants that were the principal marine shell grave good in both Late Archaic and Late Prehistoric contexts. The widespread exchange of *Busycon* pendants between Central and Southern Texas groups in Late Archaic contexts is nicely exemplified by the recovery of very similar styles of pendants decorated with horizontal and vertical drilled perforations in burial sites along the lower Brazos-Colorado rivers (Hall 1981:Figure 47:Form 7; Black et al. 1992), in the Blackland Prairie (Lukowski 1988:Figures 29-31; Vereen 1993) below the Edwards Plateau, at Morhiss on the lower Guadalupe (Dockall and Dockall 1996:Figure 2d), and at the Loma Sandia site in the Nueces River basin (Dreiss 1995:Figure 309b). That the exchange was even more far-reaching in Late Archaic times is evident in the recovery of similar decorated conch shell pendants from the Old Tom Burial site (41DK16) in the Texas Panhandle (Parsons et al. 1979:Figures 3-4).

Conversely, in burial sites along the central coast and the inland coastal prairie, a more diverse set of marine and freshwater shell grave goods were chosen, including columella beads, freshwater mussel shell ornaments, unmodified mussel shells, whole marine bivalves, and *Marginella* shell beads (see Table 19). This intra-regional diversity in the use of marine and freshwater mussel shells as grave goods (cf. Dockall and Dockall 1996:228) further highlights the existence of different, but contemporaneous, mortuary traditions within Central and Southern Texas.

Research Issues of Continuing Interest for the Study of Central and Southern Texas Mortuary Practices

It has long been recognized that the character of burial sites and associated mortuary goods from archeological sites have the powerful potential to provide significant and unique information on "the history of humankind" (Buikstra and Ubelaker 1994:1) through the pursuit of a wide variety of archeological and bioarcheological research problems. These research issues may include studies that offer important insights into health, diet, and genetic relationships of human populations as determined from the study of skeletal remains (Owsley 1997), through better understanding of the pace, tempo, and dynamics of cultural change, differences between groups in ways of life, and the strengths of ritual beliefs from the burial practices and grave goods found in association with the dead.

Paleodemography and Paleopathology

Paleodemographic and paleopathological changes over time in human populations, or between populations (as seen through the study of the age, sex, sexual dimorphism, mortality, and skeletal pathologies in human remains and burial populations) provide essential information about the growth and size of groups and communities of related individuals at different times, as well as their health and well-being. To evaluate these changes in the Central Coastal and Rio Grande Plains regions, it is important to understand why prehistoric populations increased or decreased at certain times, the demographic structure and composition of communities and population groups, and how changes in population size and composition affected the nutrition and health of a population during periods of cultural change.

Given the presumed relationship between the establishment of territories and the development of large cemeteries among several groups in many sub-regions of Central and Southern Texas, research efforts should focus on determining if there are significant trends in stress, diet, and health in these hunter-gatherer populations that evidence changes in their quality of life. Also, what paleodemographic and paleopathological changes were associated with mobile hunter-gatherer groups whose mortuary practices did not include the use of large cemeteries?

The synthetic efforts of Reinhard et al. (1989, 1990), Steele et al. (1999), and Dockall (1997a) provide a solid framework for the further investigation of these paleodemographic and paleopathological relationships, employing mean age of death and mortality curves (which showed strong similarities across much of the study area examined by Reinhard et al. 1989, 1990), as well as rates of metabolic, degenerative, and infectious diseases to evaluate the quality of life among aboriginal groups across a wide swath of Texas. Although the mean age of death between burial populations is comparable, their paleopathological findings point to significant regional differences in the health and diet of

burial populations, with the highest rates of metabolic and infectious diseases among groups in the south Coastal Plain (in their sample, see Reinhard et al. 1989:Table 19, ranging from sites in the lower Colorado-Brazos, Blackland Prairie and the Central Coastal Plain sub-regions as defined herein to the Wilson and Karnes county San Antonio River sub-region of South Texas), and the lowest rates among upper Texas coast and Lower Pecos area burial populations, respectively. Further analyses by Dockall (1997a) suggest instead that coastal strand populations had the highest rates of infectious diseases. How do these competing paleopathological trends comport with relative population densities across each of the sub-regions, the appearance and maintenance of large cemeteries, territory formation and consolidation, and the incidence of violence?

Health

It is important to establish how similar or different the health of hunter-gatherers in these two regions were, and how their health compared to coastal and other non-coastal populations. Are there diachronic and/or spatial correlations in levels of biological stress seen with particular groups or populations across the regions, and if so, how do indicators of stress (such as porotic hyperostosis, linear enamel hypoplasia, and cribra orbitalia, Harris lines, and periostitis) associate with apparent changes in population size and density, or with increased sedentism as denoted by other aspects of the archeological record? Similarly, what specific health conditions may be indicated by the presence and frequency of treponemal infections from inland Rio Grande (Wilson and Hester 1996:12) and south central coastal Texas (Comuzzie et al. 1986; Jackson et al. 1987) Late Archaic and Late Prehistoric burial populations, particularly the increased endemic treponematosis and anemic disorders in coastal strand populations?

Powell (1988; see also Dockall 1997a) has made a strong case for differences in adaptive success between prehistoric Native Americans by comparing regional differences in levels of biological stress between contemporaneous burial populations in the Edwards Plateau, the Coastal Plain, and the central Texas Coast. The findings and implications of this paleopathological study should be extended to other burial populations in the study area to examine differing levels of health between Archaic and Late Prehistoric populations in sub-regional settings.

In addition to health considerations for prehistoric burial sites and mortuary practices in the Central Coastal and Rio Grande Plains, a related research effort should concern itself with investigating the effects of European contact on the health of aboriginal populations in the two regions. Ethnohistoric records indicate that there were considerable numbers of aboriginal groups living in Central and Southern Texas in the late 17th and 18th centuries—some of whom had immigrated into the area from Mexico in advance of Spanish colonization efforts—and others who had lived in the two regions since before Europeans had come to Texas (see Campbell 1988; Newcomb 1993). How did contact with Europeans affect them?

E. Miller's (1996) comparative examination of the health of prehistoric South Texas coastal and coastal plain hunter-gatherers, and Mission San Juan Capistrano and Mission San Xavier burial populations of missionized Indians who had been rounded up in the broader region (including the Central Coastal and Rio Grande Plains), indicates that the overall health of these groups declined significantly after direct contact with European groups, and they now had high amounts of skeletal pathologies indicative of long-term systemic and chronic stress (E. Miller 1996:138 and Tables 6.3 and 6.4). She attributed this decline in health to a forced adoption of an agricultural lifeway, confinement to the mission, and a change in diet (i.e., the consumption of maize). If burial sites of this period are to be studied in the Rio Grande and Central Coastal Plains (and presently none are known), it will be important to evaluate whether similar stressful conditions were experienced by the aboriginal groups who remained outside of the missions, or was their health better. Did they experience episodes of epidemic disease with the same intensity as the sedentary missionized Indians?

Subsistence

Interpretations of continuity and changes in prehistoric subsistence and diet from skeletal remains are based on characteristics of the human bones themselves (such as tooth wear and defects, caries rates, and pathologies) as well as through chemical analyses, particularly carbon and nitrogen stable isotope ratios in bone collagen (see D. Boyd 1996:195-201). Of particular importance for the regional and diachronic assessment of subsistence in Central and Southern Texas is to examine

the variability in burial populations at sub-regional contexts for dental pathology and wear (i.e., caries rates, dental attrition or antemortem tooth loss, and abscesses), skeletal morphology and pathologies (i.e., the frequency of enamel hypoplasias, porotic hyperostosis, and infectious diseases, along with changes in cranial and postcranial skeletal morphologies), and bone chemistry. Because of the relatively small size of fully documented skeletal populations from burial sites in the two regions, broad, regional-scale analyses (e.g., Reinhard et al. 1989, 1990) have been forced to lump together burial population samples from very different settings and times to be able to make comparative statements on prehistoric health and the quality of life for aboriginal groups in these parts of Texas. Such an approach assuredly limits the kinds of inferences that can be made on changes in prehistoric subsistence and diet. Where practical, comparisons of subsistence must begin with analyses of contemporaneous burial populations from comparable environmental settings (as exemplified by Dockall's 1997a work with Morhiss and Ernest Witte skeletal populations), and then secondarily with contemporaneous and non-contemporaneous populations from different environmental settings.

As part of the analysis of human skeletal remains from burial sites in the Central Coastal and Rio Grande Plains regions, stable isotope studies of small samples of bone collagen from human remains are essential for determining prehistoric diets and subsistence patterns, particularly the mix of C3 (most plants, herbs and shrubs, as well as temperate cool-season grasses), CAM (mainly desert succulents), and C4 plants (maize, tropical and warm-season grasses, and certain shrubs) and animal foods, and in coastal and near-coastal settings, the proportion of marine foods in the diet. Stable isotope ratio analyses conducted to date on prehistoric (and historic, see Cargill 1996, and Cargill and Hard 1999) coastal and inland riverine human bone samples from Central, Southern, and Southeast Texas (see Table 12) have provided useful information on the terrestrial vs. marine diet of coastal and inland populations, but also have demonstrated consistent stable isotopic patterns "within the spatial distribution of discrete cultural patterns within their specific environmental zones" (Huebner 1994: 416).

Continued refinement of these stable isotopic patterns should be attempted by conducting stable carbon and nitrogen isotope analyses for burial populations across the Central Coastal and Rio Grande Plains sub-regions. With refinement, and in conjunction with absolute dates on the human remains and associated grave goods, detailed subsistence and dietary reconstructions can be obtained for the different aboriginal groups that lived in the two archeological regions. Were there age- or sex-related related differences in diet between groups, or did individuals consume the same basic range of plant and animal foods?

Assessment of barium levels in human bone from coastal and coastal plain burial sites should also be attempted. Barium levels in bone have been shown to be an indicator of marine versus terrestrial resources in the diet in burial sites in the American Southwest, the coast of South America, South Africa, Ireland, and other contexts (Burton and Price 1990). Determining barium levels in Central and Southern Texas burial populations would provide further corroboration of stable isotope data for populations with presumed terrestrial or marine-based diets.

Biological and Ethnic Affiliations

Multivariate measurements of phenotypic traits of bone and teeth in human skeletal populations (such as metric and non-metric cranial traits) have been used for many years by bioarcheologists to elucidate biological, ethnic, and population affiliations. This follows from a basic assumption that much of the variation in metric and non-metric trait frequency comparisons between individuals and populations reflects genetic differences. The study of such affiliations is important in an area such as the Rio Grande and Central Coastal Plains in attempting to discern distinct biological and social differences (both temporal and spatial) within and between mobile groups that regularly interacted and came together seasonally at certain places on the landscape, at least in historic times, to exploit dense resource patches of pecans and prickly pears. From such studies of skeletal and dental morphology, and in conjunction with archeological comparisons of the kinds and sources of grave goods found in burial sites, research questions may be posed concerning the use of burial sites by single groups of related individuals, or by more than one group, perhaps not related by kinship. How might residence and mobility patterns have differed between riverine and non-riverine groups in the two regions?

Certain types of skeletal and dental pathologies, related to genetic abnormalities within a population, may provide further hints about biological and ethnic

affiliations, including transposed teeth and vertebral anomalies (see D. Boyd 1996:207). In areas with small populations and some measure of geographic isolation, the identification of these genetic abnormalities in burial populations would help to link potential kinsmen or members of the same residence group.

A most promising method of bone chemistry for elucidating biological and ethnic affiliations is ancient mitochondrial DNA analysis (D. Boyd 1996:204-205; Merriwether et al. 1994; O'Rourke et al. 1996; Schurr and Wallace 1999; Stone 1999). Shared and similar DNA lineage types between individual skeletons and groups of skeletons from different burial sites "offer enormous opportunities for direct inferences about kinship relations from human bone" (D. Boyd 1996: 204). Such DNA analyses have not been conducted for Central Coastal Plains and Rio Grande Plains burial populations.

Personal and Ritual Technology

The grave goods found in association with different individuals on aboriginal burial sites should be studied to provide important information on prehistoric technology—both personal and ritual. As Howard (1993:30) notes, "the primary archeological source of information on ritual technology is human interments, which may encapsulate information on belief in an afterlife as well as political and social systems."

The kinds of grave goods found with adult and sub-adult burials range from those of presumed utilitarian (stone, bone, and shell tools) and ornamental (marine and bone beads, pendants, and ornaments) use to goods of ritual function (ocher and ocher pigment, biface caches, stone pipes, antler racks, pebbles from rattles, etc.; see Taylor 1995a:689-694). Of basic concern is: what does the quantity and kinds of grave goods (including those made of local versus exotic raw materials, and items found in both habitation and mortuary contexts, or only in mortuary contexts) placed with burials mean with respect to group and community mortuary practices within the Central Coastal and Rio Grande Plains regions? Does it reflect the social position of the deceased, philosophical-religious beliefs, the circumstances of death, or other determinants of mortuary practices and forms? Did males and females receive the same sorts of grave goods? It has been established that the kinds and amounts of grave goods placed with the deceased strongly varied by sub-region, as this information was one of the primary bases used in defining sub-regional mortuary traditions across Central and Southern Texas (see Figures 8 and 9). It remains an important research effort to document grave good associations by age and sex from the large Late Archaic burial population at the Morhiss site; currently, with the exception of the marine shell artifacts (Dockall and Dockall 1996) and a burial with knapping implements (Dockall and Dockall 1999), such associational data are lacking for the 200+ Morhiss burials.

From a large body of ethnographic data summarized by Carr (1995:169 and Table XIV), the kinds, sources, and quantity of grave furniture placed with the deceased in most societies appear to have more to do with personal identity than with that person's social position, and that other mortuary practices (such as the amount of energy expended on the burial rites, including the treatment and preparation of the body and the burial pit) better indicate the social rank of a person (cf. Tainter 1978:121). Such mortuary practice and grave good relationships by age and sex should be explored for the Late Archaic and Late Prehistoric burial populations for each sub-region (see the discussion by Taylor [1995b:401-404] for the Loma Sandia burial site), focusing on the estimation of the following key practices: overall energy expenditure; grave form; kinds of grave furniture; number and types of burials recognized in a burial population; local grave location; body preparation; body treatment; body position at burial; and the regional location of the burial area relative to settlements.

Other forms of ritual mortuary treatment that may be determined from bioarcheological evidence in Central Coastal and Rio Grande Plains burial sites include kinds of body processing after death, such as defleshing prior to secondary burial or cremations. Is there evidence for such body processing, and if so, are secondary burials more likely to occur at large cemeteries than small burial sites, as would be expected if large cemeteries were used for burials during seasons of group aggregation? Another form of mortuary treatment that is thought to be informative about both the social position of the deceased and the religious beliefs of hunter-gatherer groups (see Carr 1995:Table VI) is the preparation of the body or bones with a pigment (usually red ochre, but biotite schist pigment has been noted at the Ernest Witte site). Ochre-stained human bones, and crushed ochre pigment stains in burial pits, are common features of burial sites in the Rio Grande delta (see Table 5), at the

Loma Sandia site (see Table 8), Morhiss (see Table 10), large Late Archaic cemeteries along the Central Texas Blackland Prairie (see Table 15), and at several cemeteries on the lower Colorado-Brazos rivers (see Table 18). These are areas known to be focal points for Late Archaic and Late Prehistoric populations. Were such rituals of body preparation not shared with groups outside of high resource settings?

Population Dynamics and Territoriality

It is generally agreed that the development of prehistoric cemeteries in Central and Southern Texas is a reflection of both population growth and the establishment of territoriality among the various prehistoric groups living in these areas. As such, the study of population dynamics and the recognition of group-specific territories from burial sites and sub-regional mortuary practices is a way to track those periods of time when certain populations were expanding across and/or into [new] resource zones, becoming less mobile, when groups were competing for resources within certain areas, and those periods of time when such territorial use was being consolidated. Just as importantly, documenting the absence of large cemeteries from several sub-regions of Central and Southern Texas may indicate where those areas were that were used only by low densities of peoples, groups that were more mobile, and where competition for resources was not as intense.

Were periods of population growth and territorial establishment in Central and Southern Texas always accompanied by violence and conflict? How do widespread periods of trade and interaction between groups correspond to periods of territorial establishment as opposed to territorial consolidation (i.e., when ritual activities were intensified)? From mortuary evidence and grave goods at Ernest Witte and Bering Sinkhole, probably the two burial sites with the most compelling archeological information on long-distance trade, intensified periods of ritual activities (between ca. 2500-1500 B.P. at Ernest Witte and ca. 4000-2300 B.P. at Bering Sinkhole) closely correlate with extensive trading opportunities, but these relationships only became fully developed long after these cemeteries were in use.

Of related concern in understanding changes in population dynamics from burial sites would be to determine why only the south central Coast, the inland central coastal plain, and the Central Texas prairie sub-regions with large cemeteries dating to the Middle and Late Archaic periods also had large Late Prehistoric cemeteries, while other sub-regions either had large cemeteries in one or the other of these broad temporal periods. Were the former sub-regions the scene of continued cyclical and long-term territory formation and resource competition, while in other areas territorial formation could only be sustained for relatively short periods? How is this related to relative population densities between groups in the different sub-regions?

A proxy measure of mobility—strontium isotope ratios in human bones and teeth of known age—may contribute important information from burial sites on the structure and timing of individual and group population movements across and through "territories" at both intra- and inter-regional levels within the Central Coastal and Rio Grande Plains regions. Essentially, differences in strontium isotope ratios between bones and teeth enamel apparently track the movement of the individual through life because strontium in tooth enamel formed during early childhood, reflecting the local area at that time, while bone seems to assimilate strontium from residences occupied during a person's later years. Comparisons of strontium isotope ratios between individuals in burial sites (particularly the large, repeatedly used cemeteries such as Loma Sandia, Morhiss, and Ernest Witte) across the archeological regions should show if there are measurable mobility differences during the life of any individual, between different individuals from the same cemetery, and between burial sites across the study area.

Intra-and Inter-Regional Interaction and Contact

The association of burial sites with a wide range of finished goods of apparent non-local origin allows for the consideration of intra- and inter-regional interaction and contact between aboriginal populations living in the Central Coastal and Rio Grande Plains. Hall's (1981) study of the Ernest Witte cemetery on the lower Brazos river—containing groundstone objects from Central Arkansas, *Busycon* pendants probably from the Florida coast, and corner-tang knives from Central Texas (see also Kraft 1994)—was the first burial site to provide substantial evidence for the participation of aboriginal groups in long-distance interaction and contact. Other burial sites in the two regions, however, generally show little evidence of long-distance trade and interaction.

What are the mechanisms that account for the differential participation of these groups in such long-distance exchange networks?

In conjunction with bioarcheological studies of biological and ethnic affiliations between groups, documenting the kinds and amounts of goods that were being traded and exchanged at different times should help to establish which groups maintained social and political relationships. How were these relationships tied into elaborations in mortuary practices and ritual that are seen at sites such as Loma Sandia and Ernest Witte beginning about 2800 to 2500 years ago?

The chemical sourcing of *Busycon* marine shell artifacts from archeological sites and burial sites in Central and Southern Texas (e.g., Claassen and Sigmann 1993) should be continued to further evaluate the scope, direction, and range of proposed long-distance trade networks among lower Colorado-Brazos river groups in the Late Archaic. From this, researchers will be in a better position to offer interpretations of the role of long-distance trade in the appearance and elaboration of mortuary rituals in the Central Coastal Plains.

The large *Busycon* pendants from the Ernest Witte site are presumed to originate along the western coast of Florida (cf. Hall 1981, 1992), and the shell chemistry of that area is distinctly different from chemical signatures on *Busycon* shells recovered in Nueces and Cameron counties, Texas (Claassen and Sigmann 1993:Tables 3 and 4). The shell chemistry of the Ernest Witte marine shell artifacts is of first priority, but a program of marine shell sourcing should also be established for Late Archaic and Late Prehistoric burial sites within the main sub-regions where marine shell artifacts are common burial goods (see Table 19).

Violence and Group Conflicts

Violence and hostility within and between aboriginal groups was a notable feature of the Late Archaic and Late Prehistoric periods in Central and Southern Texas. The available archeological evidence does not suggest that there was a uniform temporal increase in conflict, or a consistent geographical area within which conflict occurred, but rather there were punctuated periods of hostility at different times and places, usually along frontier areas. The overall low frequency of violent deaths in this part of Texas indicates that group conflicts were in the form of small-scale hostilities, probably as competition for available resources, and probably violence "did not play a very large role in disturbing the quality of life" (Dockall 1997a:264), in contrast with the archeological evidence reviewed by Milner (1999) for eastern North America.

Data collection efforts that build on the research of Dockall and Baker (1995) should be continued to fully document in space and time all burials and burial sites in Central and Southern Texas that have evidence of violence, including projectile point wounds and embedded points, unhealed traumas, and severe head and parry fractures. Examining the distributions and ages of these sites, and estimating the intensity of violence (cf. Reinhard et al. 1989, 1990) among populations in riverine and non-riverine settings, should permit the definition and correlation of different zones of conflict with long-term cultural changes in settlement, subsistence, group movements, establishment and expansion of territories, and population dynamics. Were there changes in the nature of violent conflicts through time?

Another approach is to look more closely at different dimensions of violence and group conflicts among Central and Southern Texas aboriginal populations. For example, is there regional bioarcheological evidence of scalping and body dismemberment, as there is on the Southern Plains in Oklahoma (Brooks 1994)? Were males and females, or adults and children, both victims of violence, or were there sex- and age-related risks involved among the native Texan groups exposed to situations of conflict? It will also be important to ascertain which groups were in conflict (or if the conflict was within a single related group), and this is best conducted by an analysis of the kinds of projectile points (and the raw material they were manufactured on) that were the cause of death. This information can readily suggest likely areas where such projectile points were being manufactured, thus linking the weapons with aboriginal groups in different Central and Southern Texas sub-regions.

Conclusion: Current Research Needs

Finally, there are a number of current research needs regarding the study of prehistoric mortuary practices in Central and Southern Texas. They include:

1. more thorough archeological data that documents the distribution and density of burial sites (cemeteries and isolated burials) and any associated grave goods from all parts of the two regions. Attention and priority burial site identification efforts should focus on those

parts of the two regions thought to be characterized by high resource productivity, as burial sites are most likely to be concentrated in a restricted range of environmental habitats (particularly riverine areas at the confluence of major streams), and areas with high densities of sinkholes and rockshelters;

2. more chronometric dates and associated stable carbon/nitrogen isotope values from a broader range of burial sites of different apparent ages and regional settings;

3. the identification and full study of prehistoric hunter-gatherer sites that contain interpretable skeletal populations, namely bioarcheological populations where questions of paleodemography, biological and ethnic affiliation, health, diet and nutrition, and personal and group ritual, etc. can be reasonably addressed without the problems of small sample sizes. Such documentation should follow current standards for data collection from human skeletal remains, such as those advocated by Buikstra and Ubelaker (1994) and Colby et al. (n.d.); and

4. burial sites are very vulnerable to looting activities, whether they are on public or private lands, particularly the burial sites that have quantities of grave goods. It is important that all burial sites be properly protected from looting and other adverse effects (see Potter and Simons 1999). There is an immediate need for land-owning federal and state agencies, with appropriate input from Native American groups and the professional and avocational archeological communities, to prepare unmarked burial protection plans for their lands. This is particularly the case for the Falcon Reservoir on the Rio Grande, owned and managed by the International Boundary and Water Commission. With low water levels and wave erosion in the last five years or so, more than 20 prehistoric burial sites have become exposed along the shoreline, where they are unprotected and have been subjected to looting (see Boyd 1996a, 1996b, 1996c, 1997, n.d.a, n.d.b; Boyd and Wilson 1996, 1998; Boyd et al. 1997; Hester 1996b; Perttula et al. 1996; Perttula and Boyd 1998).

End Notes

1. Hall (1994:102) further suggests that beads, celts, and adzes of exotic Central Arkansas lithic raw materials should also be included among the inventory of grave goods in Late Archaic cemeteries along the lower Brazos-Colorado rivers.

2. A Travis point embedded in the bone of one burial at the Bering Sinkhole site documents evidence of violence as early as 4500-4000 years B.P. in the southern Edwards Plateau.

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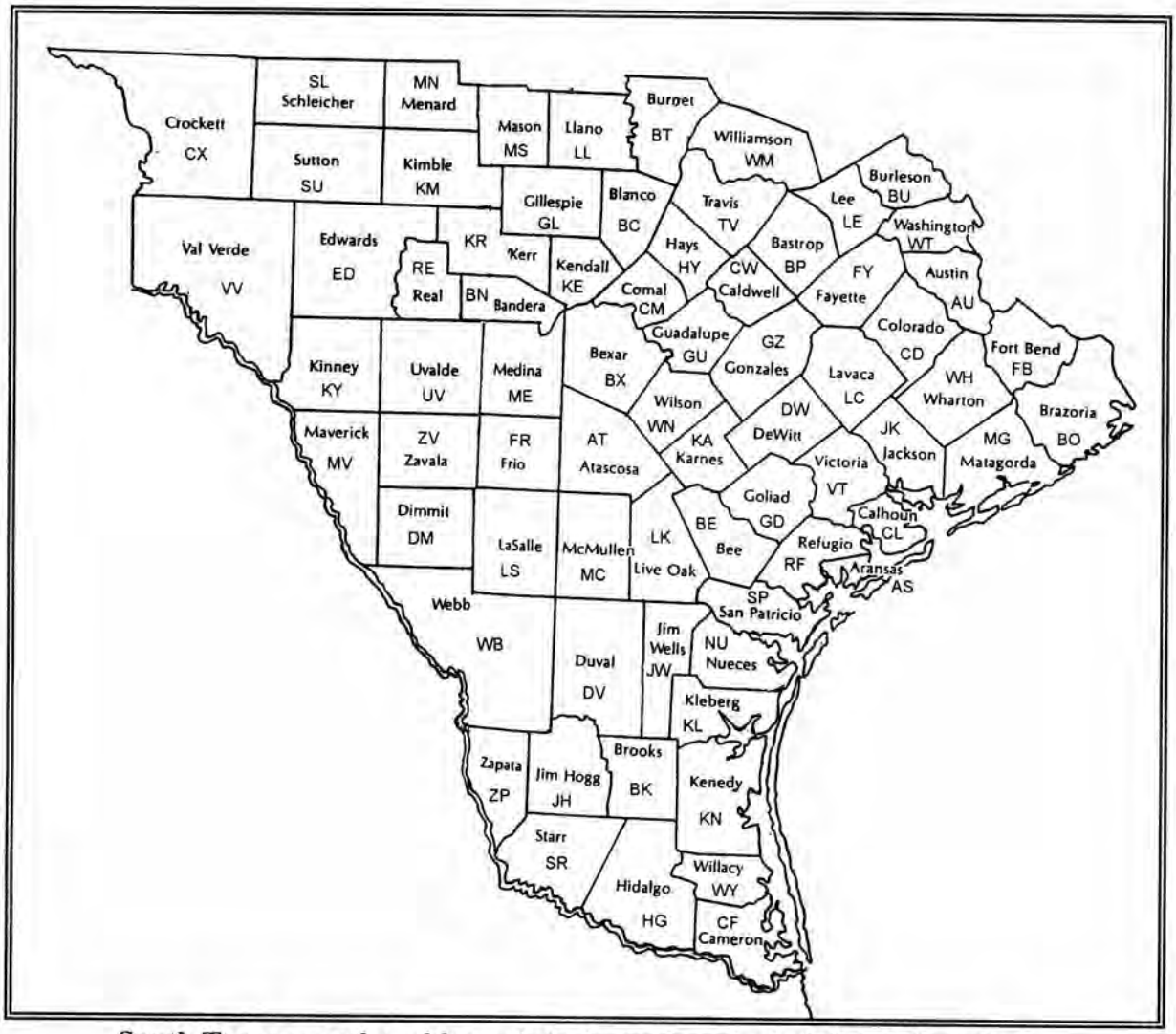
NOTES



South Texas counties with symbols for archaeological site designations.

CONVERSION CHART

Multiply	By	To Get	Multiply	By	To Get
millimeters (mm)	0.0394	inches	inches	25.4	millimeters
centimeters (cm)	0.394	inches	inches	2.54	centimeters
centimeters	0.0328	feet	feet	30.48	centimeters
meters (m)	3.281	feet	feet	0.3048	meters
meters	1.094	yards	yards	0.9144	meters
kilometers (km)	0.621	mile	mile	1.609	kilometers
hectares (ha)	2.471	acres	acres	0.4047	hectares

THE SOUTHERN TEXAS ARCHAEOLOGICAL ASSOCIATION

FULL MEMBERSHIP APPLICATION FORM

Check type of membership: New _____ Renewal _____ for the calendar year 20_____

_____ Active ($20 per year)
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Name _____

Address _____

City _____State _____ Zip _____ - _____

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Roy Banning
11807 Broadwood
San Antonio, TX 78249

MEMBERSHIP PLEDGE:

All members shall agree to abide by the following statement of ethics:

"I pledge that I will not intentionally violate the terms and conditions of any Texas Antiquities Statutes, as same now exist, or shall hereafter be amended or enacted, or engage in the practice of buying or selling artifacts for commercial purposes or engage in the willful destruction or distortion of archaeological data or disregard proper archaeological field techniques."

Signed _____ DATE _____

THE SOUTHERN TEXAS ARCHAEOLOGICAL ASSOCIATION

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* A subscription does not entitle the subscriber to any other benefits of STAA membership, such as the Newsletter, participation in fieldwork, etc. If you are interested in full membership, contact Roy Banning at the above address or via email: royb@swlegal.com

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Back issues of *La Tierra* are available for subscribers at $5.00 each. Shipping is $1.50 for the first copy and .50 cents for each additional copy. A listing of back issues and contents are shown on the STAA website, soutxarchaeology.org . Inquiries may be addressed to Karen Fulghum via e-mail, baytree@prodigy.net .

THE SOUTHERN TEXAS ARCHAEOLOGICAL ASSOCIATION

The Southern Texas Archaeological Association brings together persons interested in the prehistory of south-central and southern Texas. The organization has several major objectives: To further communication among avocational and professional archaeologists working in the region; To develop a coordinated program of site survey and site documentation; To preserve the archaeological record of the region through a concerted effort to reach all persons interested in the prehistory of the region; To initiate problem-oriented research activities which will help us to better understand the prehistoric inhabitants of this area; To conduct emergency surveys or salvage archaeology where it is necessary because of imminent site destruction; To publish a quarterly journal, newsletters, and special publications to meet the needs of the membership; To assist those desiring to learn proper archaeological field and laboratory techniques; and To develop a library for members' use of all the published material dealing with southern Texas.

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