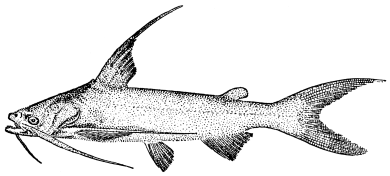

CHAPTER 4
FIRST SPANISH PERIOD VERTEBRATE USE IN ST. AUGUSTINE AND IN APALACHEE AND TIMUCUA PROVINCES

Information about animal use by Spaniards and Native Americans in St. Augustine and at missions in Apalachee and Timucua provinces provides a background against which to interpret the zooarchaeological evidence from Santa Catalina de Guale (figs. 1.1 and 4.1). Data from St. Augustine and these provinces offer models for foodways in the colony that distinguish among animal use by secular townspeople (which, for purposes of this discussion, includes civilians, government employees, and members of the military), members of the religious community in St. Augustine, and by Spaniards and Native Americans at missions in peninsular Florida. St. Augustine was the governmental, cultural, economic, and military center of Spanish Florida, an urban setting where people of many ethnic and social backgrounds lived (Bushnell, 1981; Corbett, 1974; Deagan, 1993; Dunkle, 1958; Lyon, 1976; TePaske, 1964). Furthermore, the Franciscan administrative center was based in St. Augustine at the Convento de San Francisco (fig. 4.2; SA 42A; K. Hoffman, 1990, 1993). From St. Augustine, civil, military, and religious authority extended westward into Timucua and Apalachee provinces, with missions, fortifications, and ranches placed along the way.

Despite their similar cultural backgrounds and frequent exchanges among the various colonial settings, secular and religious Spanish residents of St. Augustine and of Apalachee and Timucua provinces developed distinctive responses to local conditions. Likewise, Native American communities in each of these locations also developed distinctive strategies. A summary of secular Spanish diet shows that wild vertebrates dominated the diet in St. Augustine throughout the First Spanish period. A more varied picture of animal use emerges at those missions for which Spanish deposits have been studied. Spanish data from missions show distinct patterns of animal use at each mission, none of which are replicated in St. Augustine. Spaniards at St. Augustine appear to have modified the Iberian strategy defined in chapter 1 by incorporating much of the Native American coastal tradition defined in chapter 3. Despite Spanish efforts to alter indigenous exploitation strategies, Native American strategies persisted both in St. Augustine and at Apalachee and Timucua missions. These regional Native American dietary and exploitation strategies influenced Spanish practices through the economic contributions of Native Americans to secular St. Augustine and to the Franciscan headquarters at the Convento de San Francisco.

Assessing the missions' contributions to secular St. Augustine and to the Franciscan Convento de San Francisco is frustrated by difficulties inherent in recognizing relatively brief units of time, such as decades, in archaeological deposits. It is rarely possible to date such archaeological contexts so precisely. Archival sources suggest that substantial quantities of food were sent to St. Augustine from missions during the middle and late 17th century when missions and cattle ranches were abundant and active (see chap. 1). Much of the 17th century was dominated by the 1627–1667 drought (Blanton and Thomas, 2008), which undoubtedly influenced the economy of Spanish Florida and the productivity of fishing, farming, and ranching. A very different characterization of animal use in

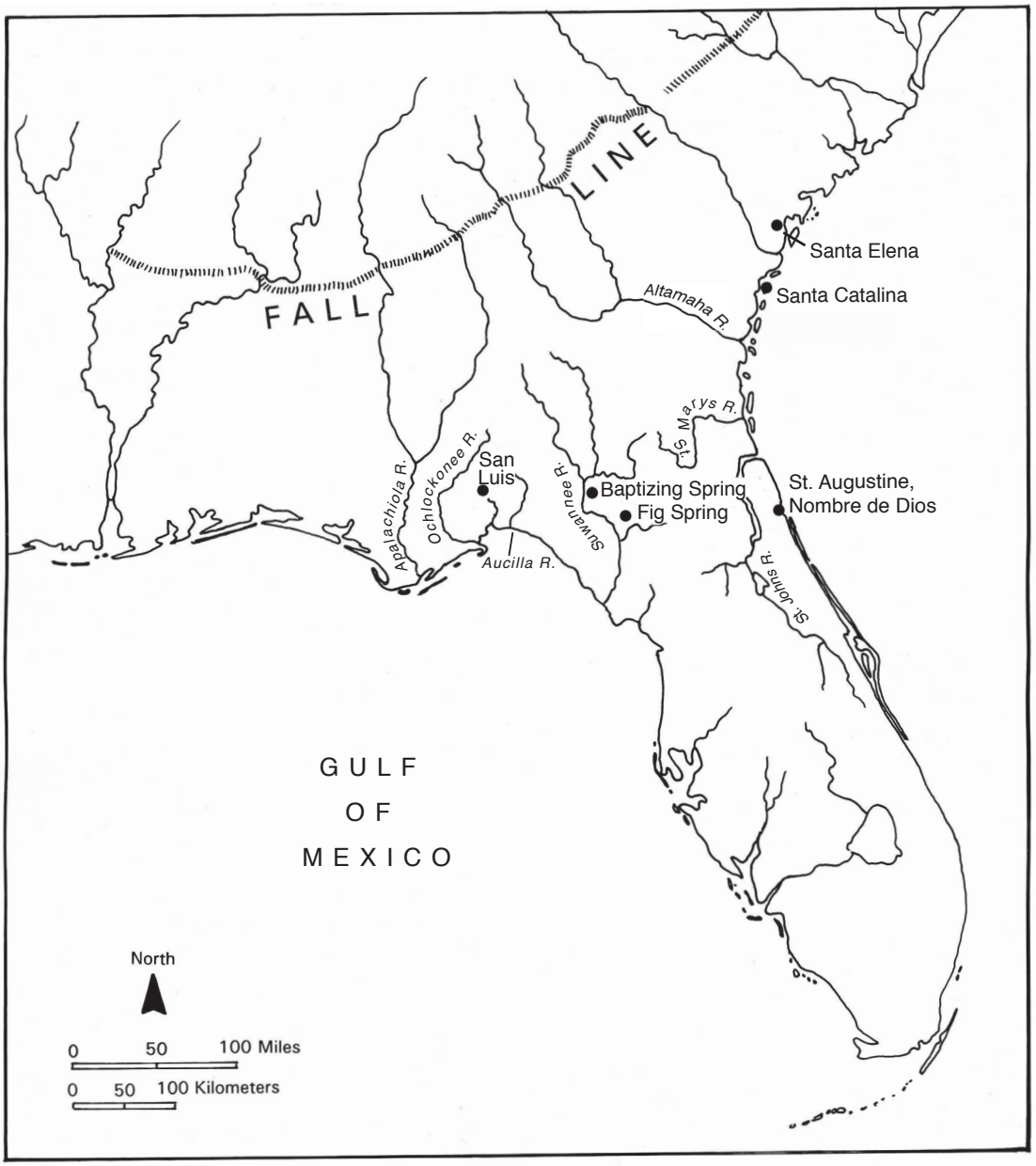

Fig. 4.1. Map of Spanish Florida. Circles indicate archaeological sites.

the town and at missions might emerge if it were possible to separate 17th-century contexts into segments reflecting the growth of the missions, the development of the ranches, and the impact of the drought.

Unfortunately, isolating early, middle, and late 17th-century contexts from each other is difficult, a task made particularly problematic by the fact that faunal data are available for only three 17th-century St. Augustine sites (fig. 4.2): SA 34-2 (the Ximenez-Fatio House), SA 36-4 (the Francisco Ponce de León House), and SA 42A (the Convento de San Francisco). In a few cases it is possible to isolate early from late 17th-century samples at all

of these sites, but that leaves us with very small samples, no comparative context, and concerns about reliability. Sample size does matter in zooarchaeological analysis. Small samples limit our ability to draw conclusions regarding the role of missions and ranches in secular St. Augustine during the 17th century.

It is difficult to define deposits that are clearly associated with specific economic, ethnic, or social groups encapsulated by such terms as peninsulares, criollos, mestizos, African, and Native American (see chap. 1 for a definition of these terms). Where it has been possible to control for one or more of these social variables it is evident that economic, ethnic, and social backgrounds did influence food choices. Surviving documentary records, for example, have enabled us to identify the 18th-century mestizo affiliation of the Maria de la Cruz site (SA 16-23) and the peninsulare affiliation of the Cristoval Contreras site (SA 34-2; Reitz and Cumbaa, 1983) in St. Augustine; but this is unusual and typically possible only for sites occupied at the time Spanish St. Augustine was transferred to British control and for which an inventory was made of property ownership. Records of ownership, of course, may not be records of occupancy, but the interpretation of sites as peninsulare, criollo, and mestizo is often supported by material culture from each site (Deagan, 1983).

Dale Hutchinson and Clark Spencer Larsen (2001; see also Larsen et al., 2001a) report regional bioarchaeological differences between coastal and interior settings, as well as between the peninsular mission chain and that extending northward along the Georgia Bight. So, too, were there differences in animal use in interior settings compared to coastal ones, and between contemporaneous communities on what are now the Florida and Georgia coasts. Regional differences were compounded by local differences. These local differences include: (1) asynchronous timing associated with the beginning of plant cultivation in each area; (2) the bioarchaeological impact of farming once it began; and (3) the timing and consequences of missionization. For the time being, however, it is necessary to characterize 17th-century Spanish, Apalachee, and Timucuan economies broadly for comparisons with Santa Catalina de Guale, anticipating that this synthesis will stimulate more detailed work in the future.

A consistent and compelling pattern in both the Spanish and Native American faunal collections emerges despite these limitations. It seems unlikely that people in St. Augustine enjoyed a bounty of those meats associated with missions and ranches (pork, venison, beef, and chicken) even in the middle and late 17th century. This assessment is based on two observations: (1) that the limited zooarchaeological data from the 17th century are consistent with the more substantive zooarchaeological data from the 16th-century and 18th-century secular town; and (2) that pork, venison, beef, and chicken are absent or rare in all but one of the mission collections, regardless of whether the mission context is Spanish or Native American. The mission chain's seemingly limited contributions to St. Augustine could have been because: (1) these meats were not consumed at local missions; (2) primarily deboned, cured meats were sent to St. Augustine, leaving no zooarchaeological evidence; and (3) animals and/or meats were sent almost exclusively to the Franciscan headquarters in St. Augustine while very few animals and little meat was sent to secular St. Augustine.

Perhaps pigs (*Sus scrofa*), white-tailed deer (*Odocoileus virginianus*), cattle (*Bos taurus*), and chickens (*Gallus gallus*) were not consumed by either Spaniards or Native Americans at Apalachee and Timucua missions so as to maximize the amount of livestock and meats sent to St. Augustine. This seems unlikely given the economic and political tensions that existed between the provinces and the colonial administration in St. Augustine (Bushnell, 1981). It is difficult to think that members of either the secular or the religious communities in Apalachee or Timucua provinces would deny themselves venison or beef for the benefit of anyone in St. Augustine.

Given the length of time required for native porters to carry goods overland to St. Augustine, 100–200 km away, any fresh meat sent to the town would be pretty ripe by the time it got there. Thus, pork, venison, and beef were probably cured before they were sent to St. Augustine. Preserving meat by salting, soaking in brine, and/or smoking was probably not a common, or a successful, approach given the year-round warm, humid climate typical of the subtropical Florida peninsula, though it might work if the pieces were small. Mullet fillets (*Mugil* spp.) smoke very successfully in part because the high oil content of the flesh enhances preservation, though

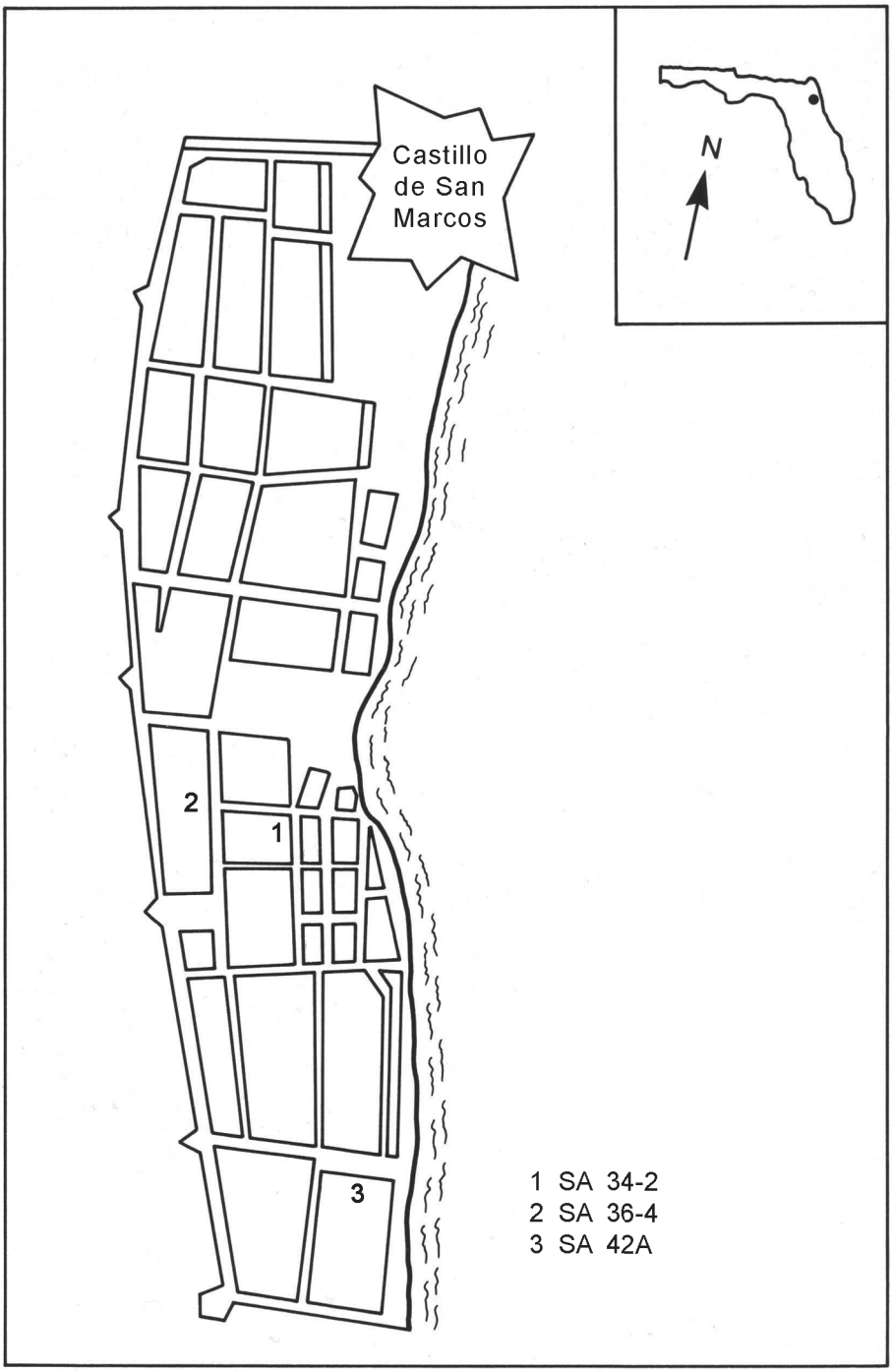

Fig. 4.2. Map of St. Augustine. Numbers indicate archaeological sites.

it is hard to imagine why mullets would be sent from Apalachee, for example, to St. Augustine. Chickens and turkeys (*Meleagris gallopavo*) might be smoked successfully, but it is also not difficult to transport live birds with adequate attention to their food and water. Deboned meats preserved in brine or smoked would be essentially invisible in the archaeological record of St. Augustine. In the 19th century, however, some U.S. Army barrels of salt pork contained nearly entire skeletons/carcasses of more than one pig carcass (Lucas, 2007). This suggests that certain preservation techniques might not skew the zooarchaeological evidence after all.

It is possible that pigs and cattle were trailed from the missions to St. Augustine. Driving pigs and cattle from Apalachee and western Timucua provinces through the swamps, wetlands, streams, and woodlands of northern Florida to St. Augustine would have been a challenge. If livestock were sent primarily or exclusively to the Franciscan headquarters at Convento de San Francisco instead of to the town, the Convento assemblage may contain more evidence of the bounty of missions and cattle ranches than do collections from other locations in St. Augustine. As a consequence, the Convento might offer a better framework for conceptualizing Spanish animal use at Mission Santa Catalina de Guale than that which can be obtained from secular St. Augustine.

Another reason is that missionaries and ranchers with access to the Gulf of Mexico traded directly with Cubans and other commercial buyers and rarely sent their products to St. Augustine (Bushnell, 1981; Deagan, 1993; McEwan, 1993). This seems the most plausible, for economic reasons, and would mean that townspeople had to rely upon the erratic situado and their own abilities to acquire foods locally. Given the dominance of criollo families in St. Augustine, acquiring foods locally may not have been difficult and kinship ties with local Native Americans might have facilitated the town's self-reliance. The Convento de San Francisco may have depended upon the local community, tithes from the faithful, as well as servants and slaves, for meats obtained locally.

Evidence for vertebrate use from secular sites in St. Augustine, from Spanish and Native American contexts at Apalachee and Timucua missions, and from Spanish contexts at the Convento de San Francisco are summarized in the following sections of this chapter. Emphasis is placed on those aspects of each faunal collection that might indicate the degree to which the mission chain supplied animal products to secular St. Augustine and/or to the Convento de San Francisco. The premise is that secular and religious officials in St. Augustine attempted to influence Native American economic practices at the missions in order to obtain animal products for consumption and for the global market, but were not entirely successful in meeting these goals.

In the following pages, we show that secular, religious, Spanish, and Native American residents of St. Augustine and of Apalachee and Timucua provinces each developed distinctive responses to local conditions and almost certainly were self-reliant for most of their food. Outside Apalachee province, very little evidence is found correlating the production of commercial products with local diets. In outlying Apalachee and Timucua provinces, the Spanish diet incorporated many elements of pre-Hispanic diets and Native American diets were little influenced by Iberian foodways or Eurasian domestic animals.

FIRST SPANISH PERIOD ANIMAL USE AT SECULAR SITES IN ST. AUGUSTINE

One of the striking features of St. Augustine animal use is the overall consistency in the vertebrate-based portion of the secular town's exploitation strategy throughout the First Spanish period (tables 4.1 and 4.2; figs. 4.3 and 4.4; Reitz, 1992a, 1992b; Reitz and Cumbaa, 1983; Reitz and Scarry, 1985). The basic form that arose during the early days of settlement continued for 200 years. Only in the 18th century, *after* the outlying missions and ranches were destroyed, did meat from domestic animals contribute more than half of the biomass or influence the biomass diversity (tables 4.1 and 4.3; fig. 4.4). Wild, noncommensal taxa contribute at least 80% of the Minimum Number of Individuals (MNI) in the 16th, 17th, and 18th centuries of the First Spanish period (table 4.1). Fish collections from St. Augustine are characterized by high taxonomic richness and moderate diversity, reflecting the wide range of estuarine animals used (table 4.3; Reitz, 2004). Most of the fish biomass in the First Spanish period is from high-trophic-level fishes (table 4.3) with relatively few small-bodied and mass-captured fishes (compare fig. 4.5 with fig. 3.5; see appendix A for a discussion of commensal taxa and other methods used in this study).

TABLE 4.1
Summary of Fauna from First Spanish Period St. Augustine[a]

	Late 16th century				17th century				Early 18th century			
	MNI		Biomass		MNI		Biomass		MNI		Biomass	
	No.	%	kg	%	No.	%	kg	%	No.	%	kg	%
Domestic mammals	54	4.8	57.39	45.6	15	9.0	4.681	32.4	84	10.5	288.78	79.2
Domestic birds	45	4.0	3.617	2.9	11	6.6	0.353	2.4	39	4.9	3.73	1.0
Deer	31	2.8	16.13	12.8	2	1.2	1.816	12.6	31	3.9	34.85	9.6
Other wild mammals	43	3.8	3.385	2.7	5	3.0	0.301	2.1	22	2.7	2.39	0.7
Wild birds	71	6.3	3.118	2.5	7	4.2	0.254	1.8	46	5.7	1.825	0.5
Turtles/alligators	61	5.4	10.792	8.6	14	8.4	1.520	10.5	53	6.6	8.717	2.4
Sharks, rays, & fishes	767	68.1	30.459	24.2	105	63.3	5.135	35.5	486	60.7	22.315	6.1
Commensal taxa	54	4.8	0.967	0.8	7	4.2	0.389	2.7	40	5.0	2.237	0.6
Total	1126		125.858		166		14.449		801		364.844	

[a] Data from Reitz (1992a), Reitz and Brown (1984), Reitz and Cumbaa (1983), and Reitz and Scarry (1985).

TABLE 4.2
Summary of Domestic Taxa: Convento de San Francisco, Mission Nombre de Dios, and 16th-, 17th-, and 18th-Century Secular St. Augustine[a]

	CSF ca. 1600	CSF ca. 1650	NDD	16th century	17th century	18th century
MNI						
Pig	2	2	—	39	9	43
Cow	—	—	—	14	3	34
Caprine	—	—	—	1	3	7
Chicken	1	6	—	45	11	35
Total MNI	56	72	451	1126	166	801
Biomass, kg						
Pig	0.977	0.032	—	26.24	1.751	46.99
Cow	—	—	—	31.06	2.151	235.59
Caprine	—	—	—	0.09	0.779	6.2
Chicken	0.045	0.14	—	3.617	0.353	3.63
Total biomass	4.322	2.37	14.95	125.858	14.449	364.844

[a] Key to abbreviations: CSF, Convento de San Francisco; NDD, Mission Nombre de Dios. Nombre de Dios data include both 16th/17th-century and 17th/18th-century mission components from the Fountain of Youth site. Data are from Reitz (1985, 1991, 1992b, 1992c), Reitz and Cumbaa (1983), Reitz and Brown (1984), and Reitz and Scarry (1985).

Diversity and the degree to which local foods were used tend to reflect the economic, ethnic, and social affiliations of the occupants of secular St. Augustine, in those cases where the identities of the property owners, and sometimes the occupants, are available in historical records (see Reitz, 1992b; Reitz and Cumbaa, 1983; Reitz and Scarry, 1985). Household-level subsistence was the primary avenue through which animal remains arrived at residences known to have been owned by upper-status and lower-status households. The properties owned by upper- and lower-status individuals also have produced the most diverse collections. On the other hand, trade and allotted rations were primary means through which animal nutrients reached sites owned by middle-status individuals with limited financial means. Households with ties to Spain tried to maintain an Iberian pattern of animal use, if they could afford to do so, and criollo households of elevated social status attempted to follow the more prestigious Iberian strategy. Upper-status households also had the wealth to hire help or to own slaves to fish, hunt, and tend their livestock. Those households with Native American ties drew upon reciprocity within that network to maintain access to a range of local foods. The households that exhibited less diverse animal remains and appeared to rely more heavily on Eurasian livestock, particularly cattle, were lower status, less affluent criollos. These people did not have the means to retain servants or slaves, could not supplement their situado income or their wages, and did not have local kinship ties through which to obtain food. Their official duties may have left them little time to fish, hunt, or tend livestock for themselves. Regardless of ethnicity or status, the Iberian dietary pattern was substantially modified in peninsulare, criollo, and mestizo households to meet the social, economic, and environmental conditions prevailing in Spanish Florida.

Exclusive of commensal taxa, 24 out of 140

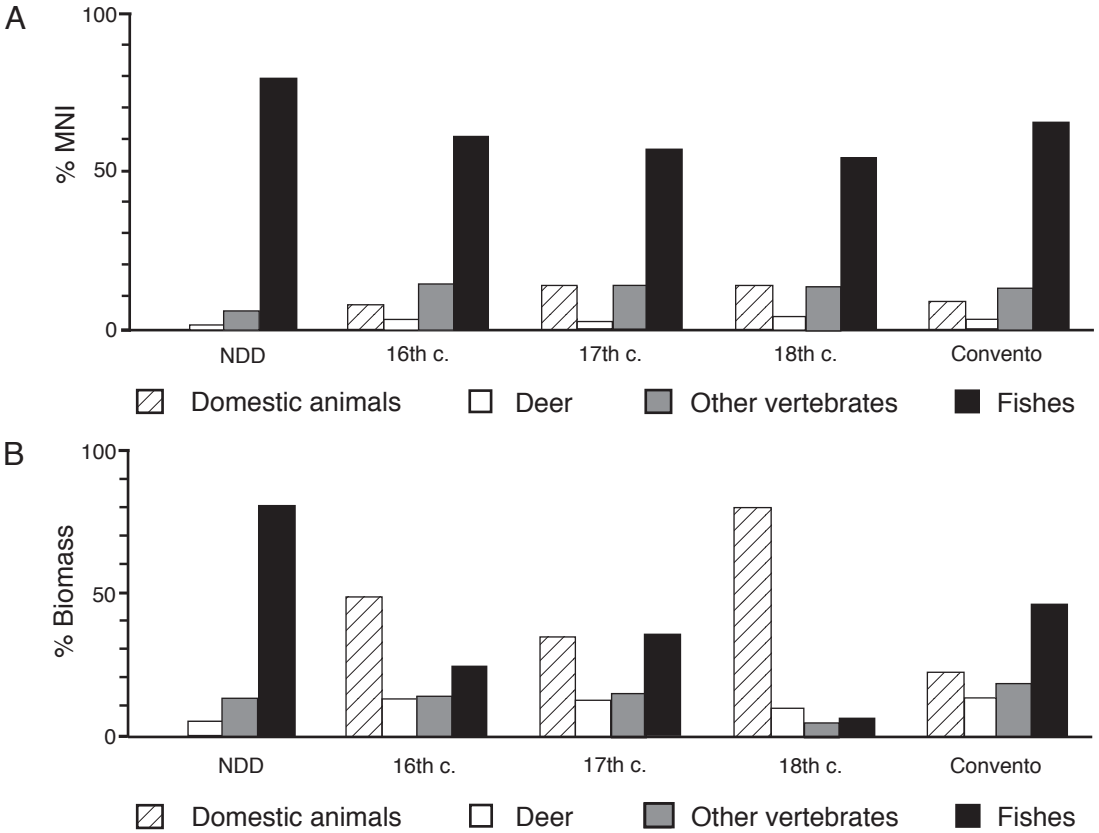

Fig. 4.3. Bar graph of animal use at Nombre de Dios (NDD), 16th-, 17-, and 18-century secular St. Augustine, and the Convento de San Francisco: (**A**) MNI and (**B**) biomass. Other vertebrates include birds, reptiles, amphibians, and wild mammals other than deer. Nombre de Dios (NDD) data include both 16th/17th-century and 17th/18th-century mission components from the Fountain of Youth site. The Convento de San Francisco data include only the ca. 1600 and 1650 components. Commensal taxa are not included in the Convento calculation.

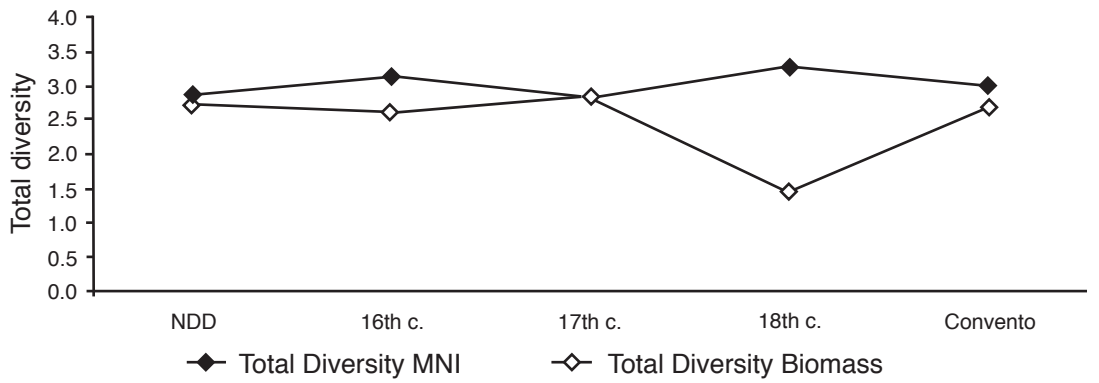

Fig. 4.4. Total collection diversity based on MNI and biomass at Nombre de Dios (NDD), 16th-, 17-, and 18-century secular St. Augustine, and the Convento de San Francisco. Nombre de Dios (NDD) data include both 16th/17th-century and 17th/18th-century mission components from the Fountain of Youth site. The Convento de San Francisco data include only the ca. 1600 and 1650 components and do not include commensal taxa.

wild and domestic vertebrate taxa are present in collections from all three First-Spanish-period centuries. These taxa include rabbits (*Sylvilagus* spp.), squirrels (*Sciurus* spp.), raccoons (*Procyon lotor*), deer, herons (*Ardea herodias*), ducks (*Anas* spp.), turkeys, song birds (Passeriformes), diamondback terrapins (*Malaclemys terrapin*), gopher tortoises (*Gopherus polyphemus*), sea turtles (Cheloniidae), sharks (Carcharhinidae, *Carcharhinus* spp., *Galeocerdo cuvier*, Sphyrnidae), sea catfishes (*Ariopsis felis, Bagre marinus*), sheepsheads (*Archosargus probatocephalus*), seatrouts (*Cynoscion* spp.), Atlantic croakers (*Micropogonias undulatus*), black drums (*Pogonias cromis*), red drums (*Sciaenops ocellatus*), mullets, and flounders (*Paralichthys* spp.). The taxa present in every century also include Eurasian animals: pigs, cattle, goats (*Capra hircus*), sheep (*Ovis aries*), and chickens. Pigs, however, constitute no more than 5% of the individuals in any of the assemblages from the three centuries and cattle contribute no more than 4% of the individuals (table 4.2). Caprines are even rarer. Except for the 18th century, chickens are more common than either pigs or cattle. The 18th century is also the only century when most of the biomass consisted of domestic meats (table 4.1). During both the 16th and 17th centuries, local wild meat sources were critical ingredients of the secular diet in

TABLE 4.3
Diversity, Equitability, and Mean Trophic Level (TL) for Nombre de Dios (NDD) and St. Augustine[a]

	NDD 16th	NDD 18th	St Aug 16th	St Aug 17th	St Aug 18th	CSF 1600	CSF 1650
MNI	129	322	1126	166	801	56	72
MNI diversity	2.879	2.537	3.127	2.811	3.266	3.141	2.98
MNI equitability	0.838	0.688	0.679	0.757	0.712	0.923	0.938
MNI richness	31	40	100	41	98	30	24
Fish MNI diversity	2.563	2.13	2.105	1.795	2.153	2.422	2.272
Fish MNI equitability	0.856	0.662	0.587	0.663	0.621	0.894	0.948
Fish MNI richness	20	25	36	15	32	15	11
Fish MNI TL	3.025	3.244	2.822	2.745	2.883	3.038	3.204
Biomass diversity	2.26	2.612	2.608	2.838	1.443	2.302	2.534
Biomass equitability	0.671	0.713	0.567	0.769	0.318	0.691	0.808
Biomass richness	29	39	99	40	93	28	23
Fish biomass diversity	2.458	2.213	2.538	2.2	2.453	2.192	2.272
Fish biomass equitability	0.821	0.688	0.714	0.812	0.721	0.809	0.947
Fish biomass richness	20	25	35	15	30	15	11
Fish biomass TL	3.315	3.411	3.208	3.276	3.348	3.365	3.404

[a] Key to abbreviations: NDD, Mission Nombre de Dios (Fountain of Youth site) divided into late 16th/early 17th-century and late 17th/early 18th century components; St Aug, St. Augustine; 16th, 16th-century; 17th, 17th-century; 18th, 18th-century First Spanish Period; CFS 1600, Convento de San Francisco, ca. 1600; CFS 1650, Convento de San Francisco, ca. 1650. The Delphinidae in the 16th-century Nombre de Dios collection is not included in the fish estimates of diversity, equitability, or mean trophic level.

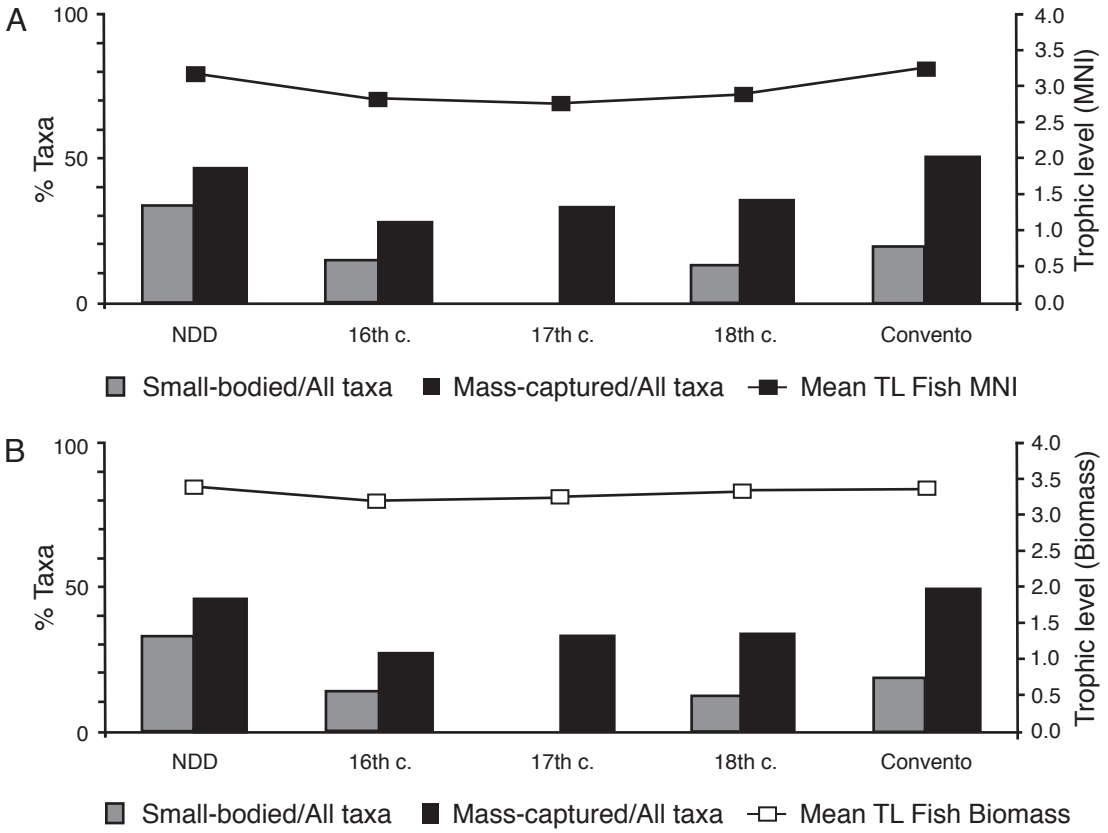

Fig. 4.5. Relationships among small-bodied fish taxa, mass-captured fish taxa, and mean trophic level at Nombre de Dios (NDD), 16th-, 17-, and 18-century secular St. Augustine, and the Convento de San Francisco: (**A**) MNI and (**B**) biomass. Nombre de Dios (NDD) data include both 16th/17th-century and 17th/18th-century mission components from the Fountain of Youth site. The Convento de San Francisco data include only the ca. 1600 and 1650 components.

the town and continuity was more characteristic of animal use than was change. The secular St. Augustine diet throughout the First Spanish period shared many similarities with pre-Hispanic ones in the Georgia Bight.

The significance of these observations is complicated by a methodological problem raised in chapter 3 and elaborated upon in appendix A. Although an estimate of MNI indicates the relative frequency with which an animal was used, biomass gauges the contribution of that animal in terms of meat. Percentages of MNI show relatively little change in animal use over the centuries, but percentages of biomass suggest an increase in the amount of meat contributed by domestic mammals, particularly beef, in the 18th century compared to the earlier centuries. These patterns in MNI and biomass are not necessarily contradictory. The data reflect consumption in St. Augustine of a wide range of animals during the First Spanish period, accompanied by an 18th-century increase in the amount of beef available.

The percentages of domestic mammal individuals and biomass increased from the 16th to the 18th century (table 4.1), particularly in terms of cattle (table 4.2). The amount of beef consumed did not increase steadily from the 16th to the 18th century and, in fact, the use of beef was low in secular 17th-century households (Reitz, 1992a). Although these data may indicate that the animal remains summarized in table 4.1 are primarily from the early part of the 17th century,

before missions and ranches flourished, they also may indicate that missions and ranches supplied very little beef to the town or that most of that beef was deboned. A more likely explanation is that when the ranches and missions flourished, so, too, did the illicit Gulf coast trade, through which most beef probably was sold. In the 18th century, after the Apalachee and western Timucua missions and ranches were gone, ranching near St. Augustine grew in importance and townspeople had a more reliable and accessible source of meat because they no longer had to compete with more lucrative markets for these products. None of these possibilities can be refuted or supported with the available data nor are they mutually exclusive.

The decline in cattle (MNI) and beef (biomass) in the 17th century was not associated with an increase in pigs (MNI) and pork (biomass), which are present in consistently low levels in secular collections from all three centuries (table 4.2). The percentages of pig individuals remained relatively constant throughout the First Spanish period in proportions that exceeded cattle. In terms of biomass, pork declined by almost half after the 16th century and remained low during the 17th and 18th centuries. About a quarter of the meat consumed in the town during the 16th century was pork, which became a secondary resource in the 17th and 18th centuries. By the 18th century, five times more beef was consumed in the secular town than pork. Although pigs may have been sent to the town from missions, this economic contribution is not evident in the 17th-century assemblage.

Documentary sources indicate that the missions also sent venison and deer hides to St. Augustine; however, evidence for this is not found in secular St. Augustine (table 4.1). If venison was a high-status meat available primarily through the mission system, perhaps we should not expect large quantities of venison to be available in the secular town. The role of venison apparently was stable throughout the First Spanish period and venison was consumed at about the same rate as pork in the 17th and 18th centuries. As with pork and beef, there is no 17th-century increase in venison that might reflect meats sent to the town from missions. Hides and deboned venison would both be difficult to observe in these data.

Chickens often are enumerated among the important commodities sent from missions to St. Augustine. Chickens, however, are not markedly more common in the 17th-century assemblage than they are in the 16th- and 18th-century assemblages (table 4.2). In terms of individuals, chickens were used at about the same rate as pigs and deer. Their dietary contribution, however, was between 1% and 3% of the biomass. Despite frequent references to chickens in written accounts, they were not major food resources in secular St. Augustine. Chickens provide commodities such as feathers and eggs in addition to meat. Eggs, in particular, would be difficult to observe in the archaeological record unless chicken egg shells were commonly found in archaeological excavations, which they are not.

A local wild terrestrial resource, gopher tortoises, played a role in the town's diet that equaled or exceeded that of chickens. Gopher tortoise meat was apparently in high demand in St. Augustine. Gopher tortoises are the fourth-ranked contributor of biomass in the 16th-century assemblage (3% of the individuals and 6% of the biomass). This biomass estimate exceeds that of chickens in the 16th century. In the 17th-century assemblage, gopher tortoises contributed 6% of the individuals and 5% of the biomass, which also exceeds the biomass contribution of chickens. Gopher tortoises declined in the 18th-century assemblage, contributing 3% of the individuals and 1% of the biomass, which equals chickens.

Gopher tortoises today are largely confined to the Florida peninsula (Carr, 1952: 332; Franz and Quitmyer, 2005; Johnson et al., 1974: 166). Given their preference for sandy, dry soils, they probably were common near the missions and ranches around St. Augustine and west of the town. Missions and ranches may have supplied gopher tortoises to secular St. Augustine during the 17th century, as live tortoises easily could have been transported from the missions to the town. People in the town, however, did not need to rely upon the missions for this resource because gopher tortoises could be obtained locally. They are still found inside the city limits today.

Marine fishes in the St. Augustine diet are the reason species lists from sites within the town are so rich in taxa. Over half the individuals and a substantial portion of the biomass in the secular St. Augustine assemblages are fishes (table 4.1). Freshwater fishes might be considered logical contributions by inland missions to St. Augustine; however, the evidence suggests that most of the fishes consumed in St. Augustine were from estuaries rather than from freshwater swamps, marshes, lakes, and streams. Freshwater fishes are

exceedingly rare in the zooarchaeological remains and most of the freshwater fishes found in these collections, such as gars (*Lepisosteus* spp.) and bullhead catfishes (Ictaluridae), are also found in estuarine waters. The only truly freshwater fish identified in a secular St. Augustine context is a largemouth bass (*Micropterus salmoides*) in a 16th-century sample. Freshwater fishes are no more abundant in the 17th-century assemblage than in the 16th- or 18th-century assemblages. We cannot rule out the possibility that freshwater fishes were filleted and smoked before being sent to St. Augustine, but the available data indicate that interior missions did not send freshwater fishes to secular St. Augustine.

Coastal missions such as the Shrine of Nuestra Señora de la Leche/Mission Nombre de Dios (including a portion at the Fountain of Youth site; figs. 1.3 and 4.1; Deagan, 2009; Waters, 2009) were in a position to supply fish to the town, but the taxa that might have been contributed by coastal missions were the same fishes that could be obtained by townspeople through their own efforts. Fishes taken through Spanish efforts might be indistinguishable from those taken by Native Americans. If Spaniards caught larger individuals than did Native Americans, then a larger mean fish body size might be a distinctive characteristic of Spanish-caught fishes; this possibility should be explored in more detail in the future.

Three marine fish families are most common: sea catfishes, drums (Sciaenidae), and mullets. Sea catfishes and drums are abundant in both pre-Hispanic and Spanish contexts, but large numbers of large mullets are characteristic of Spanish St. Augustine collections (Reitz, 1985, 1991, 2004). The large mullets so abundant in St. Augustine collections contrast with the small, fingerling mullets more typical of pre-Hispanic collections recovered using fine-meshed screens or flotation (e.g., the St. Simons Marsh Ring and Jacksonville Electric Authority site; Reitz et al., 2009; see chap. 3). Mullets contributed 32% of the individuals and 5% of the biomass in the secular 16th-century assemblage; 34% of the individuals and 9% of the biomass in the 17th-century assemblage; and 26% of the individuals and 1% of the biomass in the 18th-century assemblage. The documented use of fishing nets, including cast nets, in St. Augustine during the 16th and 17th centuries (Bushnell, 1981: 11; García 1902: 202–203; Lyon, 1992: 21) is reflected in these data.

It appears that the secular population within St. Augustine did not rely upon missions and ranches for animal nutrients. Although some of the animal resources used in St. Augustine could have been sold, traded, or otherwise provided by outlying communities to the town, the majority of the animal remains in St. Augustine vertebrate assemblages are from nearby estuaries. This suggests local self-sufficiency on the part of the civilian and military residents of the town and minimal reliance upon missions and ranches. The similarity between the Spanish and Native American diets, however, might reflect economic contributions from nearby coastal missions, such as Mission Nombre de Dios, or foods derived through the kinship ties of local native women. These possibilities are developed in the next section.

VERTEBRATE USE AT APALACHEE AND TIMUCUA MISSIONS

The limited faunal data available from Spanish and Native American contexts at 17th-century missions in Apalachee and Timucua provinces indicate that animal use at missions was very different from that in secular St. Augustine (tables 4.1, 4.4, and 4.5; figs. 1.1 and 4.1). Distinctive habits of animal use also distinguish Spanish from Native American contexts within missions and among missions (Reitz, 1993a). Eurasian domestic animals, however, are generally uncommon in collections from these missions, especially in those from native contexts. The Spanish administrative center at San Luis de Talimali in Apalachee province is an exception. Cattle are more common in the San Luis collection than in any other First Spanish period context, regardless of economic, ethnic, or status affiliations, or of site function. (For studies of pre-Hispanic animal use in what became Apalachee and Timucua provinces, the reader is referred to Cumbaa [1972], among others; for a limited study of animal use at a nonmission Native American site in Apalachee province see Bierce-Gedris [1981: 231–233]; and for a limited study of animal use at a cattle ranch see Seaberg [1955: 163]).

Spanish Vertebrate Use at Apalachee and Timucua Missions

At the Apalachee mission of San Luis de Talimali (8Le4) pork and, especially, beef were used extensively (table 4.4; fig. 4.1; McEwan,

TABLE 4.4
Summary of Fauna from Spanish Contexts at Apalachee and Western Timucua Missions[a]

	San Luis de Talimali				Baptizing Spring	
	MNI		Biomass		MNI	
	No.	%	kg	%	No.	%
Domestic mammals	34	39.5	146.542	94.3	2	15.4
Domestic birds	3	3.5	0.115	0.1	—	—
Deer	7	8.1	6.261	4.0	4	30.8
Other wild mammals	4	4.7	0.015	0.01	—	—
Wild birds	2	2.3	0.005	0.003	—	—
Turtles	7	8.1	1.607	1.0	6	46.2
Sharks, rays, & fishes	23	26.7	0.731	0.5	—	—
Commensal taxa	6	7.0	0.182	0.1	1	7.7
Total	86		155.458		13	

[a] Data from Loucks (1993), Reitz (1993a), and Weinand and Reitz (1992).

TABLE 4.5
Summary of Fauna from Native American Contexts at Missions[a]

	Baptizing Spring		San Martín		Mission Nombre de Dios			
	MNI	%	MNI	%	MNI	%	Biomass (kg)	%
Domestic mammals	3	8.6	1	2.0	—	—	—	—
Domestic birds	—	—	—	—	—	—	—	—
Deer	12	34.3	6	12.2	7	1.6	0.766	5.1
Other wild mammals	2	5.7	3	6.1	12	2.7	0.884	5.9
Wild birds	1	2.9	1	2.0	4	0.9	0.119	0.8
Turtles/alligators	15	42.9	10	20.4	13	2.9	0.953	6.4
Sharks, rays, & fishes	1	2.9	26	53.1	398	88.2	12.064	80.7
Commensal taxa	1	2.9	2	4.1	17	3.8	0.154	1.0
Total	35		49		451		14.94	

[a] Data from Loucks (1993), Newsom and Quitmyer (1992), Quitmyer (1991), and Reitz (1985, 1991). San Martín de Ayacuto is probably the Fig Springs site. The Mission Nombre de Dios data combine the late 16th/early 17th-century and late 17th/early 18th-century components from the Fountain of Youth site.

1993; Reitz, 1993a; Weinand and Reitz, 1992). The faunal collection from San Luis is small, but shows that Spaniards at San Luis enjoyed greater access to pork and beef than did Spaniards at other settlements in Spanish Florida including 17th-century St. Augustine (tables 4.1 and 4.4). Pigs contributed 23% of the individuals estimated for the San Luis samples and cattle 16%. Pork contributed an estimated 16% of the biomass, but beef constituted as much as 78% of the meat consumed by Spaniards at San Luis. This is the only First Spanish period context in which domestic meats, particularly beef, achieved such a prominent dietary role. Deer was the only other major animal resource. Deer individuals, if not venison, are more abundant in the Spanish context at San Luis than in secular 17th-century St. Augustine. Gopher tortoises (5% of the individuals) and aquatic turtles may have been more frequently consumed by Spaniards than were small mammals, chickens, or turkeys. Although fishes did not play a significant role in the diet in terms of biomass, a quarter of the estimated individuals are fishes. Seven of the 11 fish taxa in the San Luis Spanish collection are from brackish coastal waters and not from the freshwater sources closer to the mission. Due to Florida's geological history, many of Florida's "fresh" waters are sufficiently saline to support some marine fishes, but it is unlikely that sharks, vermilion snappers (*Rhomboplites aurorubens*), sheepsheads, or seatrouts would be found so far upstream. The presence of these marine fishes suggests that seafood was brought to San Luis from outposts on the Gulf of Mexico.

Limited Spanish data are available from excavations conducted by L. Jill Loucks (1993) at a western Timucua province mission located adjacent to Baptizing Spring (8Su65) on the Suwannee River (fig. 4.1). This may be the location of Mission San Juan de Guacara (Hann, 1996: 186; Worth, 1998a: 70, 156). The site was occupied from the early part of the 17th century until at least 1655. A pig and a cow are the only domestic animals identified in Spanish contexts at Baptizing Spring (table 4.4; Loucks, 1993). Deer constitute 31% of the individuals in this collection and gopher tortoises 46%. No fishes are reported from Spanish deposits at this mission. The exceedingly small collection from Baptizing Spring suggests that Spaniards had less access to domestic animals at western Timucua missions than they did at San Luis de Talimali in Apalachee province.

Native American Vertebrate Use at Western Timucua Missions

Limited data are available from native contexts at western Timucua missions. The pueblo associated with Baptizing Spring is one of the few western Timucua sources of information about Native American vertebrate use (table 4.5; fig. 4.1; Loucks, 1993). Two pigs and a cow contributed 9% of the individuals whereas indigenous wild fauna constituted 91% of the individuals. The most common of these indigenous animals were deer (34% of the MNI) and gopher tortoises (23% of the MNI). Other reptiles contributed an additional 20% of the individuals. A single fish, a mullet, was identified from the village. As observed above, Florida fresh waters are somewhat saline and it is not uncommon to find mullet far inland, so this fish may have been taken from a nearby river instead of the Gulf of Mexico.

The other western Timucua mission collection is from the Fig Springs site (table 4.5; fig. 4.1; 8Co1; Deagan, 1972; Newsom and Quitmyer, 1992; Quitmyer, 1991; Weisman, 1992). The Fig Springs mission was probably San Martín de Ayacuto, established about 1607 and abandoned around 1656 (Hann, 1990: 461, 473; Worth, 1998a: 48). Faunal samples are from a Native American structure near the convento and church as well as from the associated pueblo. A single pig contributed 2% of the vertebrate individuals; the rest of the individuals were indigenous wild animals. Deer contributed 12% of the individuals; gopher tortoises 10%; and freshwater fishes 53%. Native American's use of marine resources is demonstrated by the presence of two species of whelks (*Busycon sinistrum* and *Vasum muricatum*) and three species of marine clams (*Noetia ponderosa, Macrocallista nimbosa,* and *Anadara novalis*) at the site, in addition to two freshwater snail species (Deagan, 1972). Fine-meshed screen (1.59 mm [1/16-inch] mesh) was used during excavation; hence, the San Martín collection likely offers the most accurate picture of Native American life at an inland, western Timucua mission and demonstrates that Eurasian animals did not replace local wild resources in native foodways, suggesting continuity instead of change.

Native American Vertebrate Use at an Eastern Timucua Mission

The use of animals by Native Americans in western Timucua was very different from that

in eastern Timucua province. This conclusion is drawn from faunal remains recovered from a portion of Mission Nombre de Dios (NDD) in the Fountain of Youth site (FOY; 8SJ31; figs. 1.3 and 4.1; Chaney, 1987: 17; Deagan, 1983: 48, 2009; Gannon, 1965: 27; Hann, 1990: 427; Luccetti, 1977; Merritt, 1977, 1983; Waters, 2009). Animal remains were recovered from both late 16th/early 17th-century and late 17th/early 18th-century components from Nombre de Dios (Reitz, 1985, 1991). The earlier mission animal remains probably represent primarily Timucua and Guale (or Mocama) diet and exploitation strategies (Merritt, 1983: 143) at what was the first Native American mission north of Mexico. The later mission remains likely were deposited by a variety of Native American groups from throughout Spanish Florida as people at other missions retreated to St. Augustine during the late 17th/early 18th century in the face of English-sponsored aggression.

The two faunal collections from Nombre de Dios/Fountain of Youth are large and were recovered using fine-screen recovery techniques. Although the faunal collections can be divided into late 16th/early 17th-century and late 17th/early 18th-century components, the data are merged into a single First Spanish period mission assemblage for this summary. Despite the proximity of Nombre de Dios to St. Augustine, the pre-Hispanic focus on marine resources remained intact throughout the First Spanish period (compare tables 3.2, 3.3, and 4.5; fig. 1.3; Reitz, 1985, 1991). Only 4% of the vertebrate individuals in the First Spanish period Nombre de Dios assemblage are terrestrial mammals. With the exception of a domestic dog (*Canis familiaris*), classified as a commensal animal, no domestic animals are present in the assemblage. In contrast to the prominence of deer and gopher tortoises in the collections from Apalachee and western Timucua, deer contribute less than 2% of the vertebrate individuals and no gopher tortoises are present. Marine vertebrates, including many species of fish, a dolphin (Delphinidae), and sea turtles, contribute 90% of the individuals in the assemblage.

This pattern is present in both the late 16th/early 17th-century and late 17th/early 18th-century Nombre de Dios assemblages and is very similar to that of the pre-Hispanic collections from this site. Vertebrate use at Nombre de Dios contrasts dramatically with that at Native American contexts in the western Timucua province (table 4.5).

Summary of Apalachee and Timucua Zooarchaeological Data

Summarizing the Apalachee and Timucua materials is complicated by uneven sample size, recovery methods, and other limitations of these data. Nonetheless, it seems unlikely that Eurasian domestic animals replaced wild animals in the diet at most missions. Instead, limited use of domestic animals was incorporated into an exploitation strategy that continued to focus on locally available wild foods. Domestic animals rarely were used by Native Americans and may only have been a common component of Spanish diets in Apalachee province (though see García, 1902: 192, 194). On the other hand, local wild animals were heavily used by both Spaniards and Native Americans. Native Americans appear to have relied most frequently on deer, gopher tortoises, and fishes. The contrasts in the dietary role of fishes between Baptizing Spring and San Martín may reflect different archaeological techniques, occupation dates, and site formation processes (table 4.5). Fishes probably played a larger role in Apalachee and western Timucua mission diets than the data from Baptizing Spring indicate.

The basic pattern is similar at all of the sites reviewed here with the exception of San Luis de Talimali: limited or no use of Eurasian livestock and extensive use of local wild resources. To the extent that Native Americans in Apalachee and Timucua provinces contributed to the Spanish colonial economy, it was in local products like those found in mission contexts from those provinces. More data from pre-Hispanic contexts in Apalachee and Timucua provinces are needed to assess change and continuity in native strategies in those provinces, but the Nombre de Dios data suggest that changes were minimal and continuity pervasive. Beyond Apalachee province, Spanish food preferences or commercial intentions had little influence on native foodways and exploitation strategies.

It also is apparent that Apalachee province was in a position to be economically self-sufficient and to contribute commodities to the larger economy of the Spanish Empire. In taking advantage of the productivity and economic opportunities of Apalachee, as well as access to ports on the Gulf coast, people in that province endeavored to circumvent the civil authority of St. Augustine (Deagan, 1993) and made few contributions to the meat-based diet in that town.

Limited evidence at Nombre de Dios and in secular St. Augustine for the remains of those animals listed as mission commodities suggests that the interior missions did not supply either Nombre de Dios or secular St. Augustine with pork, venison, beef, chicken, or gopher tortoise. Nor did Nombre de Dios provide such products to secular St. Augustine. On the other hand, Spanish contexts suggest that local wild resources were an important part of the Spanish diet, whether those resources were obtained by Spaniards for themselves or were supplied by Native Americans. Only where cattle flourished and could be sold beyond the boundaries of Spanish Florida is there evidence for a change in native foodways or an approximation of the Iberian strategy in Spanish foodways. However, the possibility that missions and ranches sent St. Augustine meats that were deboned or otherwise archaeologically invisible cannot be refuted without further testing. None of these data suggest that we should anticipate evidence for changes in Guale strategies or continuity in Spanish strategies at Santa Catalina de Guale.

CONVENTO DE SAN FRANCISCO

The Convento de San Francisco (SA 42A), dedicated to the Immaculate Conception (La Concepción), was the headquarters of the Franciscan mission chain in Spanish Florida during the 17th century (K. Hoffman, 1990, 1993). The site is located in St. Augustine at what is now known as St. Francis Barracks and currently serves as the Florida National Guard headquarters (fig. 4.2). After 1606, it was the principal convent for the Custody of Santa Elena de la Florida. It was abandoned in 1763, along with the rest of Spanish Florida, when the brief British period commenced. Between 1786 and 1792, during the Second Spanish period, Franciscan friars re-occupied the Convento. In 1792, they were replaced by Spanish soldiers who occupied the site until the Spanish administration ended in 1821. The 17th-century faunal data from this site allow us to: (1) evaluate animal use at the administrative center of the Spanish mission chain; (2) consider evidence for the contributions to the Convento by outlying missions; and (3) assess whether members of the Spanish religious community were able to establish and maintain an Iberian diet even though their fellow townspeople apparently could not do so. The Second Spanish period materials may be from either the religious or military occupants.

We should expect some differences between animal use at the Convento and the outlying missions if only because people at the Convento lived in urban St. Augustine instead of at a rural mission. Although only a few friars lived permanently at the Convento, African servants and Native American laborers also lived there, at least occasionally. The friary also served as a guest house for visiting church officials, a training center for new friars, and a hospice for sick and elderly friars. For these reasons, we might expect more urban characteristics in the Convento animal remains than in those from rural locations (e.g., Reitz, 1986). We also might expect to find a more prestigious diet that emphasized the Iberian and "civilizing" character of the Franciscans' purpose as well as their status and authority in the colony.

Although many mission products could have been, and undoubtedly were, sent to St. Augustine, the bulk of the vertebrate remains in secular St. Augustine faunal collections are from the nearby estuaries and show little input from nonestuarine locales. Missions may have sent livestock, venison, or gopher tortoises only to the Convento, their administrative headquarters. If Franciscans at the Convento received contributions from the mission chain, they likely consumed more pork, venison, beef, chicken, and gopher tortoise than did secular and military townspeople. If the Convento deposits are similar to those from Apalachee and western Timucua missions, this would indicate that interior missions did provide meat to the Franciscan headquarters even though they rarely sent meat to the secular town. Alternatively, if interior missions seldom sent livestock, venison, or gopher tortoises to either St. Augustine or the Convento, Franciscans at the convent may have had frequent meals consisting of local fishes just as did secular St. Augustinians and people at Nombre de Dios (Reitz 1985, 1991, 1992b). If the Convento de San Francisco animal remains are similar to those from secular St. Augustine, this would be evidence that missions and ranches provided little meat to either the town or the Convento.

The faunal data from the Convento de San Francisco are available in technical report form only (Reitz, 1992c); thus, more detail is provided for this assemblage than for the other collections reviewed in this chapter. The

vertebrate assemblage contains 4658 specimens (NISP) weighing 2213.34 g and the remains of an estimated 144 individuals. Samples from ca. 1600, ca. 1650, and the Second Spanish period are reported here. Collections from all three temporal components are small, but suggest that distinct diets prevailed in each time period and that local foods were augmented with meats from the missions during the middle portion of the 17th century.

Vertebrate Use in the ca. 1600 Component: Convento de San Francisco

The collection from the ca. 1600 component contains 1669 specimens (NISP), represents the remains of an estimated 56 vertebrate individuals (MNI), and weighs 588.26 g (table 4.6). MNI is estimated for 30 taxa. Domestic animals constitute 5% of the individuals and 24% of the biomass of taxa for which MNI was estimated (tables 4.7 and 4.8). Domestic animals are exclusively pigs and chickens; no cattle, sheep, or goats are present (table 4.2). In terms of meat, 23% of the estimated biomass is pork, which contrasts with the amount of meat contributed by chickens (1%; table 4.2). Pigs are represented primarily by teeth (NISP = 10; table 4.9).

Wild, noncommensal taxa contribute 84% of the individuals and 47% of the estimated biomass (tables 4.7 and 4.8). No deer are present in the collection, but gopher tortoises contribute 4% of the individuals and 9% of the biomass. Most of the wild taxa are fishes from the nearby estuary. The most common fishes in the collection are croakers, which constitute 18% of the individuals.

The low percentage of biomass from fishes is primarily due to an unusually high percentage of commensal taxa. Six commensal individuals constitute 11% of the MNI and 29% of the biomass estimated for the collection. One of the striking features of the ca. 1600 collection is the large number of cats (*Felis catus*) present (tables 4.6 and 4.9). Remains of two cats were recovered, but both skeletons are incomplete. The cat remains were scattered throughout the strata of Feature 30, a well-construction pit, suggesting the cats originally were buried but subsequently were disturbed by the construction of the well. Thirty-eight of the cat specimens (52%) were recovered from the lowest levels of the construction pit.

Evidence for modifications, sex, and age is limited in the ca. 1600 collection. Modifications are present on 4% of the specimens identified at some level other than Indeterminate vertebrate and 47 Indeterminate vertebrate specimens also are modified (table 4.10). The most common modification is burning, which is found on 89% of the modified collection. One Indeterminate mammal specimen was worked. The pigs are represented by the remains of a subadult individual and an adult. One of the cats was a subadult and the other was an adult when it died. The chicken was an adult at death. Three Indeterminate bird specimens contain medullary bone, indicating the presence of at least one female bird in egg-laying condition, and one specimen is from a juvenile bird.

Vertebrate Use in the ca. 1650 Component: Convento de San Francisco

The collection from the ca. 1650 component contains 1273 specimens (NISP), represents the remains of an estimated 72 vertebrate individuals (MNI), and weighs 435.1 g (table 4.11). MNI is estimated for 24 taxa. Domestic animals contribute 11% of the individuals in this collection and 7% of the biomass for those taxa for which MNI was estimated (tables 4.7 and 4.8). Domestic animals include pigs and chickens, but no cattle, sheep, or goats (tables 4.2 and 4.11). In terms of meat, only 1% of the estimated biomass is pork; chickens contribute 6% of the meat. Pigs are represented primarily by teeth (NISP = 3; table 4.9).

Wild, noncommensal taxa contribute 76% of the individuals and 90% of the estimated biomass (tables 4.7 and 4.8). Deer contributed 4% of the individuals and 31% of the biomass; gopher tortoises contribute 1% of the individuals and 4% of the biomass. Deer are represented by an auditory bulla, a metatarsus, a tibia, a phalanx, and a sesamoid (table 4.9). Only the tibia could be considered a prime cut. Most of the wild taxa are estuarine fishes, of which mullets are the most common.

Nine commensal individuals constituted 13% of the individuals and 3% of the biomass (tables 4.7 and 4.8). Four of the commensal individuals are rodents (*Rattus* spp., *Sigmodon hispidus*), two are snakes (Colubridae), and two are toads or frogs (*Bufo*/*Rana* spp.). A single cat individual is represented in the collection by two specimens recovered from the lower part of Feature 31, the barrel well (table 4.9).

Other data are limited in the ca. 1650 sample. Burning is the primary modification present (table

TABLE 4.6 **Convento de San Francisco, ca. 1600: Species List**

			MNI			
Scientific name	Vernacular name	NISP	No.	%	Wt. (g)	Biomass (kg)
Indeterminate mammal		304	—	—	158.53	2.69
Didelphis virginiana	Opossum	1	1	1.8	0.05	0.002
Scalopus aquaticus	Mole	1	1	1.8	0.33	0.01
Ursus americanus	Bear	1	1	1.8	1.59	0.04
Felis catus	Domestic cat	73	2	3.6	72.39	1.241
Artiodactyla	Even-toed ungulate	9	—	—	20.55	0.4
Sus scrofa	Pig	15	2	3.6	52.48	0.977
Indeterminate bird		46	—	—	5.56	0.103
Anatidae	Ducks	1	1	1.8	0.49	0.011
Cathartes aura	Turkey vulture	1	1	1.8	0.17	0.004
Phasianidae	Turkey or chicken	1	—	—	0.13	0.003
Gallus gallus	Chicken	7	1	1.8	2.4	0.045
Meleagris gallopavo	Turkey	2	1	1.8	14.1	0.227
Alligator mississippiensis	Alligator	1	1	1.8	1.72	—
Indeterminate turtle		150	—	—	34.95	0.407
Emydidae	Pond turtles	20	—	—	7.26	0.148
Malaclemys terrapin	Diamondback terrapin	1	1	1.8	1.67	0.045
Terrapene carolina	Box turtle	1	1	1.8	1.31	0.038
Gopherus polyphemus	Gopher tortoise	37	2	3.6	30.72	0.388
Viperidae	Pit vipers	1	1	1.8	0.01	0.0001
Bufo/*Rana* spp.	Toad/frog	6	2	3.6	0.13	—
Carcharhinidae	Requiem sharks	6	2	3.6	1.7	0.218
Indeterminate fish		623	—	—	62.12	0.913
Elops saurus	Ladyfish	1	1	1.8	0.11	0.005
Ariidae	Sea catfishes	55	—	—	10.69	0.192
Ariopsis felis	Hardhead catfish	90	3	5.4	13.24	0.236
Bagre marinus	Gafftopsail catfish	11	2	3.6	3.01	0.059
Carangidae	Jacks	2	—	—	0.19	0.007
Caranx hippos	Crevalle jack	1	1	1.8	0.29	0.01
Archosargus probatocephalus	Sheepshead	13	2	3.6	3.03	0.044
Sciaenidae	Drums	10	—	—	1.58	0.055
Bairdiella chrysoura	Silver perch	1	1	1.8	0.06	0.005
Cynoscion spp.	Seatrout	15	3	5.4	1.67	0.068
Cynoscion nebulosis	Spotted seatrout	6	(1)	—	1.34	0.048
Leiostomus xanthurus	Spot	1	1	1.8	0.03	0.003
Menticirrhus spp.	Kingfish	2	1	1.8	0.29	0.016
Micropogonias undulatus	Atlantic croaker	36	10	17.9	13.83	0.284
Pogonias cromis	Black drum	6	3	5.4	2.86	0.097
Sciaenops ocellatus	Red drum	1	1	1.8	0.49	0.023
Mugil spp.	Mullet	75	4	7.1	5.83	0.131
Paralichthys spp.	Flounder	35	2	3.6	3.96	0.095
Indeterminate vertebrate		—	—	—	55.4	—
Total		1669	56		588.26	9.288

TABLE 4.7 **Convento de San Francisco: Summary of MNI**

	ca. 1600		ca. 1650		Spanish II	
	MNI	%	MNI	%	MNI	%
Domestic mammals	2	3.6	2	2.8	5	31.3
Domestic birds	1	1.8	6	8.3	1	6.3
Deer	—	—	3	4.2	1	6.3
Other wild mammals	2	3.6	1	1.4	—	—
Wild birds	3	5.4	2	2.8	2	12.5
Turtles/alligators	5	8.9	4	5.6	1	6.3
Sharks, rays, & fishes	37	66.1	45	62.5	5	31.3
Commensal taxa	6	10.7	9	12.5	1	6.3
Total	56		72		16	

TABLE 4.8 **Convento de San Francisco: Summary of Biomass**

	ca. 1600		ca. 1650		Spanish II	
	kg	%	kg	%	kg	%
Domestic mammals	0.977	22.6	0.032	1.4	7.484	97.3
Domestic birds	0.045	1.0	0.14	5.9	0.008	0.1
Deer	—	—	0.739	31.2	0.024	0.3
Other wild mammals	0.042	1.0	0.022	0.9	—	—
Wild birds	0.242	5.6	0.042	1.8	0.011	0.1
Turtles/alligators	0.471	10.9	0.163	6.9	0.022	0.3
Sharks, rays, & fishes	1.294	29.9	1.171	49.4	0.138	1.8
Commensal taxa	1.251	28.9	0.061	2.6	0.003	0.04
Total	4.322		2.37		7.69	

TABLE 4.9 **Convento de San Francisco: Summary of Elements**

	ca. 1600		ca. 1650			Spanish II		
Skeletal elements	Cat	Pig	Cat	Pig	Deer	Pig	Deer	Cow
Head	6	10	—	3	1	—	1	48
Vertebra/rib/sternum	27	1	—	—	—	—	—	1
Forequarter	6	—	—	—	—	—	—	—
Forefoot	—	—	1	—	—	—	—	—
Foot	21	3	—	1	2	1	—	—
Hindfoot	5	—	—	—	1	—	—	—
Hindquarter	8	1	1	—	1	—	—	—
Total	73	15	2	4	5	1	1	49

TABLE 4.10
Convento de San Francisco, ca. 1600: Modifications[a]

Taxa	Cut	C.-cut[a]	Hacked	Burned	Worked
Indeterminate mammal	1	—	1	25	1
Bear	—	—	—	1	—
Artiodactyla	1	1	—	1	—
Pig	—	—	—	2	—
Phasianidae	—	—	—	1	—
Chicken	2	—	—	—	—
Indeterminate turtle	—	—	—	17	—
Gopher tortoise	1	—	—	—	—
Indeterminate fish	1	—	—	7	—
Sea catfishes	2	—	—	—	—
Drums	—	—	—	1	—
Seatrout	—	—	—	1	—
Black drum	1	—	—	—	—
Mullet	1	—	—	—	—
Indeterminate vertebrate	—	—	—	47	—
Total	10	1	1	103	1

[a] Key to abbreviation: C.-cut, clean cut.

4.12), found on 9% of the collection. Feature 53 contained 39% of the burned specimens and Feature 31 contained 43%. The pigs include a subadult and an indeterminate individual. One deer was an adult at death, one was at least 18 months old, and the age of the third individual could not be estimated. The cat was an adult when it died. One chicken was a subadult and five were adults. Four Indeterminate bird specimens contain medullary bone and another Indeterminate bird specimen is from a juvenile bird. It is likely that the Indeterminate bird specimens are from chickens, indicating that females in egg-laying condition and young birds were slaughtered.

Vertebrate Use in the Second Spanish Period Component: Convento de San Francisco

The collection from the Second Spanish period contains 1716 specimens (NISP), represents the remains of an estimated 16 vertebrate individuals (MNI), and weighs 1189.98 g (table 4.13). MNI is estimated for 13 taxa. Domestic animals contribute 38% of the individuals and 97% of the biomass for which MNI was estimated (tables 4.7 and 4.8). Domestic animals include pigs, cattle, and chickens (table 4.2). No sheep or goats are present. Less than 1% of the collection's biomass is from pork but 97% is from beef. The amount of meat contributed by chicken is less than 1%. Pigs are represented by a single specimen from the foot (table 4.9). Four cattle are represented by cranial fragments and a rib. Of the 48 cattle cranial fragments, 42 are teeth.

Wild, noncommensal taxa contribute 56% of the individuals and 2% of the estimated biomass (tables 4.7 and 4.8). A single adult deer is represented by a tooth (table 4.9). Gopher tortoises contribute 6% of the individuals but less than 1% of the biomass. Fishes contribute the same number of individuals as domestic mammals, but a much smaller percentage of the biomass. A single commensal individual, a mole (*Scalopus*

TABLE 4.11
Convento de San Francisco, ca. 1650: Species List

		NISP	MNI		Wt. (g)	Biomass (kg)
Scientific name	Vernacular name		No.	%		
Indeterminate mammal		345	—	—	209.77	3.689
Sylvilagus spp.	Rabbit	2	1	1.4	0.84	0.022
Rattus spp.	Old World rat	2	2	2.8	0.3	0.01
Sigmodon hispidus	Hispid cotton rat	4	2	2.8	0.46	0.014
Felis catus	Domestic cat	2	1	1.4	1.31	0.034
Artiodactyla	Even-toed ungulate	1	—	—	9.1	0.192
Sus scrofa	Pig	4	2	2.8	1.14	0.032
Odocoileus virginianus	White-tailed deer	5	3	4.2	39.63	0.739
Indeterminate bird		58	—	—	10.23	0.193
Anas spp.	Dabbling duck	1	1	1.4	0.17	0.004
Gallus gallus	Chicken	13	6	8.3	7.13	0.14
Meleagris gallopavo	Turkey	1	1	1.4	2.0	0.038
Indeterminate turtle		97	—	—	23.3	0.392
Emydidae	Pond turtles	18	—	—	8.35	0.185
Malaclemys terrapin	Diamondback terrapin	5	3	4.2	2.34	0.076
Gopherus polyphemus	Gopher tortoise	7	1	1.4	4.55	0.087
Colubridae	Non-venomous snakes	2	2	2.8	0.16	0.003
Bufo/*Rana* spp.	Toad/frog	13	2	3.8	0.58	—
Carcharhinidae	Requiem sharks	4	2	2.8	1.2	0.162
Rhizoprionodon terraenovae	Sharpnose shark	1	1	1.4	0.79	0.103
Indeterminate fish		450	—	—	38.6	0.769
Ariidae	Sea catfishes	32	—	—	4.61	0.091
Ariopsis felis	Hardhead catfish	39	5	6.9	10.54	0.199
Bagre marinus	Gafftopsail catfish	11	4	5.6	4.09	0.08
Archosargus probatocephalus	Sheepshead	4	3	4.2	1.09	0.018
Sciaenidae	Drums	26	—	—	3.77	0.127
Cynoscion spp.	Seatrout	7	4	5.6	1.71	0.078
Cynoscion nebulosis	Spotted seatrout	1	(1)	—	0.28	0.015
Micropogonias undulatus	Atlantic croaker	10	7	9.7	4.02	0.146
Pogonias cromis	Black drum	19	4	5.6	2.43	0.096
Sciaenops ocellatus	Red drum	2	2	2.8	0.86	0.04
Mugil spp.	Mullet	62	8	11.1	5.18	0.14
Paralichthys spp.	Flounder	25	5	6.9	4.23	0.109
Indeterminate vertebrate		—	—		30.34	—
Total		1273	72		435.1	8.023

TABLE 4.12
Convento de San Francisco, ca. 1650: Modifications

Taxa	Cut	Burned
Indeterminate mammal	3	24
Indeterminate bird	—	3
Chicken	—	2
Indeterminate turtle	—	19
Pond turtles	—	1
Indeterminate fish	—	9
Hardhead catfish	—	1
Black drum	1	1
Mullet	—	1
Indeterminate vertebrate	—	51
Total	4	112

aquaticus), is present in the collection.

Evidence for modifications, age, and sex is limited. Modifications are present on 10% of the specimens and four Indeterminate vertebrate specimens also are modified (table 4.14). Evidence of burning is found on 20% of the modified collection and three specimens are either cut or hacked. One of the cut specimens is from a willet (*Catoptrophorus semipalmatus*). Many worked specimens are present (NISP = 137). These are all Indeterminate mammal specimens used to manufacture buttons. Most are blank fragments from which buttons had been removed; however, two complete buttons are still attached to blanks. The buttons are the single-hole type with a diameter of 13 mm. The blanks appear to be the flat portion of a cow scapula, tibia, or mandible. The pig was a subadult at death. One cow was less than 18 months of age when it died and three were at least 18 months old. One Indeterminate bird specimen is from a juvenile bird. The chicken was an adult when it died.

Summary of Vertebrate Use at the Convento de San Francisco

Many of the animals in the Convento assemblage are from the nearby estuary, suggesting that interior missions did not augment the secular diet in the town to the extent anticipated and that missions were not the only, or even the primary, source of meat for the Convento. This was particularly true during the early decades of the 17th century. When the Convento data are compared with those from missions and secular 17th-century St. Augustine, it appears that the Franciscans at the Convento combined some of the dietary characteristics of secular St. Augustine with those found in the mission chain (tables 4.1, 4.4, and 4.5; fig. 4.3). The collection from the middle decades of the 17th century (ca. 1650 period), however, can be distinguished from the ca. 1600 Convento collection and 17th-century secular St. Augustine specifically in terms of chicken and venison.

The high percentage of commensal animals in the Convento de San Francisco assemblage hampers analysis (tables 4.7 and 4.8). The 17th-century component contains the remains of a mole, four rodents, three cats, three snakes (Colubridae, Viperidae), and four toads or frogs. Although commensal taxa are a consistent part of all St. Augustine collections, commensal animals are unusually abundant in the Convento assemblage (tables 4.1, 4.7, and 4.8). The cats in the ca. 1600 component, in particular, are responsible for the high biomass percentage of commensal taxa in the collection from that time period. High percentages of commensal taxa are not otherwise associated with wells in St. Augustine (Reitz, 1994a). In the case of the Convento, the well (Feature 31) contained only one of the cats and two of the toads or frogs. Other than the cat in the well, most of the commensal animals are distributed among the excavation units in an apparently random fashion. Given that stored foods attract rodents, and that rodents attract snakes and cats, it is tempting to interpret this as evidence that large quantities of foods were stored in the Convento. These commensal animals are not thought to be part of the subsistence activities at the Convento, and they are omitted from the MNI and biomass estimates used in the following discussion of the Convento assemblage (table 4.15).

Like other St. Augustinians, the friars at the Convento made use of a wide variety of animals, many of which were from the nearby estuary, following a strategy practiced in the area prior to the 17th century (fig. 3.4) and at Nombre de Dios throughout the First Spanish period (fig. 4.3). In terms of individuals, the 17th-century Convento collection is similar to those of 16th- and 17th-century St. Augustine (tables 4.1, 4.2, and 4.15).

TABLE 4.13
Convento de San Francisco, Second Spanish Period: Species List

		NISP	MNI		Wt. (g)	Biomass (kg)
Scientific name	Vernacular name		No.	%		
Indeterminate mammal		1468	—	—	568.43	7.929
Scalopus aquaticus	Mole	1	1	6.3	0.1	0.003
Artiodactyla	Even-toed ungulate	5	—	—	4.8	0.108
Sus scrofa	Pig	1	1	6.3	0.49	0.014
Odocoileus virginianus	White-tailed deer	1	1	6.3	0.9	0.024
Bos taurus	Cow	49	4	25.0	531.98	7.47
Indeterminate bird		12	—	—	2.14	0.041
Gallus gallus	Chicken	2	1	6.3	0.35	0.008
Catoptrophorus semipalmatus	Willet	1	1	6.3	0.31	0.007
Zenaida macroura	Mourning dove	1	1	6.3	0.18	0.004
Indeterminate turtle		23	—	—	7.36	0.12
Gopherus polyphemus	Gopher tortoise	2	1	6.3	0.57	0.022
Indeterminate fish		105	—	—	9.86	0.188
Ariidae	Sea catfishes	10	—	—	1.75	0.034
Ariopsis felis	Hardhead catfish	6	1	6.3	1.81	0.035
Bagre marinus	Gafftopsail catfish	6	1	6.3	1.93	0.037
Archosargus probatocephalus	Sheepshead	1	1	6.3	0.16	0.003
Sciaenidae	Drums	4	—	—	0.4	0.02
Cynoscion spp.	Seatrout	3	1	6.3	0.48	0.023
Mugil spp.	Mullet	15	1	6.3	1.59	0.04
Indeterminate vertebrate			—	—	54.39	—
Total		1716	16		1189.98	16.13

TABLE 4.14
Convento de San Francisco, Second Spanish Period: Modifications

Taxa	Cut	Hacked	Burned	Worked
Indeterminate mammal	1	1	28	137
Willet	1	—	—	—
Indeterminate turtle	—	—	3	—
Indeterminate vertebrate	—	—	4	—
Total	2	1	35	137

Deer were either absent or at least very rare in the Convento collection of ca. 1600. By ca. 1650, however, deer are more common in the Convento collection than in the 17th-century assemblage from the secular town. With commensal taxa omitted from the Convento calculations, the percentage of fish individuals in both components of the Convento assemblage is higher than in the secular 17th-century St. Augustine assemblage, though this may reflect the flotation recovery used at the Convento rather than differences between secular St. Augustine and the Convento.

In terms of biomass, the Convento materials suggest a diet that was different from that in the secular 17th-century town and at Nombre de Dios (tables 4.1, 4.2, and 4.15). Pork was abundant at the Convento in the early part of the 17th century, but very rare in the middle part of the century. Beef was even more scarce. This latter characteristic is also found in the Nombre de Dios assemblage and distinguishes both from the 17th-century town. Chickens might have been more commonly consumed in the ca. 1650 period at the Convento than in the rest of the town or at Nombre de Dios. Fishes contribute a higher percentage of the 17th-century Convento biomass than of the secular 17th-century St. Augustine biomass.

Although the high percentages of fish might be a product of the fine-screen recovery technique used at the Convento, it is worth considering that fishes were consumed more frequently within the religious community than by secular colonists. This is what we would expect if residents in the Convento conformed more strictly to the ritual avoidance of meat required during parts of the Roman Catholic religious calendar.

Food taboos are not the only reason pork and beef are rare, however. The most striking aspect of the Convento assemblage is the large quantity of venison consumed during the ca. 1650 period (32% of the noncommensal biomass; table 4.8). This is despite religious prohibitions against eating meat at certain times. This level of venison consumption is not found in secular St. Augustine or at Nombre de Dios (tables 4.1 and 4.5; Reitz, 1985, 1991). It is also unusual for the other missions reviewed in this chapter (tables 4.4 and 4.5). This could be the signature contribution of the missions to the Convento.

The MNI diversity for the Convento assemblage is slightly higher than that for the Nombre de Dios and the 17th-century secular St. Augustine assemblages (tables 4.3 and 4.16; fig. 4.4). Other measures of diversity are more variable but, often, the Convento is at the presumably more prestigious end of the range compared to secular St. Augustine. Although the differences are not great, within the social context of 17th-century St. Augustine, even these modest differences in diversity might be an expression of

TABLE 4.15
Convento de San Francisco: Summary of 17th-century Fauna, Excluding Commensal Taxa[a]

	MNI		Biomass	
Category	No.	%	kg	%
Domestic mammals	4	3.5	1.009	18.8
Domestic birds	7	6.2	0.185	3.4
Deer	3	2.7	0.739	13.7
Other wild mammals	3	2.7	0.064	1.2
Wild birds	5	4.4	0.284	5.3
Turtles/alligators	9	8.0	0.634	11.8
Sharks, rays, & fishes	82	72.6	2.465	45.8
Total	113		5.38	

[a] The Convento de San Francisco values in this table combine ca. 1600s and ca. 1650s data.

TABLE 4.16
Diversity, Equitability, and Mean Trophic Level (TL) for Nombre de Dios and Convento de San Francisco[a]

Category	Nombre de Dios	Convento de San Francisco
MNI	451	113
MNI Diversity	2.869	2.995
MNI Equitability	0.726	0.88
MNI Richness	52	30
Fish MNI Diversity	2.289	1.885
Fish MNI Equitability	0.673	0.68
Fish MNI Richness	30	16
Fish MNI TL	3.181	3.231
Biomass Diversity	2.741	2.675
Biomass Equitability	0.708	0.794
Biomass Richness	48	29
Fish Biomass Diversity	2.027	2.284
Fish Biomass Equitability	0.596	0.824
Fish Biomass Richness	30	16
Fish Biomass TL	3.405	3.384

[a] The Mission Nombre de Dios values are based on the combined late 16th/early 17th-century and late 17th/early 18th century components and the Convento de San Francisco values are based on the combined ca. 1600s and ca. 1650s components without commensal taxa. The Delphinidae in the 16th-century Nombre de Dios collection is not included in the Fish estimates of diversity, equitability, or mean trophic level.

wealth, status, or authority.

Differences between secular St. Augustine and the mission chain are particularly striking in the fishing strategies practiced (figs. 4.5 and 4.6). Ten of the 15 fish taxa in the 17th-century secular St. Augustine assemblage are susceptible to mass-capture techniques and none of the fish taxa are small-bodied. Nor are any of the fishes deep-sea taxa; all were taken from the estuary or the adjacent inshore waters. Although more small-bodied fishes were used at Nombre de Dios than at the Convento, the use of mass-capture techniques and the mean trophic level exploited are very similar in the Convento and Nombre de Dios assemblages and dissimilar to practices in secular 17th-century St. Augustine. Some of the fishes used at the Convento probably were contributions from Nombre de Dios or similar coastal missions. Alternatively, perhaps the Convento had slaves or hired labor to fish for them and these people followed local, native traditions.

The fishing strategies reflected in the Nombre de Dios and the Convento assemblages are not duplicated in the secular St. Augustine assemblage. Mean MNI trophic level is higher for both the Nombre de Dios and the Convento de San Francisco assemblages than for secular 17th-century St. Augustine (fig. 4.5A). Although mean biomass trophic level is essentially

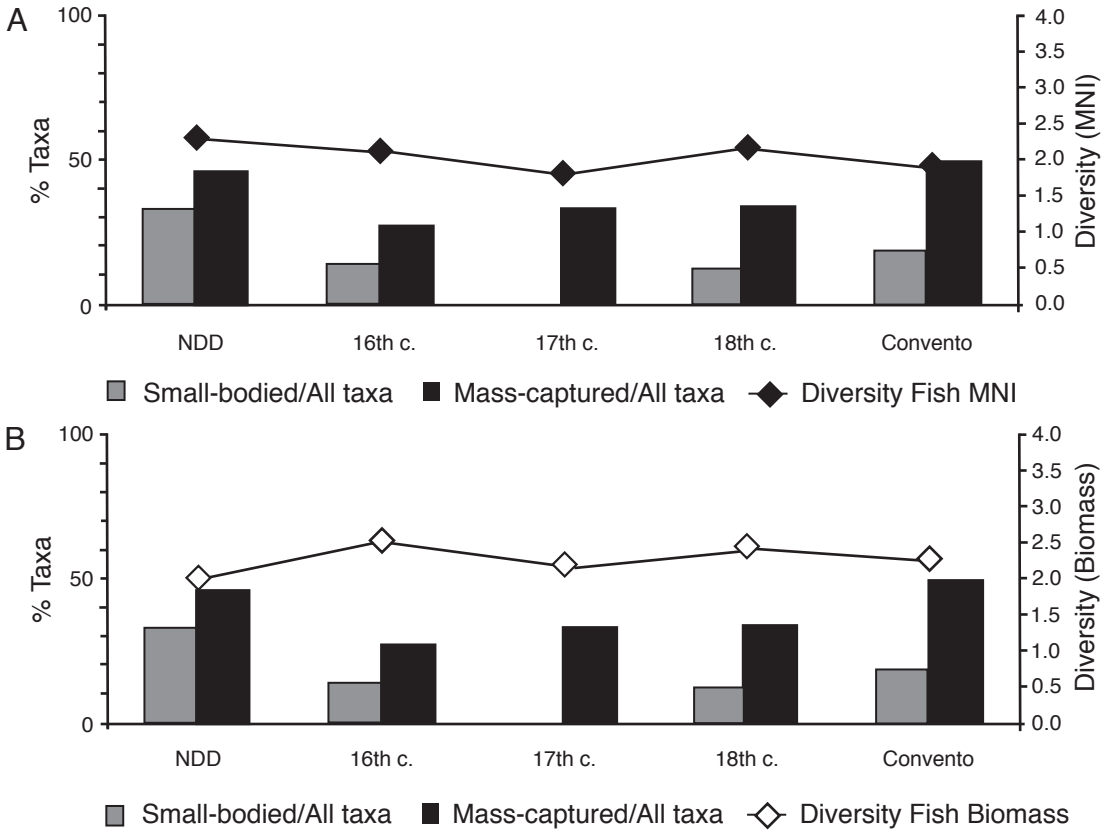

Fig. 4.6. Relationships among small-bodied fish taxa, mass-captured fish taxa, and fish diversity at Nombre de Dios (NDD), 16th-, 17-, and 18-century secular St. Augustine, and the Convento de San Francisco: (**A**) MNI and (**B**) biomass. Nombre de Dios (NDD) data include both 16th/17th-century and 17th/18th-century mission components from the Fountain of Youth site. The Convento de San Francisco data include only the ca. 1600 and 1650 components.

identical for all three assemblages, both Nombre de Dios and the Convento fishes are from mean trophic levels above 3.4 and the secular St. Augustine fish biomass is from a mean trophic level of 3.3 (fig. 4.5B).

Fish MNI diversity is higher in the Nombre de Dios assemblage than in the 17th-century secular St. Augustine and Convento de San Francisco assemblages largely because fishes are more abundant in the Nombre de Dios assemblage (tables 4.3 and 4.16; fig. 4.6A). This is reflected in the high fish richness of the Nombre de Dios assemblage compared to secular St. Augustine and the Convento. Fish biomass diversity values show that the sources of fish biomass were more limited at Nombre de Dios than in the other two contexts. This is not due to low richness, but because five fish taxa, out of 30, contribute over 76% of the fish biomass (table 4.16). These taxa are requiem sharks (Carcharhinidae), sea catfishes (Ariidae, *Ariopsis felis*, *Bagre marinus*, and croakers. This suggests that the secular town was not supported by the mission chain and operated independently of the mission economy.

Earlier it was hypothesized that, if the Convento was locally self-sufficient, Franciscan meals at the Convento de San Francisco would consist primarily of fishes, as did those of secular St. Augustinians and of Native Americans at Nombre de Dios. Alternatively, if Franciscans received contributions from missions, this might be demonstrated by higher percentages of pork,

venison, beef, chicken, or gopher tortoises in the Convento assemblage compared to the secular town. The Convento data suggest that these hypotheses need to be modified to accommodate differences between the early part of the 17th century (ca. 1600) and the later portion (1650).

It is plausible that missions supplied chickens and venison to the Franciscan Convento during the middle part of the century, but not to the secular town. This leaves the problem of how to safely transport meat over 100–200 km without refrigeration. Venison, at least, must have been preserved in some way that retained bones with the meat, or was enjoyed in a well-aged condition. An equally plausible explanation is that the Convento had its own hunters and raised its own chickens, thereby having local access to luxuries that may have been beyond the reach of others in St. Augustine.

Looking specifically at commodities that may have been supplied by missions to the Convento or to St. Augustine, there is little evidence that pork was supplied by the missions whereas venison and chickens may have been (tables 4.1, 4.2, and 4.15). Pig individuals are less common in the Convento assemblage than in the 17th-century secular assemblage, though they are not common in either context. Pork is slightly more abundant in the Convento assemblage than in the 17th-century secular assemblage but the difference is small. Deer, another one of the commodities missions may have supplied the Convento, are absent in the ca. 1600 Convento collection, but venison constitutes a third of the ca. 1650 biomass consumed at the Convento compared to 13% in the secular town (tables 4.1 and 4.8). Likewise, chickens supplied more individuals and biomass at the Convento during the ca. 1650 period than during the ca. 1600 period or in the 17th-century town. Gopher tortoises contributed fewer individuals to the Convento assemblage than to the 17th-century secular town but slightly more biomass. The peak usage of gopher tortoise at the Convento, however, was during the early decades of the 17th century (ca. 1600) when use of venison at the Convento was minimal. Gopher tortoise may have been a local resource that was commonly used at the Convento in the early part of the century but was replaced by venison later in the century. The use of pigs, deer, chickens, and gopher tortoises also distinguishes the Convento from Nombre de Dios, suggesting that local missions were not the source of the venison and chickens consumed at the Convento.

Venison may be evidence that more distant missions provided meat to the Convento but not to the town. Although the low use of beef and pork coupled with the high use of fish may reflect food taboos associated with the Roman Catholic ritual calendar, it is clear that residents of the Convento did not abstain from meat and that they made equal, if not greater, use of venison than did members of the secular Spanish community during the mid-1600s. Furthermore, the uncommonly high percentage of commensal taxa recovered from the Convento could be evidence that larger quantities of grains and other foods were stored at the Convento than in the town.

The assemblage from the Convento is small and these interpretations should be viewed with caution, but they would explain much of the tension between religious and secular officials in Spanish Florida (e.g., Bushnell, 1981; Gannon, 1990; Matter, 1972; TePaske, 1964). The possibility that missions sent meat or animals directly to the Convento, bypassing the secular town, is an aspect of animal use in Spanish Florida that warrants further study.

It is difficult to interpret the small sample from the Second Spanish period, when the Convento functioned as a religious administrative center and then as a military barracks. The Convento's Second Spanish period collection bears little resemblance to the only collection available from this time period for comparison: that from Ximenez-Fatio (SA 34-2; tables 4.7, 4.8, and 4.17; fig. 4.2; Ewen, 1984; Reitz and Brown, 1984). During the Second Spanish period, the Ximenez-Fatio site was used primarily as a residence, though a grocery store and a boarding house operated on the property after 1797. Faunal data from Second Spanish period contexts at Ximenez-Fatio suggest that beef and pork were a significant part of the diet at the site, though the percentages of pig and cow individuals are low compared to those from the Convento. Deer and gopher tortoises were important wild resources at Ximenez-Fatio, though sea turtles are as abundant as gopher tortoises. Mullets are the most common fishes in the Ximenez-Fatio collection, followed by drums and hardhead catfishes (*Ariopsis felis*). These characteristics all stand in sharp contrast to the Second Spanish period Convento data. It could be that rations of beef were so commonly consumed by either friars or soldiers during the Second Spanish period that other meats were of secondary importance. Despite

TABLE 4.17
Summary of Fauna from Ximenez-Fatio, Second Spanish Period[a]

	MNI		Biomass	
Category	No.	%	kg	%
Domestic mammals	12	7.9	31.34	57.7
Domestic birds	11	7.2	0.77	1.4
Deer	2	1.3	2.1	3.9
Other wild mammals	2	1.3	0.05	0.1
Wild birds	6	3.9	0.063	0.1
Turtles/alligators	14	9.2	7.98	14.7
Sharks, rays, & fishes	91	59.9	9.69	17.8
Commensal taxa	14	9.2	2.329	4.3
Total	152		54.322	

[a] Data from Reitz and Brown (1984).

the quantity of beef consumed at the Convento, wild animals continued to be used. The remains of fishes, gopher tortoises, and deer indicate that the tradition of complementing rations with local wild foods continued into the Second Spanish period.

INFLUENCES ON NATIVE AMERICAN AND SPANISH FOODWAYS IN PENINSULAR FLORIDA

Data from the St. Augustine area are far more robust than are those from elsewhere in peninsular Florida, yet even these data are limited for a variety of reasons. Eventually these problems will be resolved by improved contextual control that will enable us to examine many important distinctions within the 17th century. Future studies likely will find differences in animal use: (1) by diverse social groups during the early 17th century before the drought and before the missions and ranches reached their peak; (2) during the mid-1700s when cattle ranches and missions flourished; and (3) during the last few decades of the century as these outposts fell victims to English incursions and native unrest, and the drought abated. It also is probable that adverse temperature and rainfall patterns of the so-called Little Ice Age impacted the productivity and reliability of fisheries, farming, and ranching during the early part of the century.

Nonetheless, when zooarchaeological data from the mission chain and St. Augustine are compared, the range of influences on Spanish and Native American foodways and the variety of responses to those influences are apparent. If the vertebrate data currently available from these locations accurately reflect diet and exploitation strategies in Apalachee and Timucua provinces, it is evident that subsistence strategies were heterogeneous within the mission chain. At San Luis de Talimali, pork and, especially, beef were extensively used. This is the only Spanish locality where cattle played a prominent role and where the hypothetical Iberian diet was approximated prior to the Second Spanish period. At Baptizing Spring, Spaniards enjoyed access to venison, but also ate gopher tortoise, pork, and beef. Extensive use of fishes in eastern Timucua contrasts sharply with habits in western Timucua or Apalachee provinces.

To the extent that Spaniards at each of these locations were dependent primarily on their own efforts to acquire animal nutrients locally, they not only "ate like Indians" (Rodríguez-Alegría, 2005) but hunted and fished like them, and probably with them, as well. Only after the mission chain had collapsed did Iberian elements such as pork and beef contribute more than half of the meat used by the secular population in St. Augustine, even at the Convento de San Francisco.

Work by Sandor Bökönyi (1975) can be brought to bear on the discussion of Iberian adaptations in Spanish Florida. He suggests that when people arrive in a new environment they will try to maintain their original husbandry system under the changed circumstances. They will do so even if it is unproductive, making up short-falls through increased use of wild meat sources before incorporating a different suite of domestic resources. This hypothesis was proposed to explain changes that occurred in animal use when a human population with an established animal husbandry tradition migrates into a region to which their livestock are not adapted and where no alternative domesticated animals are present. This characterizes the situation in Spanish Florida. The original suite of animals that the Menéndez charter required him to supply Florida reflected the Iberian preference for sheep and pigs (Lyon, 1976: 215). The sheep, at least, were not a viable alternative (see appendix B). Given the low numbers of pigs, they apparently did not flourish either. Pigs, as well as cattle, required a period of adaptation to the new environmental settings (Reitz, 1992a). Although these animal colonists initially failed to thrive, Spaniards had before them an example of a viable alternative strategy practiced by local native peoples. It was this strategy that was incorporated into the colonial economy of Spanish Florida.

In those cases where the economic and ethnic identity of the household is known, less well-to-do or less-well-connected households used more meat from Eurasian livestock than did peninsulare, affluent criollo, or mestizo households (Reitz and Cumbaa, 1983). Affluent criollo and peninsulare households could afford to have others hunt and fish for them. Mestizo households had reciprocal obligations within their Native American kinship networks upon which to draw. Those criollos and peninsulares with limited finances or no local ties had to rely on the rations available through the situado.

Otherwise, the animal remains from St. Augustine, Apalachee missions, and Timucua missions indicate that meats consumed by Spaniards at each location were from locally available, primarily wild, sources. Native American diets and exploitation strategies were little changed under Spanish influence. The dominance of criollos in Spanish Florida, and of kinship ties that linked them with Native Americans, clearly influenced routine dietary choices in the colony despite the fact that the governors, who were peninsulares, found the menu choices unacceptable.

CONCLUSIONS

The Convento de San Francisco offers the best framework for anticipating characteristics of diet, exploitation strategies, and sources of economic support at Santa Catalina de Guale. These characteristics should be: limited use of Eurasian domestic mammals, relatively high use of chickens, high use of venison, and extensive use of both large-bodied and small-bodied estuarine fishes, many of which could be captured using mass-capture techniques. Except for the presence of Eurasian animals, diet at Santa Catalina de Guale should conform to the pre-Hispanic pattern on St. Catherines Island reviewed in chapter 3. Exploitation strategies reflected in the Mission Santa Catalina de Guale component should be similar to those practiced in Pueblo Santa Catalina de Guale in terms of diversity, mean trophic level, and the use of small-bodied and mass-captured fishes. This similarity may be either because Spaniards posted to the mission adopted native traditions or because Guale contributions to the local mission economy were little changed from pre-Hispanic habits. It is unlikely that efforts to influence Guale economic practices at Santa Catalina de Guale, and to obtain animal products to support St. Augustine or the Convento, were any more successful on St. Catherines Island than they were in Apalachee and Timucua provinces.