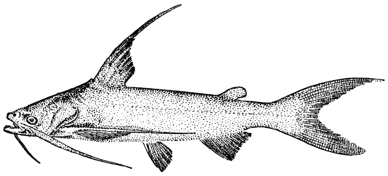

CHAPTER 5
FIRST SPANISH PERIOD VERTEBRATE USE AT MISSION SANTA CATALINA DE GUALE

The Spanish and Native American dietary and exploitation strategies practiced before the 17th century and during the First Spanish period in the southern Georgia Bight and elsewhere in Spanish Florida provide a historical and regional framework within which to assess change and continuity at both the mission and pueblo of Santa Catalina de Guale. This framework enables us to examine, from a comparative perspective, foodways on the island in the 17th century as well as the implications of providing goods and services to the Spanish colonial economy.

Data from Apalachee and Timucua provinces, though limited, indicate that the missionaries' diets changed in those provinces, and the Apalachee's diet probably also changed. Based on the review in chapter 4, the following characteristics should be present in both Spanish and Guale deposits: (1) limited use of Eurasian domestic mammals; (2) relatively high use of chickens (*Gallus gallus*); (3) high use of venison; (4) moderately high diversity; and (5) extensive use of both large-bodied and small-bodied estuarine fishes, many of which were captured using mass-capture techniques from mean trophic levels of 2.8 or higher. Except for the presence of Eurasian animals, the diet and exploitation strategies at Santa Catalina de Guale should conform more to the pre-Hispanic pattern on St. Catherines Island than to a hypothetical Iberian strategy (see chap. 3). It is anticipated that neither the Iberian nor the St. Augustine patterns were practiced at Santa Catalina de Guale.

Animal remains from Apalachee and Timucua provinces indicate that priests had little influence on Native American diets but may have altered local economic strategies to focus on commodities, such as beef, that could be sold through outlets along the Gulf of Mexico. Economic strategies in Apalachee and Timucua provinces were altered because of the opportunity to trade livestock, deer hides, furs, and meat products using vessels from Cuba and elsewhere (Bushnell, 1981: 90–91). It is not known if such opportunities were available on St. Catherines Island. Nonetheless, deer elements present in the collections, and their modifications, may provide evidence for deer hide production.

If Spaniards posted to St. Catherines Island attempted to maintain social distance between themselves and the Guale converts in the pueblo, then the Spanish diet might be expected to deviate from pre-Hispanic habits and those of the Guale at the mission. Use of venison probably was considered a prestige food by Spanish priests (e.g., Pluskowski, 2007). Thus, the use of venison might have increased from the already high levels found in the pre-Hispanic Guale diet. Diversity, which is both a symbol of higher status and a way to respond to a deteriorating resource base, might be higher than pre-Hispanic levels (recall the significant drought between 1627 and 1667 [Blanton and Thomas, 2008]). As additional symbols of Spaniards' status in the community, we also might find greater use of Eurasian domestic animals and local animals that were rare in the environment or required more effort to sustain or capture, as well as evidence of fishing at high mean trophic levels. The degree to which these characteristics are found inside the mission compound would depend on the extent to which Spaniards did their own hunting and fishing or relied upon Guale contributions. Spanish data are reviewed in this chapter and Guale data are presented in chapters 6 and 7. Expectations for diet and exploitation strategies will be revisited at the end of chapter 6 when the mission and pueblo data are compared.

Evidence for change and continuity reviewed in this chapter is from four areas inside the Mission Santa Catalina de Guale compound. These four areas were excavated by students, volunteers, and staff of the American Museum of Natural History under the direction of David Hurst Thomas (fig. 5.1; see chap. 2 and appendix A). The areas are known as Structure 1, the iglesia or church (including Structure 1NWC); Structure 2, the cocina or kitchen; Structure 2/4, an area between Structures 2 and 4; and Structure 4, the convento or friary. Subsequent to the original designation, Structure 2/4 was found to be a garden area containing two wells. Most of the faunal remains from Structure 2/4 are from the second, larger well that was one of the last features built at the mission. Structures 2, 2/4, and 4 are combined into a single analytical unit because these areas are adjacent to one another and it is likely that animal refuse was scattered among all three areas. Structures 2 and 4, as well as the area between them, are jointly referred to

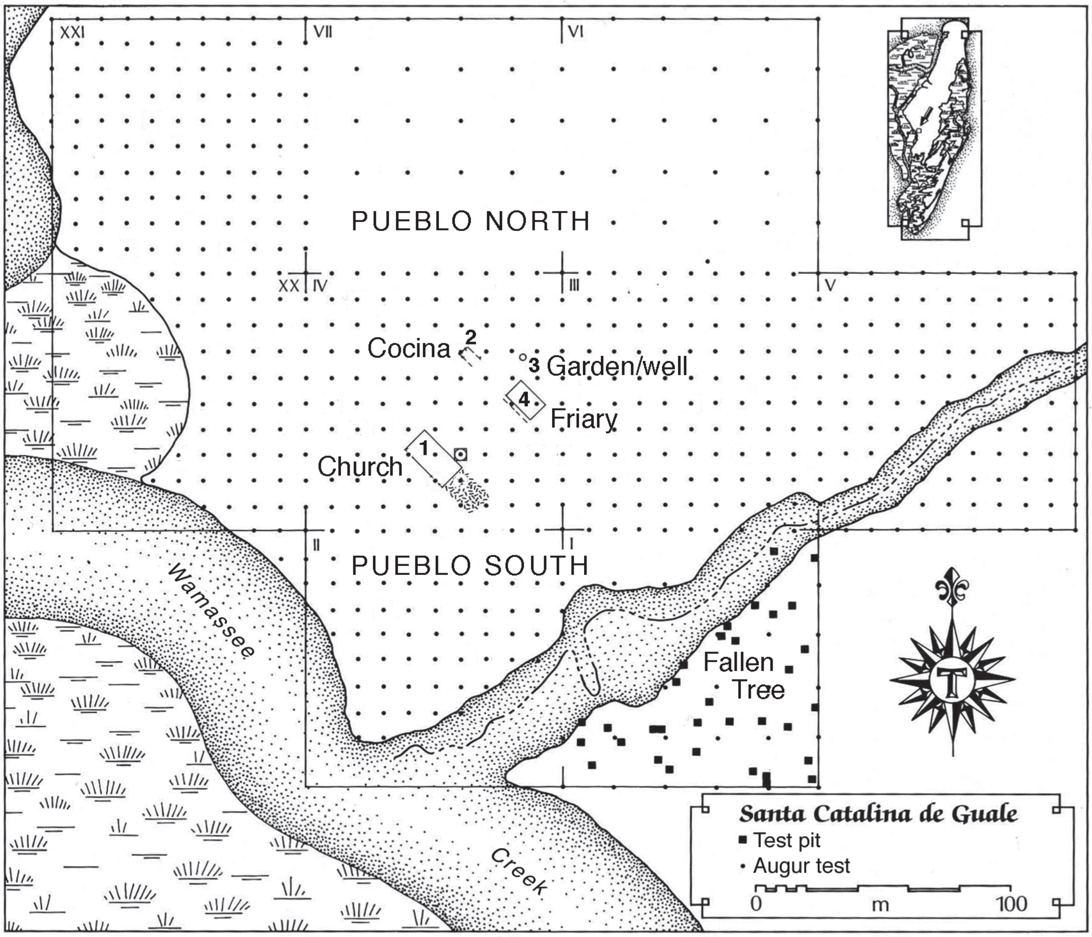

Fig. 5.1. Map showing location of Mission Santa Catalina de Guale and Pueblo Santa Catalina de Guale (Pueblo South, Pueblo North, and Fallen Tree sectors). The numbers designate the church (Structure 1), the cocina (Structure 2), the friary (Structure 4), and the early well (3). The garden (Structure 2/4) lies between Structures 2 and 4. Modified from Thomas (1987: fig. 25).

as the Eastern Plaza Complex. Species lists for Structure 2, Structure 2/4, and Structure 4 are provided in appendix C. Miscellaneous other contexts and the auger survey of the mission compound are summarized in appendix D and a discussion of density-mediated attrition is presented in appendix E.

It is not known who actually lived inside the mission compound and who lived in the adjacent village. In the following discussion, people who lived inside the compound are referred to as "Spanish" and those who lived in the pueblo are referred to as "Guale" and are presumed to be converts to Catholicism. As discussed in chapter 1, many social identities are subsumed under the terms "Spanish" and "Guale." It also seems likely that at least some Guale neophytes, or other Native Americans, lived inside the mission compound and that some Spaniards lived in the pueblo. It is plausible that Spanish soldiers lived with Guale wives in the pueblo and that Guale servants lived inside the compound. We cannot prove or disprove any of these assumptions. We can presume, however, that whatever trash was discarded inside the compound and within the pueblo would, to some degree, be a reflection upon those who frequented these areas. Social distinctions within the mission compound were almost certainly maintained through diet and cuisine, as they were in the pueblo.

SUMMARY OF PRE-HISPANIC AND 17TH-CENTURY SECULAR ST. AUGUSTINE DIET AND EXPLOITATION STRATEGIES

The historical and regional patterns of Spanish and Native American diets, exploitation strategies, and economic contributions of Native Americans to the Spanish colonial enterprise are described at length in chapters 3 and 4, but the main points are summarized here.

Combining estuarine resources with white-tailed deer (*Odocoileus virginianus*) and other vertebrates was a long-standing tradition in the southern Georgia Bight. This tradition was modified on St. Catherines Island to the extent that venison played a more prominent role in the diet than it did elsewhere on the coast (figs. 3.4 and 3.10; see chap. 3). Many of the fish taxa present in the St. Catherines Island pre-Hispanic collections are susceptible to mass-capture techniques with small-bodied fishes somewhat less common (fig. 3.12). Total diversity was low (fig. 3.13) and the average fish trophic level would be considered high by today's standards (fig. 3.14). This was the tradition encountered by Spanish priests when they established their mission on St. Catherines Island. To the extent that the Guale people influenced Spanish foodways on the island by hunting and fishing for the Spanish priests and preparing their food, this is the pattern that would be followed.

Fishes and other sources of nondomestic animal nutrients played an important role in the diet of secular and religious colonists at St. Augustine in the 17th century (fig. 4.3). Little evidence of a generalized Iberian diet was present in secular St. Augustine or the Convento de San Francisco. The secular St. Augustine pattern is interpreted as evidence of Spanish self-sufficiency in which Spanish Floridians combined rations with local resources obtained largely through their own efforts. Self-sufficiency took the form of purchase, barter, hiring specialists, or fishing, hunting, and herding on their own. Some effort was made to maintain status distinctions through greater diversity. Access to Eurasian meats was rare, though such access may have been a symbol of status in the town. Eurasian meats did not dominate the diet until the 18th century, after the Apalachee and western Timucua missions were destroyed.

Some of the characteristics of pre-Hispanic foodways in the southern Georgia Bight are found in secular St. Augustine collections. Spanish dietary diversity in St. Augustine, however, was higher than pre-Hispanic dietary diversity (figs. 3.6, 3.13, and 4.4). The contribution of fish biomass was greater in the 17th-century Spanish diet in St. Augustine than it was at any time prior to the 17th century on St. Catherines Island (figs. 3.11B and 4.3B). No small-bodied fishes, however, are present in the secular 17th-century St. Augustine assemblage and the use of mass-captured fishes is comparatively low (fig. 4.5). The mean trophic level of fishes in 17th-century secular St. Augustine (fig. 4.5) was slightly lower than the pre-Hispanic mean trophic level on St. Catherines Island (figs. 3.15 and 4.5), but a similar suite of fishes is present in pre-Hispanic and Spanish assemblages.

Although missions are thought to have contributed meats to the Spanish town in the 17th century, these contributions were minor and made primarily, if not exclusively, to the mission administrative headquarters located at the Convento de San Francisco (see chap. 4). Spanish and Native American use of animals at the missions was variable and dissimilar to patterns of animal use in St. Augustine itself. Even habits of animal use at Mission Nombre de Dios were dissimilar to those practiced in St. Augustine only a couple of kilometers to the south. In many respects, use of animals at Nombre de Dios was more similar to the pre-Hispanic strategy than to that practiced in St. Augustine. Particularly noteworthy is the limited use of pigs (*Sus scrofa*), cattle (*Bos taurus*), goats (*Capra hircus*), sheep (*Ovis aries*), and chickens at Mission Nombre de Dios even at the end of the First Spanish period (Reitz, 1985).

The strongest evidence for a mission contribution to St. Augustine is found in the high level of venison estimated for the ca. 1650s component of the Convento de San Francisco. To the extent that Spanish preferences influenced Guale subsistence efforts, we might expect similar high percentages of venison inside the Mission Santa Catalina de Guale compound. Venison had prestige value in the generalized Iberian foodway and might have been a status marker among Spaniards posted to St. Catherines Island whether they were peninsulares or criollos, priests or soldiers. We also might expect that the Guale neophytes provided Spaniards with higher-quality portions of the carcass, while retaining the lower-quality portions for themselves.

VERTEBRATE USE IN THE CHURCH (STRUCTURE 1)

Most of the faunal materials from the church are from daub pits flanking the walls of the structure (see chap. 2). The collection from the church consists of 4139 specimens (NISP) containing the remains of at least 44 individuals (MNI), and weighing 2768.757 g (table 5.1). MNI is estimated for 28 taxa. Domestic animals contribute 7% of the individuals, fishes 23%, and commensal taxa 34% (table 5.2; see appendix A for a discussion of methods). It is unlikely that these specimens are from primary deposits because of the religious rituals that took place inside the church. A third of the individuals in the collection are commensal taxa, suggesting that at least some of these animals lived and died inside the church. Wild mammals and birds are very common in the collection; venison alone contributes three-quarters of the biomass (table 5.2). Noncommensal Eurasian domestic animals are very rare and include only two pigs and a chicken, with two additional Eurasian animals, horse or donkey (*Equus* spp.) and a cat (*Felis catus*), grouped with the commensal taxa.

Use of adjacent estuarine waters and beaches is demonstrated by the high percentages of individuals from that biotope, though the meat contribution of these animals is low (table 5.2). Turtle remains suggest foraging took place in three distinct habitats. The mud turtle (*Kinosternon* spp.) was probably taken from a shallow-water ditch (Carr, 1952: 104); the diamondback terrapin (*Malaclemys terrapin*) from a brackish estuary; and the sea turtle (Cheloniidae) from either open waters in the estuary or from one of the beaches on the seaward side of the island (e.g., Carr, 1952: 387). All of the fish taxa identified are estuarine species that could be taken from locations near the mission compound. Hardhead catfishes (*Ariopsis felis*) are the most abundant fishes. A requiem shark (*Carcharhinus* sp.) and a stingray (*Dasyatis* spp.) constitute 22% of the fish taxa, 20% of the fish individuals, and 15% of the fish biomass in the collection.

Commensal taxa are abundant in the church collection (table 5.2). Dog (*Canis familiaris*) specimens are from three separate excavation units (L91, O91, and L99) and the cat specimen is from a single unit (M97). The horse or donkey is represented by 11 tooth fragments, all from the same context (L105, Pit A). The dog, cat, and horse or donkey specimens may have been debris incorporated into the church stratigraphy by burial and construction activities. A number of dog remains, including a dog burial, also were found in miscellaneous contexts in the mission area (see appendix D). The other commensal animals were probably attracted to the church by grains and other stored products, by the protection the structure offered, or by the other commensal animals (as prey) upon which they could feed.

Human (*Homo sapiens*) remains also are present in the faunal collection studied from the church (Larsen, 1990). Given that a large number of people were buried in the campo santo located beneath the church floor, it is not surprising that these fragments are present in the collection. Sixty of the 80 human specimens are tooth fragments. These remains have been reburied (Thomas, 1988b).

Modifications to the faunal specimens from the church include cutting, hacking, burning, working,

TABLE 5.1
Mission Santa Catalina de Guale: Church (Structure 1) Species List

		NISP	MNI		Wt. (g)	Biomass (kg)
Scientific name	Vernacular name		No.	%		
Indeterminate mammal		2645	—	—	1220.967	15.777
Indeterminate small mammal		11			1.37	0.035
Scalopus aquaticus	Mole	29	3	6.8	0.8	0.022
Homo sapiens	Human	80	—	—	49.78	—
Sylvilagus spp.	Rabbit	9	2	4.5	4.97	0.114
Indeterminate rodent		5			0.81	0.022
Sciurus sp.	Squirrel	1	1	2.3	0.01	0.0004
Sciurus carolinensis	Gray squirrel	2	—	—	1.07	0.028
Peromyscus sp.	Mouse	1	1	2.3	0.01	0.0004
Canis familiaris	Domestic dog	153	1	2.3	60.4	1.054
Procyon lotor	Raccoon	10	2	4.5	14.76	0.297
Felis catus	Domestic cat	20	1	2.3	16.07	0.320
Equus spp.	Horse or donkey	11	1	2.3	12.54	0.256
Artiodactyla	Even-toed ungulate	22	—	—	14.9	0.299
Sus scrofa	Pig	37	2	4.5	61.06	1.065
Odocoileus virginianus	White-tailed deer	229	6	13.6	1082.55	14.158
Indeterminate bird		19	—	—	7.62	0.130
Gallus gallus	Chicken	4	1	2.3	1.93	0.037
Rallidae	Rails	1	1	2.3	0.31	0.007
Quiscalus sp.	Grackle	1	1	2.3	0.07	0.002
Indeterminate turtle		123	—	—	32.3	0.325
Kinosternon sp.	Mud turtle	1	1	2.3	0.37	0.016
Emydidae	Pond turtles	18	—	—	6.08	0.106
Malaclemys terrapin	Diamondback terrapin	6	1	2.3	5.37	0.098
Cheloniidae	Sea turtles	8	1	2.3	47.81	0.422
Indeterminate snake		8	—	—	0.66	0.009
Colubridae	Nonvenomous snakes	141	2	4.5	2.5	0.035
Indeterminate toad/frog		89	—	—	3.17	—
Scaphiopus holbrookii	Spadefoot toad	35	2	4.5	0.62	—
Bufo spp.	Toad	99	4	9.1	3.39	—
Chondrichthyes	Cartilaginous fishes	2	—	—	0.02	0.004
Carcharhinidae	Requiem sharks	5	—	—	0.2	0.032
Carcharhinus sp.	Requiem shark	1	1	2.3	0.3	0.045
Rajiformes	Skates and rays	1	—	—	0.01	0.002
Dasyatis spp.	Stingray	2	1	2.3	0.02	0.004
Indeterminate fish		134	—	—	5.65	0.12
Lepisosteus spp.	Gar	2	1	2.3	0.03	0.002
Siluriformes	Catfishes	2	—	—	0.62	0.013
Ariidae	Sea catfishes	72	—	—	5.55	0.102
Ariopsis felis	Hardhead catfish	49	2	4.5	7.06	0.128
Bagre marinus	Gafftopsail catfish	2	1	2.3	0.3	0.006
Archosargus probatocephalus	Sheepshead	1	1	2.3	0.06	0.001
Sciaenidae	Drums	8	—	—	0.09	0.007
Cynoscion sp.	Seatrout	1	1	2.3	0.31	0.016
Pogonias cromis	Black drum	27	1	2.3	3.74	0.103
Mugil spp.	Mullet	12	1	2.3	0.44	0.014
Indeterminate vertebrate		—	—	—	90.09	—
Total		4139	44		2768.757	35.232

TABLE 5.2
Mission Santa Catalina de Guale: Church (Structure 1) Summary

	MNI		Biomass	
	No.	%	kg	%
Domestic mammals	2	4.5	1.065	5.8
Domestic birds	1	2.3	0.037	0.2
Deer	6	13.6	14.158	77.7
Other wild mammals	5	11.4	0.411	2.3
Wild birds	2	4.5	0.009	0.05
Turtles	3	6.8	0.536	2.9
Sharks, rays, & fishes	10	22.7	0.32	1.8
Commensal taxa	15	34.1	1.687	9.3
Total	44		18.222	

TABLE 5.3
Mission Santa Catalina de Guale: Church (Structure 1) Modifications[a]

Taxa	Cut	Hacked	Burned	Worked	R.-gnawed	C.-gnawed
Indeterminate mammal	6	—	362	5	18	1
Rabbit	—	—	1	—	—	—
Indeterminate rodent	—	—	1	—	—	—
Artiodactyla	1	—	1	—	—	—
Pig	—	—	1	—	—	1
Deer	11	1	20	—	2	1
Indeterminate bird	—	—	6	—	—	—
Chicken	—	—	—	—	—	1
Indeterminate turtle	—	—	9	—	—	—
Indeterminate fish	—	—	5	—	—	—
Sea catfishes	1	—	3	—	—	—
Hardhead catfish	—	—	1	—	—	—
Seatrout	—	—	1	—	—	—
Black drum	1	—	—	—	—	—
Mullet	—	—	1	—	—	—
Indeterminate vertebrate	—	—	72	—	—	—
Total	20	1	484	5	20	4

[a] Key to abbreviations: R.-gnawed, rodent-gnawed; C.-gnawed, carnivore-gnawed.

rodent gnawing, and carnivore gnawing (table 5.3). Only 11% of specimens identified at some level other than Indeterminate vertebrate (NISP = 462) are modified. Seventy-two of the Indeterminate vertebrate fragments also are modified. The most common modification is burning, which constitutes 91% of the modifications observed. Five Indeterminate mammal specimens are cut, polished, grooved, or drilled, indicating they were intentionally modified, though the pieces are too fragmentary to determine what tools or ornaments were intended.

The pig and deer specimens identified in the church collection are summarized in table 5.4 and the deer specimens illustrated in figure 5.2 (see appendix A for a discussion of specimen categories). Pig is represented primarily by teeth (NISP = 30). Deer specimens are compared to the unmodified deer skeleton in figure 5.3 (see also table 5.5). Deer are represented by specimens from the entire skeleton, with cranial specimens somewhat more common than specimens from the foot (table 5.4; fig. 5.2). Compared to the standard deer skeleton, specimens from the body and the foot are underrepresented and specimens from the head are overrepresented (fig. 5.3). Nonetheless, high food-utility portions of the deer skeleton are overrepresented when compared to a complete, undisturbed deer skeleton (table 5.6; fig. 5.4; see appendix A for a discussion of food-utility indices).

TABLE 5.4
Mission Santa Catalina de Guale: Church (Structure 1) Summary of Elements

Skeletal elements	Pig	Deer
Head	32	90
Vertebra/rib/sternum	—	4
Forequarter	—	41
Forefoot	—	7
Foot	3	36
Hindfoot	1	20
Hindquarter	1	31
Total	37	229

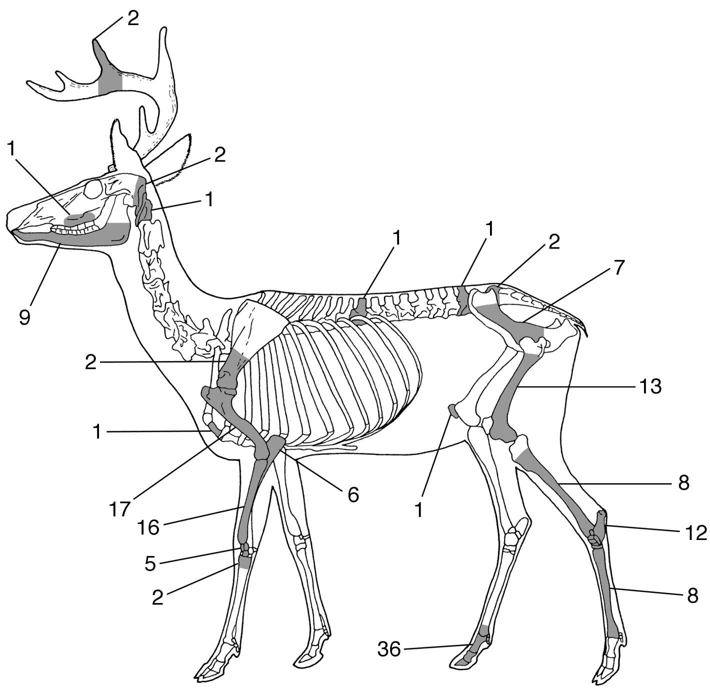

Fig. 5.2. Mission Santa Catalina de Guale, church (Structure 1) deer elements. NISP = 229 (76 teeth not shown). The numbers indicate the number of specimens from that portion of the deer skeleton.

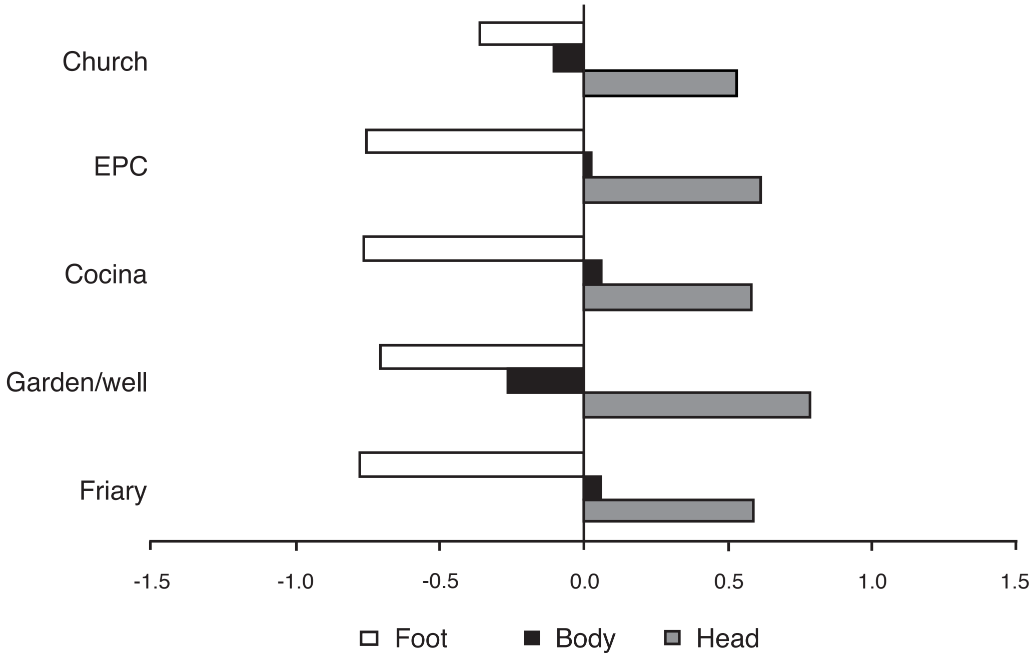

Fig. 5.3. Ratio diagram comparing deer elements from Mission Santa Catalina de Guale, the church (Structure 1), and the Eastern Plaza Complex with a complete standard deer skeleton. Categories with positive values are more abundant than the standard, and negative values indicate categories that are less abundant than the standard.

TABLE 5.5
Mission Santa Catalina de Guale: Deer Element Summary[a]

	Standard		Church		Cocina		Garden		Friary		EPC	
Skeletal elements	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Head	63	23.9	90	39.3	480	42.8	113	52.3	114	43.0	707	44.1
Body	97	36.7	76	33.2	436	38.9	61	28.2	103	38.9	600	37.4
Foot	104	39.4	63	27.5	206	18.4	42	19.4	48	18.1	296	18.5
Total	264		229		1122		216		265		1603	

[a] Standard refers to the distribution of elements in the unmodified deer skeleton and EPC refers to Eastern Plaza Complex.

Evidence for estimating age at death and sex for these animals is limited in the church faunal collection. The dog was a small subadult and the cat was an adult. Unfortunately, none of these archaeological specimens could be measured. One pig was a juvenile when it died and the other was at least a subadult at death. One of the pig individuals was a female and the other was a male. One deer was less than 18 months of age at death, two were subadults, one was an adult, and two were of indeterminate age (tables 5.7 and 5.8). All of the chickens were adults at death and no evidence of medullary bone is present.

VERTEBRATE USE IN THE EASTERN PLAZA COMPLEX

The Eastern Plaza Complex combines data from the cocina (Structure 2), the friary (Structure 4), and the well (Structure 2/4). The vertebrate assemblage from the Plaza Complex consists of 43,206 specimens (NISP) weighing 24,512.268 g and contains the remains of at least 204 individuals (MNI; table 5.9). MNI is estimated for 54 taxa. It is unclear if these materials are from primary deposits and it is very likely that units of meat and skeletal fragments from individual animals were scattered throughout the Plaza Complex as meat was prepared, cooked, consumed, and disposed of around the friary and cocina. This may be only a small portion of the refuse if much of the trash was discarded elsewhere inside the

TABLE 5.6
Number of Deer Specimens (NISP) in Each Food Utility Category (FUI) from Structures Inside the Mission Compound Compared to the Numbers in a Complete Standard Deer Skeleton[a]

Categories	Church	Cocina	Garden	Friary	EPC	Standard deer
Low Utility (< 1000 FUI)						
Antler	2	14	2	14	30	2
Mandible	9	42	5	7	54	2
Tooth	76	362	98	84	544	32
Other skull fragments	3	62	8	9	79	27
Atlas/axis	1	7	1	—	8	2
Metacarpus/carpus	7	33	14	13	60	16
Phalanx/sesamoid	24	66	5	16	87	48
Subtotal	122	586	133	143	862	129
Medium Utility (1000 - 3000 FUI)						
Other vertebrae	2	74	14	19	107	24
Pelvis/sacrum	9	54	6	4	64	10
Rib	—	18	4	2	24	26
Scapula	2	31	4	9	44	2
Humerus	17	36	5	11	52	2
Radius/ulna	22	84	15	14	113	4
Metatarsus	8	26	4	1	31	2
Subtotal	60	323	52	60	435	70
High Utility (>3000 FUI)						
Sternum	1	7	2	—	9	7
Femur	13	42	3	21	66	2
Tibia/tarsal	20	138	18	36	192	14
Subtotal	34	187	23	57	267	23
Total NISP	216	1096	208	260	1564	222

[a] Eastern Plaza Complex (EPC) specimens include those from the cocina, garden, and friary (Structures 2, 2/4, and 4) but exclude those from the church (Structure 1). Food utility categories follow Purdue et al. (1989). Some specimens could not be used in this procedure, e.g., the patella and specimens identified only as metapodials.

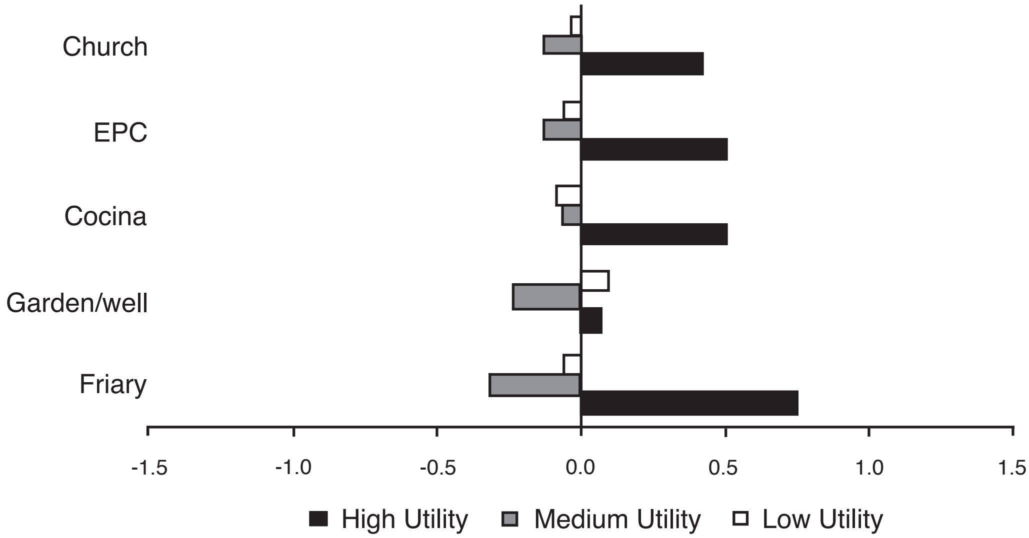

Fig. 5.4. Ratio diagram comparing food utility categories (FUI) for deer from Mission Santa Catalina de Guale, the church (Structure 1), and the Eastern Plaza Complex with food utility categories in a complete standard deer skeleton. Categories with positive values are more abundant than the standard and negative values indicate categories that are less abundant than the standard.

TABLE 5.7
Mission Santa Catalina de Guale: Church (Structure 1) Deer Epiphyseal Fusion

Skeletal elements	Unfused	Fused	Total
Early fusing			
Humerus, distal	1	7	8
Scapula, distal	—	1	1
Radius, proximal	—	6	6
Acetabulum	—	—	—
Metapodials, proximal	—	5	5
1st/2nd phalanx, proximal	1	5	6
Middle fusing			
Tibia, distal	1	1	2
Calcaneus, proximal	1	1	2
Metapodials, distal	6	2	8
Late fusing			
Humerus, proximal	1	1	2
Radius, distal	3	2	5
Ulna, proximal	3	—	3
Ulna, distal	—	1	1
Femur, proximal	2	—	2
Femur, distal	2	—	2
Tibia, proximal	—	—	—
Total	21	32	53

TABLE 5.8
Mission Santa Catalina de Guale: Summary of Deer by Age

Contexts	Juvenile	Subadult	Adult	Indeter-minate	Total
Church (Structure 1)	1	2	1	2	6
Eastern Plaza Complex	3	14	10	—	27
Total	4	16	11	2	33

mission compound (i.e., to fill the daub pits associated with the church) or beyond the walls of the compound.

Deer, other wild mammals, turtles, and an alligator (*Alligator mississippiensis*) comprise many of the individuals and most of the biomass in the Plaza Complex assemblage (table 5.10; fig. 5.5). Eurasian domestic animals are rare and include pigs and chickens. The commensal taxa include a cat. Local wild animals contribute far more biomass than do domestic animals. Deer contribute an estimated 13% of the individuals and 72% of the biomass. The estuarine diamondback

TABLE 5.9
Mission Santa Catalina de Guale: Eastern Plaza Complex Species List

			MNI			
Scientific name	Vernacular name	NISP	No.	%	Wt. (g)	Biomass (kg)
Indeterminate mammal		18712	—	—	7862.445	84.334
Blarina carolinensis	Short-tailed shrew	1	1	0.5	0.04	0.001
Scalopus aquaticus	Mole	20	3	1.5	0.89	0.024
Homo sapiens	Human	3	—	—	0.64	—
Sylvilagus spp.	Rabbit	98	6	2.9	34.75	0.641
Sylvilagus cf. *aquaticus*	Probable swamp rabbit	2	—	—	0.97	0.026
Indeterminate rodent		3	—	—	0.25	0.008
Sciurus spp.	Squirrel	192	5	2.5	31.75	0.591
Sciurus carolinensis	Gray squirrel	35	—	—	6.62	0.144
Sciurus niger	Fox squirrel	1	—	—	1.1	0.029
Sigmodontinae	New World mice and rats	12	—	—	0.3	0.009
Oryzomys palustris	Rice rat	2	1	0.5	0.12	0.004
Peromyscus spp.	Mouse	3	1	0.5	0.35	0.01
Cetacea	Whales	1	—	—	251.8	3.81
Delphinidae	Porpoises	8	1	0.5	87.2	1.467
Indeterminate carnivore		2	—	—	0.24	0.007
Canis familiaris	Domestic dog	18	1	0.5	8.57	0.182
Procyon lotor	Raccoon	136	5	2.5	169.29	2.665
Felis catus	Domestic cat	1	1	0.5	0.01	0.0004
Artiodactyla	Even-toed ungulate	919	—	—	1581.91	19.919
Sus scrofa	Pig	701	5	2.5	1241.22	16.013
Odocoileus virginianus	White-tailed deer	1603	27	13.2	8974.14	94.993
Indeterminate bird		3122	—	—	397.545	4.736
Ardea herodias	Great blue heron	2	1	0.5	0.78	0.016
Butorides striatus	Green heron	1	1	0.5	0.7	0.015
Casmerodius albus	Great heron	1	1	0.5	1.08	0.022
Mycteria americana	Woodstork	3	1	0.5	10.47	0.173
Anatidae	Ducks	2	—	—	4.34	0.078
Anas sp.	Dabbling duck	1	1	0.5	0.7	0.015
Branta canadensis	Canada goose	3	1	0.5	1.05	0.021
Phasianidae	Turkey or chicken	52	—	—	6.62	0.114
Gallus gallus	Chicken	1143	26	12.7	532.84	6.183
Rallus sp.	Rail	1	1	0.5	0.21	0.005

TABLE 5.9 — (*Continued*)

			MNI			
Scientific name	Vernacular name	NISP	No.	%	Wt. (g)	Biomass (kg)
Grus canadensis	Sandhill crane	2	1	0.5	6.7	0.115
Columbidae	Doves	1	1	0.5	0.13	0.003
Passeriformes	Song birds	3	—	—	0.06	0.002
Corvus ossifragus	Fish crow	1	1	0.5	0.25	0.006
Muscicapidae	Thrushes	1	1	0.5	6.73	0.116
Mimidae	Thrashers	1	1	0.5	0.2	0.005
Emberizidae	Warblers	4	—	—	0.351	0.008
Cardinalis cardinalis	Cardinal	1	1	0.5	0.05	0.001
Alligator mississippiensis	Alligator	1	1	0.5	7.07	—
Indeterminate turtle		1036	—	—	220.315	1.174
Chelydra serpentina	Snapping turtle	1	1	0.5	0.23	0.012
Kinosternidae	Mud/musk turtles	1	—	—	0.07	0.005
Kinosternon spp.	Mud turtles	25	2	1.0	5.29	0.097
Kinosternon subrubrum	Mud turtle	1	—	—	0.1	0.007
Emydidae	Pond turtles	86	—	—	36.53	0.352
Deirochelys reticularia	Chicken turtle	1	1	0.5	0.41	0.017
Malaclemys terrapin	Diamondback terrapin	725	15	7.4	670.91	2.477
Terrapene carolina	Box turtle	1	1	0.5	1.31	0.038
Gopherus polyphemus	Gopher tortoise	1	1	0.5	1.2	0.036
Indeterminate lizard		5	—	—	0.21	—
cf. *Ophisaurus* spp.	Possible glass lizard	44	1	0.5	0.66	—
Indeterminate snake		3	—	—	0.05	0.001
Colubridae	Nonvenomous snakes	27	1	0.5	1.25	0.017
Indeterminate toad/frog		79	—	—	3.31	—
Scaphiopus holbrookii	Spadefoot toad	8	2	1.0	0.43	—
Bufo spp.	Toad	50	6	2.9	7.58	—
Rana spp.	Frog	7	1	0.5	0.21	—
Chondrichthyes	Cartilaginous fishes	2	—	—	0.05	0.01
cf. Lamnidae	Possible mackerel shark	3	1	0.5	1.02	0.128
Odontaspis taurus	Sand tiger shark	1	1	0.5	0.11	0.019
Carcharhinidae	Requiem sharks	5	—	—	1.021	0.128
Carcharhinus sp.	Requiem shark	1	1	0.5	0.35	0.051
Galeocerdo cuvier	Tiger shark	2	1	0.5	0.7	0.093
Squaliformes	Cartilaginous fishes	2	—	—	1.27	0.155

TABLE 5.9 — (*Continued*)

			MNI			
Scientific name	Vernacular name	NISP	No.	%	Wt. (g)	Biomass (kg)
Rajiformes	Skates and rays	2	—	—	0.04	0.008
Dasyatis spp.	Stingray	19	1	0.5	0.55	0.075
Indeterminate fish		11664	—	—	308.95	3.068
Lepisosteus spp.	Gar	6	1	0.5	2.29	0.058
Siluriformes	Catfishes	176	—	—	14.93	0.26
Ariidae	Sea catfishes	402	—	—	36.93	0.615
Ariopsis felis	Hardhead catfish	797	31	15.2	131.317	2.053
Bagre marinus	Gafftopsail catfish	177	7	3.4	60.5	0.983
Perciformes		7	—	—	0.42	0.013
Archosargus probatocephalus	Sheepshead	5	1	0.5	0.58	0.01
Sciaenidae	Drums	15	—	—	9.83	0.211
Bairdiella chrysoura	Silver perch	3	1	0.5	0.32	0.017
Cynoscion spp.	Seatrout	32	3	1.5	4.441	0.117
Cynoscion nebulosus	Spotted seatrout	40	—	—	4.58	0.12
Pogonias cromis	Black drum	107	3	1.5	35.07	0.541
Sciaenops ocellatus	Red drum	18	3	1.5	16.6	0.311
Stellifer lanceolatus	Star drum	1	1	0.5	0.1	0.007
cf. *Mugil* spp.	Possible mullet	10	—	—	0.025	0.001
Mugil spp.	Mullet	775	18	8.8	48.489	0.69
Paralichthys spp.	Flounder	14	1	0.5	5.39	0.118
Indeterminate vertebrate		—	—	—	1643.849	—
Total		43206	204		24512.268	250.604

TABLE 5.10
Mission Santa Catalina de Guale: Eastern Plaza Complex Summary

	MNI		Biomass	
Category	No.	%	kg	%
Domestic mammals	5	2.5	16.013	12.2
Domestic birds	26	12.7	6.183	4.7
Deer	27	13.2	94.993	72.4
Other wild mammals	17	8.3	5.364	4.1
Wild birds	13	6.4	0.513	0.4
Turtles/alligators	22	10.8	2.677	2.0
Sharks, rays, & fishes	75	36.8	5.271	4.0
Commensal taxa	19	9.3	0.238	0.2
Total	204		131.252	

terrapin is the most abundant of the turtles but two terrestrial turtles are also present: a box turtle (*Terrapene carolina*) and a gopher tortoise (*Gopherus polyphemus*). The gopher tortoise is of particular interest because it had previously been reported as occurring on the Georgia coast only on Cumberland Island, where it is said to have been introduced (Johnson et al., 1974; see Franz and Quitmyer [2005] for a paleontological and zooarchaeological review of gopher tortoises).

Fishes contribute 37% of the individuals, but very little biomass (table 5.10; fig. 5.5). All of the fishes could have been taken from estuarine waters near the mission. Particularly noteworthy among the Plaza Complex fishes are five shark and ray taxa (cf. Lamnidae, *Odontaspis taurus*, *Carcharhinus* sp., *Galeocerdo cuvier*, *Dasyatis* spp.). Cartilaginous fishes such as these are present in pre-Hispanic collections but the taxonomic richness of sharks and rays is typically low even in very rich pre-Hispanic collections. In contrast, cartilaginous fishes constitute a third of the fish taxa in the assemblage from the Plaza Complex, 7% of the fish individuals, and 7% of the fish biomass. Six of the eight fish taxa with at least 90% ubiquity in pre-Hispanic southern Georgia Bight collections (chap. 3) are present in the Plaza Complex assemblage. These six taxa are gars (*Lepisosteus* spp.), sea catfishes (*Ariopsis felis, Bagre marinus*), seatrouts (*Cynoscion* spp.), star drums (*Stellifer lanceolatus*), mullets (*Mugil* spp.), and flounders (*Paralichthys* spp.). These six fish taxa constitute 83% of the fish individuals and 76% of the fish biomass in the Plaza Complex assemblage. The two most abundant taxa in terms of individuals are hardhead catfishes (41% of the MNI) and mullets (24% of the MNI). Hardhead catfishes and mullets are also the two dominant sources of fish biomass (39% and 13% of the biomass, respectively.)

Compared to the church, fewer commensal taxa are present in the Plaza Complex assemblage (tables 5.2 and 5.10). As with the church, commensal animals likely were attracted by stored food, discarded refuse, or by the other animals attracted to the area.

Modifications to the specimens include cutting, hacking, burning, rodent gnawing, and carnivore gnawing (table 5.11). Only 10% of specimens identified at some level other than Indeterminate vertebrate (NISP = 4524) are modified and 2563 of the Indeterminate vertebrate fragments also are modified. The most common modification, burning, is present on 93% of the modified specimens. Twelve specimens are worked. The five worked Indeterminate mammal specimens include two polished fragments, a fragment that appears to have been a bevel, a shaft fragment with an intricately carved diamond design, and a fragment with a design on the

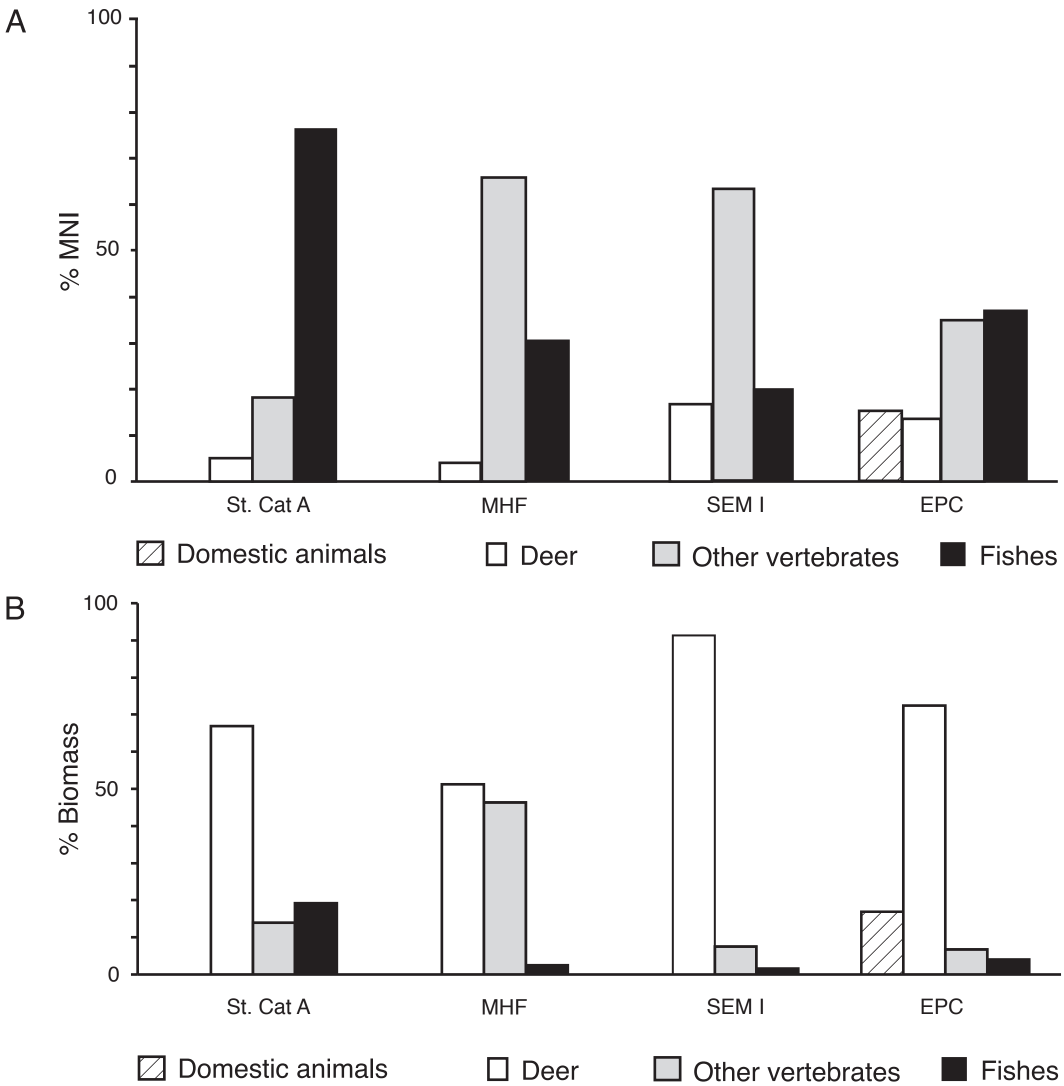

Fig. 5.5. Bar graph of animal use at some sites on St. Catherines Island: (**A**) MNI and (**B**) biomass. Other vertebrates include birds, reptiles, amphibians, and wild mammals other than deer. **St. Cat A**, St. Catherines Shell Ring; **MHF**, Irene-period Meeting House Field (all mounds combined); **SEM I**, Irene-period South End Mound I; and **EPC**, First Spanish period Eastern Plaza Complex.

surface. A pig canine may have been used as an engraver. Three deer fragments in the assemblage are worked, including a humerus shaft fragment with one edge that appears abraded, a metatarsus that appears grooved and snapped, and a mandible fragment that may have been worked into a point. One Indeterminate bird shaft fragment has several arch-shaped cuts across its polished surface. Two small holes had been drilled into a seatrout vertebral centrum, perhaps to make a bead or a button. Similarly modified fish vertebrae are reported from Chevington Chapel, a 13th/14th-century chapel in Northumberland, England. Sue Stallibrass (2007: 55) interprets the Chevington Chapel fish vertebrae as beads that might have been used in rosaries or paternosters. An Inde-

TABLE 5.11
Mission Santa Catalina de Guale: Eastern Plaza Complex Modifications[a]

Taxa	Cut	Hacked	Burned	Worked	R.-gnawed	C.-gnawed
Indeterminate mammal	123	9	3244	5	23	10
Mole	—	—	1	—	—	—
Rabbit	1	—	1	—	—	—
Squirrel	2	—	3	—	—	—
Indeterminate carnivore	—	—	1	—	—	—
Raccoon	5	—	6	—	3	—
Artiodactyla	49	2	65	—	4	2
Pig	2	2	15	1	—	—
Deer	113	28	54	3	29	7
Indeterminate bird	17	2	104	1	1	—
Ducks	1	—	—	—	—	—
Canada goose	—	—	1	—	—	—
Chicken	36	—	13	—	1	1
Sandhill crane	1	—	—	—	—	—
Indeterminate turtle	4	—	123	—	—	—
Snapping turtle	—	—	1	—	—	—
Mud/musk turtles	—	—	1	—	—	—
Mud turtles	—	—	21	—	—	—
Mud turtle	—	—	1	—	—	—
Pond turtles	—	—	5	—	—	—
Chicken turtle	—	—	1	—	—	—
Diamondback terrapin	6	—	3	—	—	1
Cartilaginous fishes	—	—	1	—	—	—
Possible mackerel shark	—	—	1	—	—	—
Indeterminate fish	4	1	192	—	—	—
Catfishes	3	—	20	—	—	—
Sea catfishes	2	—	15	—	—	—
Hardhead catfish	2	—	46	—	—	—
Gafftopsail catfish	1	—	12	—	—	—
Perciformes	—	—	1	—	—	—
Seatrout	1	—	1	1	—	—
Spotted seatrout	1	—	—	—	—	—
Black drum	1	—	27	—	—	—
Star drum	—	—	1	—	—	—
Mullet	—	—	31	—	—	—
Indeterminate vertebrate	9	—	2552	1	1	—
Total	384	44	6564	12	62	21

[a] Key to abbreviations: R.-gnawed, rodent-gnawed; C.-gnawed, carnivore-gnawed.

terminate vertebrate fragment was worked to a point. Nine of the worked specimens are from the cocina (Structure 2), one is from the garden area (Structure 2/4), and two are from the friary (Structure 4).

Deer specimens from the entire skeleton are present in the Plaza Complex assemblage (tables 5.5 and 5.12; figs. 5.6, 5.7, and 5.8). When these specimens are compared to the complete unmodified deer skeleton, it appears that similar portions of the skeleton were discarded in all three Plaza Complex sectors (tables 5.5 and 5.13; fig. 5.3). Cranial specimens are overrepresented and are more than twice as common as specimens from the foot. In terms of food utility, all three sectors are dominated by high-utility portions (table 5.6; fig. 5.4) with both medium- and low-utility portions underrepresented as compared to the standard deer. The presence of fewer specimens from the body and more low-utility specimens in the garden may be an indication of the open character of this area compared to the cocina and the friary.

The Plaza Complex produced other interesting specimens. The dog is represented by loose teeth from unit AA119 and a maxilla from W121 and the cat is from unit W121; both are from the cocina area. As observed previously in this chapter, additional dog remains, including a nearly complete dog burial, are present in the miscellaneous mission collection (see appendix D). Two virtually complete diamondback terrapin carapaces and plastrons were recovered from the cocina. Three fragments of juvenile human teeth were recovered from the garden area.

There is some evidence for age at death and sex of the animals in the Plaza Complex assemblage. One of the raccoons (*Procyon lotor*) was a juvenile and the others were older individuals. One of the raccoons was a male. The dog was an adult and the cat was a kitten. Unfortunately, none of these archaeological specimens could be measured. Two of the pigs were juveniles, one was a subadult, and one was an adult (table 5.14). Three individuals were males. Three of the deer were less than 18 months of age, 14 were subadults, and 10 were adults (tables 5.8 and 5.15). Five deer were males: two were young males with unshed antlers; one was an adult male with an unshed antler; and two deer were killed after shedding their antlers. Four of the chickens were males and seven were females. Twenty-one of the chickens were adults and five were juveniles. Some of the females were laying hens based on the presence of medullary bone. The gopher tortoise was a female.

SPANISH DIET AND EXPLOITATION STRATEGIES AT MISSION SANTA CATALINA DE GUALE

Mission Santa Catalina de Guale is unique in its rich material culture (Thomas, 1990, 1993b) and it is not surprising that it is equally unique in the animal-based portion of the diet. Unlike at

TABLE 5.12
Mission Santa Catalina de Guale: Eastern Plaza Complex Summary of Elements

Skeletal elements	Pig	Deer
Head	637	707
Vertebra/rib/sternum	4	148
Forequarter	11	209
Forefoot	8	60
Foot	14	122
Hindfoot	24	114
Hindquarter	3	243
Total	701	1603

TABLE 5.13
Mission Santa Catalina de Guale: Eastern Plaza Complex Deer Elements by Structure

Skeletal elements	Cocina	Garden	Friary
Head	480	113	114
Vertebra/rib/sternum	106	21	21
Forequarter	151	24	34
Forefoot	33	14	13
Foot	88	13	21
Hindfoot	85	15	14
Hindquarter	179	16	48
Total	1122	216	265

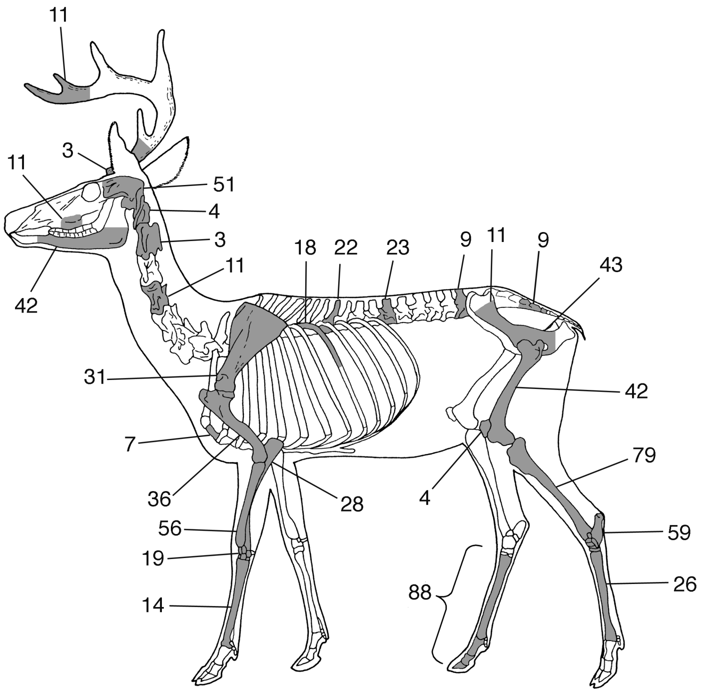

Fig. 5.6. Eastern Plaza Complex, cocina (Structure 2) deer elements. NISP = 1122 (362 teeth not shown). The numbers indicate the number of specimens from that portion of the deer skeleton.

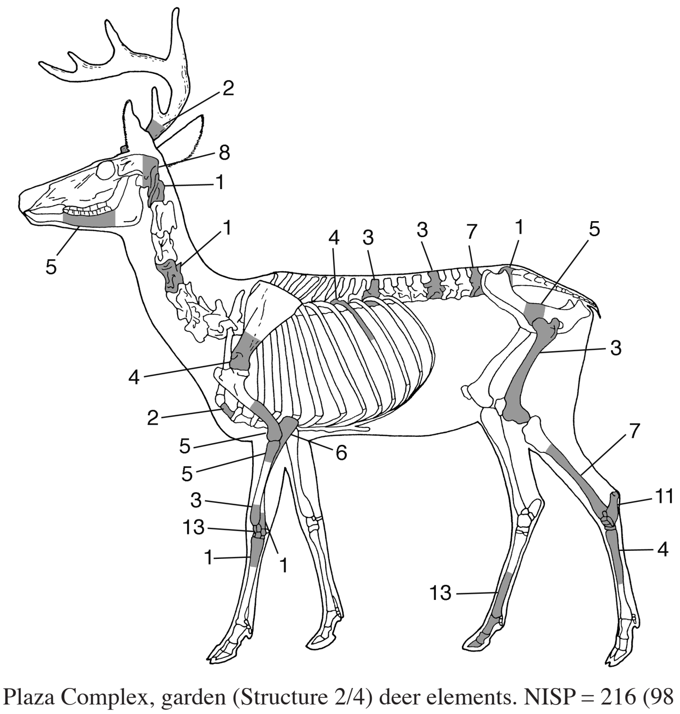

Fig. 5.7. Eastern Plaza Complex, garden (Structure 2/4) deer elements. NISP = 216 (98 teeth not shown). The numbers indicate the number of specimens from that portion of the deer skeleton.

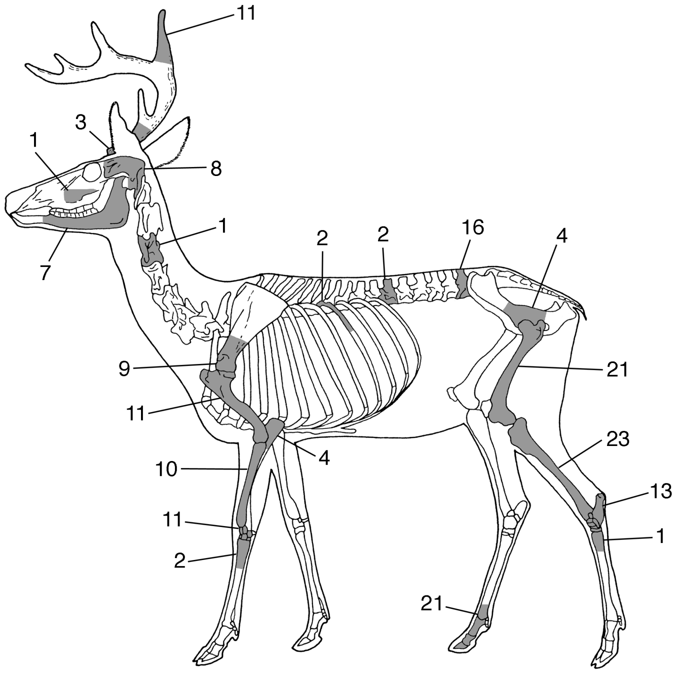

Fig. 5.8. Eastern Plaza Complex, friary (Structure 4) deer elements. NISP = 265 (84 teeth not shown). The numbers indicate the number of specimens from that portion of the deer skeleton.

the Apalachee mission of San Luis de Talimali, where wealth was expressed in cattle herds, the wealth of Mission Santa Catalina de Guale was expressed in venison. Although animal use at the Convento de San Francisco was somewhat different from that practiced in secular 17th-century St. Augustine, the Plaza Complex pattern is not at all similar to other Spanish Florida contexts. Far more venison was consumed in the Plaza Complex at Santa Catalina de Guale than in secular 17th-century St. Augustine or in the Convento de San Francisco (figs. 4.3B and 5.5B). The Plaza Complex assemblage, however, does conform to the broader characterization of other Spanish contexts: local wild resources were combined with limited use of Eurasian domestic animals.

When deer specimens recovered from inside the Mission Santa Catalina de Guale compound are compared to the complete unmodified deer skeleton, it appears that similar portions of the skeleton were discarded in all four areas (tables 5.4, 5.5, and 5.13). Cranial specimens are consistently overrepresented and specimens from the foot are consistently underrepresented (fig. 5.3). In terms of food utility (FUI), each of the four areas inside the mission compound is dominated by high-utility portions (table 5.6; fig. 5.4) with medium- and low-utility portions underrepresented compared to the standard deer. The presence of more low-utility specimens in the garden area may be an indication of the openness of this area as compared to the cocina and the friary.

An analysis of density-mediated attrition of deer remains recovered from the auger survey and miscellaneous contexts associated with the mission area (see appendix E) augments the food-utility study of deer specimens recovered from inside the mission compound. The density study indicates that the pattern of skeletal element representation in the auger survey and miscellaneous contexts is consistent with density-mediated attrition in the assemblage, but does not rule out the influences of transport decisions by human hunters, which can mimic density-mediated attritional processes. The logged ratio diagram (fig. 5.4) based on the modified

TABLE 5.14
Mission Santa Catalina de Guale: Eastern Plaza Complex Pig Epiphyseal Fusion

Skeletal elements	Unfused	Fused	Total
Early fusing			
Humerus, distal	—	—	—
Scapula, distal	—	2	2
Radius, proximal	—	—	—
Acetabulum	—	—	—
Metapodials, proximal	—	11	11
1st/2nd phalanx, proximal	9	6	15
Middle fusing			
Tibia, distal	1	—	1
Calcaneus, proximal	—	—	—
Metapodials, distal	3	1	4
Late fusing			
Humerus, proximal	2	—	2
Radius, distal	—	—	—
Ulna, proximal	1	—	1
Ulna, distal	1	—	1
Femur, proximal	—	—	—
Femur, distal	—	—	—
Tibia, proximal	1	—	1
Total	18	20	38

food utility index (FUI; Purdue et al., 1989; see appendix A) indicates that high-utility elements are overrepresented, whereas the density results (appendix E: fig. E.1) suggest that meaty portions and phalanges are underrepresented in the auger survey and miscellaneous contexts. Skeletal specimens associated with meaty portions of the skeleton are more scarce in the assemblage than can be explained by their bone mineral density. Specimens from the foot, with the exception of metatarsal specimens, are not common in the mission compound, suggesting that many of these low-utility specimens were left behind at the kill or butchering site. Alternatively, they may have been brought into the mission compound for use in tool manufacture and not discarded as were portions of the skeleton considered food waste.

The somewhat conflicting results exhibited between the logged ratio diagram based on food utility (fig. 5.4) and the density diagram (fig. E.1) likely is due to the biases inherent in the different quantitative measures used in the two diagrams. The density diagram presents the data as the Minimum Number of Elements (MNE) and the ratio diagram is based on NISP (the number of identified specimens). Because less dense elements are likely to experience greater rates of fragmentation, these elements are likely to be underestimated when MNE is used as the quantitative measure (due to problems of identifying specific diagnostic regions). In contrast, we should expect an overestimation of the representation of less dense elements when

TABLE 5.15
Mission Santa Catalina de Guale: Eastern Plaza Complex Deer Epiphyseal Fusion

Skeletal elements	Unfused	Fused	Total
Early fusing			
Humerus, distal	1	26	27
Scapula, distal	—	26	26
Radius, proximal	1	31	32
Acetabulum	—	1	1
Metapodials, proximal	—	17	17
1st/2nd phalanx, proximal	6	51	57
Middle fusing			
Tibia, distal	10	38	48
Calcaneus, proximal	9	8	17
Metapodials, distal	22	7	29
Late fusing			
Humerus, proximal	3	4	7
Radius, distal	19	17	36
Ulna, proximal	13	6	19
Ulna, distal	2	3	5
Femur, proximal	9	15	24
Femur, distal	9	6	15
Tibia, proximal	7	13	20
Total	111	269	380

NISP is used, for the same reason: low-density elements tend to break into more fragments, inflating NISP. Because elements with high food values tend to have lower bone densities, elements with high food values are underestimated by MNE and overestimated by NISP. This is the pattern seen in the graphs, where high-utility (and low-density) elements are overrepresented in the logged ratio diagram based on FUI and underrepresented in the density graph based on MNE. Phalanges, however, are dense, compact, and resist extensive fragmentation. It is likely that most phalanx specimens (where NISP = 1) represent one MNE unit (MNE = 1), explaining why low-utility foot elements are underrepresented in both the logged ratio FUI diagrams and the density graph.

The Plaza Complex assemblage is moderately diverse in terms of individuals and has a low biomass diversity (table 5.16; fig. 5.9). MNI diversity is much higher in the Plaza Complex assemblage than in collections from the Archaic-period St. Catherines Shell Ring and the Irene-period Meeting House Field (with all four mounds combined; Reitz, 2008; see chap. 3), but biomass diversity is very similar to that estimated for the two pre-Hispanic collections. The MNI diversity is high primarily due to the large number of different birds identified. The low biomass diversity is probably due to the dominance of venison (72% of the biomass). Fish MNI and biomass diversity are higher in the Plaza Complex assemblage as compared to the St. Catherines Shell Ring and the Meeting

TABLE 5.16
Diversity, Equitability, and Mean Trophic Level (TL) for the Eastern Plaza Complex[a]

Category	Values
MNI	204
MNI Diversity	3.122
MNI Equitability	0.783
MNI Richness	54
Fish MNI Diversity	1.891
Fish MNI Equitability	0.682
Fish MNI Richness	16
Fish MNI TL	3.15
Biomass Diversity	1.148
Biomass Equitability	0.295
Biomass Richness	49
Fish Biomass Diversity	1.893
Fish Biomass Equitability	0.683
Fish Biomass Richness	16
Fish Biomass TL	3.272

[a] The Delphinidae is not included in the estimate of fish diversity, equitability, or mean trophic level.

House Field assemblages, though the fish diversity values themselves are quite low (table 5.16; fig. 5.10).

The quantity of wild bird individuals in the Plaza Complex is higher than that found in other Spanish contexts, though the biomass contributed by wild birds in the Plaza Complex is low (tables 3.2, 3.3, 3.6, 3.7, 3.8, 4.1, 4.4, 4.5, 4.15, 5.2, and 5.10). This relatively higher percentage of birds could be misleading because it assumes that passerine birds (fish crow [*Corvus ossifragus*], thrush [Muscicapidae], thrashers [Mimidae], cardinal [*Cardinalis cardinalis*]) were eaten instead of being commensal taxa (see appendix A for a list of taxa interpreted as commensal taxa). Three of the four passerine individuals in the Plaza Complex assemblage are from the cocina, suggesting that they were food debris, but they also might have been wild birds that died in this open-air structure, the remains of caged birds discarded with the other cocina trash when they died, or something brought in by the cat.

Figure 5.11 presents the number of small-bodied fish and mass-captured fish taxa as a percentage of all fish taxa in the St. Catherines Shell Ring, Meeting House Field, and Plaza Complex assemblages. Very few small-bodied taxa are present in the Plaza Complex assemblage and relatively few taxa are susceptible to mass-capture techniques. Over half of the fishes are

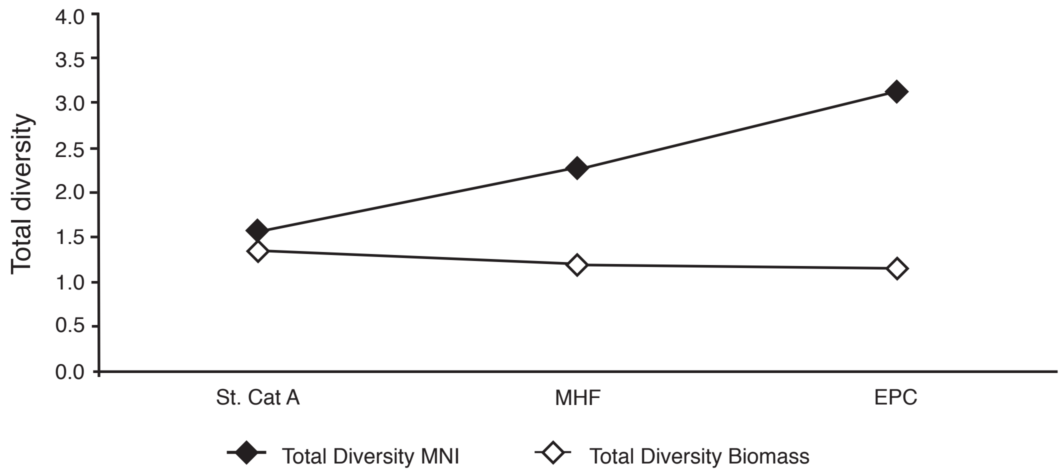

Fig. 5.9. Total collection diversity based on MNI and biomass. **St. Cat A**, St. Catherines Shell Ring; **MHF**, Meeting House Field (all mounds combined); and **EPC**, Eastern Plaza Complex.

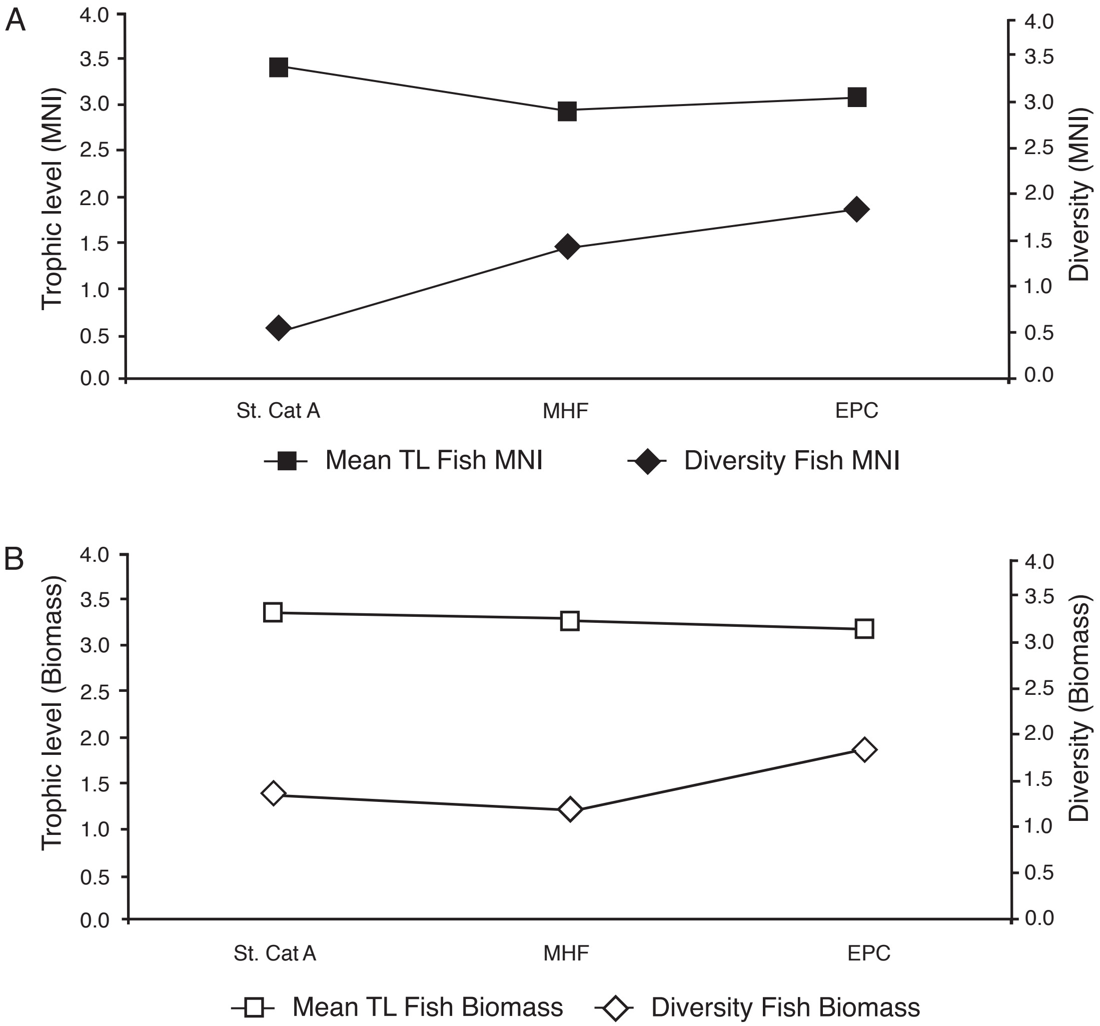

Fig. 5.10. Relationship between mean trophic level and fish diversity: (**A**) MNI and (**B**) biomass. **St. Cat A**, St. Catherines Shell Ring; **MHF**, Meeting House Field (all mounds combined); and **EPC**, Eastern Plaza Complex.

large-bodied, presumably high-ranking, taxa and many are susceptible to gorges, hooks, or leisters instead of mass-capture devices. The mullets likely were taken using cast nets, a Spanish-introduced technology (García 1902: 202–203; Lyon, 1977; Reitz and Cumbaa, 1983; Reitz and Scarry, 1985: 81–82; see chap. 4).

It appears that the exploited resource base expanded during the First Spanish period as more emphasis was placed on fishes from lower trophic levels (table 5.16; fig. 5.12). In the Plaza Complex assemblage this change can be attributed to the high percentage of mullets (24% of the fish individuals and 13% of the fish biomass). These fishes generally feed at trophic level 2.1. It is these fishes that tend to be large-bodied, at least in this context, and susceptible to mass-capture techniques. Cast nets were a particularly important addition to the First Spanish period fishing technology and these mullets likely indicate that cast nets were present on the island.

The assumption has been that priests influenced all aspects of native life at missions,

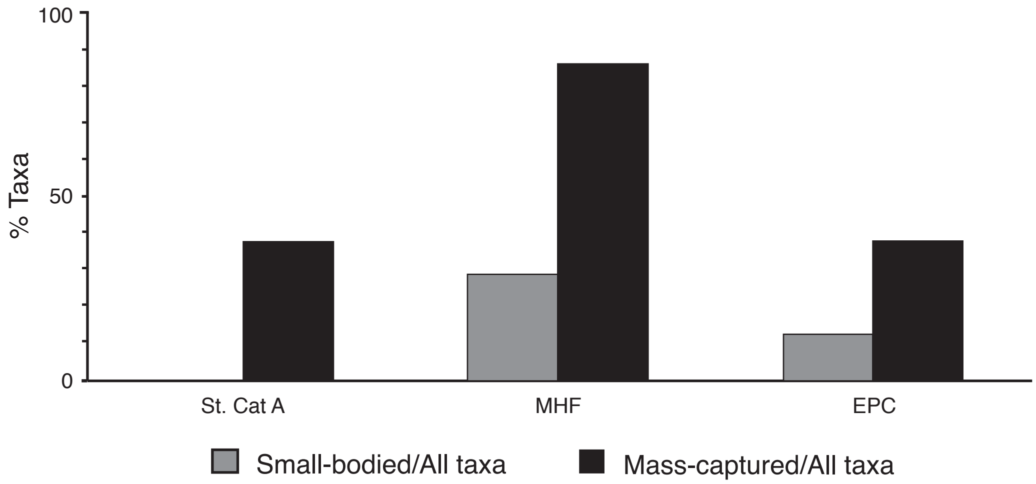

Fig. 5.11. Relationships among small-bodied fish taxa and mass-captured fish taxa. **St. Cat A**, St. Catherines Shell Ring; **MHF**, Meeting House Field (all mounds combined); and **EPC**, Eastern Plaza Complex.

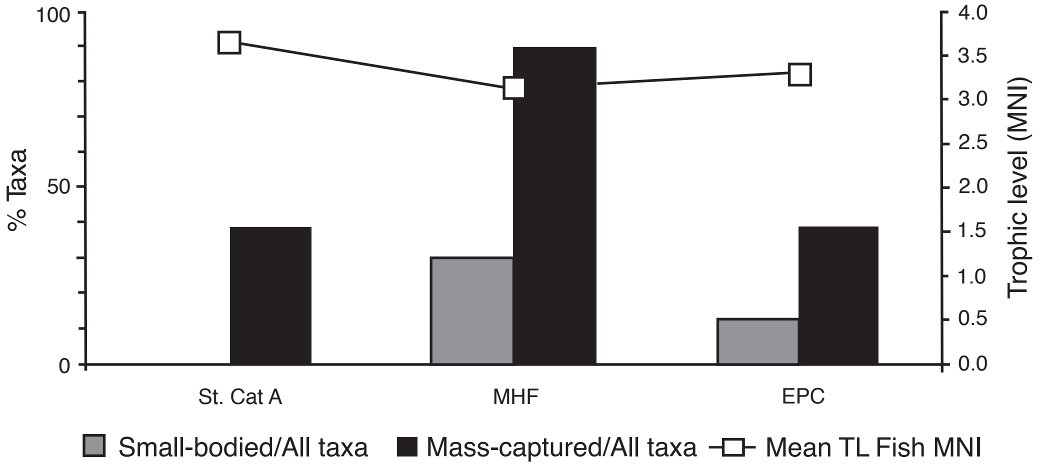

Fig. 5.12. Relationships among small-bodied fish taxa, mass-captured fish taxa, and mean trophic level (MNI). **St. Cat A**, St. Catherines Shell Ring; **MHF**, Meeting House Field (all mounds combined); and **EPC**, Eastern Plaza Complex.

yet it appears that it was the lives of missionaries that changed markedly, at least in terms of diet and exploitation strategies. In most respects, the Spanish diet on St. Catherines Island conforms to the pre-Hispanic pattern established on the island centuries earlier. Spanish habits as reflected in the Plaza Complex assemblage differ from pre-Hispanic habits in several areas, however: (1) pigs were used within the mission compound, albeit in small quantities; (2) chickens were used within the mission compound, also in small quantities; (3) the amount of venison increased from pre-Hispanic levels; (4) total diversity and fish diversity is higher; and (5) both small-bodied and large-bodied estuarine fishes were used and many of these were captured from a mean trophic level above 3.1. The percentages of small-bodied and mass-captured fishes in the Plaza Complex assemblage are lower than in the Meeting House Field assemblage and the mean trophic level is higher, all of which are characteristics that can be attributed to the higher number of shark and ray taxa in the Plaza Complex. Some changes in fishing strategies are indicated by evidence for targeted use of mullets. These are more differences in degree than in fundamentals. If the foods used represent Guale labor and the foods themselves were prepared by Guale neophytes, the similarities between Guale and Spanish behaviors are unsurprising. If, however, the foods were obtained and prepared by Spaniards themselves, then the cultural changes that these data document were profound.

CONCLUSIONS

By demonstrating the extent to which the Spanish diet on the island changed, these data and those reviewed in chapter 4 indicate that diets and exploitation strategies varied considerably within Spanish Florida depending upon whether a site was secular or religious and whether it was located on the coast or inland. Based on faunal data, it is risky to consider diet and exploitation strategies uniform throughout Spanish Florida or to assume that Iberian preferences prevailed. These data might also be related to the poorly understood exchange networks that operated within the mission system. They likely reflect the input of native contributions in kind and labor to each local economy.

If these data represent Guale contributions to the Spanish diet and economy at Santa Catalina de Guale, then those contributions were substantial and the foods used within the mission compound represent a merger of Guale traditions and labor with Spanish technology. If, however, the foods were obtained and prepared by Spaniards themselves, then the changes in Spanish behavior were remarkable. We interpret these data as evidence of important changes in the behavior of Spaniards at the mission, in spite of their efforts to encourage animal husbandry. In chapter 6, through an examination of faunal remains from Pueblo Santa Catalina de Guale, we will continue to see that Spaniards altered their diet toward local Guale subsistence patterns far more than Guale members of the community altered theirs to conform with Spanish practices.