Wildlife in urban Charleston, South Carolina, USA

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ABSTRACT
The quantity and variety of animals contributing to foodways and landscapes often are overlooked in studies of urban experiences after AD 1500 in North America. Charleston, South Carolina (USA) was founded in its present location in 1680 and the Charleston faunal assemblage reviewed here was deposited between 1692 and the early 1900s at multiple sites. It contains over 134,000 specimens (NISP) and the remains of an estimated 2,174 individuals (MNI) from 152 vertebrate taxa. This large faunal assemblage demonstrates that the urban setting contained a rich mosaic of people and animals with some of these animals filling multiple roles in that landscape. Non-commensal wild and domestic animals contributed to a unique lowcountry cuisine and many of these same animals, in addition to commensal ones, lived in the city. Many aspects of the urban environment were designed to accommodate and restrict these animals. The activities of animals shaped, and were shaped by, the developing urban environment. Unlike other environmental components, though, the animals were active players in the affairs of daily life and efforts to control them varied in their success.

KEY WORDS
Urban wildlife,
Charleston,
South Carolina,
zooarchaeology,
post-medieval
archaeology,
historical archaeology.

RÉSUMÉ

Vie sauvage urbaine à Charleston, Caroline du Sud, États-Unis.

En Amérique du Nord, la quantité et la variété d'ossements d'animaux contribuant aux pratiques alimentaires et aux paysages sont souvent négligées dans les études de l'expérience urbaine après 1500 AD. Charleston, en Caroline du Sud (États-Unis) fut fondée en 1680 à son emplacement actuel, et l'assemblage faunique de Charleston examiné dans le présent article fut déposé sur plusieurs sites entre 1692 et le début des années 1900. Il contient plus de 134 000 spécimens (NISP) et les restes de quelque 2,174 individus (MNI) représentant 152 taxons de vertébrés. Cet assemblage faunique considérable démontre que l'environnement urbain contenait une riche mosaïque de personnes et d'animaux, dont certains remplissaient des rôles multiples dans le paysage. Des animaux non-commensaux, sauvages et domestiques, contribuaient à une cuisine 'lowcountry' originale, et plusieurs de ces mêmes animaux, en plus des animaux commensaux, vivaient dans la ville. Plusieurs aspects de l'environnement étaient conçus pour accommoder et restreindre ces animaux. Les activités des animaux façonnaient, et étaient en retour façonnées, par l'environnement urbain en cours de développement. Cependant, contrairement à d'autres éléments environnementaux, les animaux étaient des joueurs actifs dans les affaires de la vie quotidienne, et les efforts pour les contrôler connurent un succès varié.

MOTS CLÉS
La faune urbaine,
Charleston,
Caroline du Sud,
archéozoologie,
archéologie post-médiévale,
l'archéologie historique.

INTRODUCTION

One of the major contributions zooarchaeology makes to studies of the 'modern', post-1500 world is evidence that interactions between people and other animals did not stop in the year 1500. Often the assumption is that most meats consumed in urban centres after 1500 were from domesticated sources. A further assumption is that urban households obtained these meats from shops, markets and vendors. The animals themselves are ignored as active members of the urban landscape because it is assumed they were raised for the urban market at nearby or distant centres of production. Under this model, animals enter urban centres primarily as meat, rarely on the hoof. If other animals are considered, it is largely because they may be vectors for disease (e.g. rodents) or are charismatic (e.g. dogs [*Canis familiaris*]). Zooarchaeological research demonstrates that the provisioning of urban centres was more complex than these models presume (e.g. Bowen 1988, 1992, 1994), that many animals lived within urban centres, and that some of these were part of the local cuisine, as will be demonstrated in this paper.

To explore the variety of meats consumed within urban centres and the sources of those meats using zooarchaeological evidence, it is necessary first to distinguish between animals, or animal remains, used as food and those that were not. The raccoon (Carnivora: *Procyon lotor*) is a classic example of the difficulty inherent in this distinction. Raccoons are small omnivores native to North and Central America. Their most visible habitat in the eastern United States today is the urban environment, where they enjoy a reputation as creative raiders of rubbish bins, bird feeders and other sources of 'free food'. However, they also figure prominently as game animals, even today, and are part of many cuisines in the southern United States. Although raccoons are not the only urban animals, they are excellent examples of the ability of wildlife to live in the human-built environment and the diverse roles animals play in both rural and urban life. Raccoons also encapsulate the challenges inherent in archival and archaeological studies of urban provisioning strategies, cuisines and landscapes, exemplified in this paper by a study of animal remains recovered from Charleston, South Carolina (USA) (Fig. 1). Archaeological research in Charleston has long

focused on the urban landscape. This research is guided by the concept of land modified for human occupation and its use as a shared space evolving to serve a community (Jackson 1984: 7-8). After several decades of archaeological study, it is possible to transcend a focus on individual sites and individual actions to examine reciprocal relations among people and their alterations of the physical world over a 300-year period (Upton 1992: 51). Recently the study of diet and foodways in Charleston has been merged with landscape analysis by regarding animals as components of the urban environment. By considering animals as ingredients of both cuisine and landscape, the urban setting is revealed to contain a mosaic of people and animals. Some of these animals served multiple roles. Like the people who lived in these settings, these animals shaped, and were shaped by, the developing urban environment.

Thus, Charleston was land modified for human occupation and space shared with a diverse fauna. Many of these animals contributed to a unique lowcountry cuisine and lived within the city. Various aspects of the growing urban landscape, from buildings to fences and walls, attempted to accommodate and restrict these animals. Unlike other environmental components, though, animals were active players in the affairs of daily life and efforts to control them varied in their success.

Although the literature contains many definitions of the term 'landscape', in this study we use the ecological definition that focuses on the development and dynamics of biotic and abiotic interactions and exchanges on broad spatial and temporal scales (Odum and Barrett 2005: 375-376). Human perceptions of the space and time within which they live are important aspects of urban landscapes, as are the ways these are managed. These issues, as well as most aspects of landscape ecology, are beyond the scope of this brief review paper.

BACKGROUND

This study of animals in Charleston is based on the analysis of vertebrate collections recovered from sites located inside Charleston's current city limits.

Fig. 1. – Map showing the location of Charleston, South Carolina, and two other major cities on the Atlantic coast of the United States.

The methods used to excavate in Charleston and to study Charleston vertebrate faunal collections are described in site reports from which these data are summarised. Details of material culture are available in these reports, as are species lists, descriptions of elements represented, age at death for the major domestic animals, butchering and other modifications to the specimens, and measurements (see Zierden and Reitz (2009) for details and references). Most of the sites were excavated using a 1/4-inch (6.35mm) mesh screen to recover material culture and animal remains under the supervision of Zierden. Consistency in field and laboratory techniques over many years facilitates the synthesis of these data.

Vertebrate remains were studied under the direction of Reitz using the comparative skeletal collection at the Georgia Museum of Natural History, University of Georgia. Detailed discussions of the zooarchaeological methods used in this study are presented in Reitz and Wing (2008), Reitz *et al.* (2006) and Zierden and Reitz (2009). The primary unit of analysis for the faunal remains in this paper is the Minimum Number of Individuals (MNI *sensu*

White [1953]). This measure of taxonomic abundance is widely critiqued (e.g. Lyman 2008: 81-82; O'Connor 2000: 60; Reitz and Wing 2008: 205-210). Perhaps most concerning in urban settings is the probability that 'individuals', strictly speaking, were rarely or never present at a site. It is customary to presume that the remains of domestic food animals (e.g. pigs [*Sus domesticus*], cows [*Bos taurus*], chickens [*Gallus gallus*]) were deposited at urban sites as butchered joints instead of as individuals.

The traditional approach to assessing whether recovered remains represent individuals or joints is to examine elements represented in each collection, fragmentation patterns, and butchering marks. Such data often distinguish between locally slaughtered/butchered animals and those obtained from off-site sources such as markets and distant procurement locations. They also may distinguish between animals used as food and those that were not. These data are collected during every Charleston zooarchaeological study. They typically show that some pigs and cows were slaughtered on-site, especially if the site was an elite household (Reitz 2007; Reitz *et al.* 2006; Zierden and Reitz 2009). They also show that both domestic and non-domestic animals were consumed. Archival evidence also indicates that slaughter of live animals on urban residential lots was not uncommon, even if a live animal was purchased at a market (Smith 2007). At least some animal remains recovered from Charleston do represent individuals rather than joints. It is likely that the remains of on-site butchered individuals and units of meat purchased off-site are both present at these sites.

Thus, internal evidence suggests that some individuals of all of these taxa were present at each site. Further, every vertebrate class is represented and the number of fish or rodent specimens may be higher in a collection than the number of domestic mammal specimens. An alternative to MNI, the number of identified specimens (NISP), is also problematic for the purposes of this survey. To compensate for associated biases, MNI is augmented by the number of vertebrate taxa, defined here as the number of taxa for which MNI is estimated. NISP is available for each site in the references cited in Zierden and Reitz (2009).

The pathways over which animals and animal products entered the archaeological record in Charleston are complex. They are probably no more complex than for most urban centres, but the evidence for on-site slaughter of animals and consumption of many animals that might be considered inedible stimulates us to explicitly consider alternative pathways. Vendors sold provisions throughout the city and markets flourished in the city. In the case of elite households, slaves or retainers might hunt, fish and herd animals for the household or provisions might be sent to the household from plantations owned by the family. Charlestonians of all ethnic groups and social strata might hunt, fish and raise livestock for themselves. City ordinances show that many households had livestock on their property, ranging in size from cows and pigs to chickens and pigeons (*Columba livia*). Some of these animals roamed the city at will. Thus, we know that markets, stores and vendors were not the sole source of food in the city. Exploring the implications of this for urban provisioning and environments is one of the primary research objectives of zooarchaeological studies in Charleston.

Both wild and domestic animals in Charleston had multiple roles and individuals might occupy more than one of these during a lifetime. They could be food, represented only by meat within the city or at a specific site. They could be free-ranging animals whose ultimate purpose was to provide food or by-products but that otherwise roamed the city more or less at will, perhaps kept close to home by people who claimed ownership by feeding the animals occasionally. They could be feral animals, especially dogs, cats (*Felis catus*) and pigeons, living beyond human ownership. Or, they could be local, indigenous wild animals living in the city for their own reasons. Some of these indigenous animals became part of the local cuisine and others did not.

In the southeastern United States, it is even difficult to be confident of the domestic status of some animals. It may bear repeating that there were no indigenous domestic animals other than dogs in the southeastern United States when European colonisation began in the 1500s. Some species indigenous to the Southeast were domesticated subsequently, while others that were domesticated elsewhere in the United States (such as the turkey in the American southwest) before European colonisation, spread into this region (e.g. Speller *et al.* 2010). For example, wild populations of

Canada geese (*Branta canadensis*) and turkeys (*Meleagris gallopavo*) are indigenous to the region. Thus far, remains of Canada geese and turkeys recovered from Charleston show none of the traditional morphological changes associated with domestication and these two birds are considered wild taxa in analyses of the Charleston faunal record, though the possibility exists that some were at least tame if not domestic. To complicate the classification further, Johnston (2001: 51, 61-62) classifies both birds as casual synanthropes: birds that exploit habitats modified by people without becoming dependent on them. Pigeons are interpreted as domestic because colonists introduced them to the region, though at some point these animals clearly joined the ranks of urban wildlife.

This multiplicity of roles stimulates the use of the term 'commensal' as a shorthand way to refer to animals that we interpret broadly as animals that share space with people and may benefit from the relationship, but which were not part of the lowcountry cuisine. The term commensal refers to a "…relationship between two species in which one population is benefited but the other is not affected (Odum and Barrett 2005: 514)." As used here, the classification encompasses highly complex, interrelated and diverse roles in the urban environment and interactions with people. It merges, for sake of simplicity, organisms that in specific instances more accurately might be termed synanthropic, symbiotic, mutualistic, or parasitic; but all of which were unlikely to be consumed by Charlestonians. The dynamics of people and other animals in urban settings are much more complex than this use implies; but it enables us to compare domestic animals used as food with wild, non-commensal animals used as food, and non-food commensal animals, recognising that the validity of classifying a taxon into one of these categories often cannot be verified. It is appropriately ambiguous as a way to indicate animals whose multiple roles may be indistinguishable.

The commensal category includes the following taxa: small rodents (*Mus musculus, Peromyscus* spp., *Rattus* spp., *Sigmodon hispidus*), dogs, cats, horses, mules, or donkeys (*Equus* spp.), passerine birds (Mimidae, Emberizidae, *Sialia sialis*, Muscicapidae, *Cyanocitta cristata, Turdus migratorius, Cardinalis cardinalis*), snakes (Colubridae) and anurans (Anura, *Rana* spp., *Bufo* spp., *Scaphiopus holbrooki*). Some of the animals classified as commensal are ones that traditionally are ignored or considered vermin; this includes most frogs and snakes as well as some birds and rodents. Some of the animals classified as commensal in this paper are vectors for disease and otherwise cause significant economic damage. The category also includes domestic animals that provide labor, security, or companionship in the American colonies but that were unlikely to be widely consumed, such as dogs, cats and horses. Some of the ethnic traditions represented in Charleston would have considered any or all of these commensal animals acceptable cuisine, but they are almost all universally considered inedible, or at least famine foods, by most Charlestonians today. Many of the animals we quantify as 'cuisine' in this paper (i.e. non-commensal wild taxa) might very well have been commensal. Likewise, some of the animals classified as commensal may have been part of the early lowcountry cuisine and subsequently dropped from the menu. A good example is provided by the small passerine birds, which were part of some colonial cuisines, but are no longer considered edible.

The point is not whether these animals were commensal or interacted in some other way with people, but that they were present at all in the city, and in large numbers. Most, if not all, of the animals termed commensal in this paper could have been consumed and many of the non-commensal taxa could have been commensal. Thus, these categories are not mutually exclusive. Some of the animals considered domestic or wild, non-commensal animals in this study likely were commensal instead of cuisine, enlarging the ranks of the wild community in the city even further. Either way, they must be considered in studies of urban foodways and landscapes.

CHARLESTON

Charleston was founded in its present location in 1680 as part of the English Province of Carolina granted by royal charter to eight Lords Proprietors in 1663. Although the development of Charleston in its present location began in 1680, the earliest archaeological evidence dates to 1692. Charleston has been a vibrant presence on the Atlantic seaboard ever

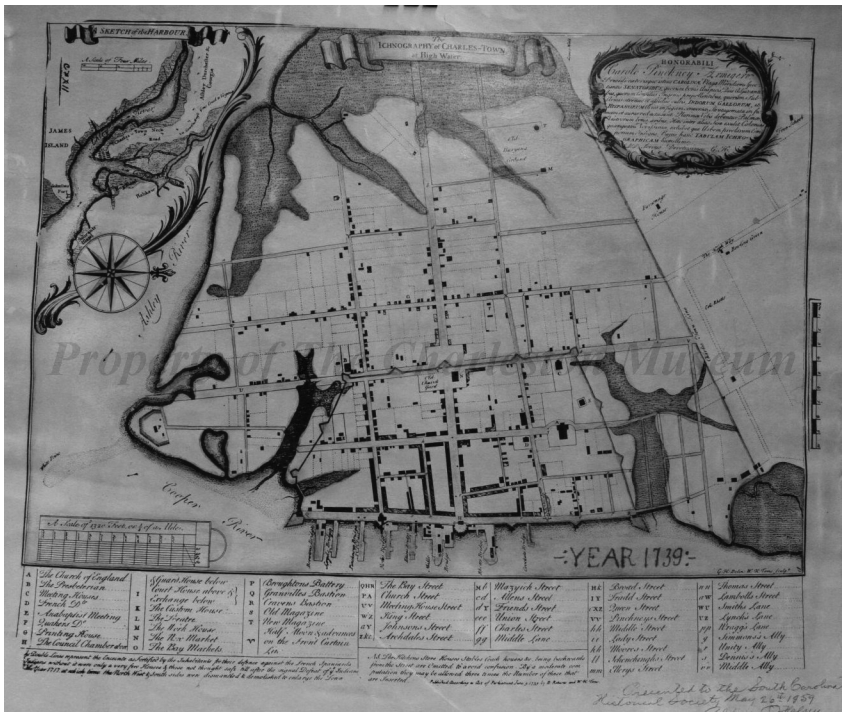

Fig. 2. – "Ichnography of Charles-Town at High Water" by B. Roberts and W. H. Toms, 1739. Courtesy of the Charleston Museum, Charleston, South Carolina (USA).

since. The city grew from a small, walled, tidewater colony into a crowded commercial hub with an active seaport that linked interior trade networks, plantations and global markets through maritime imports and exports (Fraser 1989; Zierden and Reitz 2002a). From an estimated population of 1,000 people in 1680 Charleston's population grew to 16,920 in 1790, when the first federal census was conducted, making it the fourth largest urban centre after New York, Philadelphia and Boston (Fraser 1989: 8, 178). Charleston's population increased steadily to more than 50,000 by the late 1800s (Fraser 1989: 310). Residents were predominantly enslaved and free Africans, Europeans from many countries and Native Americans. During this period, Charleston experienced numerous calamities and misfortunes, as well as periods when it flourished as 'The Queen City of the South', enjoying economic prosperity, cultural renown and political influence (Fraser 1989: 213; Zierden and Reitz 2009). It is also the city known for engaging in the first military action of the American Civil War in 1860.

One of the region's defining features is a lowcountry cuisine that merges diverse European, African, Native American and West Indian influences and recipes with foods native to, or successfully cultivated in, the lowcountry (Taylor 2000: 6). Each group introduced elements, preferences and preparations into the cuisine; West Africans traditionally ate little meat while Europeans and Native Americans preferred a diet heavy in meat, for example. Although many white residents had their roots in English cuisine, a strong French influence came from subsequent waves of immigrants, from the Huguenots of the early 18th century to refugees from Santo Domingo a century later.

The environmental and economic success of rice cultivation made this grain the basis of lowcountry diet and cuisine and the daily staple was served in a variety of ways (Hess 1992: 2-5). African-American residents were likely the main shapers of coastal

Fig. 3. – "Bird's Eye View of the City of Charleston, South Carolina, 1872" by C. Drie. Courtesy of The Charleston Museum, Charleston, South Carolina (USA).

foodways; they were responsible for most of the cooking in the white kitchens of the 18th and 19th centuries, as well as their own. African-American women dominated the city market. Lowcountry residents of all backgrounds took advantage of the bounty of the woods and waters of the coast and a host of wild game, fish, and shellfish formed the basis of many lowcountry dishes. Fruits and vegetables from Europe, Africa and the Americas grew on the fertile sea islands that protected the mainland from the Atlantic. The wealth derived from plantation agriculture made a variety of wines, spices and delicacies accessible through the trans-Atlantic trade (Edgar 1998: 191; Hooker 1981, 1984: 14-29).

The growing city encroached upon the native wildlife, which quickly became part of this cuisine as well as of the urban landscape. A 1739 map (Fig. 2) shows a congested colonial town focused on the waterfront, crowded behind a protective brick wall and outfitted with bastions and redans (a V-shaped projection). The low-lying nature of the land within and outside the old city wall is clearly visible. The image also speaks to the explosive growth of the city in the mid-18th century, as the Spanish threat decreased and trans-Atlantic commerce increased. Virtually none of this early city is visible above ground and a large portion was destroyed by fire in 1740. An 1872 aerial image of Charleston is the culmination of two centuries of development, showing the city much as it appears today (Fig. 3). The city expanded partly by subdividing lots and infilling with multiple dwellings. Filled wetlands, traversing the peninsula and along the waterfront, were likewise subdivided and developed. Long, narrow buildings on long, narrow lots, a congested waterfront filled with wharves, bridges,

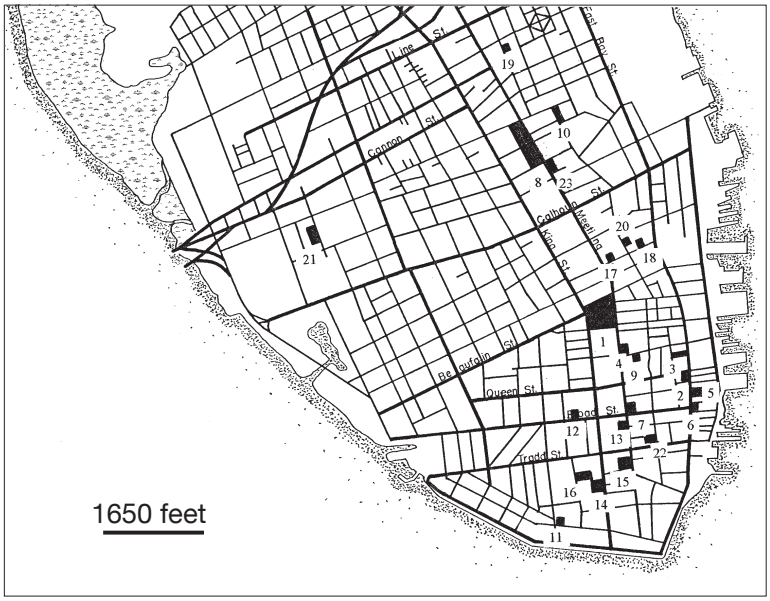

Fig. 4. – Map of Charleston, South Carolina, showing location of elite town-house sites, single-house sites, and sites with mixed residential/commercial functions. For additional information about these sites and the faunal collections see Zierden & Reitz (2009). **Public sites: 2**, McCrady's Tavern; **3**, Lodge Alley; **5**, Atlantic Wharf; **6**, Exchange; **7**, Beef Market; **9**, Powder Magazine; **Residential-commercial sites: 1**, Charleston Place; **4**, First Trident; **8**, Visitor's Center; **Upper status residences: 10**, Aiken-Rhett; **11**, William Gibbes; **12**, John Rutledge; **13**, Post Office; **14**, Miles Brewton; **15**, Nathaniel Russell; **16**, 14 Legare; **22**, Heyward-Washington; **23**, Joseph Manigault; **Modest status residences: 17**, 66 Society; **18**, 40 Society; **19**, 70 Nassau; **20**, 72 Anson; **21**, President Street.

warehouses and commercial buildings, defined the bustling commercial centre, a central point in the trans-Atlantic world.

These maps clearly show why the landscape within which Charleston grew was known as the "lowcountry" (Kovacik and Winberry 1987). The lowcountry is riddled with tidal marshes, streams, swamps and low-lying forests that were considered undesirable, sources of 'bad air' and the 'miasma' (Edgar 1998: 157; Fraser 1989: 102; Waring 1967). Efforts to fill these areas began when the city was founded and continue today; though Charleston still contains unfilled and unimproved wetlands. Such areas are visible on period maps and their evolution is evident in the pollen record (Jones 2001; Reinhard 1989, 2001a, 2001b). Many of the townhouses had highly formalised front yards but the rear of the property contained unimproved and unbounded lands. A swamp formed the common rear boundary between Miles Brewton's house and the adjoining 14 Legare house into the early 19th century, for example (Zierden 2001a, 2001b). This swamp persisted through the 18th century and the boundary between the two house lots continued to be weedy and wet into the middle of the 19th century, after which the yards of the two properties were filled and the boundary fenced (Reinhard 2001b). These and similar areas provided ample space for wild and feral animals.

URBAN CUISINE OR COMMENSAL ANIMALS?

The Charleston faunal record begins in 1692 and extends into the early 1900s. Faunal collections originated from 55 sites or components of sites with diverse functions, including several commercial or

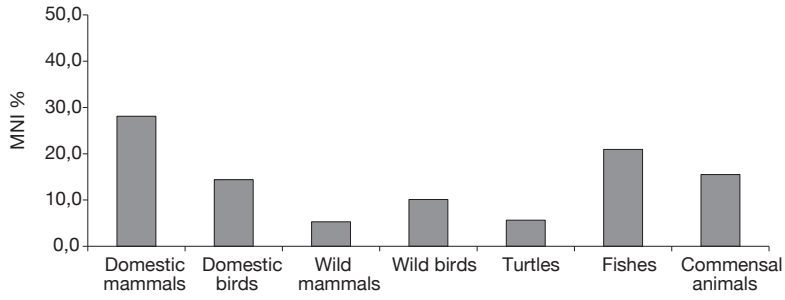

Fig. 5. – Percentages of vertebrate Minimum Number of Individuals (MNI) for the period AD 1692 to the early 1900s.

Table 1. – Summary of Charleston Minimum Number of Individuals (MNI) (after Colaninno-Meeks and Reitz 2010; Zierden and Reitz 2009).

	1692-1760	1750-1820	1820-1880s	1880s-1900s	1692-1900s	1692-1900s
Domestic mammals	90	167	251	103	611	28.1%
Domestic birds	25	73	131	83	312	14.4%
Wild mammals	15	33	54	13	115	5.3%
Wild birds	23	65	97	36	221	10.2%
Turtles and alligators	15	33	51	24	123	5.7%
Fishes	49	159	183	64	455	20.9%
Old World rats (*Rattus* spp.)	20	63	74	65	222	10.2%
Other commensal taxa	8	20	60	27	115	5.3%
Total MNI	245	613	901	415	2174	

public sites, two early markets, at least two waterfront locations used as informal dumps, properties with mixed residential-commercial functions and many residential sites (Fig. 4).

The faunal assemblage includes an estimated 2,174 vertebrate individuals (Fig. 5; Table 1). These are divided into domestic, wild and commensal categories. Taxa in the domestic and wild categories are interpreted as part of the lowcountry cuisine and those in the commensal category probably were not. Non-commensal wild animals contribute 116 of the 152 taxa present in the Charleston assemblage (Fig. 6; Table 2). The MNI estimate for non-commensal wild animals is equivalent to that of domestic animals (42% of the individuals) but the number of non-commensal wild taxa is much higher (76% compared to 7% of the taxa). About half of the non-commensal wild taxa and half of the wild individuals are fishes and the remaining wild animals are mammals (5% of the individuals and 7% of the taxa), birds (10% of the individuals

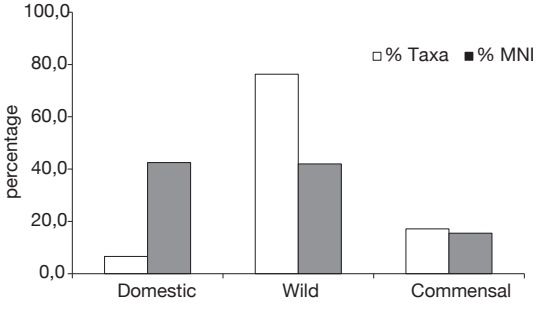

Fig. 6. – Percentage MNI of domestic, wild and commensal vertebrate taxa for the period AD 1692 to the early 1900s.

and 19% of the taxa), turtles and alligators (*Alligator mississippiensis*; 6% of the individuals and 10% of the taxa). All of these animals could have been part of the lowcountry cuisine.

The prominence of non-commensal wild animals in the city's cuisine characterises the earliest faunal collections and persists into the 1900s, with allow-

TABLE 2. – Number and percentage of taxa in each group of Charleston fauna.

	Taxa	%
Domestic mammals	5	3.3
Domestic birds	5	3.3
Wild mammals	10	6.6
Wild birds	29	19.1
Turtles and alligators	16	10.5
Fishes	61	40.1
Commensal taxa	26	17.1
Total taxa	152	

FIG. 7. – Percentages of non-commensal, wild MNI in each time period.

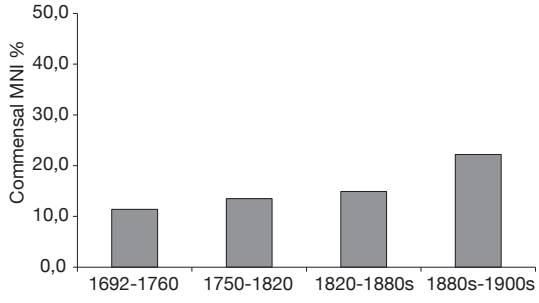

Fig. 8. – Percentages of commensal MNI in each time period.

ances for site-specific variations (Fig. 7). Many of the wild taxa considered food animals in this paper are traditional ingredients in lowcountry cuisine or otherwise do not appear to be unpalatable. A surprising number of these animals could have lived and died in the urban landscape, sharing the city with the people who built it, as well as gracing elegant dining tables. Given the large number of wild animals that are part of the lowcountry cuisine and live within the city today, it is difficult to be definitive about which individuals were consumed and which were not given that element representation, fragmentation and butchering marks offer inconclusive evidence or none at all.

Other than the fishes, many of the wild animals considered non-commensal here, even those that are traditional ingredients in the lowcountry cuisine, may have been purely commensal on a case-by-case basis, or been considered pests and vermin in specific instances. These include opossum (*Didelphis virginiana*), rabbit (*Sylvilagus* spp.), squirrel (*Sciurus* spp.), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), bear (*Ursus americanus*), raccoon, mink (*Mustela vision*) and white-tailed deer (*Odocoileus virginianus*). Wetlands within the city were likely habitat for these potential food animals, as well as for commensal animals. Many also lived in buildings and sheltered areas on urban lots and raided the gardens and stores of the work yard. Though their habitat is much reduced today, these animals remain players in the city's landscape.

Domestic animals, those used for food, security, labour and companionship, lived on urban lots. Plans of Charleston townhouse lots show a variety of back buildings, including pigeon houses, poultry houses and, most telling, cow houses (Zierden and Herman 1996). The work yards of townhouses in the 18th and 19th century were filled with domestic animals such as cows, pigs, goats (*Capra hircus*) and assorted fowl, maintained for dairy products and eggs but ultimately destined for the dinner table. This use of urban lots not only added to the sights and sounds of the city, but also offered food and shelter to urban wildlife.

The fact that Charleston was filled with livestock in the early years of colonisation and settlement is not unexpected (Hamby and Joseph 2004). That this habit persisted for centuries may be more surprising; but a work yard shared by resident slaves and livestock was common through the 19th century. An 1837 ordinance prohibited the keeping of hogs inside the city limits; cows could remain if they were in a "house floored or paved, and kept constantly

free from dirt" (McInnis 2005: 174). Keeping cattle in the city, particularly dairy cattle, continued into the 20th century (Banov 1970; Rosengarten *et al.* 1987). The maintenance of these animals, their feed, dung and bedding, other stored foods, and the resulting refuse attracted animals that were part of the lowcountry cuisine as well as those termed commensal in this paper. Whether cuisine or commensal, a great deal of effort was required to control these animals. Just as livestock were fenced out of fields in the countryside, a large part of urban garden and yard maintenance involved keeping rats out of the larder, cats out of the well, mules under control and pigs and chickens out of the garden.

The presence of commensal animals as a part of the urban landscape increased steadily over the years (Fig. 8). Initially, commensals were a relatively small component of urban faunal assemblages; but they became more common in subsequent decades. The remains of these animals are often numerous in samples from enclosed areas. In such contexts, commensal animals may comprise more than a third of the individuals (Reitz 1990; Zierden 1990; Zierden and Reitz 2002b, 2007). Most of the commensal individuals are Norway (*Rattus norvegicus*) and black (*R. rattus*) rats (Fig. 9). Rats are numerous in enclosed areas, such as stables, along wharves and in wells. They comprise 34% of the individuals in a collection from one such context (Reitz 1990; Ruff and Reitz 1992; Zierden 1990, 1993; Zierden and Reitz 2009). Although the Beef and Lower Markets were littered with tasty refuse, the market assemblages contain very few rats, 5% of the individuals. Perhaps the open-air nature of markets and high level of activity discouraged these scavengers, or efforts to control them in such public spaces were more active and more successful than elsewhere in the city.

In the early years, rats were a relatively small component of the urban landscape, but they became more common in subsequent decades (Fig. 10). By the end of the 19th century, they comprised 16% of the individuals, though only 3% of the taxa, suggesting a serious health problem existed in the now-crowded city. Although there is not a clear pattern in terms of status or site function, collections from tanneries, stables and dumps in each time period tend to have higher percentages of rodents than do collections from places where there was a great deal of human activity or where edibles were limited.

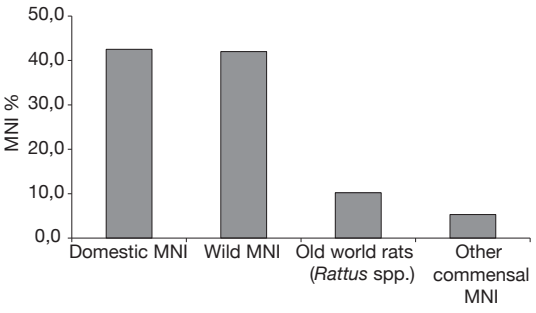

Fig. 9. – Percentages of domestic, non-commensal wild, Old World rats, and other commensal MNI for the period AD 1692 to the early 1900s.

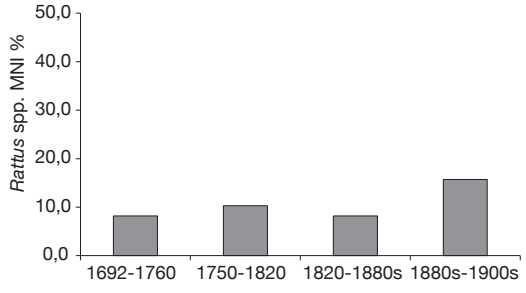

Fig. 10. – Percentages of Old World rat MNI in each time period.

Residential properties generally had the largest rat problem. The otherwise progressive Heyward-Washington household, for example, lived on a property that was full of rats, particularly inside its stable, where 22% of the individuals were rats in the period 1750-1820 (Zierden and Reitz 2007: Appendix I, Table 20). The increase in rats during the 19th century may be related to the amount of waste discarded on residential properties, the quantity of foods stored there and the quality of the storage facilities.

Among the resident animals considered both friend and foe were dogs. Dogs performed many

services and were part of the public milieu. They were subject to numerous regulations and eventually were licensed. Beginning in 1798, dogs had to be muzzled, collared and secured (Edwards 1802: 178-179, in Greene and Hutchins 2004: 64). Those being moved through town had to be leashed. African-Americans, both slave and free, could only keep a dog if the animal's collar bore the name of a "reputable white person" (Greene and Hutchins 2004:64). Butcher's dogs had to be secured to carts and were banned from the market. The City Marshall used his dogs "in catching or taking up hogs or goats about town" (Greene and Hutchins 2004: 64). Free-ranging dogs, however, continue to be a problem in Charleston, as well as in most American cities.

Horses and mules are classified as commensal animals in the three-part division used in this study. Though in most cases likely domestic, they do not appear to have been part of the lowcountry cuisine. Their remains are absent from the earliest urban faunal assemblages and there are few records of them in the archives. The low number of equid remains recovered from Charleston is one of the reasons they are considered commensal; they do not appear to be included in deposits that are likely to contain large amounts of food refuse. Equids undoubtedly made important contributions to the sights, sounds and smells of Charleston, but documenting this archaeologically will require excavating locations specifically related to their commercial stabling or to by-product rendering.

WILDLIFE IN URBAN CHARLESTON

The challenge of delineating the roles of most wild animals and some domestic animals in Charleston highlights an important aspect of urban wildlife: synanthropy, or human-mediated symbiosis (e.g. Johnston 2001: 49). A number of organisms have adapted in place to growing urban environments, have moved into urban settings attracted to the resources, protection from predators and physical environment found there, or were introduced by people for a variety of reasons (Luniak 2004; McKinney 2006). Charleston is an interesting case because many of the wild mammals identified in the archaeological record are indigenous animals that either stayed in place as Charleston grew or subsequently were attracted into the urban environment. Luniak (2004: 51) refers to urban development as offering a "free ecological niche" and argues that the main requirement for taking advantage of this ecological opportunity was ecological, demographic and behavioural plasticity. These attributes broadly characterise many of the animals classified here as wild members of the lowcountry cuisine, as well as many of those termed commensal.

The Charleston case demonstrates that the impact of urbanisation on biological richness is not a phenomenon of the last 100-200 years. This has policy implications for the management of many urban species that cannot be resolved at this time. Testing the extent and implications of this phenomenon requires analysis of all of the organisms recovered from the earliest urban centres as well as organisms associated with urban centres that grew to prominence over the past 500 years and their rural counterparts.

CONCLUSION

With few exceptions, animals that occupied the urban landscape, especially wild ones, are generally overlooked. However, lowcountry residents of all backgrounds took advantage of the bounty of the woods and waters of the Atlantic coastal plain, developing a unique lowcountry cuisine. Some of these animals also were incorporated into the city as Charleston expanded into the harbour and wetlands or came to live in the city. The crowded and messy conditions of the urban work yard were exacerbated by the presence of these animals and their remains. Archaeological research demonstrates the noisy and smelly characteristics of the city. The work yard was crowded with debris, livestock, pets, wildlife and people. While it may have been visually separated from the formal part of elite houses and gardens, the odours and sounds of livestock, their slaughter and the discard of rubbish must have been a common and obvious part of the urban scene. Livestock and work animals also filled public spaces, from streets

to vacant lots. Vermin made the dark corners and unimproved areas their home and raided food supplies and refuse with equal vigour. The impact of these resident animals on the urban environment was considerable. Moreover, it was long lasting. Livestock, work animals, pets, assorted fowl and numerous pests continue to be an integral part of Charleston's urban landscape.

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