



Mammalian Diversity in Nineteen Southeast Coast Network Parks

Natural Resource Report NPS/SECN/NRR—2010/263



ON THE COVER

Northern raccoon (*Procyon lotor*)

Photograph by: James F. Parnell

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William. David Webster

Department of Biology and Marine Biology
University of North Carolina – Wilmington
Wilmington, NC 28403

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Executive Summary

The goal of this inventory was to document the presence of 90% of the assumed number of terrestrial mammal species at 19 parks in the Southeast Coast Network (SCN), including Cape Hatteras National Seashore (CAHA), Wright Brothers National Memorial (WRBR), Fort Raleigh National Historic Site (FORA), Cape Lookout National Seashore (CALO), Moores Creek National Battlefield (MOCR), Fort Sumter National Monument (FOSU), Fort Moultrie National Monument (FOMO), Charles Pinckney National Historic Site (CHPI), Congaree National Park (CONG), Horseshoe Bend National Military Park (HOBE), Chattahoochee River National Recreation Area (CHAT), Kennesaw Mountain National Military Park (KEMO), Ocmulgee National Monument (OCMU), Fort Frederica National Monument (FOFR), Cumberland Island National Seashore (CUIS), Timucuan Ecological and Historical Preserve (TIMU), Fort Caroline National Memorial (FOCA), Castillo de San Marcos (CASA), and Fort Matanzas National Monument (FOMA).

Forty North American museums contain approximately 4,500 specimens from these parks and surrounding areas (most notably FOMA, CUIS, and CAHA), and 87 days was spent confirming the identities of and recording information associated with these specimens. Another 425 days were spent in the field inventorying the mammal species that currently inhabit these parks, and 48 days was spent in the laboratory preparing specimens and dealing with curatorial issues. Specimen lists were compiled for each park, noting the park status, abundance, nativity status, and source of documentation for each species. Forty-eight species of terrestrial mammals were documented as currently Present or Probably Present in the 19 parks, as were another nine species of bats in the North Carolina parks. Eight (16.7%) of the terrestrial species are exotic (black rat, Norway rat, house mouse, nutria, domestic dog, feral cat, horse, and feral pig), and another five species that have been introduced widely into the Southeastern United States (African wild ass, goat, European mouflon sheep, domestic cattle, and European fallow deer) have since been removed from park properties.

The most frequently encountered mammal species (followed by the number of occupied parks in parentheses) were the northern raccoon (19), feral cat (18), eastern gray squirrel (17), house mouse (17), Virginia opossum (16), eastern mole (16), marsh rice rat (16), domestic dog (16), northern river otter (16), eastern cottontail (15), hispid cotton rat (15), American mink (15), and white-tailed deer (14). The silver-haired bat, eastern red bat, and evening bat are Present or Probably Present in all five North Carolina parks. Large inland parks (CONG, HOBE, CHAT, and OCMU) had the greatest number of terrestrial mammal species, whereas small coastal parks (FOSU and CASA) had the least. Over the last century, the nine-banded armadillo, coyote, and red fox have become established in the SECN region, while the southeastern pocket gopher has been extirpated from CUIS. The red wolf, American black bear, and mountain lion have been extirpated on a landscape scale, although bear populations have since recovered in some areas within the SCN region. The Anastasia Island beach mouse, considered to be Endangered by the U.S. Fish & Wildlife Service, is the most critically imperiled mammal species existing in the Southeast Coast Network; it only occurs at FOMA. The U.S. Fish and Wildlife Service considers two bats at MOCR, the southeastern myotis and Rafinesque's big-eared bat, and one rodent at CAHA, the Buxton Woods white-footed mouse, to be Species of Concern. The negative effects of feral cats and feral pigs on native landscapes are profound; cat and pig eradication programs should be a high management priority.

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Introduction

The purpose of this investigation was to document the mammalian faunas of 19 national parks in the Southeast Coast Network, including Cape Hatteras National Seashore (CAHA), Wright Brothers National Memorial (WRBR), Fort Raleigh National Historic Site (FORA), Cape Lookout National Seashore (CALO), Moores Creek National Battlefield (MOCR), Fort Sumter National Monument (FOSU), Fort Moultrie National Monument (FOMO), Charles Pinckney National Historic Site (CHPI), Congaree National Park (CONG), Horseshoe Bend National Military Park (HOBE), Chattahoochee River National Recreation Area (CHAT), Kennesaw Mountain National Military Park (KEMO), Ocmulgee National Monument (OCMU), Fort Frederica National Monument (FOFR), Cumberland Island National Seashore (CUIS), Timucuan Ecological and Historical Preserve (TIMU), Fort Caroline National Memorial (FOCA), Castillo de San Marcos National Monument (CASA), and Fort Matanzas National Monument (FOMA). This order has been maintained in subsequent sections of this manuscript. As a cohesive unit, these parks have never been the focus of a comprehensive mammal investigation. On the other hand, there are two books (Van Gelder 1982; Burde and Feldhamer 2005) that have focused on the mammals of national parks at large, but both concentrated on western parks with large, highly visible mammals (e.g., bison and elk), save for a partial listing of mammals from CONG in the latter.

The project had two major objectives. First, I conducted an exhaustive examination of specimens in major North American museums, inspecting mammal specimens from within or adjacent to park boundaries. For some parks (e.g. CAHA, CUIS, and FOMA), thorough mammal inventories had been conducted in the past, mitigating the need to collect additional voucher material. However, some inventories were conducted several decades ago, and since those times some species of mammals either have become extirpated or have colonized the parks – in other words, the mammalian faunas of the parks is in a constant state of flux. The second part of this investigation was to conduct extensive field reconnaissance in each park to ascertain these changes or, in some instances, to provide the first comprehensive inventory documenting the mammalian faunas in those parks. In general, the amount of time spent in each park during this investigation was inversely related to the amount of work previously conducted in each park, i.e. less time was spent in parks with relatively well known mammal faunas and more time was spent in parks that had never been inventoried. In addition, units and habitats within a park were inventoried separately, so more time was spent in parks containing several units and habitats (e.g. CHAT and TIMU, respectively).

Perhaps the most significant, and one of the earliest, inventories of the parks was conducted by Outram Bangs (1898). This monumental publication included comprehensive checklists of mammals from several localities in eastern Georgia and Florida, including sites that eventually became CUIS, TIMU, and FOMA. When Bangs conducted his inventory, the nine-banded armadillo and coyote had not yet reached eastern North America and nutria had not yet been introduced from South America. In addition, due to overtrapping, overhunting, and persecution, the geographic distributions of the American beaver, red wolf, American black bear, mountain lion, and white-tailed deer were beginning to shrink. Since that time, literally hundreds of publications have referred to mammals collected in the southeastern United States by Bangs and subsequent mammalogists. Many of these are referenced in the Accounts of Species section of this tome; however, there are several that deserve mention here. Parnell et al. (1992) provided a

comprehensive checklist of mammals known from CAHA, and to a lesser extent WRBR and FORA. Sanders (1978) generated a checklist of mammals from coastal South Carolina, including many records from the Charleston area where FOSU, FOMO, and CHPI occur (although, to avoid confusion, these parks have very low mammal diversity). Elliot (1901) reported on series of mammals taken from several of the same Florida localities that were sampled by Bangs, essentially to contradict many of Bangs' taxonomic conclusions (Bangs has since been shown to have been accurate in most of his interpretations). Finally, books on the mammals of Alabama (Howell 1921), Georgia (Golley 1962), North Carolina (Lee et al. 1983), and South Carolina (Golley 1966) include county records for many mammals included in this investigation, and books with regional scopes (Webster et al. 1985; Choate et al. 1994; Brown 1997; Whitaker and Hamilton 1998; Trani et al. 2007) provide a courser-grained perspective of the natural histories of these species of mammals.

Taken from another perspective, many parks have attracted the attention of mammalogists because of the uniqueness of the park's mammalian fauna. For example, Cumberland Island (CUIS), Georgia, and Anastasia Island (FOMA), Florida, have been focal points for mammalogists for over a century, and series of publications have arisen over some of their mammals. On Cumberland Island, there once existed a pocket gopher whose taxonomic status has been debated (Bangs 1898; Pembleton and Williams 1978; Williams and Genoways 1980; Laerm 1981); this is an important conservation issue because if unique, this insular gopher should now be considered extinct, but if not, then it could be reintroduced using individuals from the adjacent mainland. On Anastasia Island, the cotton mouse was thought to be extirpated (Pournelle and Barrington 1953; Humphrey et al. 1988; Boone et al. 1993) but it recently has been rediscovered (voucher material examined during this investigation). In addition, the taxonomic status of cotton mice on Cumberland Island and Anastasia Island has been revised (Boone et al. 1993). Moreover, the remaining populations of the federally endangered Anastasia Island beach mouse likely exist only on Anastasia Island. Additional notes on management concerns, particularly for introduced species, and the state and federal listings of the species are provided in the Accounts of Species.

This manuscript is organized following standard scientific protocol (Introduction, Study Area, Methods, Results, Discussion, Conclusions, Literature Cited, and Appendices), with one exception. The Results and much of the Discussion sections are combined because, due to the length of the manuscript, it is easier to discuss the results of each park before moving on to the next park. In addition, the combined Results and Discussion section are renamed, including sections entitled Park Accounts and Accounts of Species, which include individual accounts for each park and each species of mammal, respectively. This organization allows the reader to quickly flip to a park account, using the Table of Contents, and not get bogged down in the minutiae associated with each species of mammal, although that information is available in the species accounts. This format also allows the reader to access quickly information the distribution, natural history, and documentation for individual species within the entire Southeast Coast Network. In other words, the two sections are cross-referenced. A synoptic Discussion follows; it focuses on landscape issues, using park data when appropriate. The Appendices include detailed information garnered from museum records and the results of the field investigations for each park.

Study Area

This investigation identifies the mammalian fauna of 19 national parks in the Southeast Coast Network (Figure 1). These parks range in size from 18 (CASA) to almost 50,000 (TIMU) acres and in the number of units within each park from one (most parks) to 16 (CHAT). Parks in the Southeast Coast Network are found in the Carolinian Province, which roughly coincides with the bottomland hardwood forest ecosystem. The geographic distributions of many Gulf Coast species terminate in coastal North Carolina, whereas those of many mid-Atlantic species terminate in central Florida. Thus, despite the tremendous differences in size and number of units, which are both good indicators of habitat and therefore mammalian diversity, many species of mammals, especially larger species that perforce occupy larger territories, have geographic distributions that extend throughout the entire area encompassed by the Southeast Coast Network. Detailed descriptions of habitat diversity and the study areas in each park are provided in the individual Park Accounts.

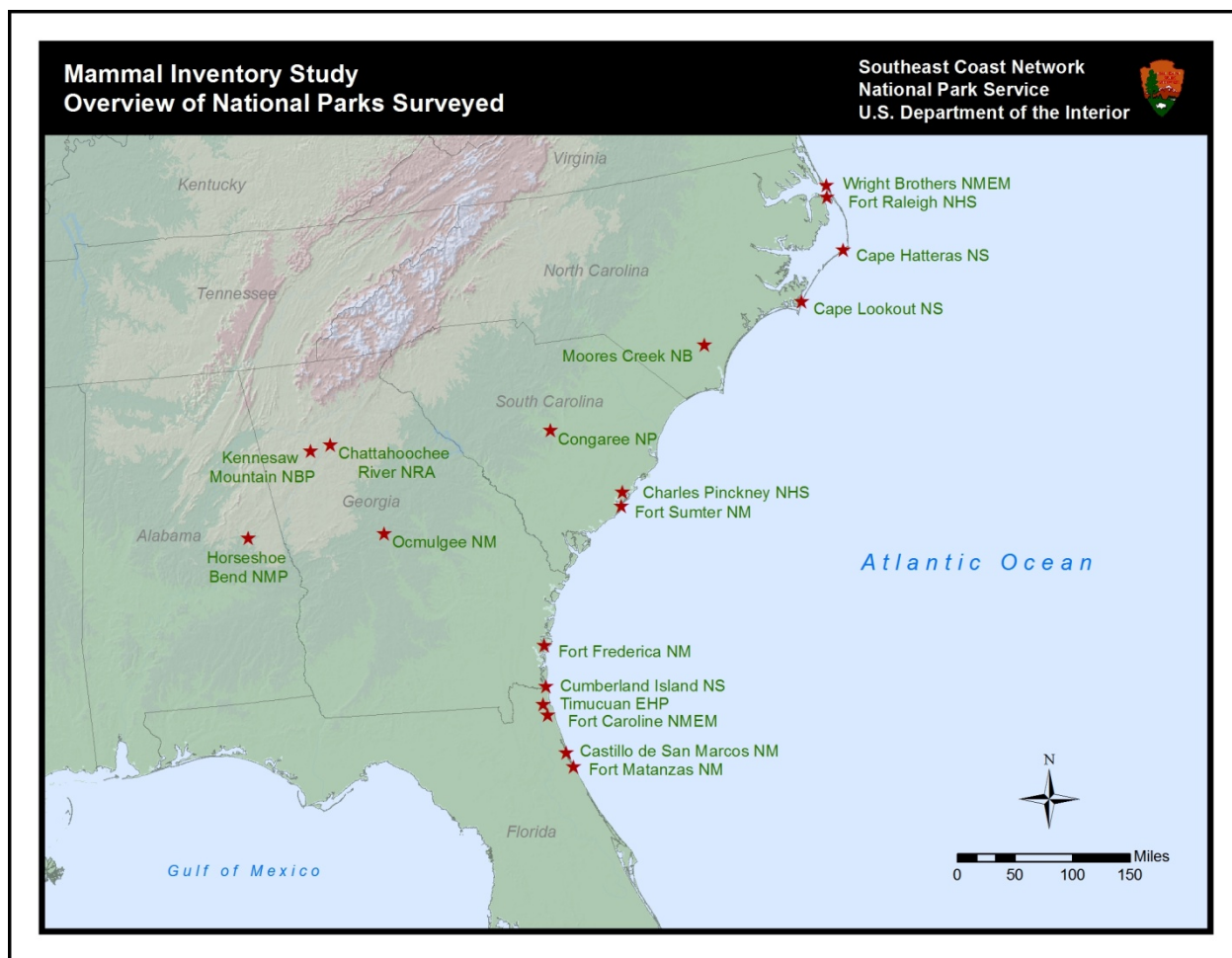


Figure 1. Southeast Coast Network parks included in this study.

Methods

This investigation involved two major objectives. First, I compiled a list of approximately 4,500 mammal specimens deposited in 40 North American museums and natural history collections (Table 1) and personally examined as many as possible given the time and financial constraints of the project – a total of 87 days was spent in museums during the course of this investigation. Identifications were verified for those specimens personally examined by me, and the following information (if available) was recorded for all museum specimens: museum and museum number, location of capture, date of capture, sex and reproductive information, and the collector and collector's specimen number. These efforts resulted in a preliminary estimate of the number of mammals in each of the SECN parks (Table 2). The second objective was to visit each park, determine with the assistance of park personnel survey sites for intensive pitfall and Sherman live trapping based on the number of habitats available and the species targeted for collection, establish trapping grids, and prepare and install voucher material into the Natural History Museum at the University of North Carolina Wilmington. Pitfall traps consisted of unbaited #10 food cans buried such that their lips were flush at ground level. Sherman live traps were 7.6 cm X 7.6 cm X 23 cm (3" X 3" X 9") aluminum traps baited with rolled oats. One grid of pitfall traps and one grid of Sherman live traps typically were installed in each habitat. Each grid consisted of five rows of traps, each row containing five traps, spaced at 10-m (33-ft) intervals, thereby trapping an area of 0.5 acres (0.25 hectares). For parks in North Carolina, bat surveys were conducted using mist nets and Sonobat, an acoustical technique that allows echolocation calls to be recorded and compared to a library of known bat calls for easy identification. A total of 425 days was spent in the field and another 48 days was spent in the laboratory preparing specimens and dealing with curatorial issues.

The status of each mammal in each park adhered to a protocol established by the Southeast Coast Network, as follows: Present – a species that has been documented within park boundaries and is assumed to be extant; Probably Present – a species that likely occurs within park boundaries because it occurs in the adjacent region and suitable habitat exists in that park; Historic – a species that historically occurred within park boundaries but is now extirpated; Unconfirmed – a species that has been assumed to occur within park boundaries based on scanty or no evidence; False Report – a species that has been assumed to occur within park boundaries but subsequently the documentation was proven false or the taxonomy was no longer accepted. Likewise, the Southeast Coast Network established the following abundance categories: Abundant – a species that occurs in relatively large numbers and may be seen daily; Common – a species that may be seen daily but not in large numbers; Uncommon – a species that may be seen monthly but occurs sporadically; Rare – a species that may be seen only a few times each year and is restricted to small areas of rare habitat; Occasional – a species that may be seen every few years; Unknown – a species whose abundance is not known. The following residency categories were used: Breeder – a species that reproduces in a park; Resident – a species that occurs in a park at least two months each year but does not reproduce there; Migratory – a species that occurs in a park less than two months each year; Vagrant – a species that typically resides outside the park; Unknown – a species whose residency status is not known. Finally, the following nativity categories were used: Native – a species that is indigenous to the region; Non-native – a species that is not indigenous to the region; Unknown – a species whose nativity status is not known.

Specific details concerning the methodology used in each park is found in the individual Park Accounts. A complete set of field notes pertaining to this project has been provided to the National Park Service.

Table 1. Museums containing mammal specimens referenced during this investigation, museum acronyms, and the number of days spent in each museum.

Museum	Acronym	Days in Collection
American Museum of Natural History, New York, NY	AMNH	3
Academy of Natural Sciences, Philadelphia, PA	ANSP	-
Appalachian State University, Boone, NC	ASU	3
California Academy of Sciences, San Francisco, CA	CAS	-
Carnegie Museum of Natural History, Pittsburgh, PA	CM	-
Cape Lookout National Seashore Collections	CALO	1
Charleston Museum, Charleston, SC	ChM	2
Cumberland Island Museum, Saint Marks, GA	CIS	-
Cornell University Museum of Vertebrates, Ithaca, NY	CUMV	-
Delaware Museum of Natural History, Wilmington, DE	DMNH	-
Field Museum (of Natural History), Chicago, IL	FMNH	-
Florida Museum of Natural History, University of Florida, Gainesville, FL	UF	4
Georgia Museum of Natural History, University of Georgia, Athens, GA	GMNH	6
Indiana State University, Terre Haute, IN	ISU	-
Louisiana Museum of Natural History, Louisiana State University, Baton Rouge, LA	LSU	-
Museum of Comparative Zoology, Harvard University, Cambridge, MA	MCZ	7
Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM	MSB	-
Museum of Texas Tech University, Lubbock, TX	TTU	-
Museum of Vertebrate Zoology, University of California Berkeley, Berkeley, CA	MVZ	7
Natural History Collections, University of Massachusetts, Amherst, MA	UMA	1
Natural History Museum, University of North Carolina Wilmington, NC	UNCW	10
Natural History Museum and Biodiversity Research Center, University of Kansas, Lawrence, KS	KU	5
Natural History Museum of Los Angeles County, CA	LACM	-
New York Science Museum, Albany, NY	NYSM	-
North Carolina Museum of Natural Sciences, Raleigh, NC	NCSM	8
North Carolina State University, Raleigh, NC	NCSU	4
Peabody Museum of Natural History, Yale University, New Haven, CT	YPM	2
Royal Ontario Museum, Toronto, ONT	ROM	1
Sam Noble Oklahoma Museum of Natural History, Norman, OK	OMNH	-
San Diego Natural History Museum, San Diego, CA	SDNHM	-
Santa Barbara Museum of Natural History	SBMNH	-
Slater Museum of Natural History, University of Puget Sound, Tacoma, WA	PSM	-
Sternberg Museum of Natural History, Fort Hays State University, Hays, KS	MHP	-
Texas Cooperative Wildlife Collection, Texas A&M University, College Station, TX	TCWC	-
The Museum, Michigan State University, East Lansing, MI	MSU	-
University of Illinois Museum of Natural History, Urbana-Champaign, IL	UIMNH	-
University of Michigan Museum of Zoology, Ann Arbor, MI	UMMZ	2
U.S. National Museum of Natural History, Washington, DC	USNM	16
Vertebrate Collections, Northeastern University, Boston, MA	NUVC	2
Virginia Commonwealth University, Richmond, VA	VCU	-

Table 2. Number of species previously reported from 19 national parks in the Southeast Coast Network.

Park	Species Known Present	Species Assumed Present	% known NPSpecies	Estimated species richness	Standard error	% known species richness
CAHA	29	54	54	58	6.3	50
FORA	0	15	0			
WRBR	0		0			
CALO	25	40	63	89	17.9	28
MOCR	0	14	0			
FOSU	0	4	0			
FOMO	0		0			
CHPI	0	47	0	78	9.9	0
COSW	8	46	19	81	11.8	10
HOBE	0	47	0	78	9.9	0
CHAT	0	44	0	101	12.2	0
KEMO	0		0			
OCMU	0	63	0	56	3.7	0
FOFR	2	7	29			
CUIS	34	57	60	77	8.3	44
TIMU	10	32	31	31	4.8	32
FOCA	0	18	0	33	5.6	0
CASA	0		0			
FOMA	5	40	13	126	25	4

Park Accounts

The following individual park accounts include a brief description of each park (at the time of the study), an overview of previous work done in each park, a description of the voucher material existing in major North American museums, an explanation of the fieldwork completed in each park, a description of the species encountered in or adjacent to each park, comments about the listing status, nativity, and management implications of each mammal inhabiting the park, and a table summarizing the status of each species of mammal in the park. Detailed information about the voucher material is provided in Appendix 1 and NPSpecies.

Cape Hatteras National Seashore (CAHA)

The third largest park in the Southeast Network, Cape Hatteras National Seashore consists of approximately 35,000 acres and 120 km (74 mi) of barrier island habitat in Dare and Hyde counties, North Carolina. The Park extends from Whalebone Junction (the intersection of Hwy 64/264 and Hwy 12/158) southward to Ocracoke Inlet. CAHA consists of four “islands” (from north to south: Bodie, Pea Island, Hatteras, and Ocracoke) that have been named because at various times in the recent past they have been separated from each other by inlets. Today, Bodie Island is connected to the northern Outer Banks; it is separated from Pea Island by Hatteras Inlet. Pea Island is connected to Hatteras Island; Bodie Island, Pea Island, and Hatteras Island are part of Dare County. Hatteras Island is separated from Ocracoke Island by Hatteras Inlet. Ocracoke Inlet separates Ocracoke Island, which is part of Hyde County, from barrier islands to the south that comprise Cape Lookout National Seashore, which are part of Carteret County. Hwy 12 runs the length of CAHA, crossing Oregon Inlet by bridge and crossing Hatteras Inlet by ferry.

The northernmost part of CAHA (Bodie Island) consists primarily of sound-side habitat; the village of South Nags Head exists on the beachfront. At a point approximately half-way between Whalebone Junction and Oregon Inlet, the village property ends and CAHA expands to include both the sound-side and beachfront habitats. South of Oregon Inlet, Pea Island National Wildlife Refuge extends across the barrier island from ocean to sound; it is administered by the U.S. Fish and Wildlife Service, although it is within the boundaries of CAHA. Continuing southward, the largely undeveloped CAHA extends across the barrier islands from ocean to sound along most of Hatteras and Ocracoke islands, although several small villages are located on both islands (from north to south: Rodanthe, Salvo, Avon, Buxton, Frisco, Hatteras, and Ocracoke). The Park also includes three visitor centers, three lighthouses, four campgrounds, and numerous maintenance and residential buildings.

The Park contains extensive segments of the habitats that are typical of barrier islands – intertidal beaches, dunes, swales, overwash terraces, maritime shrub thickets, maritime forests, intermittent to permanent ponds, high marshes, and low marshes. The number of habitats is related to the distance from the ocean to the sound and the elevational grade along this transect. Narrow flat island stretches have fewer habitats, they are much more susceptible to damage from storms, and they can quickly change over time. Conversely, wide island stretches with ancient dunes are less susceptible to damage from storms and they are much more stable over time. An excellent example of the former is found immediately north of Rodanthe, where the “S-curve” on Hwy 12 is frequently covered by sand or washed out during hurricanes and nor’easters. An excellent example of the latter is Buxton Woods, one of the largest and most stable maritime forests on the

East Coast. In addition, habitat management at CAHA has not been applied evenly throughout the entire Park, and as a result there has been a steady change in the vegetation over time (Parnell et al. 1992). In general, sites that were dominated by herbaceous vegetation two to three decades ago are now dominated by maritime shrub thickets, and forests that were once dominated by loblolly pines are now dominated by hardwoods. However, there are miles of mosquito ditches in CAHA marshes and fire has been used to maintain vegetation in an earlier stage of ecological succession. Boone (1988) provided results of the effects of fire on small mammals in four of the Parks major habitats (dune-grassland, maritime shrub thickets, high marsh, and low marsh). Similarly, management of vehicular traffic on the south end of Ocracoke Island has resulted in the replacement of open sand by a luxurious marsh.

CAHA has been the focus of extensive scientific explorations over the last 50 years or so, and the mammalian fauna of CAHA is relatively well known. Engels (1942) reported on the vertebrate fauna of Ocracoke Island, including the following mammals – eastern cottontail, marsh rabbit, black rat, house mouse, American mink, northern river otter, and feral horse. Lee et al. (1983) reported, among other species, the southeastern shrew, silver-haired bat, eastern red bat, and eastern cottontail from Pea Island; American mink from Buxton; cotton mouse and hispid cotton rat from Buxton (following Brimley 1944-46); and eastern cottontail, marsh rabbit, and eastern harvest mouse from Ocracoke Island. The most comprehensive report of mammals in the region was compiled by Parnell et al. (1992), who provided results of their fieldwork along the entire Outer Banks and other anecdotal records in their update of Quay's (1959) *The birds, mammals, reptiles, and amphibians of Cape Hatteras National Seashore Recreation Area*. Parnell et al. (1992) commented on 31 species of mammals (Virginia opossum, southeastern least shrew, southern short-tailed shrew, eastern mole, silver-haired bat, eastern red bat, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, white-footed mouse, cotton mouse, hispid cotton rat, meadow vole, common muskrat, black rat, Norway rat, house mouse, nutria, common gray fox, northern raccoon, American mink, northern river otter, feral cat, feral horse, feral pig, goat, European mouflon sheep, domestic cattle, and white-tailed deer) along the stretch of Outer Banks extending from Corolla (Currituck County) southward to Ocracoke Island; they also noted that the feral pig, goat, European mouflon sheep, and domestic cattle had been removed from this region. A list of 24 potential terrestrial species, along with two species of bats and two species of marine mammals, was provided by staff at the University of California-Davis to NPS personnel in 1992. According to NPS data, 29 species of terrestrial and marine mammals have been documented on Park property based on tangible evidence, and 54 NPSpecies are listed as possibly occurring in the park (Table 2). None of these sources mentioned the American black bear as a member of the CAHA mammalian fauna, but there is one report of an individual that swam across to Ocracoke Island; this record is not discussed beyond since the American black bear is not a permanent resident of the Outer Banks.

Fieldwork on the Outer Banks by the author and a team of biologists from the University of North Carolina Wilmington began in 1986. Fieldwork associated with Southeast Network inventory began on 11 January 2005 and ended on 13 July 2005, encompassing a total of 24 man-days in the field (Figure 2). In addition, four man-nights were used to survey bats. Additional time was spent canvassing museum collections for specimens from Dare and Hyde counties, North Carolina, and counties that are adjacent to Dare and Hyde counties. Nineteen museums have specimens from Dare and Hyde counties, North Carolina – the American Museum of Natural History has five Virginia opossums, one least shrew, one eastern cottontail,

and two marsh rice rats; Appalachian State University has one eastern red bat; the Carnegie Museum of Natural History has one eastern red bat; Cornell University has three marsh rice rats and one common muskrat; the Florida Museum of Natural History has one nutria; the Georgia Museum of Natural History has four white-footed mice; the James R. Slater Museum has three red wolves; the Museum of Comparative Zoology has two marsh rice rats, four common muskrats, six American mink, and three white-tailed deer; the Museum of Southwestern Biology has a marsh rabbit, three marsh rice rats, and one house mouse; the North Carolina Museum of Natural Sciences has specimens of the southern short-tailed shrew, big brown bat, eastern red bat, evening bat, eastern cottontail, marsh rabbit, white-footed mouse, common muskrat, coyote, and northern river otter; North Carolina State University has specimens of the eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, meadow vole, Norway rat, house mouse, nutria, American black bear, northern raccoon, and white-tailed deer; the Philadelphia Academy of Natural Sciences, has two silver-haired bats; the U.S. National Museum of Natural History has specimens of the least shrew, eastern mole, evening bat, eastern gray squirrel, eastern harvest mouse, white-footed mouse, hispid cotton rat, house mouse, nutria, American black bear, and white-tailed deer; the University of Kansas has five white-footed mice; the University of Massachusetts has four marsh rice rats, three white-footed mice, two black rats, one nutria, and two northern raccoons; the University of Michigan Museum of Zoology has specimens of the least shrew, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, and white-footed mouse; the University of North Carolina Wilmington has specimens of the Virginia opossum, southeastern shrew, least shrew, southern short-tailed shrew, eastern mole, eastern red bat, eastern cottontail, eastern gray squirrel, marsh rice rat, white-footed mouse, meadow vole, common muskrat, house mouse, nutria, common gray fox, northern raccoon, American mink, northern river otter, and white-tailed deer; Virginia Commonwealth University has one marsh rice rat, one Norway rat, and 18 house mice; and the Yale University Peabody Museum has two eastern cottontails and one northern raccoon.

Five major terrestrial habitats were identified – dunes and overwash terraces, maritime shrub thickets and forests, swales and ponds, estuarine marshes, and out-buildings and piles of debris. Given the tremendous number of specimens that are deposited in North American museums, no trapping was conducted; however, an extensive amount of ground truthing was used in each habitat to discover spoor at designated sites throughout the entire Park to ascertain changes in the mammalian fauna since the time of the Quay (1959) and Parnell et al. (1992) treatises. Since Quay and I were co-authors on the Parnell et al. (1992) study, I was able to visit the same study sites used in the mid-1950s and early 1990s, thereby extending the timeline of change in the mammalian fauna at CAHA to about 50 years. Surveys for bats were conducted using SONOBAT in Buxton Woods where Lighthouse Road is flanked on either side by permanent ponds (about 500 m south of Hwy 12).

Twenty-six species of terrestrial mammals (Virginia opossum, least shrew, southern short-tailed shrew, eastern mole, silver-haired bat, eastern red bat, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, white-footed mouse, meadow vole, common muskrat, black rat, Norway rat, house mouse, nutria, domestic dog, red fox, common gray fox, northern raccoon, American mink, northern river otter, feral cat, feral horse, and white-tailed deer) were documented on the Park property during the course of this project (Table 3). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. In addition, the evening bat is widely distributed in the southeastern United States,

and it probably occurs at CAHA. The red fox is new to the mammalian fauna of CAHA since Parnell et al. (1992), moving down the Outer Banks from southeastern Virginia to Hatteras Inlet; it has become a major predator of sea turtle eggs and hatchlings and is in need of management. The coyote encroaches on the region but has not yet been reported in the Park. The mountain lion no longer inhabits the region, although reports of mountain lions continue to persist, and four species of domestic livestock (feral pig, European mouflon sheep, goat, and domestic cattle) have been removed from the Park.

Specific comments on six other species are warranted. Reports of the southeastern shrew from Hatteras Island (Engels 1941; Lee et al. 1983) are based solely on skeletal material removed from owl pellets. Since there are no other records indicating the presence of southeastern shrews on Roanoke Island or the Outer Banks, the owl pellet records are considered to be extralimital. Single specimens of the southern short-tailed shrew from near the Cape Hatteras lighthouse (Quarles 1974) and the eastern harvest mouse from the south end of Ocracoke Island (Lee et al. 1983) likely represent two other common Park species, the least shrew and house mouse, respectively; the southern short-tailed shrew is otherwise not known from Hatteras Island and the eastern harvest mouse is otherwise not known from Bodie, Hatteras, or Ocracoke islands. Reports of the cotton mouse from Buxton Woods and Frisco Woods are based on specimens that represent the white-footed mouse (Shipp-Pennock et al. 2005). Finally, E. L. Green, Jr., collected four hispid cotton rats from “sandy shrub areas” at Cape Hatteras in 1936, and there is no reason to question his identification. It is likely that hispid cotton rats moved down the Outer Banks from southeastern Virginia in stepwise fashion as inlets migrated southward (Stick 1958; Mallison et al. 2008), eventually reaching Cape Hatteras; apparently this population was unable to survive on Hatteras Island, and the nearest hispid cotton rat record is from Nags Head Woods (Lee et al. 1983). Therefore, 26 species of terrestrial mammals were documented as occurring or probably occurring on Park property, none of which are considered to be imperiled by the U.S. Fish and Wildlife Service and the State of North Carolina (LeGrand et al. 2006). However, the Buxton Woods white-footed mouse (*Peromyscus leucopus buxtoni*), recently described by Shipp-Pennock et al. (2005), is restricted to the southern third of Hatteras Island; various aspects of its natural history should be elucidated.

On a landscape scale, the 26 species of terrestrial mammals considered to be or expected to be Present at CAHA have widespread geographic distributions in the southeastern United States (Hall 1981; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy many of the five habitats identified in this report. Species typically associated with dunes and overwash fans at CAHA include the Virginia opossum, eastern cottontail, white-footed mouse, house mouse, nutria, domestic dog, red fox, common gray fox, northern raccoon, feral cat, and white-tailed deer. Species associated primarily with maritime shrub thickets and forests at CAHA include the Virginia opossum, southern short-tailed shrew, eastern mole, eastern gray squirrel, white-footed mouse, red fox, common gray fox, northern raccoon, feral cat, and white-tailed deer. Species typically associated with swales and ponds at CAHA include the Virginia opossum, least shrew, southern short-tailed shrew, eastern mole, silver-haired bat, eastern red bat, evening bat, eastern cottontail, marsh rabbit, marsh rice rat, white-footed mouse, meadow vole, common muskrat, nutria, northern raccoon, American mink, northern river otter, and white-tailed deer. Species associated primarily with estuarine marshes at CAHA include the marsh rabbit, marsh rice rat, meadow vole, common muskrat, nutria, northern raccoon, American mink, and northern river

otter. Species associated primarily with out-buildings and piles of debris at CAHA include the Virginia opossum, white-footed mouse, black rat, Norway rat, house mouse, domestic dog, and feral cat. Finally, the feral horses at CAHA are now confined to a livestock pen on Ocracoke Island and no longer roam the islands, and the introduction of eastern gray squirrels in the village of Ocracoke was unsuccessful.

Table 3. Status of 34 mammals at Cape Hatteras National Seashore. [1 – Bodie Island; 2 – Hatteras Island; 3 – Ocracoke Island]

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X	X		Evidence in CAHA ¹²
Least shrew	Present	X	X	X		Evidence in CAHA ¹²
Southern short-tailed shrew	Present	X	X	X		Evidence in CAHA ¹
Eastern mole	Present	X	X	X		Evidence in CAHA ¹²
Silver-haired bat	Present	X	X	X		Evidence in CAHA ²³
Eastern red bat	Present	X	X	X		Evidence in CAHA ¹²
Eastern cottontail	Present	X	X	X		Evidence in CAHA ¹²³
Marsh rabbit	Present	X	X	X		Evidence in CAHA ¹²³
Eastern gray squirrel	Present	X	X	X		Evidence in CAHA ²
Marsh rice rat	Present	X	X	X		Evidence in CAHA ¹²³
White-footed mouse	Present	X	X	X		Evidence in CAHA ¹²
Meadow vole	Present	X	X	X		Evidence in CAHA ¹²
Common muskrat	Present	X	X	X		Evidence in CAHA ¹²³
Black rat	Present	X	X	X		Evidence in CAHA ³
Norway rat	Present	X	X	X		Evidence in CAHA ¹²
House mouse	Present	X	X	X		Evidence in CAHA ¹²
Nutria	Present	X	X	X		Evidence in CAHA ¹²³
Domestic dog	Present	X			X	Evidence in CAHA ¹²³
Red fox	Present	X			X	Evidence in CAHA ¹²
Common gray fox	Present	X	X	X		Evidence in CAHA ¹²
Northern raccoon	Present	X	X	X		Evidence in CAHA ¹²³
American mink	Present	X	X	X		Evidence in CAHA ¹²³
Northern river otter	Present	X	X	X		Evidence in CAHA ¹²³
Feral cat	Present	X		X		Evidence in CAHA ¹²³
Feral horse	Present	X		X		Evidence at CAHA ³
White-tailed deer	Present	X	X	X		Evidence in CAHA ¹²
Evening bat	Probably Present					Evidence in region
Coyote	Encroaching					Evidence in region
Hispid cotton rat	Absent					Extirpated
Mountain lion	Absent					Extirpated
Feral pig	Absent					Extirpated
European mouflon sheep	Absent					Extirpated
Goat	Absent					Extirpated
Domestic cattle	Absent					Extirpated

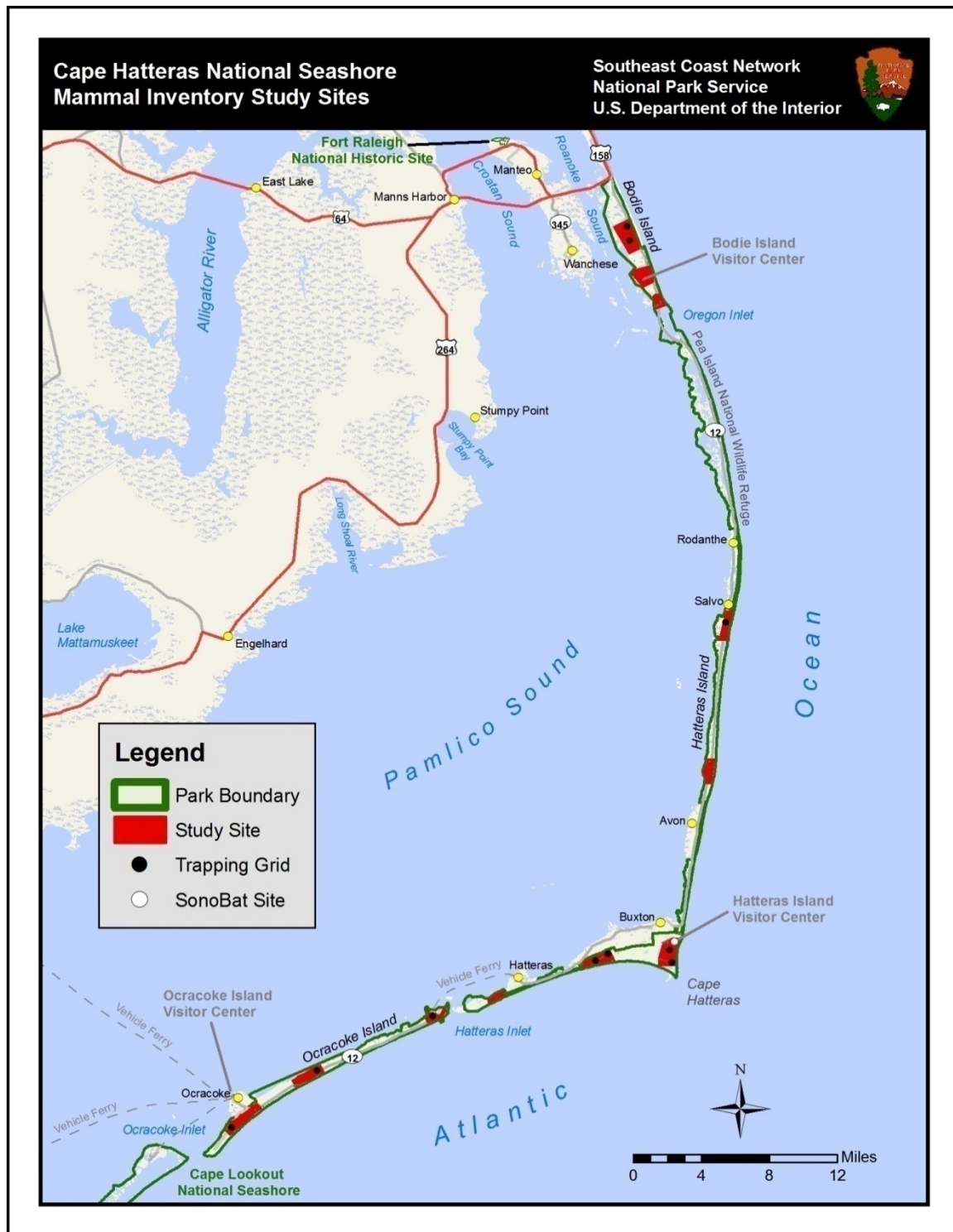


Figure 2. Mammal survey locations at Cape Hatteras National Seashore.

Fort Raleigh National Historic Site (FORA)

Fort Raleigh National Historic Site, located on the north end of Roanoke Island, Dare County, North Carolina, is thought to be the site of Roanoke Colony, the first European settlement in the New World. The site was discovered in 1584 by Sir Walter Raleigh, and the initial settlement of

108 men survived there from July 1585 to June 1586. A second group of Europeans, lead by Governor John White, arrived in 1587. This group later became known as the “Lost Colony” because they had disappeared by 1590 when White returned after a trip to England for additional supplies. Virginia Dare, the first child of European descent to be brought forth in the New World, was born 18 August 1587 in the Roanoke Colony. Today, her name figures prominently in many eastern North Carolina place-names and businesses.

The 513-acre Park currently is dominated by pine and pine-hardwood forests, brackish marshes and adjacent sandy beaches and maritime shrub thickets, swamp forests, and mechanically maintained grassy areas and trails as well as a visitor center, administrative and maintenance buildings, residences, and a theatre complex. In the early 20th Century the region was primarily farmland and pastureland; however, it probably was heavily forested at the time of European colonization.

There apparently has been little effort to document the mammalian fauna of FORA, other than the anecdotal comments in Lee et al. (1983) and Parnell et al. (1992). They reported 17 species from Roanoke Island – Virginia opossum, least shrew, southern short-tailed shrew, evening bat, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, white-footed mouse, hispid cotton rat, meadow vole, common muskrat, nutria, common gray fox, northern raccoon, northern river otter, and feral cat. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but FORA was not included as one of those Parks. According to NPS data, there have been no species of mammals documented on Park property based on tangible evidence, but there are 15 NPSpecies listed as possibly occurring in the park (Table 2).

Fieldwork began on 2 February 2004 and ended on 23 May 2005, encompassing a total of 12 man-days in the field (Figure 3). Four man-nights were used to survey bats. Additional time was spent canvassing museum collections for specimens from Dare County, North Carolina, and surrounding counties. Seventeen museums have specimens from Dare County, North Carolina – the American Museum of Natural History has five Virginia opossums, one least shrew, one eastern cottontail, and two marsh rice rats; the Carnegie Museum of Natural History has one eastern red bat; Cornell University has three marsh rice rats and one common muskrat; the Florida Museum of Natural History has one nutria; the Georgia Museum of Natural History has four white-footed mice; the James R. Slater Museum has at least one red wolf; the Museum of Comparative Zoology has two marsh rice rats and three white-tailed deer; the Museum of Southwestern Biology has a marsh rabbit, three marsh rice rats, and one house mouse; the North Carolina Museum of Natural Sciences has specimens of the southern short-tailed shrew, big brown bat, eastern red bat, evening bat, eastern cottontail, white-footed mouse, common muskrat, and northern river otter; North Carolina State University has specimens of the eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, meadow vole, Norway rat, house mouse, nutria, American black bear, northern raccoon, and white-tailed deer; the U.S. National Museum of Natural History has specimens of the eastern mole, evening bat, eastern harvest mouse, white-footed mouse, house mouse, nutria, American black bear, and white-tailed deer; the University of Kansas has five white-footed mice; the University of Massachusetts has three white-footed mice, two black rats, one nutria, and two northern raccoons; the University of Michigan Museum of Zoology has specimens of the least shrew, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, and white-footed mouse; the University of North Carolina

Wilmington has specimens of the Virginia opossum, southeastern shrew, least shrew, southern short-tailed shrew, eastern mole, eastern red bat, eastern cottontail, eastern gray squirrel, marsh rice rat, white-footed mouse, meadow vole, common muskrat, house mouse, nutria, common gray fox, northern raccoon, American mink, northern river otter, and white-tailed deer; Virginia Commonwealth University has one marsh rice rat, one Norway rat, and 18 house mice; and the Yale University Peabody Museum has one northern raccoon. It is noteworthy that Roanoke Island is located between the Dare County mainland and the Outer Banks, separated from each by a substantial body of water (Croatan Sound and Roanoke Sound, respectively). These bodies of water are isolating mechanisms that prevent many small mammals from immigrating to Roanoke Island from the North Carolina mainland or from the Outer Banks, which extends northward to the southeastern Virginia mainland.

Five major terrestrial habitats were identified – pine-hardwood forest, brackish marsh, maritime shrub thicket, swamp forest and pond, and mechanically maintained grassy areas. Given the relatively small size of the Park and its accessibility, fieldwork (Sherman livetraps, pitfall traps, and extensive ground truthing for spoor) was conducted throughout most of the Park (Figure 3). Surveys for bats were conducted using SONOBAT at the pond adjacent to where Hwy 64/264 crosses Croatan Sound and reaches Roanoke Island.

Fourteen species of terrestrial mammals (Virginia opossum, eastern mole, eastern red bat, eastern cottontail, marsh rabbit, eastern gray squirrel, common muskrat, nutria, domestic dog, common gray fox, northern raccoon, American mink, northern river otter, and feral cat) were documented on the Park property during the course of this project, and another 10 species of mammals (least shrew, southern short-tailed shrew, silver-haired bat, evening bat, marsh rice rat, white-footed mouse, hispid cotton rat, meadow vole, Norway rat, and house mouse) that are widely distributed in the southeastern United States but not encountered on Park property, would be expected at FORA (Table 4). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. The coyote, red wolf, American black bear, and white-tailed deer are not permanent residents of Roanoke Island, but individuals of these three species might swim westward across the Croatan Sound, as well as eastward across Roanoke Sound in the case of the white-tailed deer, and occasionally stray through the Park. The mountain lion no longer inhabits the region, although reports of mountain lions continue to persist among locals. The southeastern shrew, northern short-tailed shrew, big brown bat, eastern harvest mouse, cotton mouse, golden mouse, red fox, long-tailed weasel, and bobcat occur to the west on the North Carolina mainland, but they are not permanent residents of Roanoke Island or the Park because adequate segments of suitable habitat are lacking. Therefore, 23 species of mammals were documented as occurring or probably occurring on Park property, none of which are considered to be imperiled by the U.S. Fish and Wildlife Service and the State of North Carolina (LeGrand et al. 2006).

On a landscape scale, the 23 species of mammals considered to be or expected to be present at FORA have widespread geographic distributions in the southeastern United States (Hall 1981; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy many of the five habitats identified in this report. Species typically associated with the pine-hardwood at FORA include the Virginia opossum, southern short-tailed shrew, eastern mole, eastern gray squirrel, white-footed mouse, common gray fox, northern raccoon, and feral cat. Species associated primarily with the

brackish marsh, maritime shrub thicket, swamp forest, and pond habitats include the Virginia opossum, least shrew, southern short-tailed shrew, silver-haired bat, eastern red bat, evening bat, marsh rabbit, marsh rice rat, meadow vole, common muskrat, nutria, northern raccoon, American mink, and northern river otter. Species typically associated with the mechanically maintained grassy areas and out-buildings at FORA include the Virginia opossum, eastern mole, eastern cottontail, hispid cotton rat, Norway rat, house mouse, domestic dog, northern raccoon, and feral cat.

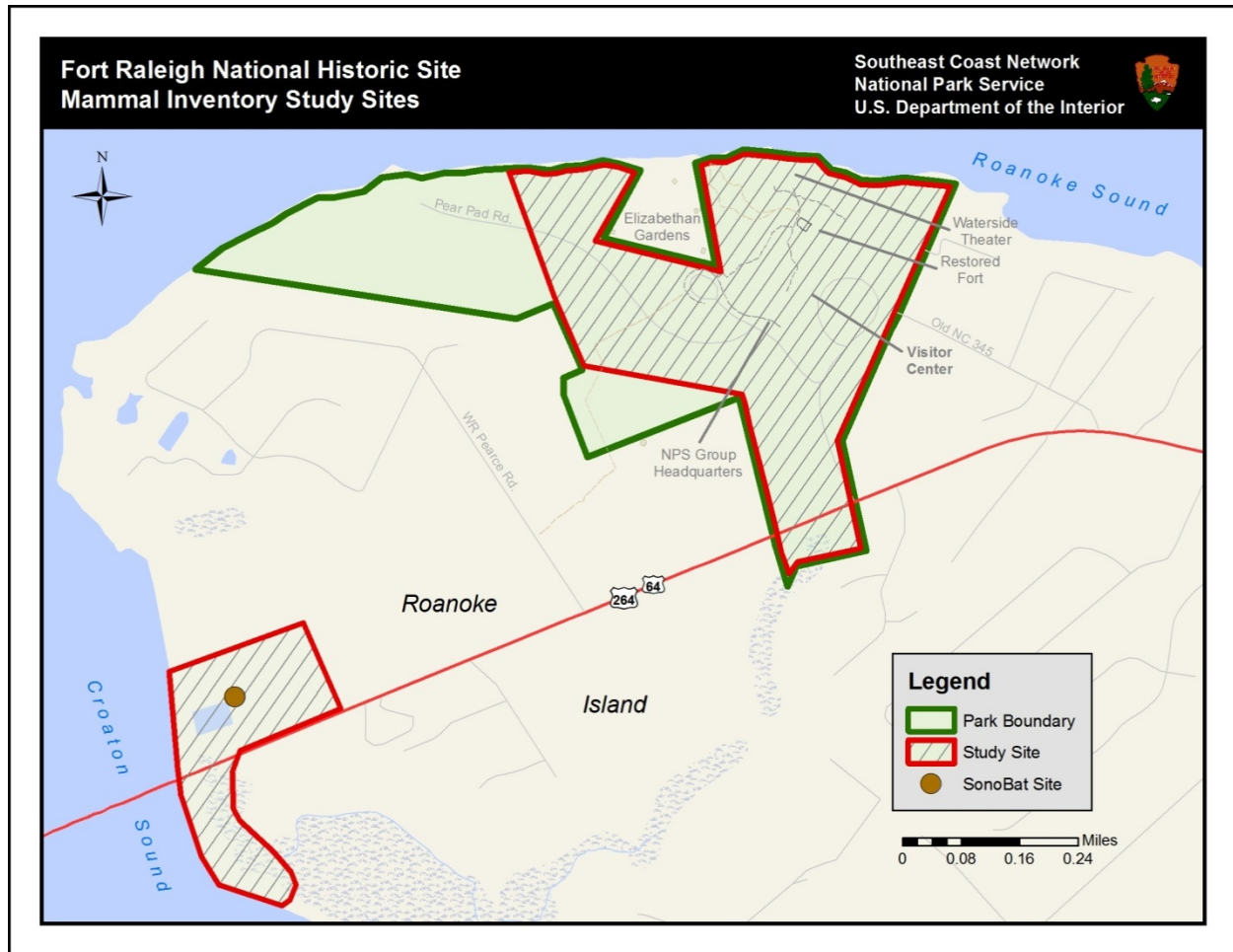


Figure 3. Mammal survey locations at Fort Raleigh National Historic Site.

Table 4. Status of 27 mammals at Fort Raleigh National Historic Site.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X			Evidence in FORA
Eastern mole	Present	X			X	Evidence in FORA
Eastern red bat	Present	X			X	Evidence in FORA
Eastern cottontail	Present	X			X	Evidence in FORA
Marsh rabbit	Present	X			X	Evidence in FORA
Eastern gray squirrel	Present	X			X	Evidence in FORA
Common muskrat	Present	X			X	Evidence in FORA
Nutria	Present	X			X	Evidence in FORA
Domestic dog	Present	X			X	Evidence in FORA
Common gray fox	Present	X			X	Evidence in FORA
Northern raccoon	Present	X			X	Evidence in FORA
American mink	Present	X			X	Evidence in FORA
Northern river otter	Present	X			X	Evidence in FORA
Feral cat	Present	X			X	Evidence in FORA
Least shrew	Probably Present					Evidence in region
Southern short-tailed shrew	Probably Present					Evidence in region
Silver-haired bat	Probably Present					Evidence in region
Evening bat	Probably Present					Evidence in region
Marsh rice rat	Probably Present					Evidence in region
White-footed mouse	Probably Present					Evidence in region
Hispid cotton rat	Probably Present					Evidence in region
Meadow vole	Probably Present					Evidence in region
Norway rat	Probably present					Evidence in region
House mouse	Probably Present					Evidence in region
Black rat	Encroaching					Evidence in region
Coyote	Encroaching					Evidence in region
Mountain lion	Absent					Extirpated

Wright Brothers National Memorial (WRBR)

Wright Brothers National Memorial, located in Kill Devil Hills, Dare County, North Carolina, is located on the site where, in 1903 and after four years of practice, Wilbur and Orville Wright successfully achieved the first sustained powered flight of a man-made airplane. Today, the Memorial encompasses about 425 acres of remnant dunes, some of which are forested with loblolly pine; mixed hardwoods, and evergreen shrubs; sandy flatlands dominated by grasses, stunted live oaks, cactus, and an assortment of typical herbaceous barrier island plants; a 3,000-foot landing strip; a visitor center; the primary monument and several smaller monuments commemorating various individuals and landmarks in the Wright brothers four-year struggle to achieve sustained flight; and several associated maintenance and residential buildings. WRBR is completely surrounded by residential and commercial development.

There has been little effort to document the mammalian fauna of WRBR per se, although the Outer Banks have been the target of many comprehensive surveys over the last 50 years. The

most comprehensive report of mammals in the region is by Parnell et al. (1992), who provided results of their fieldwork along the entire Outer Banks and other anecdotal records in their update of Quay's (1959) *The birds, mammals, reptiles, and amphibians of Cape Hatteras National Seashore Recreation Area*. Boone (1988) specifically reported three species of mammals (eastern cottontail, common gray fox, and white-tailed deer) from WRBR, and Parnell et al. (1992) opined that a total of 27 species of mammals inhabit the Outer Banks. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but WRBR was not included as one of those parks. According to NPS data, there have been no species of mammals documented on park property on the basis of tangible evidence, so it is not surprising that no NPSpecies are listed as possibly occurring in the park (Table 2).

Fieldwork began on 11 January 2005 and ended on 23 May 2005, encompassing a total of 16 man-days in the field and 1,600 trap-nights (Figure 4). Eight man-nights were used to survey bats, four man-nights in each of two habitats. Additional time was spent canvassing museum collections for specimens from Dare County, North Carolina, and surrounding counties. Seventeen museums have specimens from Dare County, North Carolina – the American Museum of Natural History has five Virginia opossums, one least shrew, one eastern cottontail, and two marsh rice rats; the Carnegie Museum of Natural History has one eastern red bat; Cornell University has three marsh rice rats and one common muskrat; the Florida Museum of Natural History has one nutria; the Georgia Museum of Natural History has four white-footed mice; the James R. Slater Museum has at least one red wolf; the Museum of Comparative Zoology has two marsh rice rats and three white-tailed deer; the Museum of Southwestern Biology has a marsh rabbit, three marsh rice rats, and one house mouse; the North Carolina Museum of Natural Sciences has specimens of the southern short-tailed shrew, big brown bat, eastern red bat, evening bat, eastern cottontail, white-footed mouse, common muskrat, and northern river otter; North Carolina State University has specimens of the eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, meadow vole, Norway rat, house mouse, nutria, American black bear, northern raccoon, and white-tailed deer; the U.S. National Museum of Natural History has specimens of the eastern mole, evening bat, eastern harvest mouse, white-footed mouse, house mouse, nutria, American black bear, and white-tailed deer; the University of Kansas has five white-footed mice; the University of Massachusetts has three white-footed mice, two black rats, one nutria, and two northern raccoons; the University of Michigan Museum of Zoology has specimens of the least shrew, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, and white-footed mouse; the University of North Carolina Wilmington has specimens of the Virginia opossum, southeastern shrew, least shrew, southern short-tailed shrew, eastern mole, eastern red bat, eastern cottontail, eastern gray squirrel, marsh rice rat, white-footed mouse, meadow vole, common muskrat, house mouse, nutria, common gray fox, northern raccoon, American mink, northern river otter, and white-tailed deer; Virginia Commonwealth University has one marsh rice rat, one Norway rat, and 18 house mice; and the Yale University Peabody Museum has one northern raccoon. It should be mentioned, however, that the boundaries of Dare County, North Carolina, extend from the mainland eastward to Roanoke Island and part of the Outer Banks, so some of the species mentioned above occur only on the North Carolina mainland or only on the mainland and Roanoke Island, and they do not occur on the Outer Banks or only rarely so.

Three major terrestrial habitats were identified at WRBR – pine-hardwood forest, sandy flats dominated by grasses and other herbaceous plants and stunted live oaks (36°01.405'N, 75°40.110'W), and mechanically maintained grassy areas and road edges and the airport (36°01.149'N, 75°40.229'W). Given the relatively few number of habitats (one of which was greatly disturbed by mechanical devices) and the fact that the region has been surveyed repeatedly in the recent past, fieldwork was limited to one grid of Sherman livetraps and one grid of pitfall traps in each habitat; however, the Park was ground truthed extensively for spoor on several occasions (Figure 4). Surveys for bats were conducted using SONOBAT in the northern corner of the Park (sandy flats dominated by herbaceous plants and stunted oaks) and along Colington Road along the western edge of the Park (mixed pine-hardwood forest).

Thirteen species of mammals (Virginia opossum, eastern mole, eastern red bat, eastern cottontail, eastern gray squirrel, white-footed mouse, house mouse, domestic dog, red fox, common gray fox, northern raccoon, feral cat, and white-tailed deer) were documented on the Park property during the course of this project, and another seven species of mammals (least shrew, southern short-tailed shrew, silver-haired bat, evening bat, eastern harvest mouse, hispid cotton rat, and Norway rat) that are widely distributed in the southeastern United States but not encountered on Park property would be expected at WRBR, at least occasionally (Table 5). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. Some species of small mammals (southeastern shrew, northern-short-tailed shrew, big brown bat, cotton mouse, and golden mouse) that inhabit the Dare County mainland do not occur on the Outer Banks, although there are dubious records of the southeastern shrew and cotton mouse from the Outer Banks (Brimley 1944-46; Lee et al. 1983). Moreover, some species of large mammals (coyote, red wolf, and American black bear) that inhabit the Dare County mainland can move easily across the Albermarle, Croatan, Roanoke, and Pamlico sounds and might occasionally stray through the Park, and the coyote can easily move down the Outer Banks from southeastern Virginia (as did the red fox); however, there are no migratory or permanent populations of the coyote, red wolf, or American black bear in WRBR at this time and they are therefore not considered to be part of the Park's fauna. This is also the case with the feral pig, which historically has wandered south along the Outer Banks from Currituck County into Dare County and onto Park property. The marsh rabbit, marsh rice rat, meadow vole, common muskrat, nutria, American mink, and northern river otter occur in the sound-side wetlands and nearshore waters to the west of WRBR, but they are not permanent residents of the Park because adequate segments of suitable habitat is lacking. The mountain lion probably never occurred on the Outer Banks, although reports of its occurrence persist there even today. Therefore, 19 species of mammals were documented as occurring or probably occurring on Park property, none of which are considered to be imperiled by the U.S. Fish and Wildlife Service and the State of North Carolina (LeGrand et al. 2006).

On a landscape scale, the 19 species of mammals considered to be or expected to be Present at WRBR have widespread geographic distributions in the southeastern United States (Hall 1981; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances, a necessary prerequisite for survival on barrier islands. Most occupy or would be expected to occupy all three habitats identified in this report. Species typically associated with the pine-hardwood forests at WRBR include the Virginia opossum, southern short-tailed shrew, eastern mole, silver-haired bat, eastern red bat, evening bat, eastern gray squirrel, white-footed mouse, common gray fox, northern raccoon, feral cat, and white-tailed deer. Species associated

primarily with the sandy flatlands dominated by herbaceous plants and stunted live oaks include the least shrew, southern short-tailed shrew, eastern mole, silver-haired bat, eastern cottontail, eastern harvest mouse, white-footed mouse, hispid cotton rat, house mouse, red fox, common gray fox, northern raccoon, feral cat, and white-tailed deer. Species associated with the mechanically maintained areas and out-buildings include the Virginia opossum, eastern mole, eastern cottontail, Norway rat, house mouse, domestic dog, feral cat, and white-tailed deer.

One additional item deserves comment. WRBR is located approximately three-quarters of the way down the northern Outer Banks from the Virginia line to Hatteras Inlet. Historically, inlets along the Outer Banks open in the north and then migrate southward until a new inlet opens to the north (Stick 1958; Mallison et al. 2008). This ‘conveyor belt’ movement of inlets provides corridors of upland habitat for terrestrial mammals to move southward along the Outer Banks from southeastern Virginia. Over the last 50,000 years, the mammalian fauna of southeastern Virginia has changed in response to shifts in climate, and some of these transient faunas were able to move southward along the Outer Banks until they reached an existing inlet. As that inlet continued to move south, so did those recent immigrants, who eventually became isolated when a new inlet formed to the north. Such is the case with several species of mammals that inhabit WRBR. Perhaps the most noteworthy species that have moved southward along the Outer Banks as inlets migrated southward are the eastern mole, eastern gray squirrel, eastern harvest mouse, white-footed mouse, hispid cotton rat, and meadow vole. The geographic distributions of these species terminate at various places along the Outer Banks, depending on the length of time since the inlet migration permitted southward movement. Conversely, the geographic distributions of larger, more vagile species (nutria, American mink, and northern river otter) that are capable of easily swimming across inlets in both northward and southward directions, and therefore are ubiquitous along the entire Outer Banks.

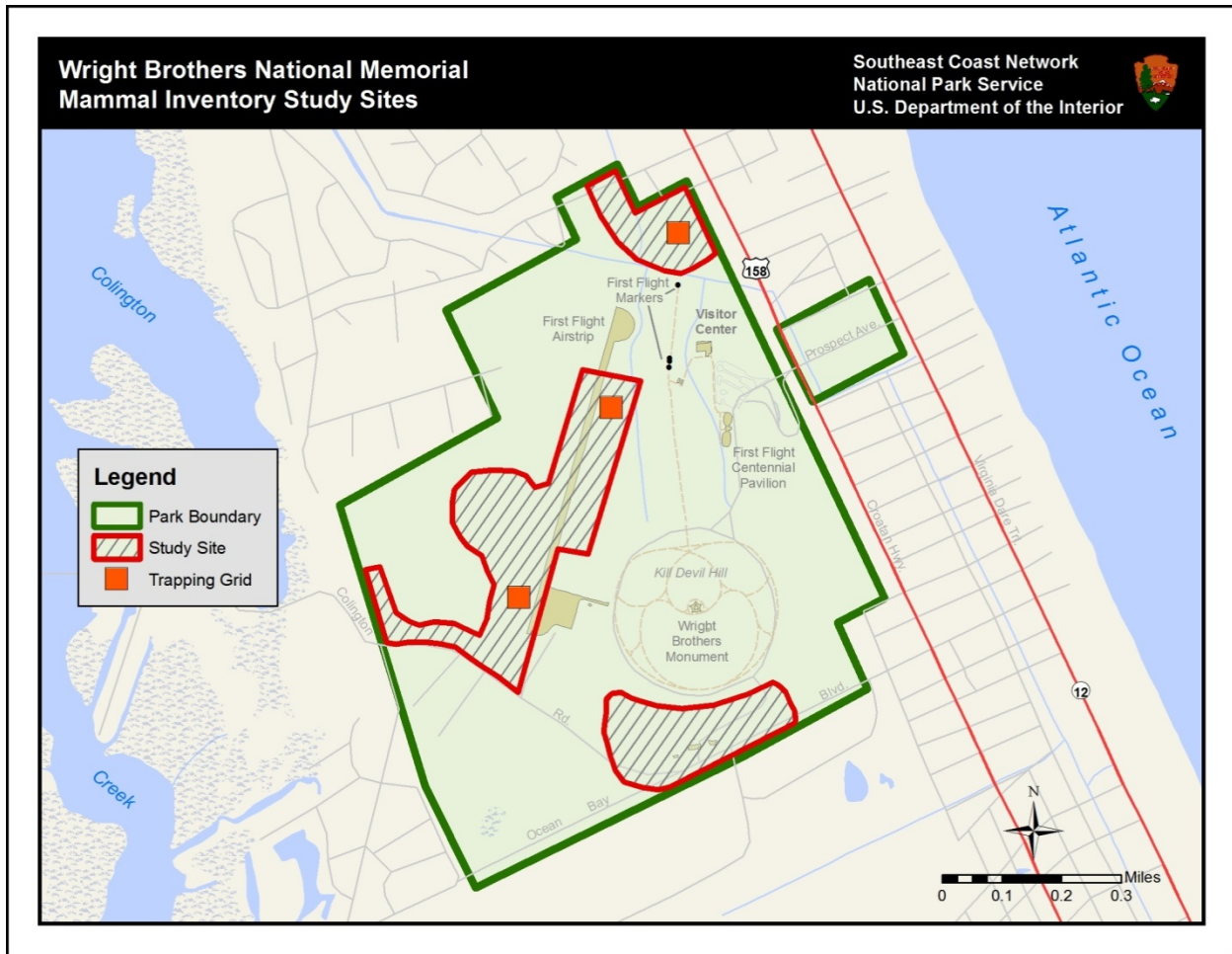


Figure 4. Mammal survey locations at Wright Brothers National Memorial.

Table 5. Status of 24 mammals at Wright Brothers National Memorial.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X			X	Evidence in WRBR
Eastern mole	Present	X			X	Evidence in WRBR
Eastern red bat	Present	X			X	Evidence in WRBR
Eastern cottontail	Present	X		X	X	Evidence in WRBR
Eastern gray squirrel	Present	X			X	Evidence in WRBR
White-footed mouse	Present	X	X			Evidence in WRBR
House mouse	Present	X	X			Evidence in WRBR
Domestic dog	Present	X			X	Evidence in WRBR
Red fox	Present	X			X	Evidence in WRBR
Common gray fox	Present	X	X	X		Evidence in WRBR
Northern raccoon	Present	X			X	Evidence in WRBR
Feral cat	Present	X			X	Evidence in WRBR
White-tailed deer	Present	X			X	Evidence in WRBR
Least shrew	Probably Present					Evidence in region
Southern short-tailed shrew	Probably Present					Evidence in region
Silver-haired bat	Probably Present					Evidence in region
Evening bat	Probably Present					Evidence in region
Eastern harvest mouse	Probably Present					Evidence in region
Hispid cotton rat	Probably Present					Evidence in region
Norway rat	Probably present					Evidence in region
Black rat	Encroaching					Evidence in region
Coyote	Encroaching					Evidence in region
Feral pig	Unconfirmed					Historic
Mountain lion	Absent					Extirpated

Cape Lookout National Seashore (CALO)

Cape Lookout National Seashore is one of the Southeast Networks most remote parks. Although the visitor center on the east end of Harkers Island is accessible by automobile, the majority of CALO consists of three barrier islands or “banks” (North Core Banks, South Core Banks, and Shackleford Banks) that are accessible only by boat. Ocracoke Inlet forms the northern boundary of the Park, and today the best way to reach the north end of CALO, the abandoned Portsmouth Village, is by boat from the village of Ocracoke. Today, only about 20 structures (of over 100) remain in Portsmouth Village. Cape Lookout, with its distinct black-and-white diamond lighthouse, a small museum, maintenance buildings, and a few residences, is located about 71 km (44 mi) to the southwest of Portsmouth Village. Between Portsmouth Village, at the northernmost end of North Core Banks, and Cape Lookout, at the southernmost end of South Core Banks, are transient inlets that separate the banks. Shackleford Banks, a 13-km (8-mi) long island that is oriented in an east-west direction, is located to the west of Cape Lookout across Barden Inlet. There are no permanent structures on Shackleford Banks today, although there once was a village, Diamond City, on the east end of the island.

CALO contains approximately 28,000 acres, including vast segments of the habitats that are typical of barrier islands – intertidal beaches, dunes, swales, overwash fans, maritime shrub thickets, maritime forests, intermittent to permanent ponds, high marshes, and low marshes. The number of habitats is related to the distance from the ocean to the sound and the elevational grade along this transect. Most of North Core Banks and South Core Banks are narrow, low in relief, and have few habitats. They are much more susceptible to damage from storms and they can quickly change over time, such as the stretch of beach just south of Long Point that has a history of inlet (Old Drum, New Drum, Ophelia) openings and closings. Conversely, Shackleford Banks and the Cape Lookout region of South Core Banks are wide, they have extensive dunes, and they have greater habitat diversity. Also, they are less susceptible to damage from storms and therefore much more stable over time. It is not surprising that Shackleford Banks and the Cape Lookout region are similar topographically, as Barden Inlet did not open until 1933 (Mallison et al. 2008).

Engels (1952) surveyed the vertebrate fauna of Shackleford Banks, and noted the presence of the Virginia opossum, eastern mole, marsh rabbit, marsh rice rat, house mouse, feral cat, feral horse, feral pig, European mouflon sheep, goat, and domestic cattle. Webster (1987) also surveyed the mammalian fauna of Shackleford Banks, and noted the presence of eastern cottontail, eastern gray squirrel, common muskrat, nutria, common gray fox, northern raccoon, American mink, northern river otter, feral horse, European mouflon sheep, goat, and domestic cattle; he did not record the presence of the Virginia opossum, house mouse, or feral pig. A list of 12 potential terrestrial species, along with the manatee, was provided by staff at the University of California-Davis to NPS personnel in 1992. According to NPS data, 25 species of terrestrial and marine mammals have been documented on Park property based on tangible evidence, and 40 NPSpecies are listed as possibly occurring in the park (Table 2).

Fieldwork on the Outer Banks by the author and a team of biologists from the University of North Carolina Wilmington began in 1986. Fieldwork associated with the Southeast Network inventory began on 25 June 2005 and ended on 5 November 2005, encompassing a total of seven man-days in the field (Figure 5). In addition, two man-nights were used to survey bats. Additional time was spent canvassing museum collections for specimens from Carteret County, North Carolina, and surrounding counties. Eight museums have specimens from Carteret County, North Carolina – the American Museum of Natural History has two hispid cotton rats; the Museum of Comparative Zoology has one eastern red bat; the North Carolina Museum of Natural Sciences has one hoary bat and one marsh rabbit; North Carolina State University has two eastern cottontails, one northern raccoon, and one bobcat; the University of Kansas has specimens of the three marsh rice rats and seven house mice; the University of Massachusetts has one least shrew, one eastern cottontail, 14 marsh rice rats, one hispid cotton rat, and one house mouse; the U.S. National Museum of Natural History has four least shrews, one little brown bat, two eastern red bats, five marsh rabbits, four house mice, and one feral cat; and the University of North Carolina Wilmington has one Virginia opossum, one northern short-tailed shrew, one big brown bat, nine eastern red bats, two evening bats, one eastern cottontail, two eastern gray squirrels, 33 marsh rice rats, one hispid cotton rat, one nutria, one common gray fox, and one domestic cattle. In addition, CALO has a very nice museum at the Harkers Island site; it includes specimens of the least shrew, eastern mole, marsh rice rat, Norway rat, house mouse, nutria, northern raccoon, and feral cat.

Five major terrestrial habitats were identified – dunes and overwash terraces, maritime shrub thickets and forests, swales and ponds, estuarine marshes, and out-buildings and piles of debris. Recent fieldwork was concentrated at Portsmouth Village, the Cape Lookout region, and both ends of Shackleford Banks, with an emphasis on extensive ground truthing for spoor. Surveys for bats were conducted using SONOBAT at Mullet Pond (two man-nights). No attempt was made to inventory the mammals at the mainland site on Harkers Island, North Carolina.

Seventeen species of terrestrial mammals (least shrew, eastern mole, eastern red bat, Seminole bat, eastern cottontail, marsh rabbit, marsh rice rat, common muskrat, Norway rat, house mouse, nutria, domestic dog, northern raccoon, American mink, northern river otter, feral cat, and feral horse) were documented on the Park property during the course of this project, and another three volant species (silver-haired bat, hoary bat, and evening bat) that are widely distributed in the southeastern United States would be expected at CALO (Table 6). The domestic dog is not a permanent resident of CALO and should not be included in subsequent checklists. The feral pig, European mouflon sheep, goat, and domestic cattle were extirpated from Shackleford Banks during the last two decades and no longer occur in the Park. White-tailed deer probably occupied Shackleford Banks in the past when the island was more heavily wooded and before Europeans released livestock on the island, as did the Virginia opossum. While the Virginia opossum no longer occur in the Park, deer now occur on Shackleford Banks and occasionally swim to Cape Lookout. The American black bear is not a permanent resident of CALO, an individual once swam to Shackleford Banks and then to Cape Lookout, where it was killed (Engels, 1952). Several other black bear sightings exist at CALO in more recent years on both Core Banks and Shackleford, including a photograph of a bear swimming to Shackleford. While bobcats are not permanent residents either, a record exists of one washed up dead at CALO. The red wolf and mountain lion no longer inhabit the region, although reports of mountain lions continue to persist. Therefore, 19 species of mammals were documented as occurring or probably occurring on Park property, none of which are considered to be imperiled by the U.S. Fish and Wildlife Service and the State of North Carolina (LeGrand et al. 2006).

On a landscape scale, the 19 species of mammals considered to be or expected to be Present at CALO have widespread geographic distributions in the southeastern United States (Hall 1981; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy many of the five habitats identified in this report. Species typically associated with dunes and overwash fans at CALO include the eastern cottontail, house mouse, nutria, northern raccoon, feral cat, and feral horse. Species associated primarily with maritime shrub thickets and forests at CALO include the eastern mole, northern raccoon, and feral cat. Species typically associated with swales and ponds at CALO include the least shrew, silver-haired bat, eastern red bat, Seminole bat, hoary bat, evening bat, eastern cottontail, marsh rabbit, marsh rice rat, common muskrat, nutria, northern raccoon, American mink, northern river otter, feral cat, and feral horse. Species associated primarily with estuarine marshes at CALO include the marsh rabbit, marsh rice rat, common muskrat, nutria, northern raccoon, American mink, northern river otter, and feral horses. Species associated primarily with out-buildings and piles of debris at CAHA include the Norway rat, house mouse, and feral cat.

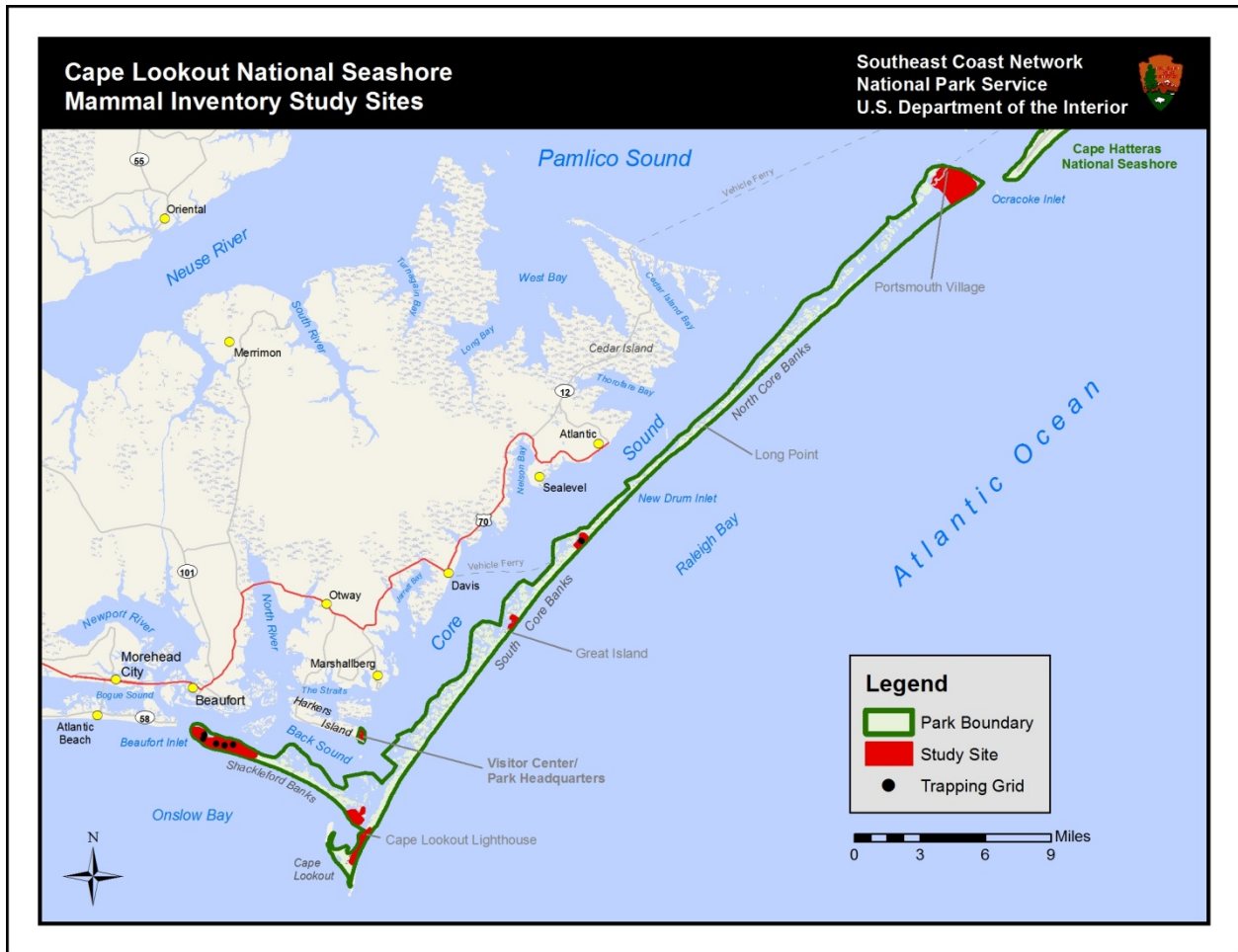


Figure 3. Mammal survey locations at Cape Lookout National Seashore.

Table 6. Status of 29 mammals at Cape Lookout National Seashore.^a this refers to feral dogs not pets

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Least shrew	Present	X	X			Evidence in CALO ¹
Eastern mole	Present	X	X	X	X	Evidence in CALO ³
Eastern red bat	Present	X			X	Evidence at CALO ¹³
Seminole bat	Present	X			X	Evidence at CALO
Eastern cottontail	Present	X	X	X		Evidence in CALO ¹²³
Marsh rabbit	Present	X		X	X	Evidence in CALO ¹²³
Marsh rice rat	Present	X	X	X		Evidence in CALO ¹²³
Common muskrat	Present	X		X	X	Evidence in CALO ¹²³
Norway rat	Present	X	X			Evidence at CALO ¹
House mouse	Present	X	X	X		Evidence in CALO ¹²
Nutria	Present	X		X	X	Evidence in CALO ¹²³
Domestic dog ^a	Present	X			X	Evidence in CALO ¹²³
Northern raccoon	Present	X	X	X		Evidence in CALO ¹²³
American mink	Present	X		X	X	Evidence in CALO ¹²³
Northern river otter	Present	X		X	X	Evidence in CALO ¹²³
Feral cat	Present	X	X	X		Evidence in CALO ¹²³
Feral horse	Present	X		X		Evidence at CALO ³
White-tailed deer	Present					Evidence at CALO ³
Silver-haired bat	Probably Present					Evidence in region
Hoary bat	Probably Present					Evidence in region
Evening bat	Probably Present					Evidence in region
Red fox	Unconfirmed					Evidence in region
Bobcat	Unconfirmed					Evidence in region
American black bear	Unconfirmed					Evidence in region
Coyote	Encroaching					Evidence in region
Virginia opossum	Absent					Extirpated
Feral pig	Absent					Extirpated
European mouflon sheep	Absent					Extirpated
Goat	Absent					Extirpated
Domestic cattle	Absent					Extirpated

^a this refers to feral dogs not pets

Castillo de San Marcos National Monument (CASA)

Castillo de San Marcos National Monument is one of two fortresses built by early Spanish colonists to protect Saint Augustine, the first permanent European city in the New World, from other European colonists. Beginning in 1672 and taking 23 years to complete, the Castillo was built in a strategic position just inside Saint Augustine Inlet on the Matanzas River, guarding Saint Augustine from direct oceanic attack. The second fortress, Fort Matanzas was built to the south, where the Matanzas Inlet joins the Matanzas River, protecting Saint Augustine's southern approach. The Castillo has never been conquered despite sieges in 1702 by Governor James Moore of South Carolina and in 1740 by General James Oglethorpe of Georgia. Today, CASA

sits on 21 water-front acres of neatly manicured property. The administrative buildings for both CASA and FOMA are nestled among live oaks on the northern boundary of the property, and the remainder of the Park includes a large parking lot along the southern boundary, the fortress, and a lawn.

There apparently has been little effort to document the mammalian fauna of CASA. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most Parks to NPS personnel in 1992, but CASA was not included as one of those Parks. According to NPS data, there have been no species of mammals documented on Park property on the basis of tangible evidence, and no NPSpecies are listed as possibly occurring in the Park (Table 2).

This investigation is the first comprehensive survey of the terrestrial mammalian fauna of CASA. Fieldwork began on 29 January 2004 and ended on 9 March 2009, encompassing four man-days in the field (Figure 6). Given the tremendous number of visitors and lack of natural habitat, there was no opportunity or need to conduct trapping exercises. Therefore, fieldwork consisted of walking the property to record spoor and talking the Park personnel. Bats were not included in this investigation.

Additional time was spent canvassing museum collections for specimens from Saint Johns County, Florida, and surrounding counties. No specimens have been taken from CASA per se, but the Anastasia Island area is one of the oldest centers of early natural history exploration in North America, dating back to the seminal work of Bangs (1898). As such, the mammals of the region are relatively well known, and there are specimens from Saint Johns County, Florida, in most major museums in the United States. For example, the American Museum of Natural History has specimens of the marsh rabbit, marsh rice rat, Anastasia Island beach mouse, Florida mouse, and hispid cotton rat; the Charleston Museum has specimens of the Anastasia Island beach mouse and three Florida mice; Cornell University has four Anastasia Island beach mice; the Field Museum of Natural History has one Anastasia Island beach mouse; the Florida Museum of Natural History has specimens of the Virginia opossum, least shrew, eastern mole, nine-banded armadillo, marsh rabbit, eastern gray squirrel, southeastern pocket gopher, marsh rice rat, Anastasia Island beach mouse, cotton mouse, Florida mouse, golden mouse, hispid cotton rat, black rat, house mouse, American black bear, and northern raccoon; the Georgia Museum of Natural History has one black rat and one northern raccoon; the James R. Slater Museum has eight Anastasia Island beach mice; Louisiana State University has two Anastasia Island beach mice; Michigan State University has two Anastasia Island beach mice and one hispid cotton rat; the Museum of Comparative Zoology has specimens of the eastern mole, eastern cottontail, marsh rabbit, marsh rice rat, Anastasia Island beach mouse, cotton mouse, hispid cotton rat, black rat, northern raccoon, and American mink; the Museum of Southwestern Biology has specimens of the Virginia opossum, least shrew, southern short-tailed shrew, eastern gray squirrel, Anastasia Island beach mouse, cotton mouse, golden mouse, hispid cotton rat, house mouse, and northern raccoon; the Royal Ontario Museum has one eastern mole, 14 Anastasia Island beach mouse, five cotton mice, and one hispid cotton rat; the Sam Noble Oklahoma Museum of Natural History has one Anastasia Island beach mouse; the U.S. National Museum of Natural History has one southern short-tailed shrew, one eastern mole, 18 Anastasia Island beach mouse, four cotton mouse, one house mouse, and three northern raccoons; and the University of Kansas has one eastern mole, one marsh rabbit, one eastern gray squirrel, one southeastern pocket gopher, 33 Anastasia Island beach mice, and one northern raccoon.

Only three species of terrestrial mammals (eastern gray squirrel, domestic dog, and northern raccoon) were documented on the Park property during the course of this project (Table 7), and three other species (black rat, house mouse, and feral cat) with widespread geographic distributions in the southeastern United States probably occur there as well. The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. Six other species of terrestrial mammals (Virginia opossum, eastern mole, eastern cottontail, marsh rabbit, marsh rice rat, and northern river otter) might occasionally make their way to the Park from the adjacent properties, but none are permanent residents. Mammalian diversity at CASA is greatly diminished due to its small size, greatly modified landscape, and lack of natural habitat in the surrounding commercial and residential properties. The five species of terrestrial mammals that were documented as permanently occurring or thought to occur on Park property are not considered to be imperiled by the U.S. Fish and Wildlife Service.

Table 7. Status of 12 terrestrial mammals at Castillo de San Marcos National Monument.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Eastern gray squirrel	Present	X			X	Evidence at CASA
Domestic dog	Present	X			X	Evidence at CASA
Northern raccoon	Present	X			X	Evidence at CASA
Black rat	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Feral cat	Probably Present					Evidence in region
Virginia opossum	Encroaching					Evidence in region
Eastern mole	Encroaching					Evidence in region
Eastern cottontail	Encroaching					Evidence in region
Marsh rabbit	Encroaching					Evidence in region
Marsh rice rat	Encroaching					Evidence in region
Northern river otter	Encroaching					Evidence in region

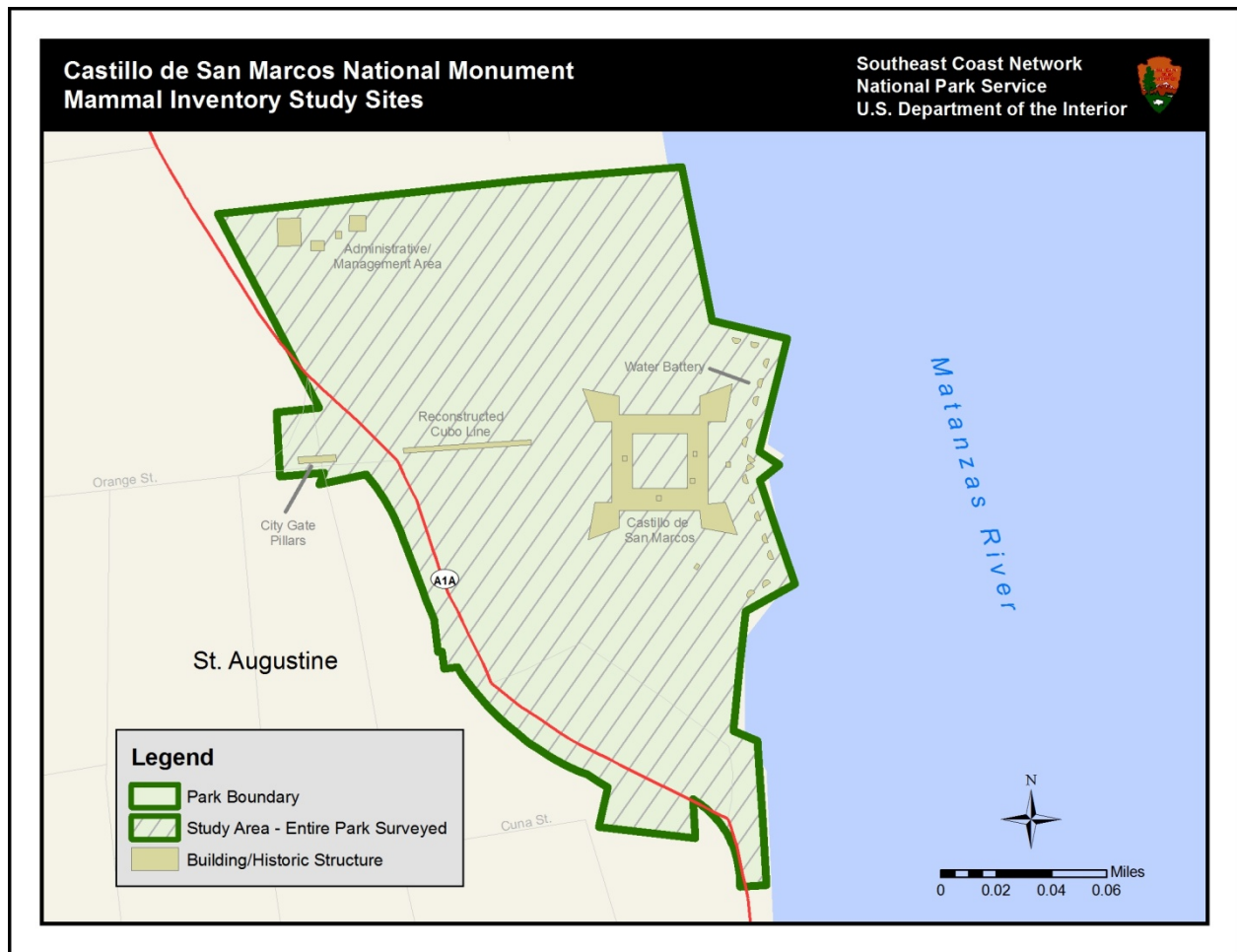


Figure 6. Mammal survey locations at Castillo de San Marcos National Monument.

Chattahoochee River National Recreation Area (CHAT)

Chattahoochee River National Recreation Area is scattered among several counties (Cobb, Forsyth, Fulton, and Gwinnett counties) in northern Georgia, extending for 78 km (48 mi) along the Chattahoochee River from Lake Sidney Lanier southwestward to Atlanta. The Park is broken into many units, including from north to south Bowmans Island, Orrs Ferry, Settles Bridge, Level Creek, McGinnis Ferry, Suwanee Creek, Abbotts Bridge, Medlock Bridge, Jones Bridge, Holcomb Bridge, Island Ford, Vickery Creek, Gold Branch, Johnson Ferry, Cochran Shoals, and the Palisades, which facilitates Park management (Figure 7). CHAT contains about 10,000 acres of mesic hardwood, upland pine, and mixed pine-hardwood forests, herbaceous and forested floodplains, and various aquatic habitats. There also are some exposed rocky cliffs along the Brevard Fault, within which the Chattahoochee River formed. River flow is managed by the U.S. Army Corps of Engineers via Buford Dam at Lake Lanier, so the scouring action of torrential currents after heavy rains has been greatly abated, and today some of the largest river birches in North America sentinel the river banks. In addition, it warrants mention that since 1993 thousands of pine trees at CHAT have died from an infestation of the southern pine beetle, and the mixed pine-hardwood forests are in transition to becoming dominated by hardwoods.

There has been little effort to document the mammalian fauna of CHAT. A list of 14 potential species (Virginia opossum, southeastern shrew, least shrew, northern short-tailed shrew, eastern cottontail, swamp rabbit, southern flying squirrel, golden mouse, meadow jumping mouse, red fox, common gray fox, northern raccoon, bobcat, and white-tailed deer) was provided to the NPS by staff at the University of California-Davis in 1992, but this list is woefully silent on bats and most small rodents. According to NPS data, there have been no species of mammals documented on Park property on the basis of tangible evidence, but 44 NPSpecies are listed as possibly occurring in the Park (Table 2). This investigation appears to be the first comprehensive survey of the terrestrial mammalian fauna of CHAT.

Fieldwork began on 2 February 2003 and ended on 12 August 2003, encompassing a total of 147 man-days in the field and 27,884 trap-nights of sampling effort. Sampling effort varied by unit, ranging from four man-days and 300 trap-nights at Johnson Ferry to 23 man-days and 4,400 trap-nights at Bowmans Island, averaging about eight man-days and 1,750 trap-nights per unit (Figures 8 – 22). Additional time was spent canvassing museum collections for specimens from Cobb, Forsyth, Fulton, and Gwinnett counties, Georgia, and adjacent counties. There are specimens of the southeastern shrew, eastern mole, golden mouse, woodland vole, and meadow jumping mouse from the Palisades where Long Island Creek empties into the Chattahoochee River in the Georgia Museum of Natural History. In addition, the American Museum of Natural History has one golden mouse, one hispid cotton rat, and one woodland vole; Cornell University has three eastern chipmunks; the Florida Museum of Natural History has one least shrew, four northern short-tailed shrews, one eastern mole, one chipmunk, two golden mice, six hispid cotton rats, one house mouse, and one feral dog; the Georgia Museum of Natural History has two Virginia opossums, 14 southeastern shrews, three least shrews, seven northern short-tailed shrews, four eastern moles, one eastern cottontail, six eastern chipmunks, six eastern gray squirrels, seven southern flying squirrels, three eastern harvest mice, one white-footed mouse, two golden mice, four hispid cotton rats, four meadow voles, 18 woodland voles, two common muskrats, three black rats, three house mice, four meadow jumping mice, and one red fox; the Louisiana State University Museum of Zoology has one meadow jumping mouse; the Museum of Southwestern Biology has one eastern chipmunk, one flying squirrel, seven white-footed mice, 41 cotton rats, 40 black rats, 14 Norway rats, and 23 house mice, which were collected in 1995 as part of a large survey to document the extent of hantavirus in rodents in the southeastern United States (Mills et al. 1998); the New York State Museum has one common muskrat; the University of Kansas has an eastern cottontail, four eastern gray squirrels, and four southern flying squirrels; the University of Michigan has two Virginia opossums, one eastern mole, three eastern cottontails, seven eastern chipmunks, two eastern gray squirrels, four southern flying squirrels, four white-footed mice, seven golden mice, and two hispid cotton rats; and the U.S. National Museum of Natural History has one eastern cottontail, one eastern chipmunk, two white-footed mice, three golden mice, nine hispid cotton rats, one woodland vole, one Norway rat, and one American mink. Moreover, Young (1946) provided some historic records of mountain lions from an unspecified locality in Bartow County and northwest of Dahlonega in Lumpkin County, Georgia.

Several major terrestrial habitats were identified: upland hardwood, pine, and pine-hardwood forests, bottomland hardwood forests, mesic and wet marshes, rocky cliffs, creek edges, various aquatic habitats, and regularly maintained grasslands and activity fields. Most fieldwork

(Sherman livetraps, pitfall traps, and extensive ground truthing for spoor) occurred in the remote areas of the park so as to avoid the areas most impacted by recreational visitors.

Four field sites were in Bowmans Island – a grid of pitfall traps was installed in a deciduous forest on the west side of the Chattahoochee River in Forsyth County (34°09.172'N 84°05.095'W), and on the east side of the Chattahoochee River in Gwinnett County a grid of Sherman livetraps (34°07.981'N 84°04.3880'W) and a grid of pitfall traps (34°08.052'N 84°04.452'W) were set in deciduous lowland forest along Richland Creek (Figure 8). At Orrs Ferry in Gwinnett County, a grid of pitfall traps was installed in an upland hardwood forest (34°07.381'N 84°05.780'W) and a grid of Sherman livetraps was set in a power-line right-of-way dominated by herbaceous vegetation (34°07.051'N and 84°05.818'W) (Figure 9). Also in Gwinnett County, a grid of pitfall traps and a grid of Sherman livetraps was set in a floodplain hardwood forest at Settles Bridge (34°05.791'N 84°06.546'W), and a grid of each trap type was set in a floodplain hardwood forest at Level Creek (34°03.797'N 84°06.618'W) (Figure 10). In Fulton County, a grid of Sherman livetraps was set at McGinnis Ferry in a floodplain forest with a thick understory and a canopy dominated by hardwoods (34°02.903'N 84°06.208'W) (Figure 11). At Suwanee Creek in Gwinnett County, a grid of pitfall traps and a grid of Sherman livetraps was set in a sloping hardwood forest (34°01.710'N 84°04.452'W) and a grid of each trap type was set in a marsh of thick herbaceous vegetation (34°01.884'N 84°07.388'W) (Figure 12). At Abbotts Bridge, a grid of pitfall traps and a grid of Sherman livetraps was set in the grasslands (34°59.369'N 84°10.342'W) and a grid of each trap type was set in a floodplain hardwood forest (34°01.743'N 84°09.902'W), all on the Gwinnett County side of and adjacent to the Chattahoochee River (Figure 13). A grid of Sherman livetraps was set in a mixed pine-hardwood forest at Medlock Bridge in Gwinnett County (34°00.106'N 84°14.283'W) (Figure 14). A grid of both pitfall traps and Sherman livetraps were set in a hardwood forest (34°59.863'N 84°15.043'W) and in a grassland (34°59.307'N 84°15.457'W) at Jones Bridge in Fulton County (Figure 15). At Holcomb Bridge in Fulton County, a grid of both trap types was set in a floodplain hardwood forest (34°58.296'N 84°15.868'W) (Figure 16). A grid of pitfall traps was installed in an upland hardwood forest (34°59.460'N 84°19.762'W) and a grid of Sherman livetraps was set in a hardwood forest (34°57.163'N 84°19.535'W) at Island Ford in Fulton County (Figure 17). A grid of Sherman livetraps and pitfall traps were set in a hardwood forest adjacent to Island Ford Road (34°08.440'N 84°04.884'W) (Figure 17). One grid of Sherman livetraps was set along an exposed rocky outcrop in hardwood forest at Vickery Creek in Fulton County (34°00.709'N 84°20.935'W) (Figure 18). One grid of pitfall traps was installed in a beetle-decimated pine forest at Gold Branch in Cobb County (33°59.092'N 84°22.888'W) (Figure 19). At Johnson Ferry in Cobb County, four grids of Sherman livetraps were set, one in a grassland (33°56.824'N 84°24.212'W) and one in a bottomland hardwood forest (33°56.995'N 84°24.078'W) on the north side of Johnson Ferry Road, and two grids of Sherman livetraps were set in marshes (33°56.361'N 84°24.715'W and 33°59.092'N 84°22.888'W) on the south side of Johnson Ferry Road (Figure 20). At Cochran Shoals in Cobb County, two grids of pitfall traps were installed in a sloping hardwood forest near Sope Creek (33°55.584'N 84°26.485'W and 33°53.394'N 84°26.772'W) and a grid of both trap types was set in a wet grassland (33°54.769'N 84°26.929'W) (Figure 21). At the Palisades in Fulton County, a grid of pitfall traps was installed in a hardwood forest (33°53.258'N 84°26.171'W) (Figure 22). Bats were not included in this investigation.

Thirty-one species of terrestrial mammals were documented on the park property during the course of this; however, the domestic dog and domestic horse are not permanent residents of CHAT and should not be included in subsequent park lists (Table 8). Looking at these 31 species collectively, however, the domestic dog was documented in all 16 units of CHAT (Table 9), and nine other species were documented in at least 10 of the 16 units (northern short-tailed shrew, eastern mole, swamp rabbit, eastern chipmunk, eastern gray squirrel, American beaver, coyote, northern raccoon, and white-tailed deer). Four other species of mammals are widely distributed in the southeastern United States were not encountered on park property, but each would be expected at CHAT (Table 8). The red wolf, American black bear, and mountain lion have been extirpated from the region, and the spotted skunk might be extirpated as well. Therefore, 33 species of terrestrial mammals inhabit CHAT, none of which are considered to be imperiled by the U.S. Fish and Wildlife Service.

On a landscape scale, the 33 species of terrestrial mammals considered to be or expected to be Present at CHAT have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy many of the habitats identified in this report. Species typically associated with the forested habitats at CHAT include the Virginia opossum, southeastern shrew, northern-short-tailed shrew, southern short-tailed shrew, eastern mole, eastern chipmunk, eastern gray squirrel, southern flying squirrel, white-footed mouse, golden mouse, woodland vole, coyote, common gray fox, northern raccoon, long-tailed weasel, striped skunk, feral cat, bobcat, and white-tailed deer. Species associated primarily with early successional grassland, marsh, and grassland-forest ecotonal habitats at CHAT include the least shrew, eastern mole, eastern cottontail, swamp rabbit, marsh rice rat, eastern harvest mouse, hispid cotton rat, meadow vole, common muskrat, house mouse, meadow jumping mouse, red fox, long-tailed weasel, striped skunk, feral cat, bobcat, and white-tailed deer. Species associated primarily with aquatic habitats include the swamp rabbit, American beaver, northern raccoon, American mink, and northern river otter. Domestic dogs were regularly encountered, typically under leash command, on numerous occasions in every unit at CHAT, especially those adjacent to dense residential developments (Abbotts Bridge, Island Ford, Vickery Creek, Gold Branch, Johnson Ferry, Cochran Shoals, and Palisades), and domestic horses were documented at Bowmans Island.

Perhaps the most surprising aspect of the mammalian inventory of CHAT was the discovery that both species of short-tailed shrews inhabit the park. The northern short-tailed shrew and southern short-tailed shrew compete intensely with each other and they almost never coexist. The result of this competition is that the species are distributed parapatrically – that is, their respective geographic distributions abut one another but seldom overlap. In the United States, the northern short-tailed shrew is distributed across much of the Northeast, Great Lakes, and Midwest regions but it also ranges down the Appalachian Mountains as far south as east-central Alabama and west-central Georgia. The southern short-tailed shrew, on the other hand, is distributed across the Gulf Coast and South Atlantic states, extending northward in the Coastal Plain and Piedmont of the Carolinas and southern Virginia (Webster et al. 1985) and along the Mississippi River bottomlands to southern Illinois (Hoffmeister 1989). At CHAT, the northern short-tailed shrew was dominant – from north to south it is a denizen of Bowmans Island, Orrs Ferry, Level Creek, Abbotts Bridge, Medlock Bridge, Jones Bridge, Holcomb Bridge, Island Ford, Gold Branch, and Palisades – whereas the southern short-tailed shrew was captured at

Suwanee Creek. It is interesting to note that the marsh rice rat, another mammal species that has affinities with the Southeast, also was found at Suwanee Creek, but not other units in CHAT.

Table 8. Status of 45 terrestrial mammals at Chattahoochee River National Recreation Area.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X	X		Evidence in CHAT
Southeastern shrew	Present	X	X			Evidence in CHAT
Least shrew	Present	X	X			Evidence in CHAT
Northern short-tailed shrew	Present	X	X	X		Evidence in CHAT
Southern short-tailed shrew	Present	X	X			Evidence in CHAT
Eastern mole	Present	X	X			Evidence in CHAT
Eastern cottontail	Present	X	X			Evidence in CHAT
Swamp rabbit	Present	X	X			Evidence in CHAT
Eastern chipmunk	Present	X	X			Evidence in CHAT
Eastern gray squirrel	Present	X			X	Evidence in CHAT
American beaver	Present	X	X			Evidence in CHAT
Marsh rice rat	Present	X	X			Evidence in CHAT
Eastern harvest mouse	Present	X	X			Evidence in CHAT
White-footed mouse	Present	X	X			Evidence in CHAT
Golden mouse	Present	X	X			Evidence in CHAT
Hispid cotton rat	Present	X	X			Evidence in CHAT
Woodland vole	Present	X	X			Evidence in CHAT
Common muskrat	Present	X			X	Evidence in CHAT
Meadow jumping mouse	Present	X	X			Evidence in CHAT
Coyote	Present	X			X	Evidence in CHAT
Feral dog	Present	X			X	Evidence in CHAT
Red fox	Present	X			X	Evidence in CHAT
Common gray fox	Present	X			X	Evidence in CHAT
Northern raccoon	Present	X	X			Evidence in CHAT
American mink	Present	X	X			Evidence in CHAT
Northern river otter	Present	X			X	Evidence in CHAT
Striped skunk	Present	X			X	Evidence in CHAT
Feral cat	Present	X	X			Evidence in CHAT
Bobcat	Present	X			X	Evidence in CHAT
Domestic horse	Present	X			X	Evidence in CHAT
White-tailed deer	Present	X	X			Evidence in CHAT
Southern flying squirrel	Probably Present					Evidence in region
Meadow vole	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Long-tailed weasel	Probably Present					Evidence in region
Woodchuck	Encroaching					Evidence in region
Eastern fox squirrel	Encroaching					Evidence in region
Oldfield mouse	Encroaching					Evidence in region
Cotton mouse	Encroaching					Evidence in region
Black rat	Encroaching					Evidence in region
Norway rat	Encroaching					Evidence in region
Eastern spotted skunk	Encroaching					Evidence in region
Red wolf	Absent					Extirpated
American black bear	Absent					Extirpated
Mountain lion	Absent					Extirpated

Table 9. Distribution of 31 terrestrial mammals at Chattahoochee River National Recreation Area.

Common name	Tangible Evidence in Park Units															
	Bowmans Island	Orrs Ferry	Settles Bridge	Level Creek	McGinnis Ferry	Suwanee Creek	Abbots Bridge	Medlock Bridge	Jones Bridge	Holcomb Bridge	Island Ford	Vickery Creek	Gold Branch	Johnson Ferry	Cochran Shoals	Palisades
Virginia opossum						X		X								
Southeastern shrew			X	X		X							X			X
Least shrew							X									
N short-tailed shrew	X	X		X			X	X	X	X	X		X			X
S short-tailed shrew						X										
Eastern mole	X	X	X	X	X	X	X	X		X		X		X	X	X
Eastern cottontail															X	
Swamp rabbit	X	X	X		X	X	X	X						X	X	X
Eastern chipmunk	X	X	X			X		X	X		X	X		X	X	X
Eastern gray squirrel	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
American beaver	X	X			X		X	X	X	X		X		X	X	X
Marsh rice rat						X										
E harvest mouse						X	X									
White-footed mouse		X		X	X										X	
Golden mouse	X					X										X
Hispid cotton rat														X		
Woodland vole	X			X			X				X					X
Common muskrat												X				
M jumping mouse																X
Coyote	X		X		X	X	X		X				X	X	X	X
Domestic dog	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Red fox		X														
Common gray fox												X				
Northern raccoon	X		X		X	X	X	X	X	X	X	X	X	X	X	X
American mink			X									X	X	X		
Northern river otter							X	X	X			X				X
Striped skunk	X															
Feral cat						X	X		X					X	X	X
Bobcat	X															
Domestic horse	X															
White-tailed deer	X	X	X	X	X	X	X	X	X		X				X	X

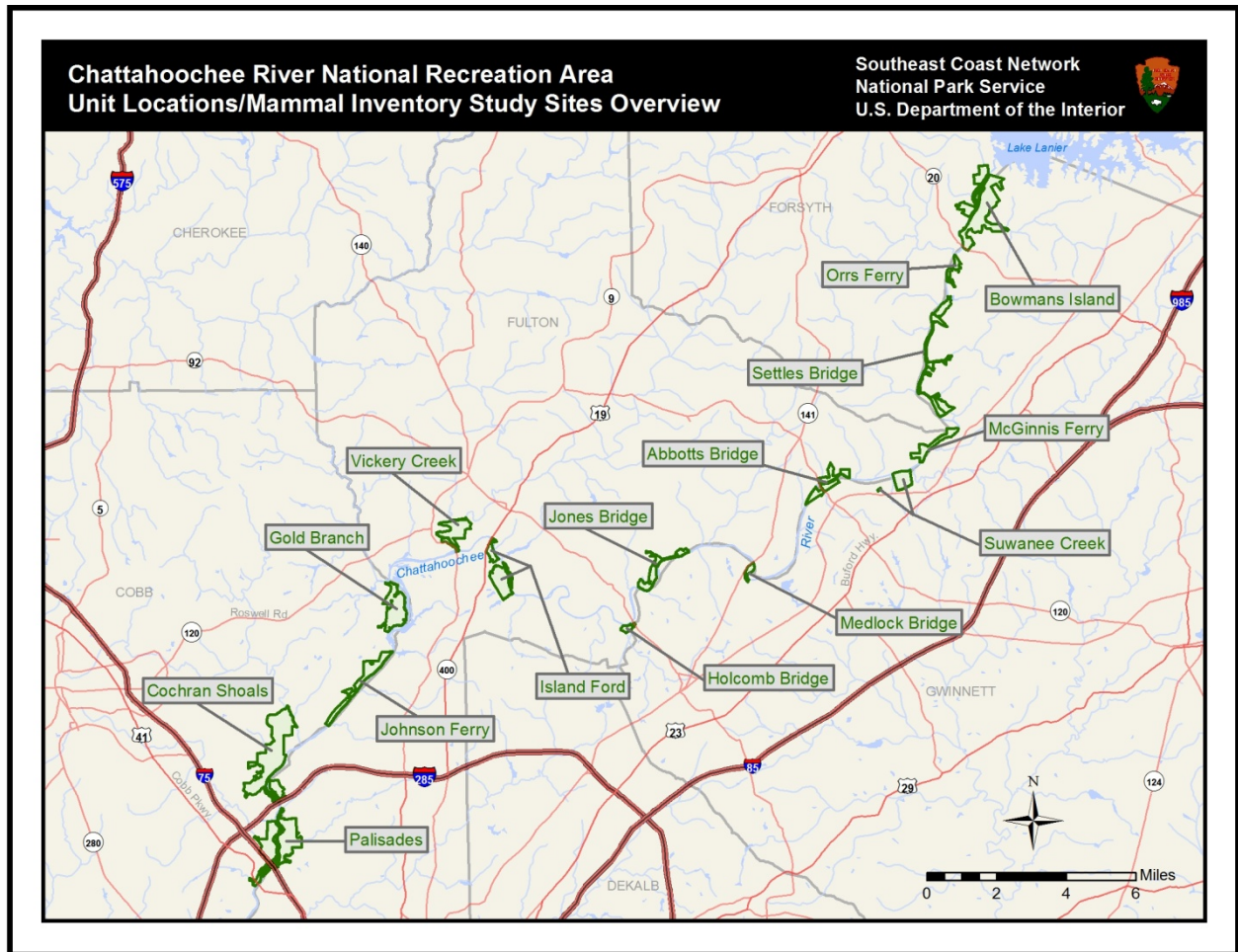


Figure 7. Chattahoochee River National Recreation Area units.

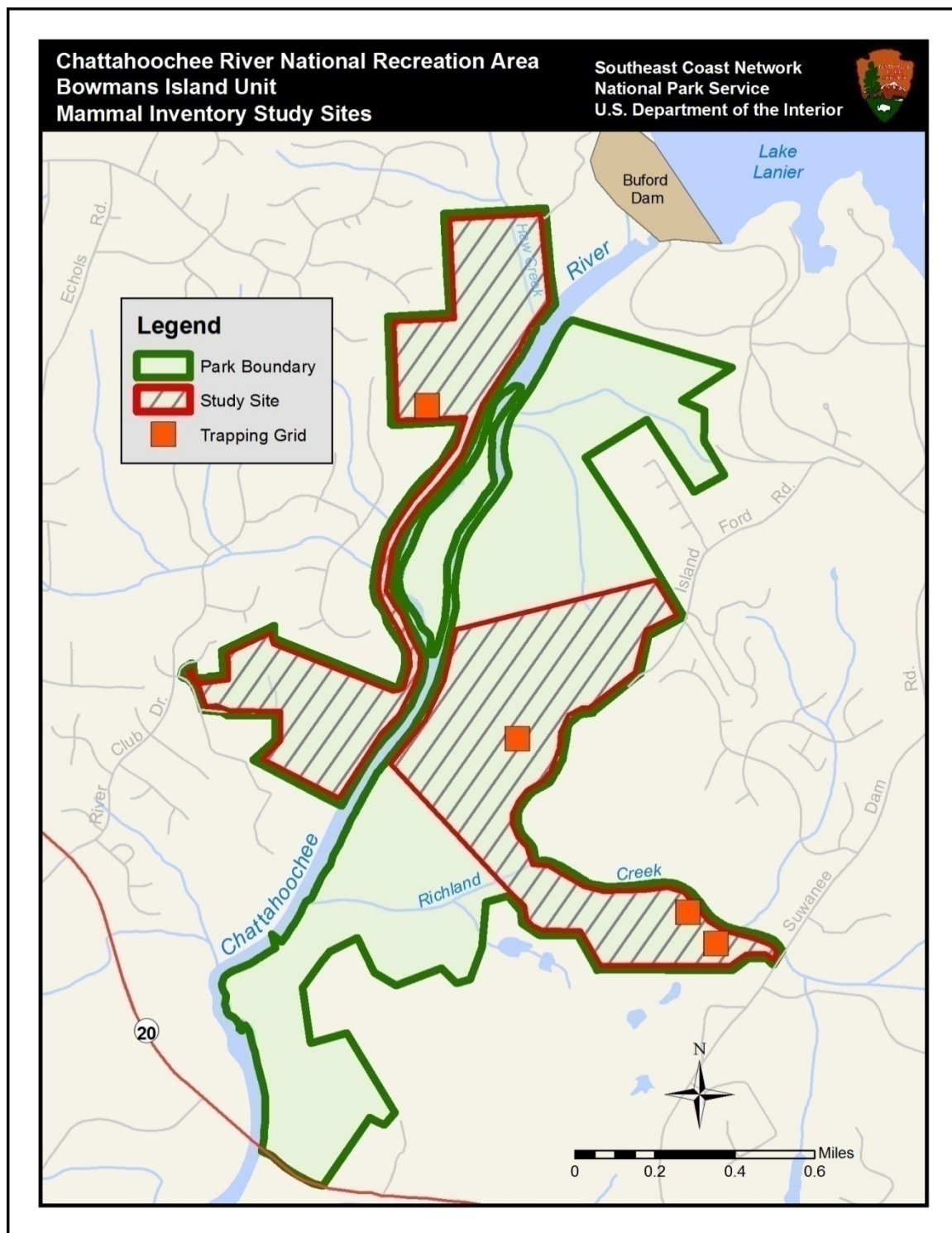


Figure 8. Mammal survey locations at Chattahoochee River National Recreation Area, Bowmans Island Unit.

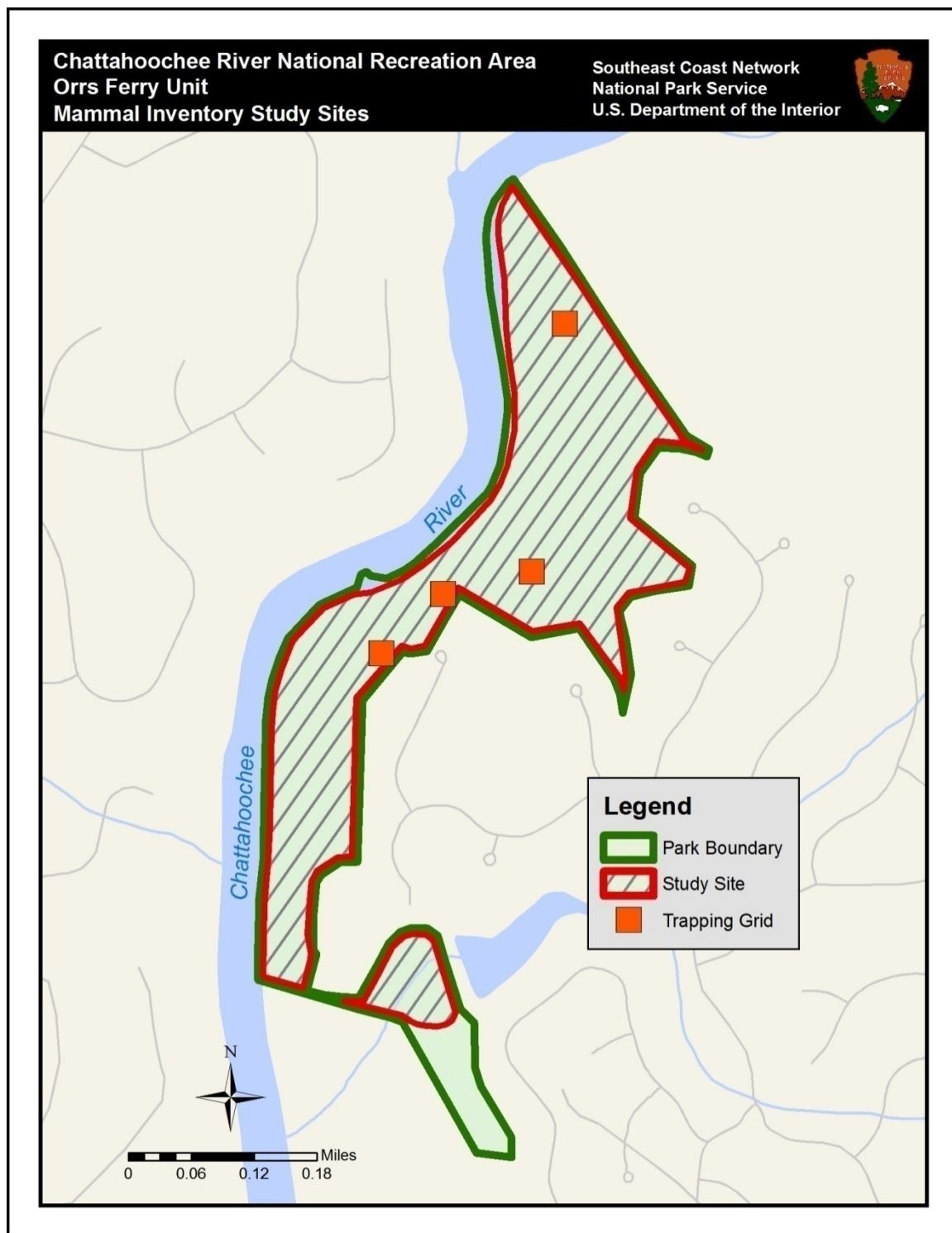


Figure 9. Mammal survey locations at Chattahoochee River National Recreation Area, Orrs Ferry Unit.

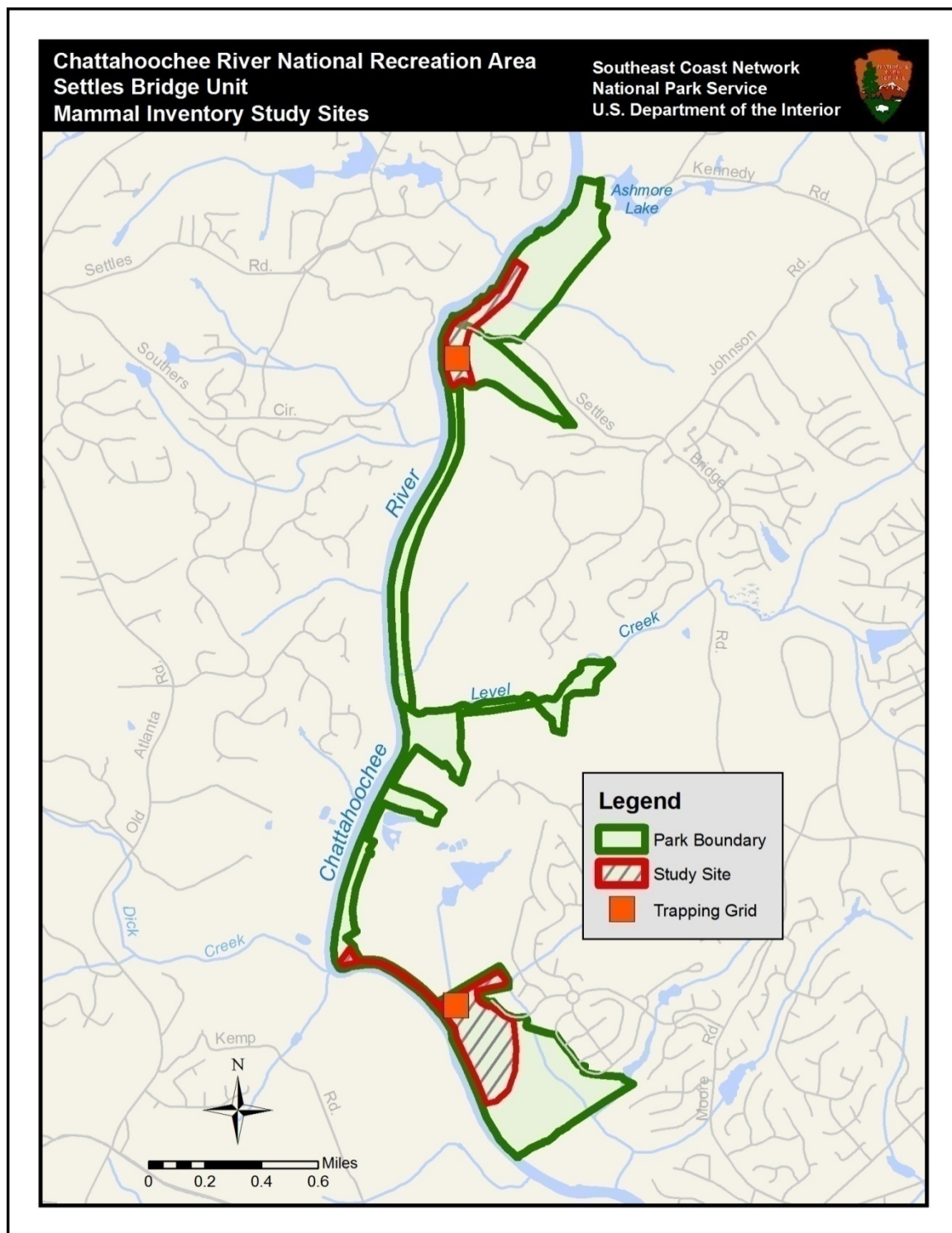


Figure 10. Mammal survey locations at Chattahoochee River National Recreation Area, Settles Bridge Unit.

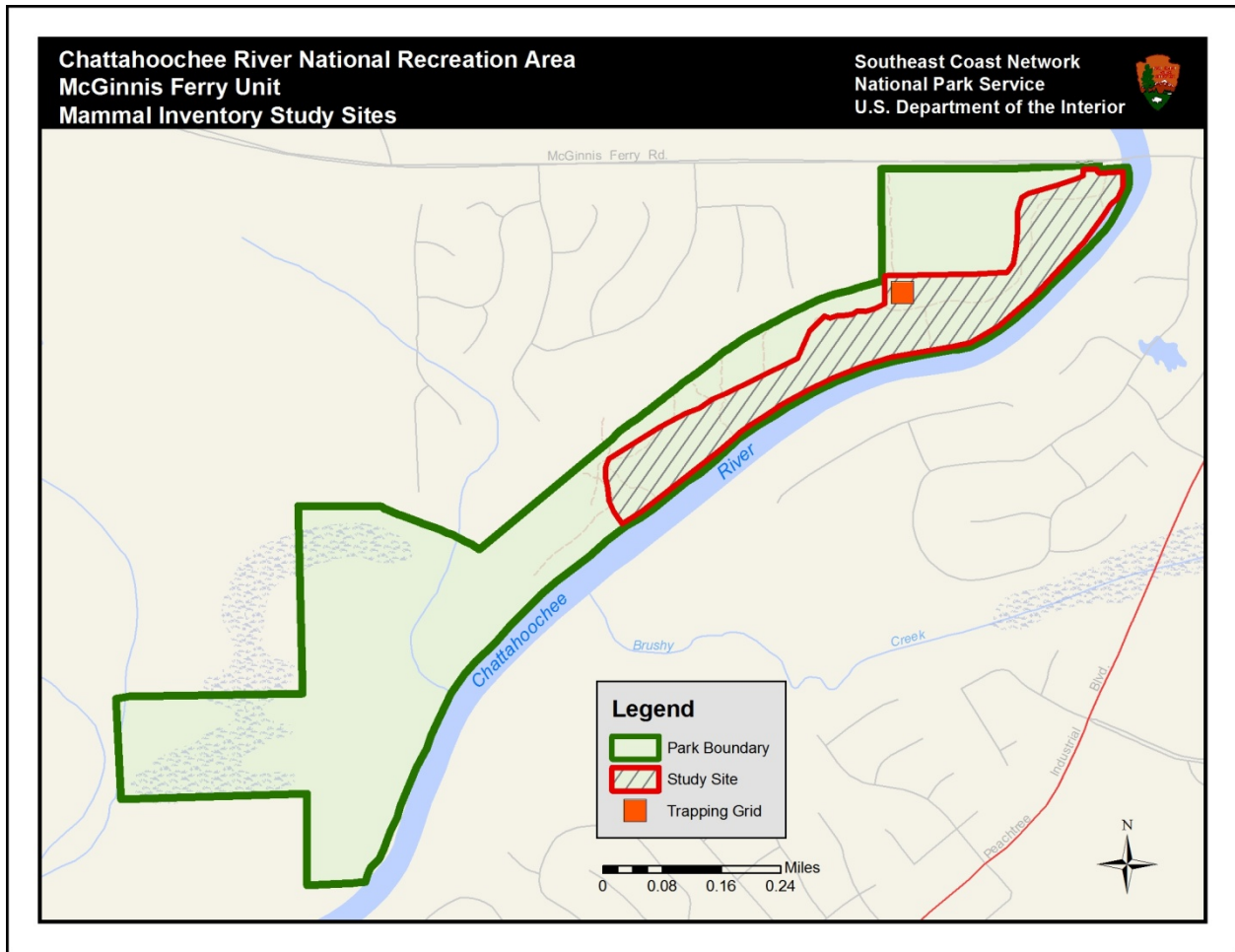


Figure 11. Mammal survey locations at Chattahoochee River National Recreation Area, McGinnis Ferry Unit.

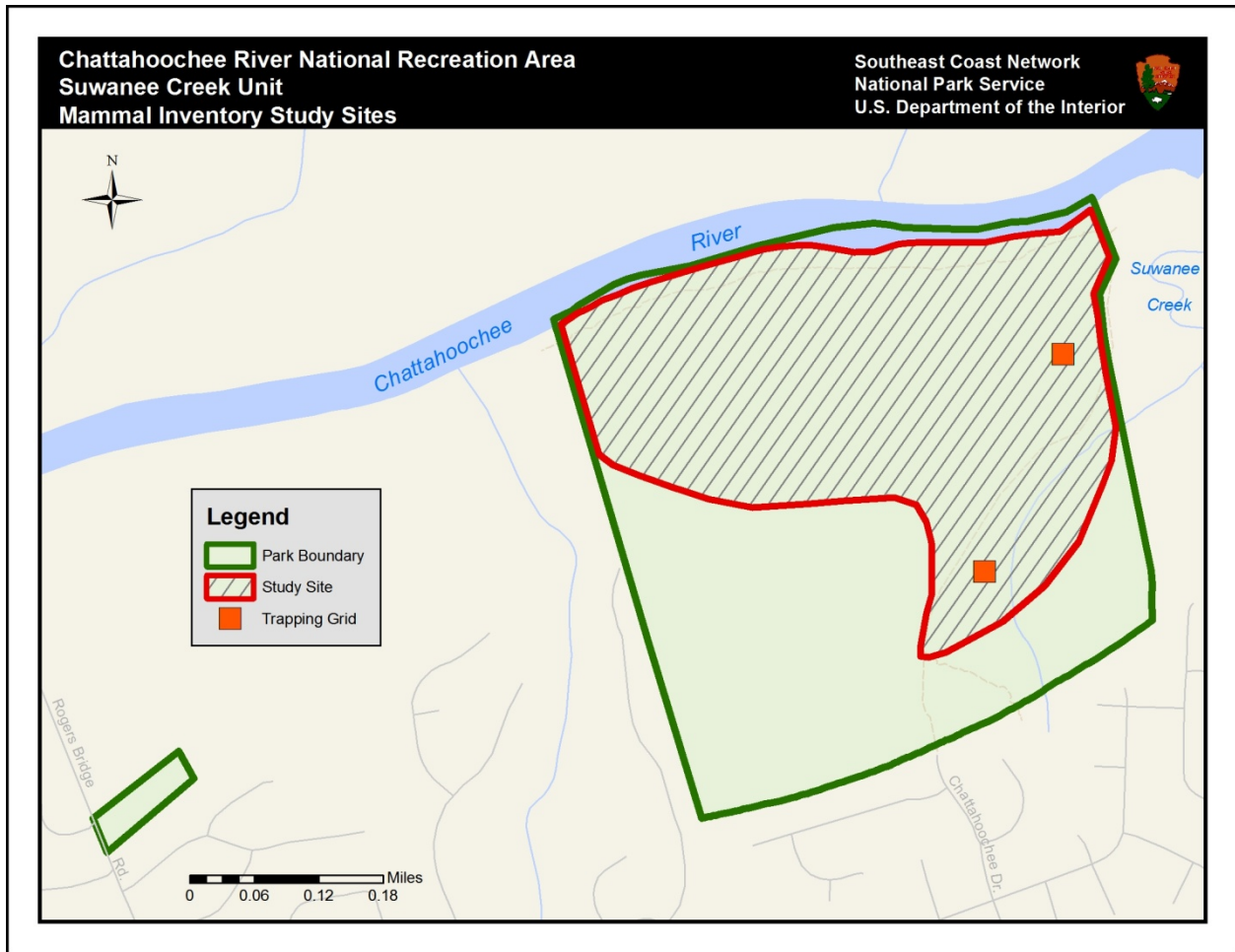


Figure 12. Mammal survey locations at Chattahoochee River National Recreation Area, Suwannee Creek Unit.

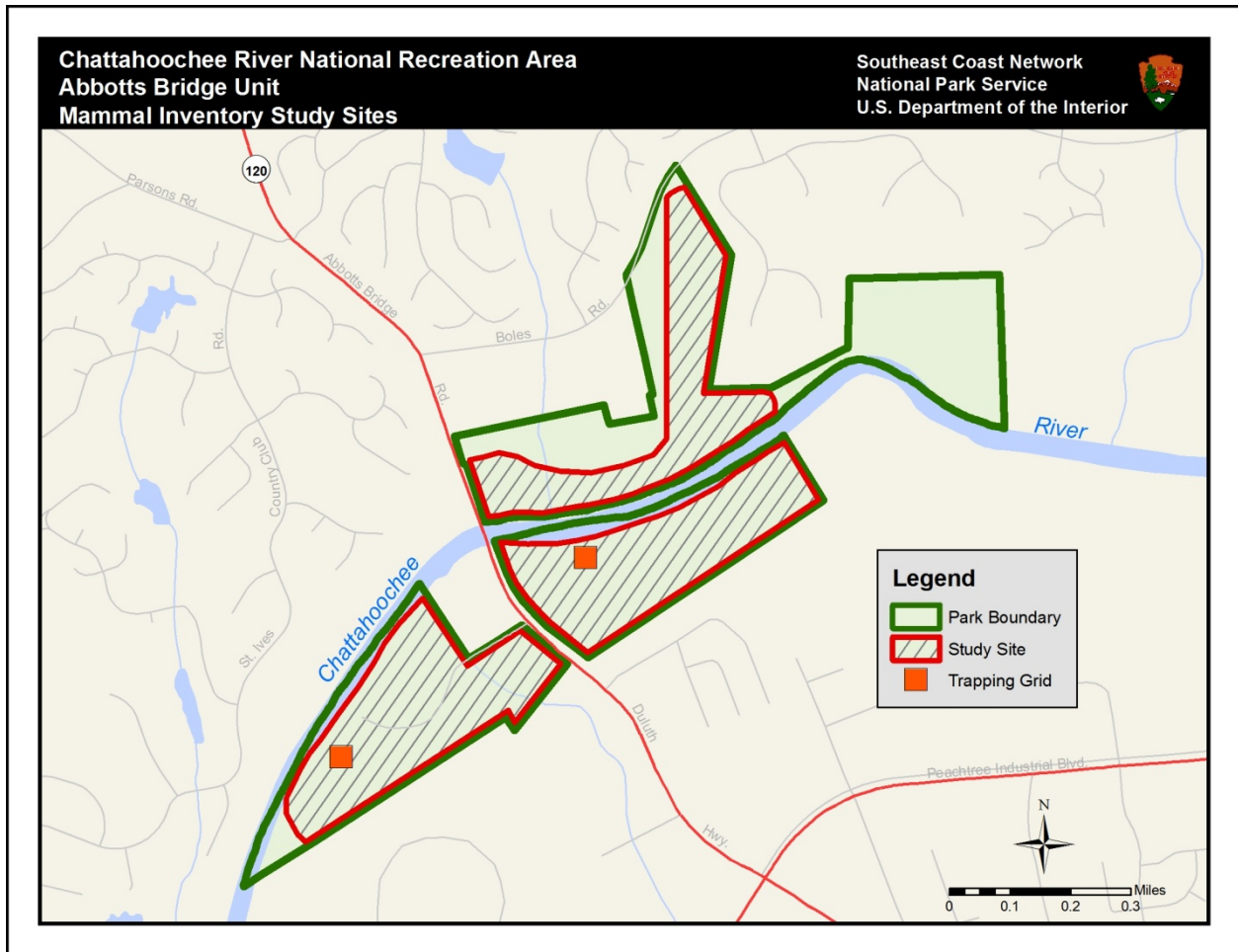


Figure 13. Mammal survey locations at Chattahoochee River National Recreation Area, Abbotts Bridge Unit.

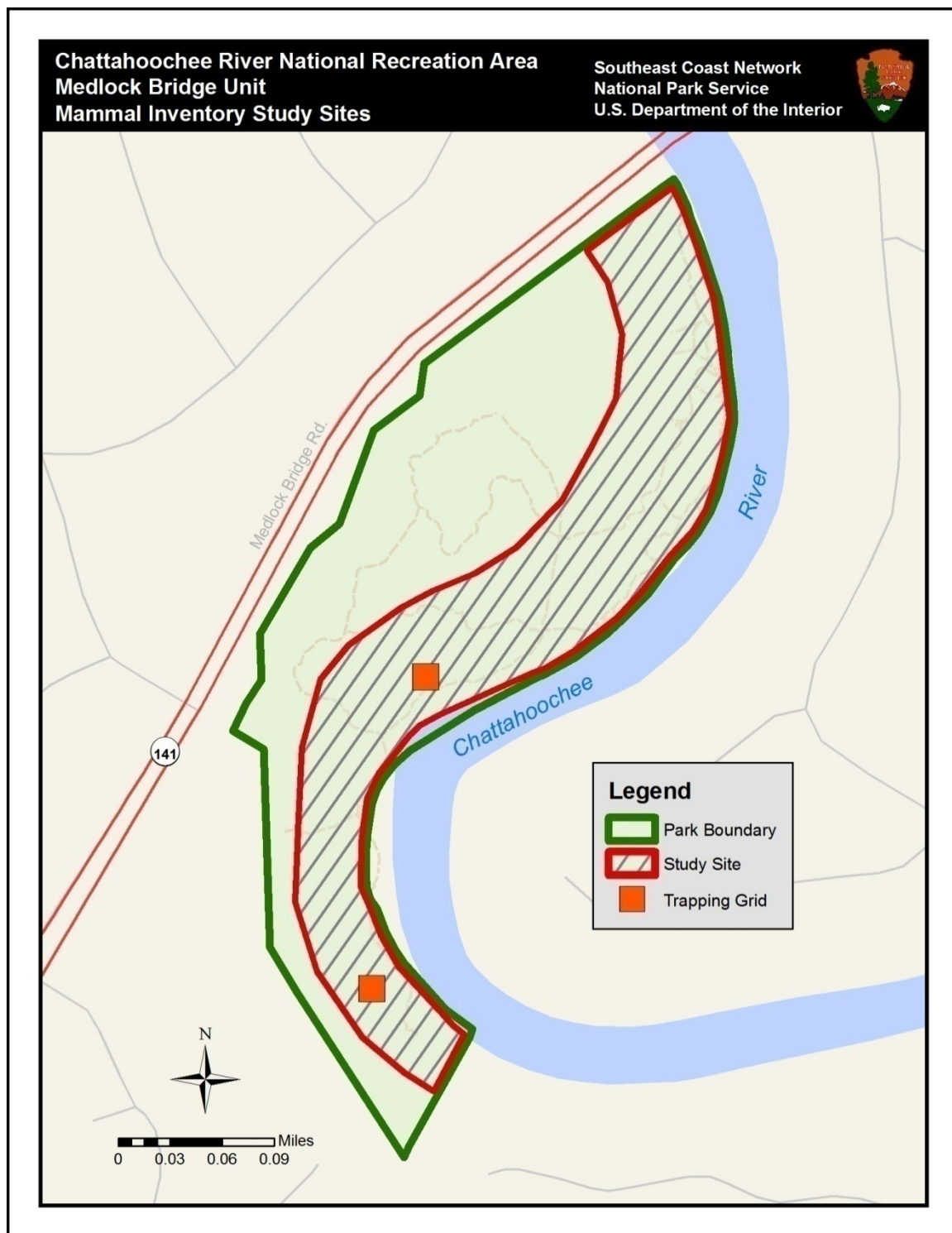


Figure 14. Mammal survey locations at Chattahoochee River National Recreation Area, Medlok bridge Unit.

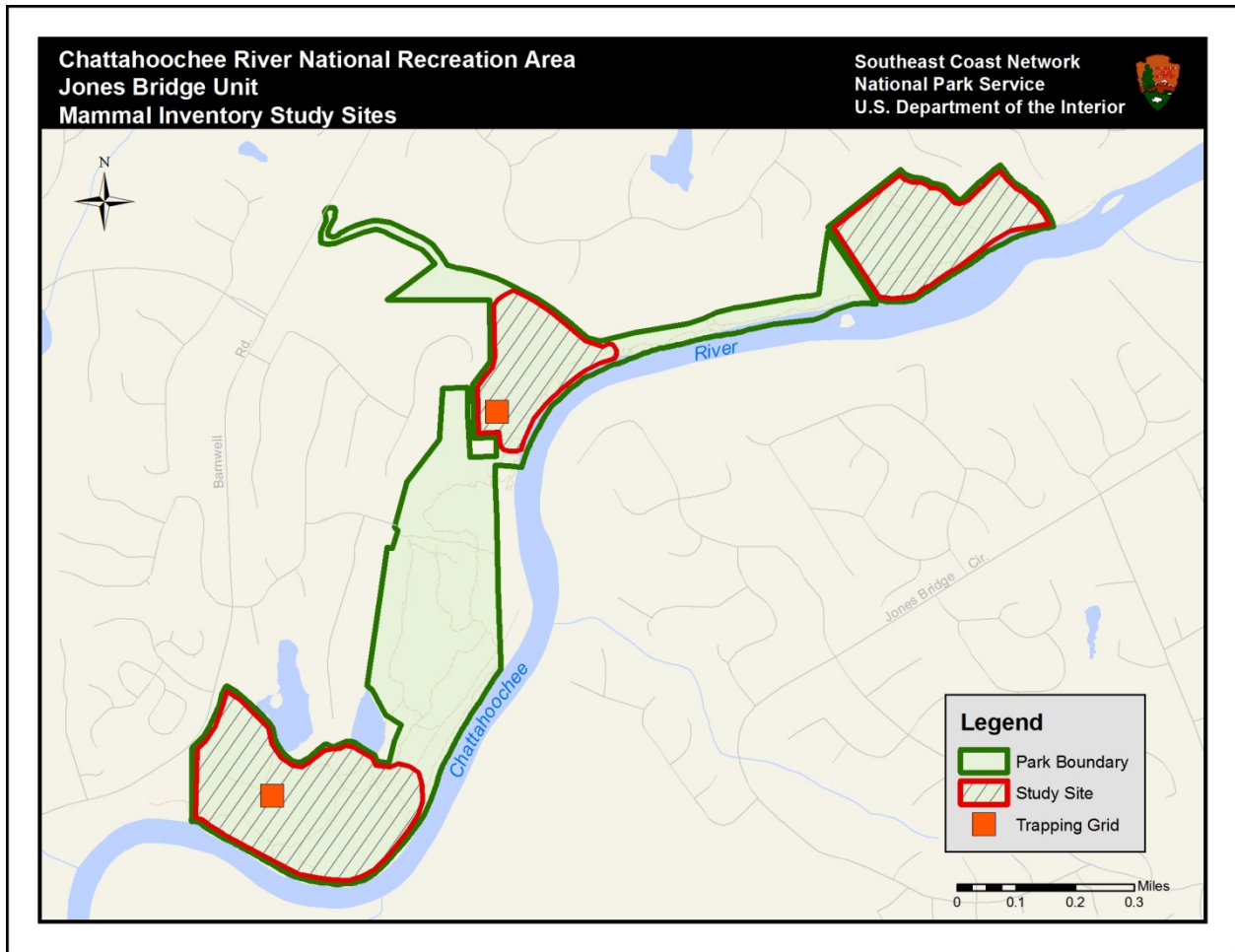


Figure 15. Mammal survey locations at Chattahoochee River National Recreation Area, Jones Bridge Unit.

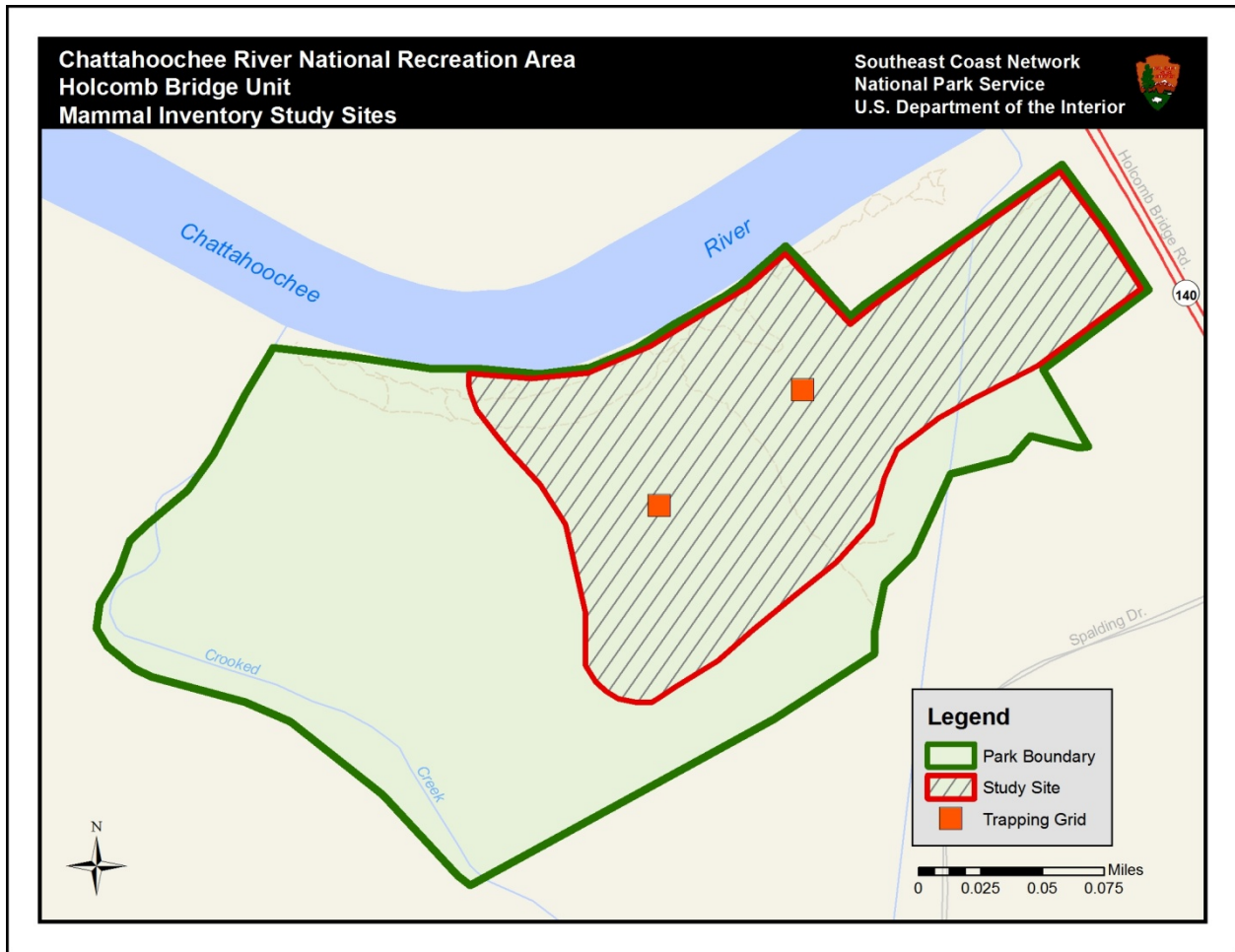


Figure 16. Mammal survey locations at Chattahoochee River National Recreation Area, Holcomb Bridge Unit.

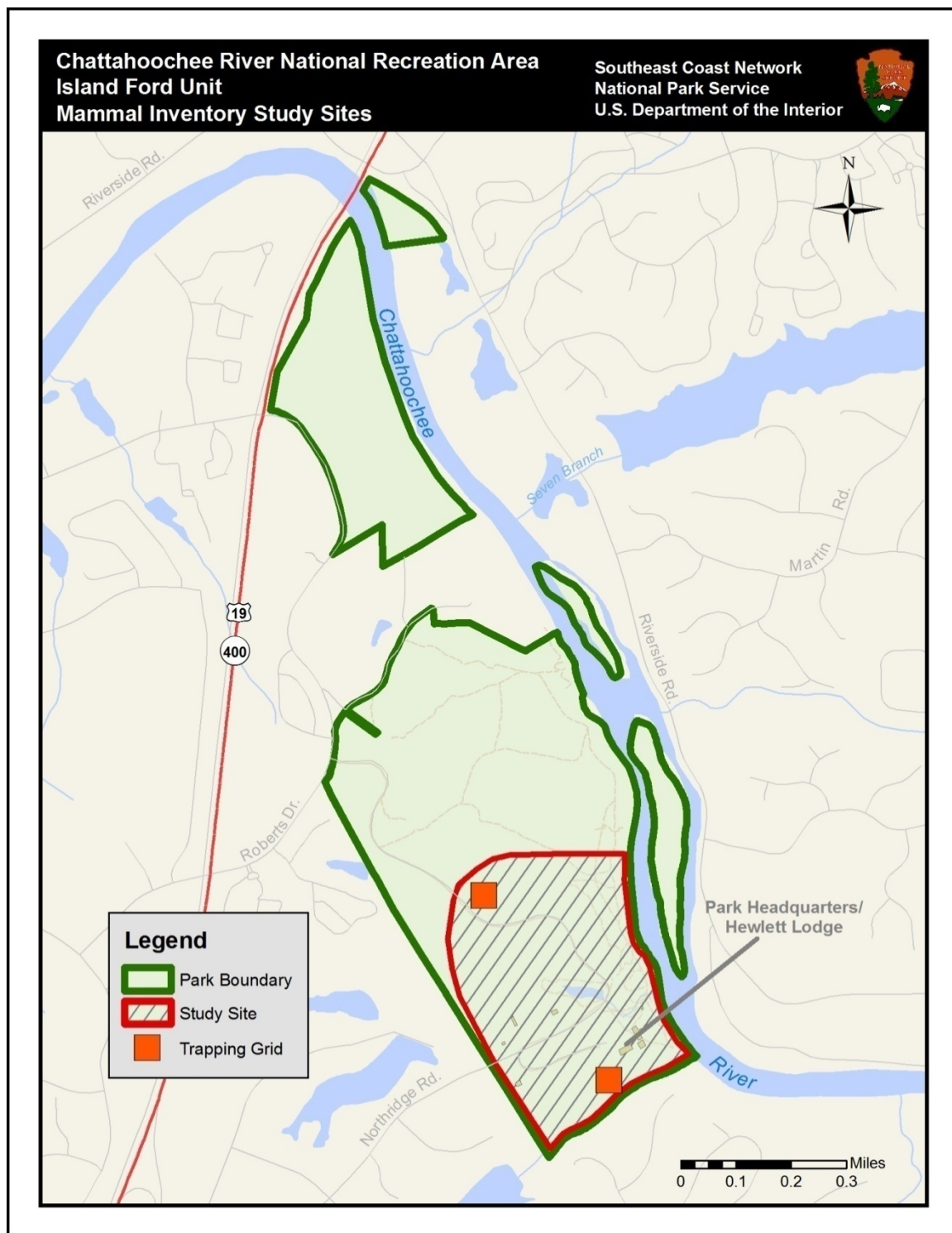


Figure 17. Mammal survey locations at Chattahoochee River National Recreation Area, Island Ford Unit.

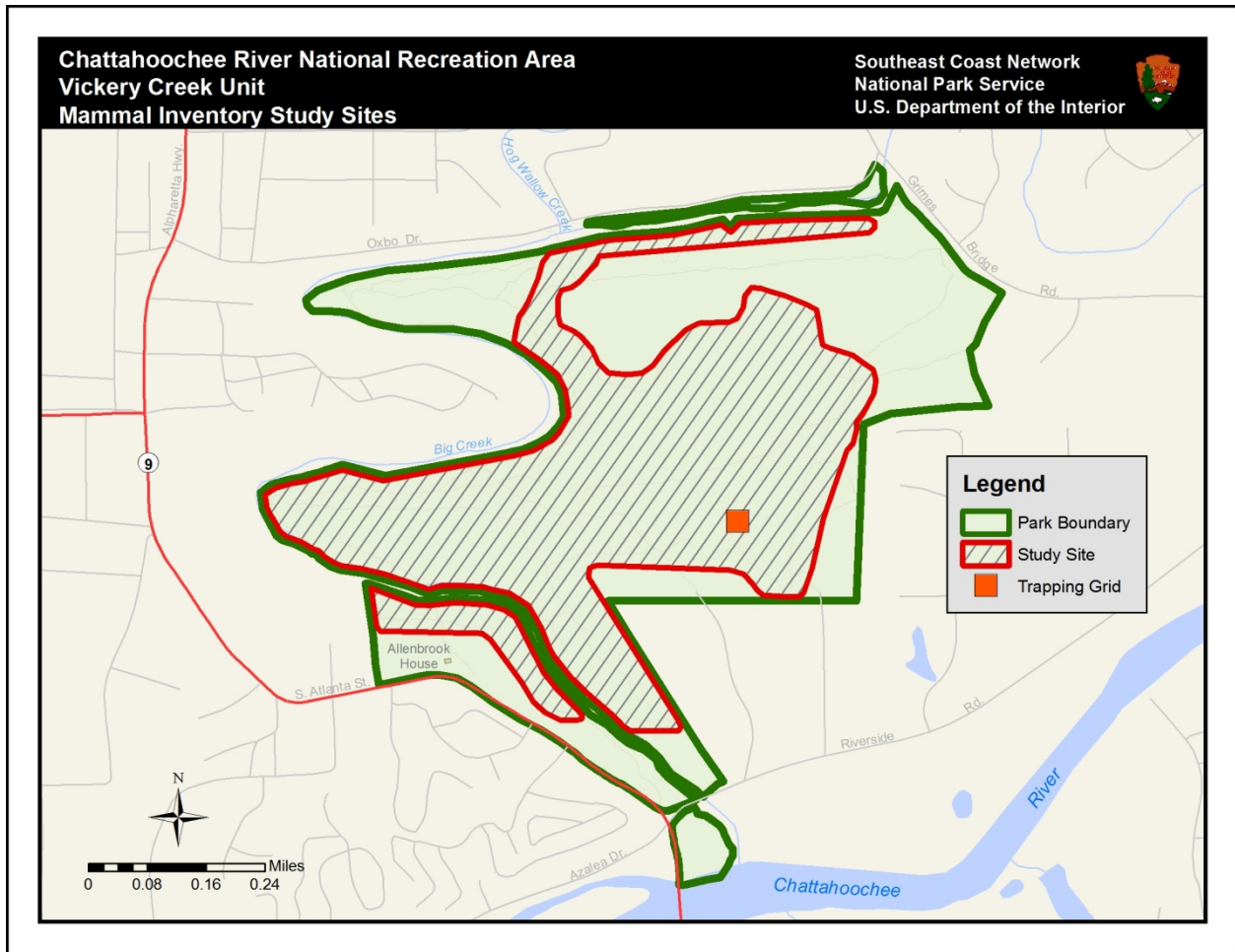


Figure 4. Mammal survey locations at Chattahoochee River National Recreation Area, Vickery Creek Unit.

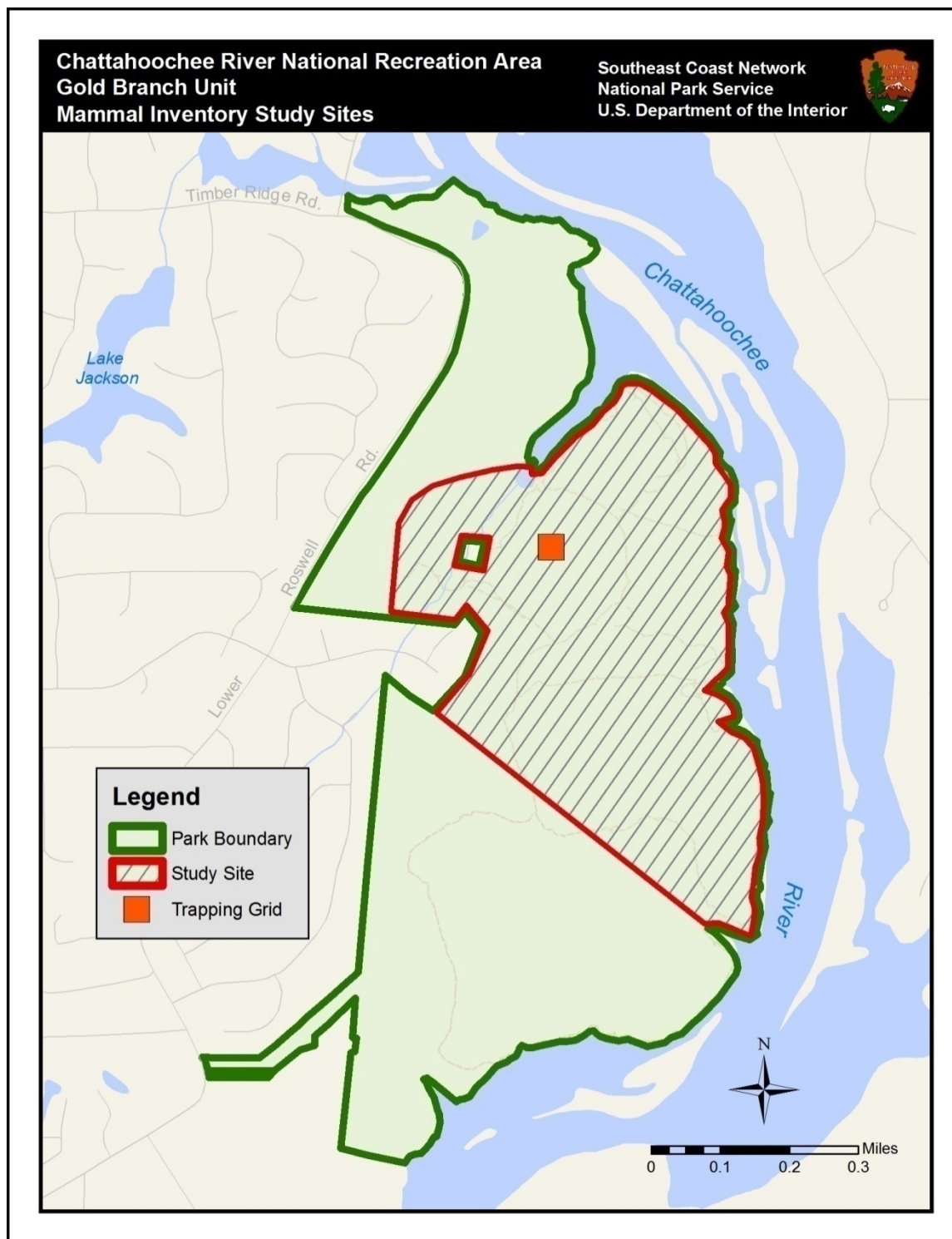


Figure 19. Mammal survey locations at Chattahoochee River National Recreation Area, Gold Branch Unit.

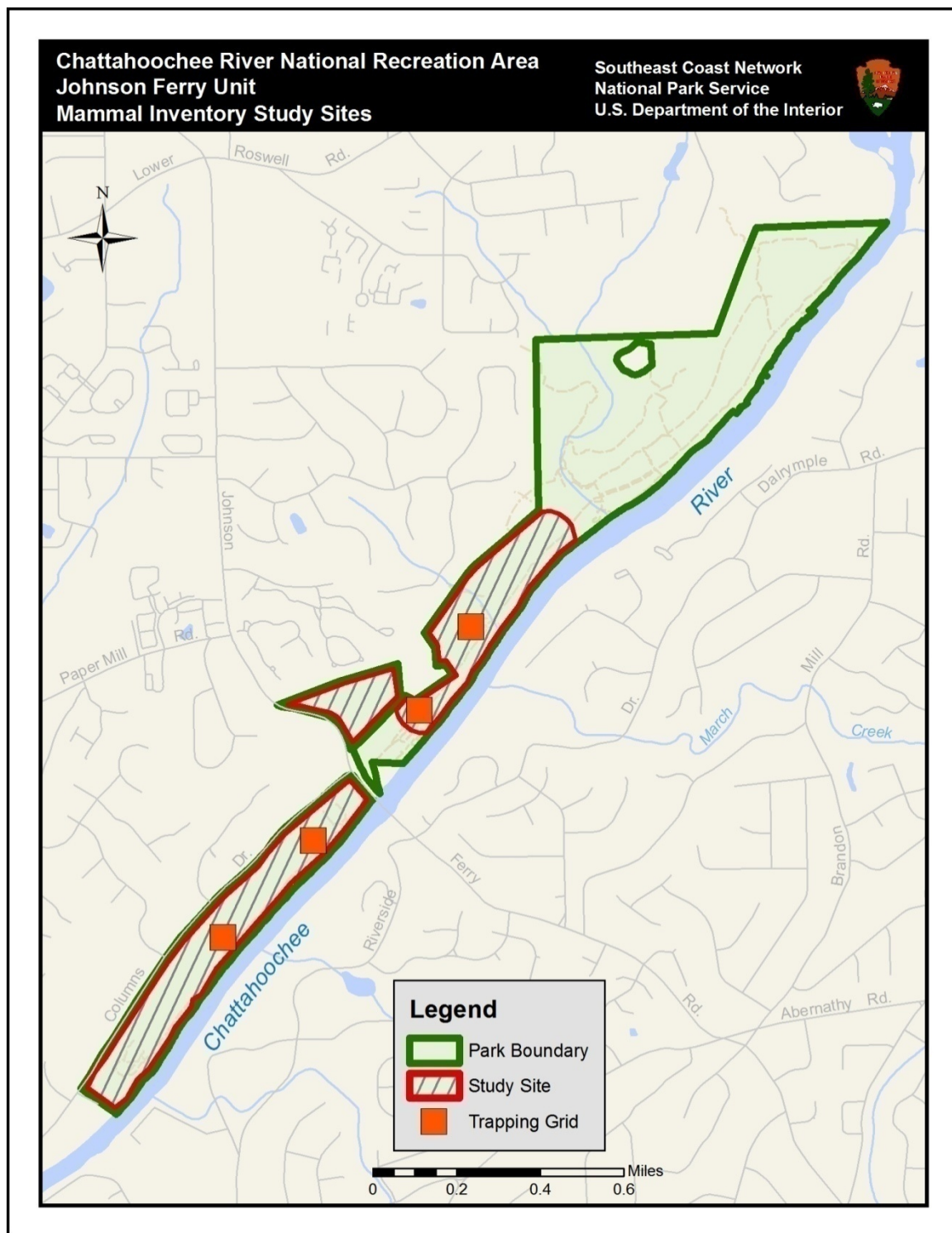


Figure 20. Mammal survey locations at Chattahoochee River National Recreation Area, Johnson Ferry Unit.

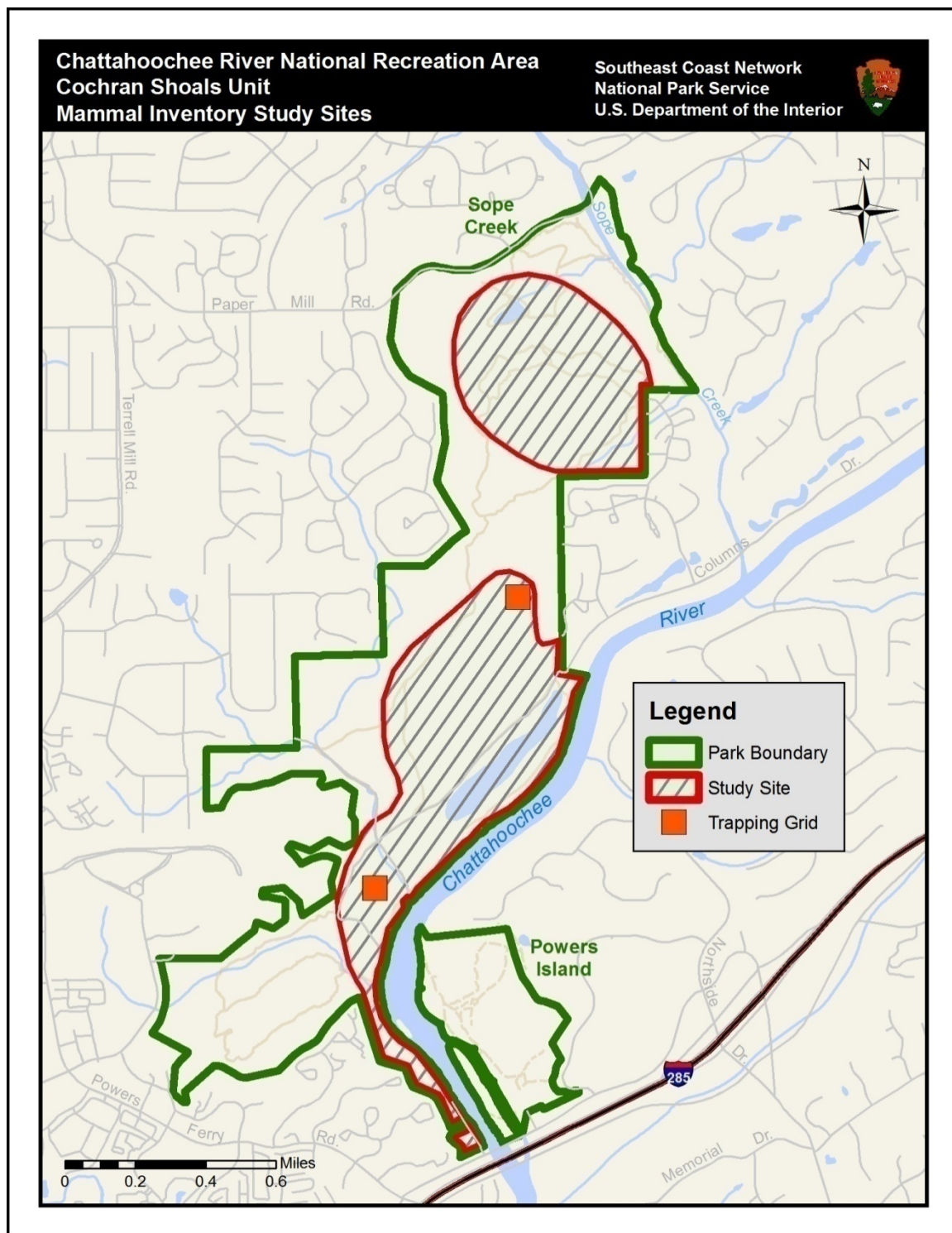


Figure 21. Mammal survey locations at Chattahoochee River National Recreation Area, Cochran Shoals Unit.

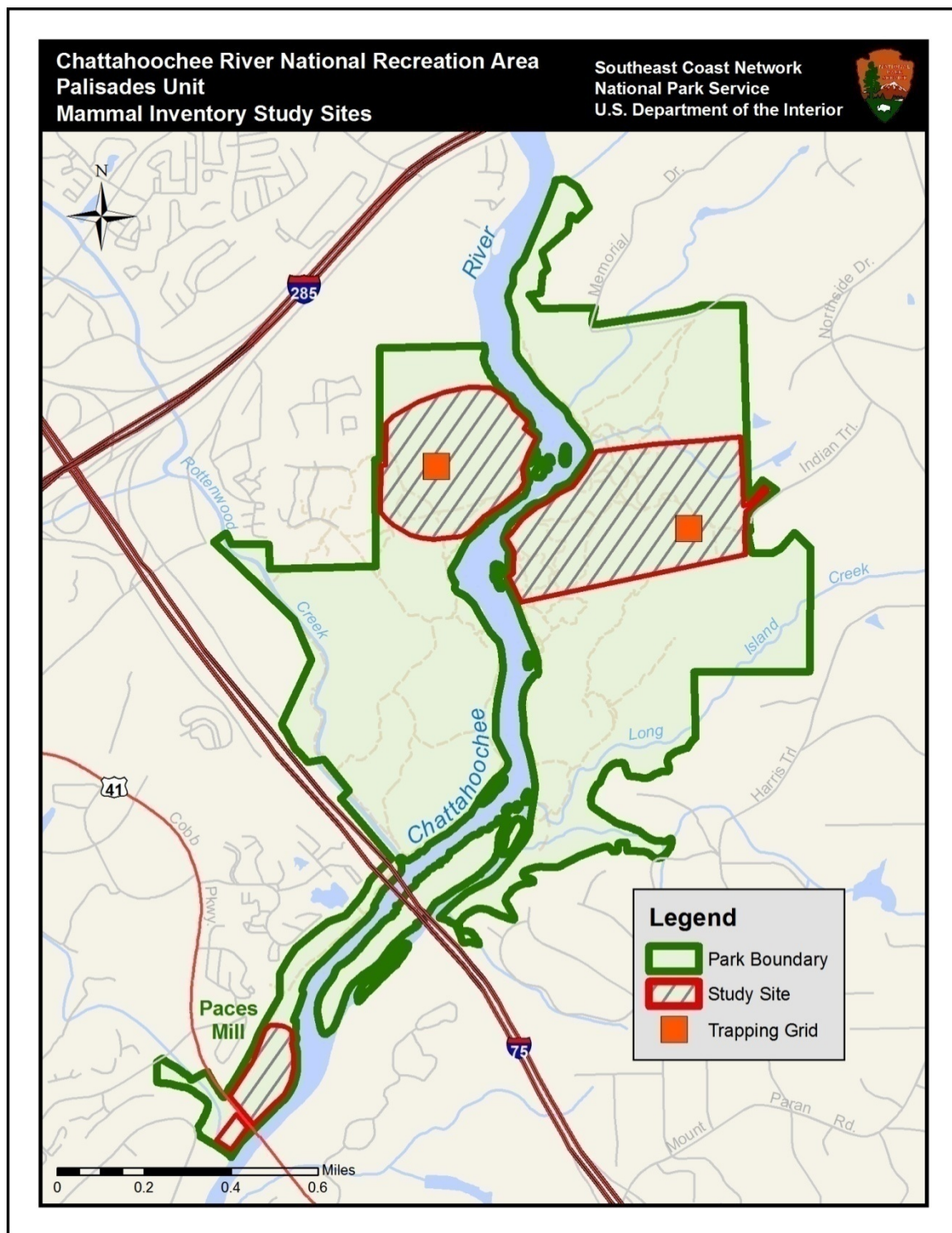


Figure 22. Mammal survey locations at Chattahoochee River National Recreation Area, Palisades Unit.

Congaree National Park (CONG)

Congaree National Park contains the largest intact tract of old-growth bottomland forest in the United States. CONG is situated on the north side of the Congaree River, approximately 32 km (20 mi) southeast of Columbia, Richland County, South Carolina. Most of the park's 26,546 acres is in the floodplain of the Congaree River, with its meandering creeks and oxbow lakes, but there also is upland habitat along the park's northern boundary and there are hammocks in the park's interior. The park is dominated by bald cypress, tupelo, a variety of oaks, and loblolly pine, including some of the largest individuals in the United States; some of the park consists of stagnant pine plantations. Access to the park's interior is limited to a boardwalk, numerous trails that are often inundated, and canoeing.

There apparently has been little effort to document the mammalian fauna of CONG, other than a general list provided in Dennis (1966). A list of 32 potential species (25 terrestrial and seven bats) was provided to the NPS by staff at the University of California-Davis in 1992, with additional notations that the swamp rabbit and American black bear were "probably absent." A checklist of mammal species available at the Visitor Center included 34 species (26 terrestrial and eight bats). Neither of these resources listed the red wolf or mountain lion, which have been extirpated from the region, the coyote, which has recently immigrated into the region, or exotics other than the feral pig. Burde and Feldhamer (2005) opined that 23 species of terrestrial mammals, including the eastern chipmunk, inhabited CONG, but they did not include small rodents in their checklist. According to NPS data, eight species of mammals have been documented on park property, although 42 NPS species are listed as possibly occurring in the park (Table 2). This investigation appears to be the first comprehensive survey of the terrestrial mammalian fauna of CONG.

Fieldwork began on 22 May 2003 and ended on 7 April 2004, encompassing a total of 22 man-days in the field, including two man-days by boat on the Congaree River. Park personnel were particularly interested in the survey and were very helpful in the fieldwork. Additional time was spent canvassing museum collections for specimens from Richland County, South Carolina, and surrounding counties. Personnel from the Museum of Southwestern Biology collected a marsh rice rat, 16 cotton mice, and three eastern woodrats from CONG in 1995 as part of a large survey to document the extent of hanta virus in rodents in the southeastern United States (Mills et al. 1998). In addition, personnel at the Georgia Museum of Natural History collected one marsh rice rat and 22 cotton mice from "Hwy 610, 1 mi N Congaree River" (Boone et al. 1999), a site that now is likely part of the CONG, and Cromer et al. (2007) reported southeastern shrews and southern short-tailed shrews from CONG. Six museums have specimens from Richland County, South Carolina – the Museum of Comparative Zoology has an eastern gray squirrel, a northern raccoon, and a bobcat; the Sternberg Museum of Natural History has specimens of the southern short-tailed shrew, eastern harvest mouse, oldfield mouse, white-footed mouse, cotton mouse, golden mouse, hispid cotton rat, and eastern woodrat; the University of Kansas has three oldfield mice; the University of Michigan has an eastern fox squirrel; the University of North Carolina Wilmington has a southern short-tailed shrew; and the U.S. National Museum of Natural History has an eastern fox squirrel and a golden mouse. Golley (1966) also provided Richland County records for the Virginia opossum, southern short-tailed shrew (listed as *Blarina brevicauda*), eastern mole, star-nosed mole, marsh rabbit, southern flying squirrel, hispid cotton rat, common muskrat, house mouse, common gray fox, American black bear, long-tailed weasel, American mink, and northern river otter. Finally, Merriam (1895) reported the southern short-tailed shrew

(listed as *Blarina brevicauda carolinensis*) from Richland County, South Carolina, and Mayer and Brisbin (1991) reported feral pigs from “Congaree Swamp.”

Five major terrestrial habitats were identified – creek and river edges, bottomland forest, upland oak-hickory forest, upland managed pine plantation, and mechanically maintained camping areas and road edges. Most fieldwork (Sherman livetraps, pitfall traps, and extensive ground truthing for spoor) occurred along the perimeter of the park, including the bottomland forest off of South Cedar Creek Road and the service road on the western boundary of the park, pine plantation off of Griffins Creek Road and Garrick Road, and the grassy field surrounding the after-hours camping area near the entrance to the park (Figure 23). Kingsnake Trail, Weston Lake Trail, Oak Ridge Trail, the boardwalk, and the logging roads off of Griffins Creek Road were used as primary footpaths for ground truthing, and a boat was used to access the southern boundary of the park. No attempt was made to access the recently-acquired property at the confluence of the Congaree and Wateree rivers, as this property was obtained after fieldwork was completed. Nonetheless, much of this habitat appears to consist of floodplain forest and the mammalian fauna in both areas should be identical. Bats were not included in this investigation.

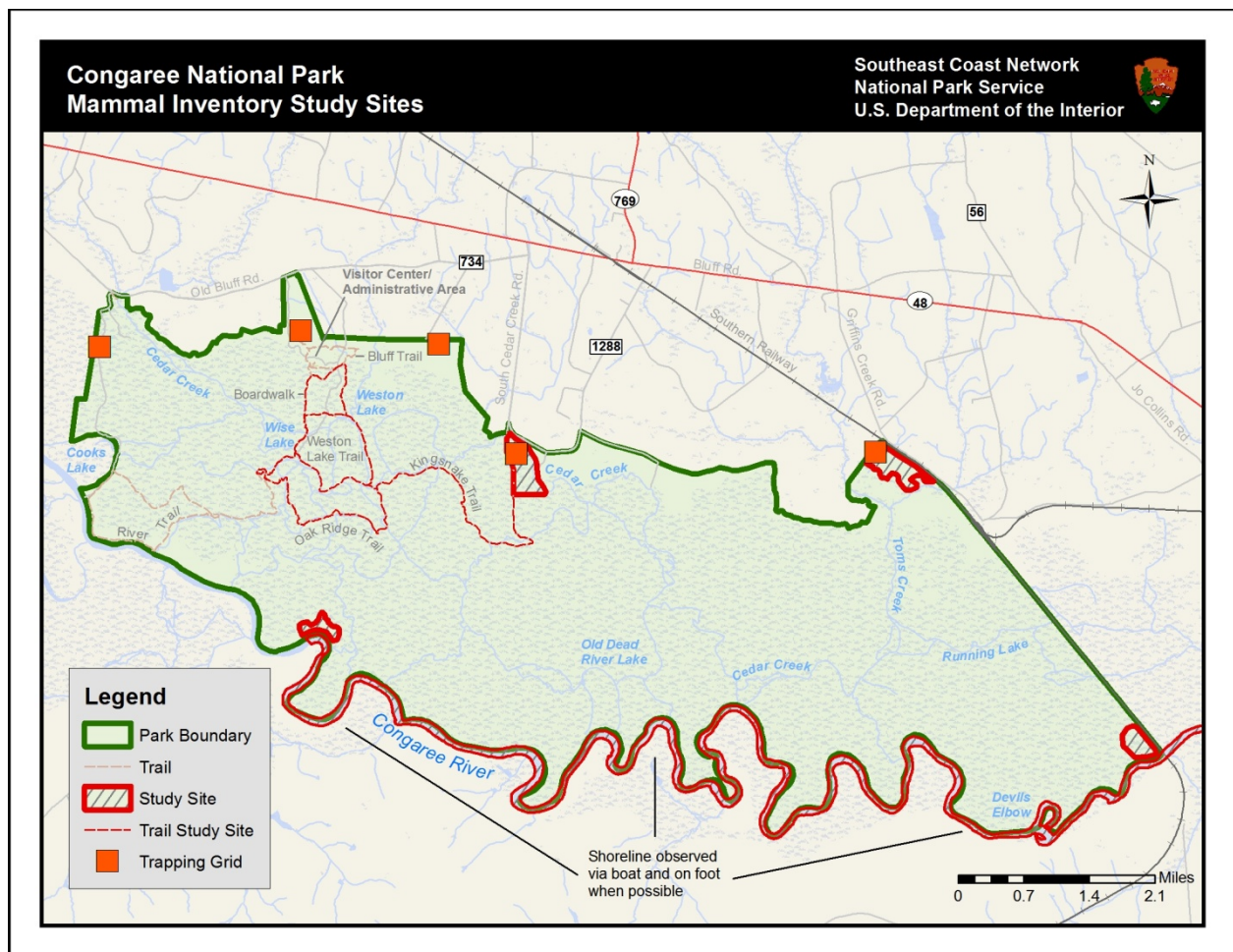


Figure 23. Mammal survey locations at Congaree National Park.

Twenty-seven species of terrestrial mammals were documented on the park property during the course of this project (Table 10), but the domestic dog and domestic horse are not permanent residents of the park and should not be included in subsequent park lists. Nine other species of mammals that are widely distributed in the southeastern United States were not encountered on park property, but each would be expected at CONG (Table 10). The red wolf, American black bear, and mountain lion no longer inhabit the region, although reports of bears in the Congaree-Wateree-Upper Santee floodplains continue to surface from time to time. The oldfield mouse and red fox occur in the region surrounding CONG, but they are not permanent residents of the park because suitable habitat is lacking. Nonetheless, there are records of red foxes in Clarendon County, South Carolina (Golley 1966); this species is extremely vagile and should be expected to occur in the park from time to time. The oldfield mouse has been collected at Fort Jackson (10 mi E Columbia), Richland County, South Carolina, but it has narrow habitat requirements, which are not present at CONG. The eastern chipmunk and white-footed mouse, common to abundant in the Upper Piedmont and Mountains, have geographic distributions that terminate northwest of CONG; the nearest chipmunk records are from Abbeville and Spartanburg counties (Golley 1966) and the nearest white-footed mouse records are from Fort Jackson in Richland County (MHP specimens) and an unspecified locality in Fairfield County, South Carolina (Golley 1966). The eastern spotted skunk, rare along the Savannah River and in the Mountains, has a geographic distribution that terminates west of CONG in Aiken County, South Carolina (Golley 1966). Therefore, 34 species of terrestrial mammals were documented as occurring or probably occurring on park property.

Several species of exotic mammals inhabit CONG, and they should be carefully monitored to determine if they are affecting native species and community structure. In particular, feral pigs have caused extensive damage in the forested parts of CONG by their foraging and wallowing activities. Feral cats are another exotic species that actively preys on native birds, small mammals, and reptiles; the negative effect of feral cats is much more subtle and difficult to quantify without tremendous cost in labor and supplies. Active management of these two species is recommended. The effect that black rats, Norway rats, and house mice have on native plant communities has not been adequately assessed, but these rodents are not native and their effects likely are detrimental.

No terrestrial mammal species at CONG is considered to be imperiled by the U.S. Fish and Wildlife Service. Three species of mammals that once were widely distributed in the eastern United States (red wolf, American black bear, and mountain lion) have been extirpated from the CONG region. There are no records of red wolves from Richland County, South Carolina, or the surrounding counties, but there is a historic record of bears from Richland County (Golley 1966). In addition, Lawson (1718) and Young (1946) reported mountain lions from the “Congaree section” and “Santee River” of South Carolina, respectively, and Mills (1826) mentions a mountain lion from Wambow Swamp in Charleston County, so these large cats were in the region in historic times. At the state level, the star-nosed mole is listed as Special Concern and ranked S3?, and the eastern fox squirrel is listed as Special Concern and ranked S4. On a related note, mink from Richland County, South Carolina, had elevated levels of DDE, PCB, and mercury in liver and kidney tissues, which causes severe reproductive dysfunction (Osowski et al. 1995).

On a landscape scale, the 34 species of mammals considered to be or expected to be Present at CONG have widespread geographic distributions in the eastern United States (Hall 1981; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy many of the five habitats identified in this report. Species associated primarily with early successional and grassland-forest ecotonal habitats include the least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, eastern harvest mouse, hispid cotton rat, woodland vole, house mouse, long-tailed weasel, striped skunk, feral cat, and bobcat. Species typically associated with the upland hardwood and stagnant pine forests at CONG include the Virginia opossum, southeastern shrew, southern short-tailed shrew, eastern mole, eastern gray squirrel, southern flying squirrel, cotton mouse, golden mouse, woodland vole, black rat, Norway rat, coyote, common gray fox, northern raccoon, long-tailed weasel, feral cat, bobcat, and white-tailed deer. Species typically associated with the floodplain forest at CONG include the Virginia opossum, southern short-tailed shrew, eastern gray squirrel, southern flying squirrel, cotton mouse, golden mouse, coyote, common gray fox, northern raccoon, long-tailed weasel, American mink, northern river otter, feral cat, bobcat, feral pig, and white-tailed deer. Species associated primarily with aquatic habitats include the star-nosed mole, marsh rabbit, American beaver, marsh rice rat, common muskrat, and northern river otter. Five other species that currently are ascribed to the CONG region or that once existed in the CONG region, either have insufficient segments of suitable habitat or have been extirpated from central South Carolina, and each does not exist or no longer exists at CONG, respectively.

Table 10. Status of 44 terrestrial mammals at Congaree National Park.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X	X		Evidence in CONG
Southeastern shrew	Present	X	X	X		Evidence in CONG
Least shrew	Present	X	X	X		Evidence in CONG
Southern short-tailed shrew	Present	X	X	X		Evidence in CONG
Eastern mole	Present	X			X	Evidence in CONG
Eastern cottontail	Present	X	X	X		Evidence in CONG
Eastern gray squirrel	Present	X		X	X	Evidence in CONG
Eastern fox squirrel	Present	X			X	Evidence in CONG
Southern flying squirrel	Present	X		X		Evidence in CONG
American beaver	Present	X			X	Evidence in CONG
Marsh rice rat	Present	X	X	X		Evidence in CONG
Eastern harvest mouse	Present	X	X			Evidence in CONG
Cotton mouse	Present	X	X	X		Evidence in CONG
Hispid cotton rat	Present	X			X	Evidence in CONG
Eastern woodrat	Present	X	X	X		Evidence in CONG
Coyote	Present	X			X	Evidence in CONG
Feral dog	Present	X			X	Evidence in CONG
Common gray fox	Present	X	X	X		Evidence in CONG
Northern raccoon	Present	X		X	X	Evidence in CONG
American mink	Present	X		X	X	Evidence in CONG
Northern river otter	Present	X		X	X	Evidence in CONG
Striped skunk	Present	X		X		Evidence in CONG
Feral cat	Present	X			X	Evidence in CONG
Bobcat	Present	X		X	X	Evidence in CONG
Feral horse	Present	X			X	Evidence in CONG
Feral pig	Present	X	X	X		Evidence in CONG
White-tailed deer	Present	X	X	X		Evidence in CONG
Star-nosed mole	Probably Present					Evidence in region
Marsh rabbit	Probably Present					Evidence in region
Golden mouse	Probably Present					Evidence in region
Woodland vole	Probably Present					Evidence in region
Common muskrat	Probably Present					Evidence in region
Black rat	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Long-tailed weasel	Probably Present					Evidence in region
Red wolf	Absent					Extirpated
American black bear	Absent					Extirpated
Mountain lion	Absent					Extirpated

Cumberland Island National Seashore (CUIS)

Cumberland Island National Seashore is the southernmost island in southeastern Georgia. At 28.2 km (17.5 mi) in length and encompassing a diverse mosaic of habitats across its 36,347 acres, it is the second largest park in the Southeast Coast Network,. CUIS is part of the South Atlantic-Carolinian Biosphere Reserve and much of the northern half of the island has been designated as a wilderness area.

CUIS has been the focus of extensive scientific explorations over the last 120 years, and the mammalian fauna of CUIS is well known. The first major fieldwork to document the mammals of the island was conducted in the 1890s by Outram Bangs of the Museum of Comparative Zoology at Harvard University (Bangs 1898). Bangs described two new mammals from Cumberland Island – the Cumberland Island pocket gopher and the Cumberland Island cotton mouse – as well as other species from the immediate vicinity of Cumberland Island (currently these three taxa are not considered to be distinct). Cumberland Island’s uniqueness greatly intrigued early American mammalogists, leading to investigations of the island by personnel from several museums in the United States, including the American Museum of Natural History, Charleston Museum, Cornell University, Delaware Museum of Natural History, Field Museum of Natural History, Museum of Vertebrate Zoology, and the U.S. National Museum of Natural History, among others. Over the last four decades, personnel at the Georgia Museum of Natural History and Museum of Southwestern Biology have sent field crews to Cumberland Island. All told, over 300 specimens, representing about 20 terrestrial species, exist in these museums. In addition, the Cumberland Island Museum, which is not affiliated with the National Park Service, contains the largest number of natural history specimens from Cumberland Island, although the total number of mammals in this collection is unknown to me because I was not allowed to catalogue the collection.

Comprehensive checklists of the mammalian fauna of Cumberland Island date back to Bangs (1898), who listed 11 species (eastern mole, marsh rabbit, eastern gray squirrel, southeastern pocket gopher, marsh rice rat, cotton mouse, hispid cotton rat, black rat, northern raccoon, American black bear, white-tailed deer) of terrestrial mammals on the island. A list of 20 potential terrestrial species, as well as four species of bats and six species of marine mammals, was provided to the NPS by staff at the University of California-Davis in 1992. According to NPS data, 34 species of terrestrial, flying, and marine mammals have been documented within park boundaries, although 57 NPSpecies are listed as possibly occurring in the park (Table 2). In addition, there are two pieces of gray literature providing checklists of mammals from Cumberland Island. *An ecological survey of the coastal region of Georgia, Appendix V, Annotated list of mammals of the coastal islands of Georgia* (Neuhauser and Baker 1974) lists 21 species of terrestrial mammals, four species of bats, and six species of marine mammals, although two species (least shrew and eastern harvest mouse) were reported on the basis of material removed from owl pellets, one species (eastern fox squirrel) certainly was introduced and is now extirpated, and two others (common gray fox and American black bear) were thought to be native to the island but are now extirpated. The second piece of gray literature, *Mammals of Cumberland Island* (Shoop and Ruckdeschel 2001), references 20 species of extant terrestrial mammals, five species of bats, 13 species of marine mammals, two species of extirpated terrestrial mammals, and seven species of terrestrial mammals that potentially occur at CUIS. Obviously, there is no consensus about how many species of terrestrial mammals inhabit CUIS.

Fieldwork began on 31 January 2004 and ended on April 2005, encompassing a total of 15 man-days in the field. Additional time was spent canvassing museum collections for specimens from Cumberland Island per se, from Camden County, Georgia, and from surrounding counties. This investigation is unique from the standpoint that it focuses on the personal examination of the extensive voucher material available in museum collections, which then was supplemented with ancillary fieldwork necessary to document changes in the mammalian fauna over the last century.

Eight major habitats were identified – foredune complex, interdune meadow, maritime thicket, maritime forest, salt grass meadow, mud flat, tidal creek, and salt marsh habitat. Fieldwork differed according to location (Figure 24), but all habitats were ground truthed extensively for spoor. Pitfall traps were installed in a young pine forest on the east side of Swamp Field and west of Yankee Paradise Trail (30°50.143'N, 81°27.291'W), an interdune meadow and thicket (30°54.739'N, 81°24.310'W) off North Cut Road, and in the maritime forest on the main road just north of Dungeness (30°44.954'N, 81°28.116'W). Sherman livetraps were set in a broken palmetto-“witness” oak forest (30°50.123'N, 81°27.171'W), along Willow Pond Trail where it crosses Swamp Field (30°50.030'N, 81°27.418'W), and in the salt marsh in Raccoon Keys (30°44.554'N, 81°28.691'W). Sherman livetraps and pitfall traps were set where Swamp Field drains into White Branch Creek (30°50.624'N, 81°27.319'W). Additional time was spent looking for evidence of the Florida salt marsh vole (*Microtus pennsylvanicus dukecampbelli*) in Swamp Field. *M. p. dukecampbelli* is found only in Waccasassa Bay in Levy County, Florida, and it is listed by the U.S. Fish and Wildlife Service as Endangered. Seashore saltgrass (*Distichlis spicata*), the prevailing vegetation at Waccasassa Bay, also is the dominant vegetation in Swamp Field. Unfortunately the characteristic clippings and scat deposited by meadow voles were not found at this site. Bats were not included in this investigation, and no attempt was made to inventory the mammals at the mainland site at Saint Marys, Georgia.

Seventeen species of terrestrial mammals were documented on the park property during the course of this project (Table 11). Two of these species have colonized CUIS in recent times, apparently without human intervention. The nine-banded armadillo, which steadily has been expanding its range northward from Florida, was first discovered on Cumberland Island in 1974 (Shoop and Ruckdeschel 2001). The coyote, a western species that has been moving eastward during the last century, did not inhabit the sea islands of Georgia until recently; I first documented its occurrence on Ossabaw Island on 29 April 2007 and, farther south, it colonized Cumberland Island, including CUIS, in 2004. Two other species of mammals (black rat and feral cat) that are widely distributed in the southeastern United States were not encountered on park property, but both were reported on Cumberland Island by Wilson and Durden (2003) and therefore would be expected to still inhabit CUIS (Table 11). Evidence of two species that historically have been present on Cumberland Island – the American beaver and American black bear – was not collected during the course of this investigation, but each is likely to occur there from time to time given their tendencies to wander great distances. Prior to European colonization of the southeastern United States, the southeastern pocket gopher and bobcat existed on Cumberland Island as well. The pocket gopher was extirpated in the 1970s (Ford 1985) and the bobcat died off in 1907 when a disease eradicated this insular population (Harper 1927).

Bobcats have since been reintroduced, five in 1972-73 (Carol Ruckdeschel personal communication) and 32 in 1989-90 (Radsdale 1993), and are thriving. Earlier reports of the

Virginia opossum on Cumberland Island (White 1849; Ober 1880) are suspect, as it was common in earlier days for natural historians to combine island and mainland sightings; this species was introduced, however, to Cumberland Island in 1993 according to Shoop and Ruckdeschel (2001) and is thriving at CUIS today. Three other species – eastern fox squirrel, African wild ass (burro), and feral cattle – were introduced to Cumberland Island in the past and one specimen of the former is deposited in the Carnegie Museum of Natural History. These species are not native to the island and they do not occur there today, so they should not be considered a part of the CUIS mammalian fauna. Discounting the southeastern pocket gopher, American beaver, eastern fox squirrel, American black bear, African wild ass, and feral cattle, 19 species of terrestrial mammals were documented as occurring or probably occurring on park property. No terrestrial mammal species at CUIS is considered to be imperiled by the U.S. Fish and Wildlife Service.

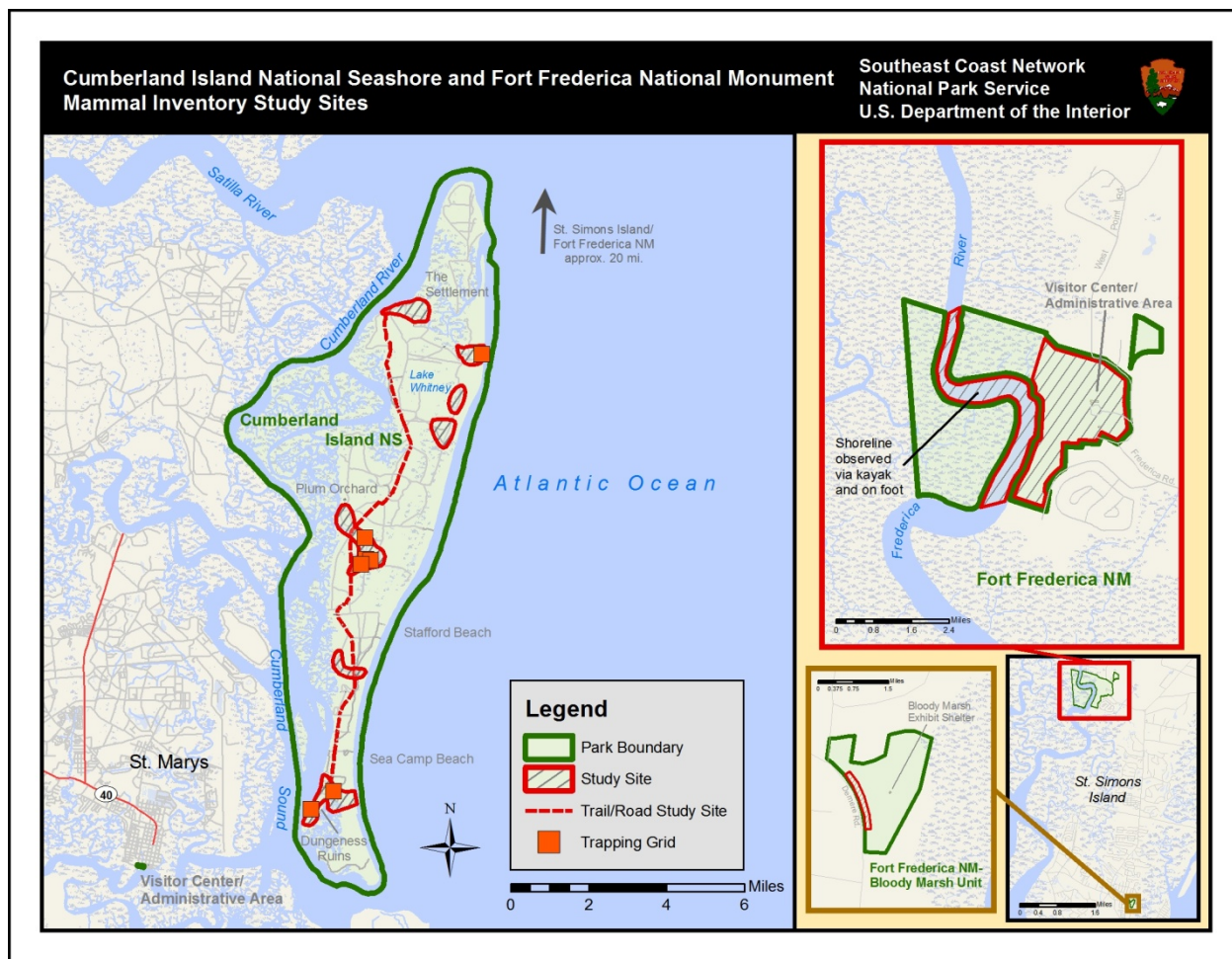


Figure 24. Mammal survey locations at Cumberland Island National Seashore and Fort Frederica National Monument.

Series of mammals from Cumberland Island are deposited at American Museum of Natural History (southeastern pocket gopher, cited in Laerm 1981, and marsh rice rat, cotton mouse, and hispid cotton rat), Carnegie Museum of Natural History (southeastern pocket gopher, cited in Laerm 1981, and eastern fox squirrel), Charleston Museum (white-tailed deer), Cornell

University (southeastern pocket gopher), Delaware Museum of Natural History (southeastern pocket gopher, cited in Laerm 1981), Florida Museum of Natural History (cotton mouse), Georgia Museum of Natural History (southern short-tailed shrew, eastern mole, marsh rabbit, eastern gray squirrel, southeastern pocket gopher, marsh rice rat, cotton mouse, hispid cotton rat, northern raccoon, American mink, and feral horse), Museum of Comparative Zoology (eastern mole, marsh rabbit, eastern gray squirrel, southeastern pocket gopher, marsh rice rat, cotton mouse, hispid cotton rat, black rat, northern raccoon, and white-tailed deer), Museum of Southwestern Biology (cotton mouse and hispid cotton rat), Museum of Vertebrate Zoology (southeastern pocket gopher and cotton mouse), University of Michigan (southeastern pocket gopher and cotton mouse), and U.S. National Museum of Natural History (southeastern pocket gopher and white-tailed deer). Moreover, although I did not catalogue the mammal collection at the Cumberland Island Museum, I was able to visually identify several species of mammals on 31 January 2005, when John Fry (Chief of Resources Management, CUIS) and I were given a one-hour tour of the site by Carol Ruckdeschel, who manages the facility. Based on this cursory examination, the Cumberland Island Museum (CIM) has specimens of the eastern mole, eastern gray squirrel, marsh rice rat, cotton mouse, hispid cotton rat, bobcat, and feral horse, among others. By way of example, 73 southern short-tailed shrews were collected on Cumberland Island in 2003 and 2004 to document the foods consumed by this voracious insectivore (Whitaker and Ruckdeschel 2006), and these specimens likely are deposited at CIM. In addition, several species of mammals from Cumberland Island were identified as host species for ectoparasites, including specimens of the Virginia opossum, eastern mole, common armadillo, marsh rabbit, eastern gray squirrel, marsh rice rat, cotton mouse, hispid cotton rat, black rat, northern raccoon, feral cat, bobcat, feral horse, feral pig, feral cattle, and white-tailed deer (Wilson and Durden 2003), and according to the authors many of these specimens are deposited at CIM and the private collection of W. Wilson Baker (Tallahassee, Florida). The present study confirmed the presence of each of these species except the marsh rice rat, black rat, and feral cat.

From the adjacent mainland of Camden County, Georgia, the American Museum of Natural History has specimens of the eastern woodrat; the Carnegie Museum of Natural History has an eastern fox squirrel; Cornell University has specimens of the southeastern pocket gopher; the Field Museum of Natural History has specimens of eastern gray squirrel, southern flying squirrel, southeastern pocket gopher, marsh rice rat, hispid cotton rat, and northern raccoon; the Florida Museum of Natural History has specimens of the southeastern pocket gopher, cotton mouse, and bobcat; the Georgia Museum of Natural History has specimens of the eastern cottontail, eastern fox squirrel, southeastern pocket gopher, eastern woodrat, and black rat; the Museum of Comparative Zoology has specimens of the American opossum, least shrew, southern short-tailed shrew, eastern cottontail, marsh rabbit, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, southeastern pocket gopher, marsh rice rat, golden mouse, hispid cotton rat, eastern woodrat, black rat, northern raccoon, American mink, and striped skunk; the Museum of Vertebrate Zoology has specimens of the southern flying squirrel, golden mouse, eastern woodrat, and black rat; the Royal Ontario Museum has specimens of the southeastern pocket gopher and cotton mouse; and the University of Michigan has specimens of the eastern gray squirrel and southeastern pocket gopher. In other words, the least shrew, southern short-tailed shrew, eastern cottontail, eastern fox squirrel, southern flying squirrel, southeastern pocket gopher, golden mouse, eastern woodrat, and striped skunk occur on the mainland of Camden County, Georgia, but not on Cumberland Island.

In addition, the star-nosed mole, eastern cottontail, and southern flying squirrel are known from Charlton County (Cornell University); the eastern fox squirrel and eastern harvest mouse are known from Charlton County, Georgia (Cornell University and Georgia Museum of Natural History); the oldfield mouse is known from Duval County, Florida (Museum of Southwestern Biology); the round-tailed muskrat is known from Charlton County (American Museum of Natural History, Georgia Museum of Natural History, Museum of Southwestern Biology, and U.S. National Museum of Natural History); the Norway rat and house mouse are known from Charlton (Cornell University) and Glynn (Museum of Comparative Zoology) counties, Georgia, and the house mouse also is known from Nassau County, Florida (Florida Museum of Natural History); the coyote is known from Duval County, Florida (this study); the feral dog is known from Nassau County, Florida (Florida Museum of Natural History); the common gray fox is known from Glynn County, Georgia (Florida Museum of Natural History); the American black bear and long-tailed weasel are known from Charlton County, Georgia (U.S. National Museum of Natural History), and also from Nassau County, Florida (Florida Museum of Natural History); the red wolf has been reported from Charlton County (Harper 1927); and the mountain lion has been reported from Glynn County (Young 1946). These species of mammals also do not occur on Cumberland Island, although it is possible that some of the larger species might have occurred there in historic times. For example, the eastern fox squirrel (Neuhauser and Baker 1974), which certainly was introduced to Cumberland Island but no longer occurs. Furthermore, the American beaver (Shoop and Ruckdeschel 2001) and American black bear (Bartram 1791; Ober 1880; Bangs 1898; Sprunt 1936) have been reported from CUIS, and it is likely that individuals of both species will stray to the island from time to time; these species were included as Historic.

Reports of several species of mammals from Cumberland Island are not considered reliable, as suitable habitat generally is lacking, there have been too many inventories on the island to overlook their presence, and historic reports often are too vague to be of value. Included in this category are reports of the least shrew and eastern harvest mouse (Neuhauser and Baker 1974), both recovered from owl pellets, and the oldfield mouse, where the report (Wright 1926) from Cumberland Island, Georgia, surely is a lapsus for Anastasia Island, Florida. The report of the common gray fox (Bent 1940) is somewhat perplexing, for the veracity of Bent's field notes generally are unquestioned. In this case, Bent (1940) was "jack lighting" a pond, where he saw raccoons, deer, horses, cows, and a "trotting gray fox." Perhaps Bent (1940) saw a lone fox that had swum to the island, for there have been no other reports of this species on Cumberland Island, either before or after, and evidence of gray foxes was not found during the course of this investigation. More recently, from 2003 until present, there have been reports from residents and island visitors of sightings of the mountain lion, but tangible evidence documenting its existence on Cumberland Island is lacking.

On a landscape scale, the 19 species of terrestrial mammals considered to be or expected to be Present at CUIS have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy most, if not all, of the eight habitats identified in this report. Species typically associated with the foredune complex and interdune meadow at CUIS include the eastern mole, marsh rabbit, marsh rice rat, hispid cotton rat, coyote, northern raccoon, feral cat, bobcat, feral horse, and white-tailed deer. Species primarily associated with the maritime thicket and maritime forest at CUIS include the Virginia opossum, southern short-tailed shrew, eastern mole, common armadillo, eastern gray squirrel, cotton mouse, black rat, coyote,

northern raccoon, feral horse, feral cat, bobcat, feral pig, and white-tailed deer. Species typically associated with salt grass meadow, salt marsh, mud flat, tidal creek, and salt marsh habitats at CUIS include the marsh rabbit, marsh rice rat, coyote, northern raccoon, American mink, northern river otter, and feral horse.

The mammalian fauna of Cumberland Island has changed significantly since the days of European colonization. Populations of the Virginia opossum, nine-banded armadillo, coyote, bobcat, feral horse, and feral pig have become established on the island, whereas the southeastern pocket gopher has been extirpated. Armadillos and pigs, due to their rooting behavior, certainly impact the flora and fauna associated with the maritime forest floor, and horses trample and overgraze lush salt-marsh habitat. Although highly controversial, especially for the latter species, control and perhaps elimination of these species is recommended. The Virginia opossum apparently did not inhabit Cumberland Island until 1993; it likely serves as a primary prey item for American alligators, raptors and owls, coyotes, and bobcats, while its omnivorous diet is likely causing insignificant changes in Cumberland Island plant and invertebrate numbers. The recent re-establishment of the bobcat ostensibly has reduced the numbers of marsh rabbits and hispid cotton rats. As a top-level predator, the bobcat population will stabilize once its carrying capacity is reached; control is therefore not recommended. The loss of the southeastern pocket gopher on Cumberland Island is lamentable, but given that recent systematic revisions have concluded that the Cumberland Island and mainland gophers are not distinct (Laerm 1981; Williams and Genoways 1980), it seems appropriate that the management plan for CUIS include a provision to reintroduce the southeastern pocket gopher to Cumberland Island.

Table 111. Status of 25 terrestrial mammals at Cumberland Island National Seashore

Common Name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X	X		Evidence in CUIS
Southern short-tailed shrew	Present	X	X	X		Evidence in CUIS
Eastern mole	Present	X	X	X		Evidence in CUIS
Common armadillo	Present	X	X	X		Evidence in CUIS
Marsh rabbit	Present	X	X	X	X	Evidence in CUIS
Eastern gray squirrel	Present	X	X	X	X	Evidence in CUIS
Marsh rice rat	Present	X	X	X		Evidence in CUIS
Cotton mouse	Present	X	X	X		Evidence in CUIS
Hispid cotton rat	Present	X	X	X	X	Evidence in CUIS
Coyote	Present	X			X	Evidence in CUIS
Northern raccoon	Present	X	X	X		Evidence in CUIS
American mink	Present	X	X	X	X	Evidence in CUIS
Northern river otter	Present	X	X	X	X	Evidence in CUIS
Bobcat	Present	X	X	X	X	Evidence in CUIS
Feral horse	Present	X	X	X		Evidence in CUIS
Feral pig	Present	X	X	X		Evidence in CUIS
White-tailed deer	Present	X	X	X		Evidence in CUIS
Black rat	Probably Present					Evidence in region
Feral cat	Probably Present					Evidence in region
American beaver	Absent					Historic
American black bear	Absent					Historic
Eastern fox squirrel	Absent					Extirpated
Southeastern pocket gopher	Absent					Extirpated
African wild ass	Absent					Extirpated
Feral cattle	Absent					Extirpated

Fort Caroline National Memorial (FOCA)

Fort Caroline National Memorial, which for the purposes of this investigation also includes the adjacent Ribault Monument and Theodore Roosevelt Area, is located on the bluffs overlooking the Saint Johns River in Duval County, Florida. This region was occupied by the Timucua natives when the French explorer Jean Ribault sailed into the Saint Johns River in 1562. Shortly thereafter, in 1564, a group of about 200 mostly French Huguenot colonists led by René de Laudonnière established the colony of ‘La Caroline’ and built the triangular ‘Fort de la Caroline’. Life was difficult in the New World and famine led to talk of abandonment, but in August 1565 Ribault returned from France with more colonists and supplies. Peace was short-lived; in September 1565 Ribault’s fleet set sail for Saint Augustine, Florida, which was located approximately 80 km (50 mi) to the south of Fort Caroline, to confront the Spanish forces led by Pedro Menéndez de Avilés. Unknown to Ribault, however, Menéndez had already begun his march to conquer Fort Caroline, and the fort quickly fell into Spanish hands since most of the Frenchmen were sailing to Saint Augustine. Meanwhile, Ribault’s fleet was blown off course and destroyed by a hurricane off the coast of Anastasia Island, Florida, but the 250 or so French sailors managed to survive the storm and swim ashore, only to be met by the Spanish forces, which by then had returned to Anastasia Island. Most of the Frenchmen were massacred. The Spanish held Fort Mateo (Fort de la Caroline) until 1568, when Dominique de Gourgues recaptured the fort, slaughtered the Spanish forces there and also in two smaller garrisons located on either side of the mouth of the Saint Johns River, destroyed the fort, and returned to France.

Today, the 138-acre Fort Caroline National Memorial (including the Ribault Monument) and the 600-acre Theodore Roosevelt Area are surrounded by residential development and Hidden Hill Country Club. None the less, there is tremendous habitat diversity in these sites, including upland hardwood and mixed pine-hardwood forests, maritime hammock forests, poorly-drained swamp forests, freshwater ponds, freshwater and estuarine marshes, and a small segment of upland scrub habitat along Timucuan Trail adjacent to the Port Authority boundary at the end of Fort Caroline Road. There also are buildings, parking lots, and mechanically maintained edge habitats.

There is no comprehensive checklist of the mammalian fauna of FOCA, although there is an on-line checklist of mammal species found in the Theodore Roosevelt Area, including the Virginia opossum, eastern mole, nine-banded armadillo, eastern cottontail, marsh rabbit, eastern gray squirrel, “field” mouse, hispid cotton rat, northern raccoon, northern river otter, and bobcat. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most Parks to NPS personnel in 1992, but FOCA was not included as one of those Parks. According to NPS data, 18 NPSpecies are listed as possibly occurring in the park, but no species of mammals have been documented on park property based on tangible evidence (Table 2).

Fieldwork began on 29 January 2004 and ended on 17 July 2004, encompassing a total of 12 man-days in the field and 525 trap-nights of sampling effort. Seven major terrestrial habitats were identified – upland scrub forest, upland hardwood forest, maritime scrub thicket, maritime hammock forest, swamp forest, freshwater pond, and estuarine marsh – and fieldwork consisted primarily of extensive ground-truthing of these habitats on both the Fort Caroline/Ribault Monument site and the Theodore Roosevelt site (Figure 25). Pitfall traps were set in the maritime hammock forest in Theodore Roosevelt Area (30°22.282’N 81°28.912’W) and

Sherman livetraps were set in the upland scrub forest and around Spanish Pond. There are no specimens in museum collections from Fort Caroline, the Ribault Monument, and Theodore Roosevelt Area per se, but additional time was spent canvassing museum collections for specimens from Duval County, Florida. The American Museum of Natural History has specimens of the least shrew, marsh rice rat, hispid cotton rat, eastern woodrat, and striped skunk; the California Academy of Sciences has 10 house mice; the Florida Museum of Natural History has specimens of the eastern mole, nine-banded armadillo, southern flying squirrel, southeastern pocket gopher, cotton mouse, golden mouse, nutria, common gray fox, American black bear, long-tailed weasel, northern river otter, bobcat, and white-tailed deer; the Georgia Museum of Natural History has specimens of the southeastern pocket gopher, northern raccoon, and bobcat; the Louisiana State University Museum of Zoology has one eastern fox squirrel; the Museum of Comparative Zoology has specimens of the eastern cottontail, marsh rabbit, eastern gray squirrel, golden mouse, and hispid cotton rat; the Museum of Southwestern Biology has two southern short-tailed shrews, one southern flying squirrel, one southeastern pocket gopher, one Anastasia Island Beach mouse, two golden mice, and six hispid cotton rats; the Texas Cooperative Wildlife Collection has two southeastern pocket gophers; and the U.S. National Museum of Natural History has specimens of the eastern mole, eastern gray squirrel, southeastern pocket gopher, and Norway rat. In addition, the Florida Museum of Natural History has an eastern fox squirrel from Baker County, Florida, and there are series of southern short-tailed shrews, southeastern pocket gophers, cotton mice, hispid cotton rats, and house mice from Nassau County, Florida, in the American Museum of Natural History, Florida Museum of Natural History, and the Georgia Museum of Natural History. Bats were not included in this investigation.

Sixteen species of terrestrial mammals (Virginia opossum, eastern mole, nine-banded armadillo, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, golden mouse, hispid cotton rat, domestic dog, red fox, common gray fox, northern raccoon, northern river otter, bobcat, and white-tailed deer) were documented on the park property during the course of this project (Table 12). Another six species of terrestrial mammals (southeastern shrew, least shrew, southern short-tailed shrew, southern flying squirrel, cotton mouse, and feral cat) that are widely distributed in the southeastern United States but not encountered on Park property would be expected at FOCA, Ribault Monument, and Theodore Roosevelt Area (Table 12). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. The eastern harvest mouse, eastern woodrat, house mouse, coyote, American bear, and American mink are encroaching on Park property, and four of these species (house mouse, coyote, American bear, and American mink) probably occur there on occasion. The mountain lion likely inhabited the region in the past, but they have been extirpated from the region. Discounting the domestic dog, 21 species of terrestrial mammals were documented as occurring or probably occurring at FOCA, the Ribault Monument, and Theodore Roosevelt Area.

On a landscape scale, the 21 species of terrestrial mammals considered to be or expected to be Present at FOCA have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Whitaker and Hamilton 1998; Trani et al. 2007). Species typically associated with the upland scrub forest include the Virginia opossum, eastern mole, nine-banded armadillo, cotton mouse, common gray fox, and feral cat. Species typically associated with the upland hardwood forest include the Virginia opossum, southeastern shrew, southern short-tailed shrew, eastern mole, nine-banded armadillo, eastern gray squirrel, southern flying squirrel,

common gray fox, northern raccoon, feral cat, and white-tailed deer. Species typically associated with the maritime scrub thicket include, southeastern shrew, eastern mole, cotton mouse, feral cat, and white-tailed deer. Species typically associated with the maritime hammock forest include Virginia opossum, southeastern shrew, southern short-tailed shrew, eastern mole, nine-banded armadillo, eastern gray squirrel, cotton mouse, golden mouse, common gray fox, common raccoon, feral cat, bobcat, and occasionally white-tailed deer. Species typically associated with the swamp forest include Virginia opossum, nine-banded armadillo, eastern gray squirrel, southern flying squirrel, golden mouse, common raccoon, and white-tailed deer. Species typically associated with the freshwater pond and estuarine marshes include the least shrew, southern short-tailed shrew, eastern cottontail, marsh rabbit, marsh rice rat, hispid cotton rat, common raccoon, northern river otter, and white-tailed deer. Species typically associated with out-buildings, trails, and disturbed habitats include the Virginia opossum, nine-banded armadillo, cotton mouse, domestic dog, red fox, common gray fox, common raccoon, feral cat, bobcat, and white-tailed deer.

Table 12. Status of 29 terrestrial mammals at Fort Caroline National Memorial.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X	X		Evidence in FOCA
Eastern mole	Present	X		X	X	Evidence in FOCA
Nine-banded armadillo	Present	X		X	X	Evidence in FOCA
Eastern cottontail	Present	X		X	X	Evidence in FOCA
Marsh rabbit	Present	X		X	X	Evidence in FOCA
Eastern gray squirrel	Present	X		X	X	Evidence in FOCA
Marsh rice rat	Present	X			X	Evidence in FOCA
Golden mouse	Present	X			X	Evidence in FOCA
Hispid cotton rat	Present	X		X	X	Evidence in FOCA
Domestic dog	Present	X			X	Evidence in FOCA
Red fox	Present	X			X	Evidence at FOCA
Common gray fox	Present	X			X	Evidence in FOCA
Northern raccoon	Present	X		X	X	Evidence in FOCA
Northern river otter	Present	X		X	X	Evidence in FOCA
Bobcat	Present	X		X	X	Evidence in FOCA
White-tailed deer	Present					Evidence in FOCA
Southeastern shrew	Probably Present					Evidence in region
Least shrew	Probably Present					Evidence in region
Southern short-tailed shrew	Probably Present					Evidence in region
Southern flying squirrel	Probably Present					Evidence in region
Cotton mouse	Probably Present					Evidence in region
Feral cat	Probably Present					Evidence in region
Eastern harvest mouse	Encroaching					Evidence in region
Eastern woodrat	Encroaching					Evidence in region
House mouse	Encroaching					Evidence in region
Coyote	Encroaching					Evidence in region
American black bear	Encroaching					Evidence in region
American mink	Encroaching					Evidence in region
Mountain lion	Absent					Extirpated

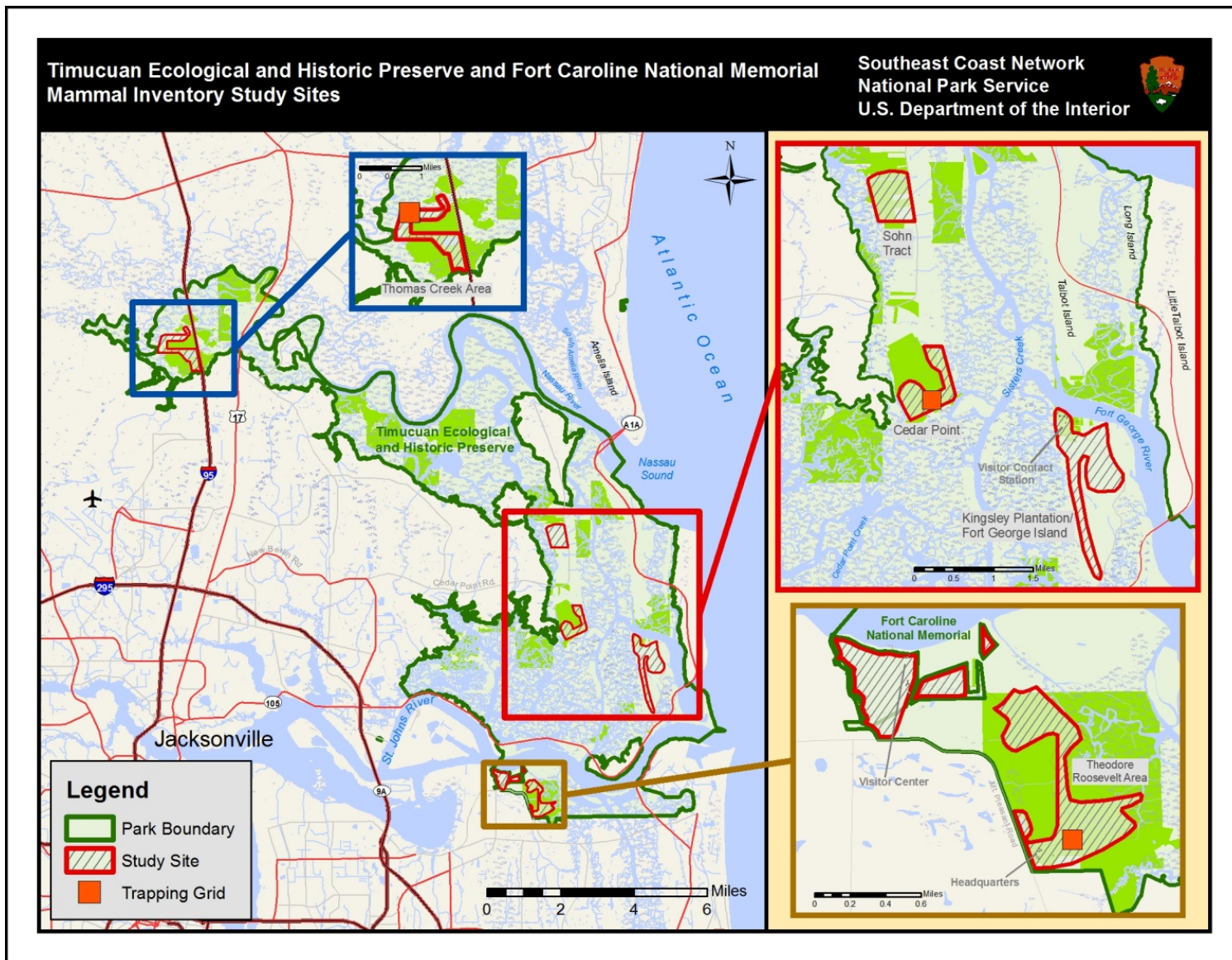


Figure 25. Mammal survey locations at Timucuan Ecological and Historic Preserve and Fort Caroline National Memorial.

Fort Frederica National Monument (FOFR)

Fort Frederica National Monument is a 241-acre site located on Saint Simons Island in Glynn County, Georgia. The location of the site, just south of the mouth of the Altamaha River, was crucial to the British Empire; as the southernmost site along the Atlantic Seaboard, it served to protect the British colonies from the Spanish colony of Florida. FOFR contains two units. The Frederica Site includes the remnants of the old fort and surrounding uplands on the east side of the Frederica River and an extensive tract of salt marsh habitat on the west side of the Frederica River. The Bloody Marsh Battle Site is approximately 9.7 km (6 mi) to the south of the Frederica Site on the Military Road to Fort Saint Simons; here, on 7 July 1742, a motley crew of 200 British colonists, Scottish Highlanders, and Native Americans led by James Oglethorpe defeated the Spanish forces commanded by Manuel de Montiano, thereby ending the Spanish threat to the British colonies.

There apparently has been little effort to document the mammalian fauna of FOFR. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but FOFR was not included as one of those parks. According to NPS data, two species of mammals have been documented on park property, although seven NPSpecies are listed as possibly occurring in the park (Table 2). It is therefore not surprising that FOFR personnel designated the mammal inventory as its top priority for the Southeast Coast Network draft study plan. This investigation is the first comprehensive survey of the terrestrial mammalian fauna of FOFR.

Fieldwork began on 8 March 2003 and ended on 1 Feb 2005, encompassing a total of 13 man-days in the field, including four man-days kayaking the FOFR salt marshes. Additional time was spent canvassing museum collections for specimens from Saint Simons Island per se, from Glynn County, Georgia, and from surrounding counties. Series of mammals from Saint Simons Island are deposited at Cornell University (hispid cotton rat and eastern woodrat), Florida Museum of Natural History (American mink), Georgia Museum of Natural History (cotton mouse), Harvard University (marsh rabbit), the University of Michigan (marsh rabbit and eastern gray squirrel), and the U.S. National Museum of Natural History (Virginia opossum, eastern mole, eastern cottontail, eastern woodrat, northern raccoon, American mink, and northern river otter). In addition, the Florida Museum of Natural History has an American mink from Jekyll Island, and the Georgia Museum of Natural History has a marsh rabbit from Sea Island, a northern river otter from the Frederica River, and specimens of the southern short-tailed shrew, eastern mole, eastern cottontail, marsh rabbit, eastern gray squirrel, marsh rice rat, cotton mouse, hispid cotton rat, and American mink from Jekyll Island, all in Glynn County, Georgia. From the adjacent mainland of Glynn County, the Florida Museum of Natural History has specimens of the eastern fox squirrel, common gray fox, and American mink, the Georgia Museum of Natural History has a bobcat specimen, and both the Museum of Comparative Zoology and U.S. National Museum of Natural History have specimens of the black rat. In addition, Golley (1962) provided Glynn County records for the southeastern pocket gopher, American beaver, and American black bear, and he provided Camden, Brantley, Ware, and McIntosh County records for the least shrew, southern flying squirrel, eastern harvest mouse, oldfield mouse, golden mouse, round-tailed muskrat, red fox, and striped skunk.

Five major terrestrial habitats were identified – salt marsh, creek and river edges, maritime pine-oak forest, second-growth pine forest, and mechanically maintained areas and road edges.

Fieldwork differed according to location (Figure 24). At the Frederica Site, the upland habitats were surveyed with Sherman livetraps and by means of extensive ground truthing for spoor, whereas the adjacent salt marsh and watercourse edge habitats were surveyed from a kayak at low tide. At the Bloody Marsh Battle Site, access was limited to the Demere Road right-of-way; the interior part of the property was closed due an attempted suicide on the property. Bats were not included in this investigation.

Fourteen species of terrestrial mammals were documented on park property during the course of this project (Table 13). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent park checklists. Five other species of mammals that are widely distributed in the southeastern United States were not encountered on park property, but each would be expected at FOFR (Table 13). In addition, to protect the archeological integrity of the park, pitfall traps were not used to ascertain the status of the southern short-tailed shrew. The southern short-tailed shrew occurs on several islands in the southeastern United States, including Ossabaw, Sapelo, and Cumberland in Georgia (Neuhauser and Baker 1974), so in time it might be discovered on Saint Simons Island. There also are sight records of the eastern fox squirrel and southern flying squirrel from Saint Simons Island (Neuhauser and Baker 1974), as well as a report of the bobcat (Reitz and Honerkamp 1983), but evidence of these species was not collected during the course of this investigation and it is doubtful that they exist at FOFR. Feral pigs were introduced to Saint Simons Island, but they have been extirpated and no longer occur there (Neuhauser and Baker 1974; Mayer and Brisbin 1991). Furthermore, European fallow deer were introduced to Little Saint Simons Island, and although some individuals managed to get to Saint Simons Island since that time (Neuhauser and Baker 1974), they no longer inhabit the island. Moore's (1840) records of the American black bear, "wildcats" (bobcats), and "tigers" (mountain lions) from Saint Simons Island are dubious, although bears are known to swim to islands on occasion, and mountain lions have been reported from the Glynn County mainland (Young 1946), as have the southeastern pocket gopher, American beaver, and American black bear (Golley 1962). Red wolves have been reported from the Okefenokee Swamp, immediately west of Glynn County (Harper 1927). All told, 18 species of terrestrial mammals were documented as occurring or probably occurring at FOFR, but the status of the southern short-tailed shrew was not determined and that of the other species mentioned above either could not be confirmed or did not seem credible. Furthermore, the nutria recently has become established in southeastern Georgia and northeastern Florida, and it likely will colonize Saint Simons Island in the next decade or so. No terrestrial mammal species at FOFR is considered to be imperiled by the U.S. Fish and Wildlife Service.

On a landscape scale, the 18 species of mammals considered to be or expected to be Present at FOFR have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy many of the five habitats identified in this report. Species typically associated with the maritime pine-oak forest and second-growth pine forest at FOFR include the Virginia opossum, eastern mole, nine-banded armadillo, eastern gray squirrel, cotton mouse, eastern woodrat, black rat, Norway rat, northern raccoon, feral cat, and white-tailed deer. Species associated primarily with the mechanically maintained areas, road edges, and grassland-forest ecotonal habitats include the eastern mole, nine-banded armadillo, eastern cottontail, hispid cotton rat, house mouse, and feral cat. Species typically associated with salt marsh and

the creek and river edges at FOFR include the marsh rabbit, marsh rice rat, northern raccoon, American mink, and northern river otter.

Table 13. Status of 22 terrestrial mammals at Fort Frederica National Monument. [¹Frederica Site, ²Bloody Marsh Site]

Common Name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X			Evidence in FOFR ¹
Eastern mole	Present	X			X	Evidence in FOFR ^{1,2}
Nine-banded armadillo	Present	X			X	Evidence in FOFR ^{1,2}
Eastern cottontail	Present	X			X	Evidence in FOFR ¹
Marsh rabbit	Present	X			X	Evidence in FOFR ¹
Eastern gray squirrel	Present	X			X	Evidence in FOFR ^{1,2}
Marsh rice rat	Present	X	X			Evidence in FOFR ¹
Eastern woodrat	Present	X	X			Evidence in FOFR ¹
Domestic/feral dog	Present	X			X	Evidence in FOFR ¹
Northern raccoon	Present	X			X	Evidence in FOFR ¹
American mink	Present	X			X	Evidence in FOFR ¹
Northern river otter	Present	X			X	Evidence in FOFR ¹
Feral cat	Present	X			X	Evidence in FOFR ¹
White-tailed deer	Present	X			X	Evidence in FOFR ^{1,2}
Cotton mouse	Probably Present					Evidence in region
Hispid cotton rat	Probably Present					Evidence in region
Black rat	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Southern short-tailed shrew	Unconfirmed					
Feral pig	Absent					Extirpated
European fallow deer	Absent					Extirpated

Fort Matanzas National Monument (FOMA)

Fort Matanzas National Monument is located on the southern end of Anastasia Island, in Saint Johns County, Florida. The word ‘matanza’ is the Spanish word for ‘slaughter’, referring to the 250 or so French Huguenots, led by Jean Ribault, who in 1565 were massacred in the region by the Spanish forces under the direction of Pedro Menéndez de Avilés. At this time, the Spanish forces were establishing Saint Augustine, Florida, the first permanent European settlement in the United States. From 1672 to 1695, they built Castillo de San Marcos to prevent French and later British sailors from entering Matanzas Bay. However, Saint Augustine was still vulnerable to attack from the south by entering Matanzas Inlet, at the southern end of Anastasia Island, and sailing northward 22 km (14 mi) along the Matanzas River. By 1742, the Spanish had addressed this vulnerability by building Fort Matanzas on Rattlesnake Island at the mouth of Matanzas Inlet, thereby blocking the south entrance to the Matanzas River. Today, both Castillo de San Marcos and the 298-acre Fort Matanzas are part of the National Park Service, in recognition of their significance during the early colonization of the United States.

Anastasia Island, and therefore FOMA, has been the focus of extensive scientific explorations over the last 120 years, and its mammalian fauna is relatively well known. The first major fieldwork to document the mammals of the island was conducted in the 1890s by Outram Bangs of Harvard University (Bangs 1898). Bangs described three new mammals from “Point Romo, Anastasia Island” – Anastasia Island mole, Anastasia Island beach mouse, and Anastasia Island cotton mouse – as well as the Atlantic saltmarsh mink from the “salt marsh opposite Matanzas Inlet, Florida.” The taxonomic distinctiveness of these species is discussed in more detail beyond. Of immediate importance, however, is the specific location of Point Romo in relation to FOMA. Point Romo first began to be included on maps in 1888 (*A new sectional map of Florida issued by the land department of the South Florida R.R. Co. and the Plant Investment Co., Sanford, Florida*) and then it disappeared from maps after 1917 as Crescent Beach and Summer Haven were added to maps. Bangs (1898) did not identify clearly that Point Romo was located on the north side of Matanzas Inlet on Anastasia Island, although he did indicate that Matanzas Point was located on the south side of Matanzas Inlet. Maps from 1888 to 1917 clearly indicate that Point Romo is located at the southern end of Anastasia Island, which today is within the boundaries of FOMA.

Anastasia Island’s uniqueness greatly intrigued early American mammalogists, leading to investigations of the island by personnel from several museums in the United States, including the American Museum of Natural History, Charleston Museum, Cornell University, Field Museum of Natural History, Florida Museum of Natural History, Georgia Museum of Natural History, Louisiana State University, Michigan State University, Museum of Comparative Zoology, Museum of Southwestern Biology, Royal Ontario Museum, Slater Museum of Natural History, U.S. National Museum of Natural History, the private collection of Albert Schwartz (now deposited, in large part, at the University of Kansas), and the Savannah River Ecology Laboratory (now deposited at the Sam Noble Oklahoma Museum of Natural History). In addition, it is a common practice for institutions to exchange specimens, so specimens from Anastasia Island can be found in several other museums as well. Currently, over 350 specimens, representing 15 terrestrial species (Virginia opossum, southern short-tailed shrew, eastern mole, nine-banded armadillo, marsh rabbit, eastern gray squirrel, marsh rice rat, Anastasia Island beach mouse, cotton mouse, Florida mouse, hispid cotton rat, black rat, house mouse, northern raccoon, American mink), exist in these museums.

There is no comprehensive checklist of the mammalian fauna of FOMA, although Bangs (1898) listed nine species (eastern mole, marsh rabbit, marsh rice rat, Anastasia Island beach mouse, cotton mouse, hispid cotton rat, black rat, northern raccoon, and mink) of terrestrial mammals on Anastasia Island. A list of nine terrestrial species (Virginia opossum, marsh rabbit, eastern gray squirrel, Anastasia Island beach mouse, Florida mouse, hispid cotton rat, round-tailed muskrat, northern raccoon, and white-tailed deer) that potentially occupy FOMA, as well as one species of bat, was provided to the NPS by staff at the University of California-Davis in 1992. According to NPS data, five species of mammals have been documented on park property, and 40 NPSpecies are listed as possibly occurring in the park (Table 2). Obviously, there is no consensus about how many species of terrestrial mammals inhabit FOMA.

Fieldwork began on 29 January 2004 and ended on 7 April 2005, encompassing a total of nine man-days in the field. Four major terrestrial habitats were identified – intertidal beaches and dunes, maritime scrub thickets, maritime hammocks, and estuarine marshes – and fieldwork consisted primarily of extensive ground-truthing of these habitats on both the Anastasia Island and Rattlesnake Island units (Figure 26). Due to the Endangered status of the Anastasia Island beach mouse and given the ease of confirming its presence by locating its conspicuously plugged burrow systems, no trapping was conducted on Anastasia Island. Evidence of its burrow systems was not found on the sandy dredge-deposition dome on northern Rattlesnake Island. Nonetheless, the use of Sherman live traps (78 trap-nights) was restricted to the perimeter of the northern island in estuarine marsh habitat to collect voucher material from that unit. Additional time was spent canvassing museum collections for specimens from Anastasia Island per se, from Saint Johns County, Florida, and from surrounding counties. Bats were not included in this investigation. One adjustment in common names is followed in this park account – given its critically Endangered status and to avoid nomenclatural confusion, the Anastasia Island beach mouse (*Peromyscus polionotus phasma*) is used instead of the oldfield mouse (*P. polionotus* spp.).

Twenty-one species of terrestrial mammals (Virginia opossum, eastern mole, nine-banded armadillo, marsh rabbit, eastern gray squirrel, marsh rice rat, Anastasia Island beach mouse, cotton mouse, Florida mouse, hispid cotton rat, black rat, house mouse, coyote, domestic dog, common gray fox, northern raccoon, American mink, northern river otter, feral cat, bobcat, and white-tailed deer) were documented on the park property during the course of this project (Table 14). In addition, the southern short-tailed shrew was not verified from park property per se, but it is widely distributed in the southeastern United States and has been collected from an unspecified location on Anastasia Island; however, based on other specimens collected and by the same collector (J. F. Wilson) and at the same time (December 1939), it might have come from Espanita, which is near Crescent Beach. The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. Although evidence of the bobcat was not collected during the course of this investigation, it has been reported from FOMA in the past (Frank and Humphrey 1996), and a mother with two kittens was observed on Park property in 2004 (NPS staff). The American black bear was reported from Anastasia Island by Bangs (1898), but it doubtfully occurs there now. Discounting the American black bear, 21 species of terrestrial mammals were documented as occurring or probably occurring on park property.

Several mammalian taxa at FOMA are considered to be imperiled. The U.S. Fish and Wildlife Service considers the Anastasia Island beach mouse to be Endangered, as does the Florida Fish and Wildlife Conservation Commission. In addition, the Florida mouse is listed as Special Concern by the Florida Fish and Wildlife Conservation Commission. The Anastasia Island beach mouse is ranked S1, the Florida mouse is ranked S3, and the Atlantic saltmarsh mink is ranked S3. It seems appropriate at this time to discuss the taxonomic status of the four mammals described by Bangs (1898) as new species. Three of these, the Anastasia Island mole (*Scalopus aquaticus anastasae*), Anastasia Island beach mouse (*Peromyscus polionotus phasma*), and Atlantic saltmarsh mink (*Mustela vison lutensis*) currently are recognized as distinct subspecies. The cotton mouse described from Anastasia Island, however, is not considered to be distinct from the mainland form (*Peromyscus g. gossypinus*) (Boone et al. 1993).

On a landscape scale, the 21 species of terrestrial mammals considered to be or expected to be Present at FOMA have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Whitaker and Hamilton 1998; Trani et al. 2007). Species typically associated with the dune complex at FOMA include the eastern mole, marsh rabbit, Anastasia Island beach mouse, hispid cotton rat, coyote, northern raccoon, feral cat, and occasionally the bobcat. Species primarily associated with the maritime scrub thicket at FOMA include the Virginia opossum, southern short-tailed shrew, eastern mole, nine-banded armadillo, cotton mouse, Florida mouse, black rat, house mouse, coyote, common gray fox, northern raccoon, feral cat, and bobcat. Species typically associated with the maritime hammocks include the Virginia opossum, eastern mole, nine-banded armadillo, eastern gray squirrel, cotton mouse, Florida mouse, common gray fox, northern raccoon, feral cat, bobcat, and on Rattlesnake Island the white-tailed deer. Species typically associated with mud flat, tidal creek, and estuarine marsh habitats at FOMA include the marsh rabbit, marsh rice rat, hispid cotton rat, northern raccoon, American mink, and northern river otter.

The mammalian fauna of Anastasia Island has changed significantly since the days of European colonization and recent beachfront development. Populations of the nine-banded armadillo, black rat, coyote, and feral cat have become established on the island, whereas the American black bear (if earlier reports are accurate) has been extirpated. Armadillos, due to their rooting behavior, certainly impact the flora and fauna associated with the maritime forest floor. Black rats likely compete with native rodents and, perhaps, eastern gray squirrels. Coyotes have only recently become established and their effect is not known. The establishment of feral cats likely has reduced the numbers of marsh rabbits, marsh rice rats, Anastasia Island beach mice, cotton mice, Florida mice, and hispid cotton rats. Especially noteworthy is the negative impact of feral cats on the Anastasia Island beach mouse (Frank and Humphrey 1996). Although highly controversial, especially for the feral cat, control and perhaps elimination of exotic species is recommended.

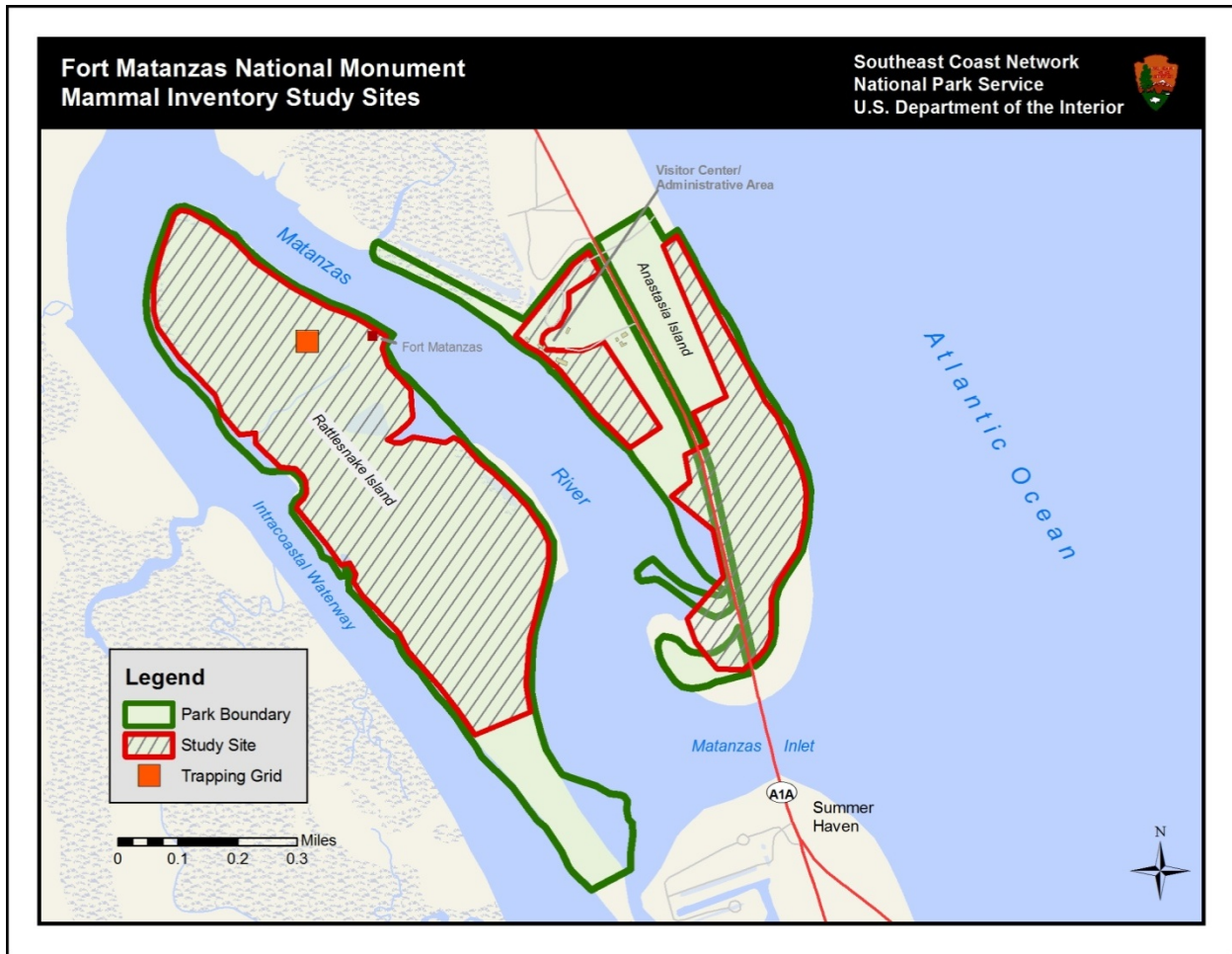


Figure 26. Mammal survey locations at Fort Matanzas National Monument.

Table 14. Status of 23 terrestrial mammals at Fort Matanzas National Monument.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X	X		Evidence in FOMA ¹
Eastern mole	Present	X	X	X		Evidence in FOMA ¹²
Nine-banded armadillo	Present	X	X			Evidence in FOMA ¹²
Marsh rabbit	Present	X	X	X		Evidence in FOMA ¹²
Eastern gray squirrel	Present	X	X			Evidence in FOMA ¹
Marsh rice rat	Present	X	X	X		Evidence in FOMA ¹²
Anastasia Isl beach mouse	Present	X	X	X		Evidence in FOMA ¹
Cotton mouse	Present	X	X	X		Evidence in FOMA ¹
Florida mouse	Present	X	X	X		Evidence in FOMA ¹
Hispid cotton rat	Present	X	X	X		Evidence in FOMA ¹²
Black rat	Present	X	X	X		Evidence in FOMA ¹²
House mouse	Present	X		X		Evidence in FOMA ¹²
Coyote	Present	X			X	Evidence in FOMA ¹²
Domestic dog	Present	X			X	Evidence in FOMA ¹
Common gray fox	Present	X			X	Evidence in FOMA ¹
Northern raccoon	Present	X	X	X		Evidence in FOMA ¹²
American mink	Present	X	X	X		Evidence in FOMA ¹²
Northern river otter	Present	X	X	X		Evidence in FOMA ¹²
Feral cat	Present	X		X		Evidence in FOMA ¹
Bobcat	Present	X		X		Evidence in FOMA ¹
White-tailed deer	Present	X	X			Evidence in FOMA ²
Southern short-tailed shrew	Probably Present					Evidence on island
American black bear	Unconfirmed					Historic

Fort Sumter National Monument (FOSU)

Fort Sumter National Monument is located in the mouth of Charleston Harbor on Fort Sumter Island, Charleston County, South Carolina. The Monument, in conjunction with fortifications on nearby James Island (Fort Johnson), Morris Island (Fort Wagner), and Sullivans Island (Fort Moultrie), were instrumental in defending Charleston Harbor. FOSU is the site of the initial engagement of the Civil War, when Confederate forces defeated the Union Army that occupied the island. FOSU consists of 122 acres of submerged land surrounding Fort Sumter Island and three upland units – the 2.5-acre Fort Sumter Island, an 8.9-acre ferry boat facility at Liberty Square in Charleston (including land leased to the South Carolina Marine Sciences Museum, herein identified as the “Aquarium”), and the 600-acre Fort Moultrie complex on Sullivans Island; a second ferry launch site exists at Patriots Point in Mount Pleasant, South Carolina. Although FOMO is part of Fort Sumter National Monument, these parks were treated separately for the purposes of this investigation.

There apparently has been little effort to document the mammalian fauna of FOSU. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but FOSU was not included as one of those parks. According to

NPS data, there have been no species of mammals documented on park property on the basis of tangible evidence, but four NPSpecies are listed as possibly occurring in the park (Table 2).

This investigation is the first comprehensive survey of the terrestrial mammalian fauna of FOSU. Fieldwork occurred on 4 October 2003, encompassing two man-days in the field. Both the Aquarium Site and the Fort Site were ground-truthed at low tide for mammal spoor (Figure 27). Bats were not included in this investigation.

Additional time was spent canvassing museum collections for specimens from Charleston County, South Carolina, and surrounding counties. No specimens have been taken from FOSU per se, but the Charleston area is one of the oldest centers of early natural history exploration in North America, dating back to Lawson (1718), Catesby (1732, 1743), Bachman (1837a, 1837b), and Audubon and Bachman (1841, 1842). As such, the mammals of the region are relatively well known, and there are specimens from Charleston County, South Carolina, in most major museums in North America. For example, the American Museum of Natural History has specimens of the cotton mouse, hispid cotton rat, eastern woodrat, woodland vole, and northern raccoon; Cornell University has one Virginia opossum, one least shrew, two southern short-tailed shrews, two southern flying squirrels, two cotton mice, and seven hispid cotton rats; the Florida Museum of Natural History has a marsh rice rat and northern raccoon; the Georgia Museum of Natural History has specimens of the least shrew, marsh rice rat, cotton mouse, hispid cotton rat, house mouse, and northern raccoon; the Louisianan State University Museum of Zoology has one southern short-tailed shrew, two eastern moles, five eastern fox squirrels, one southern flying squirrel, and one northern river otter; the Museum of Comparative Zoology has a least shrew, marsh rabbit, golden mouse, and six northern raccoons; the Museum at Texas Tech University has two eastern moles; the Museum of Vertebrate Zoology has specimens of the least shrew, eastern mole, eastern fox squirrel, marsh rice rat, cotton mouse, hispid cotton rat, eastern woodrat, and woodland vole; the Peabody Museum of Natural History has one northern raccoon; the Royal Ontario Museum has specimens of the Virginia opossum, least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, marsh rice rat, eastern harvest mouse, cotton mouse, golden mouse, hispid cotton rat, woodland vole, house mouse, and northern raccoon; the San Diego Natural History Museum has two least shrews and two hispid cotton rats; the Santa Barbara Museum of Natural History has two least shrews; the Sternberg Museum of Natural History has one southeastern shrew, one marsh rice rat, and 13 cotton mice; the University of Kansas has specimens of the least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, marsh rice rat, eastern harvest mouse, cotton mouse, eastern woodrat, woodland vole, American mink, and bobcat; the U.S. National Museum of Natural History has specimens of the Virginia opossum, southeastern shrew, least shrew, southern short-tailed shrew, eastern mole, marsh rabbit, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, marsh rice rat, eastern harvest mouse, cotton mouse, golden mouse, hispid cotton rat, eastern woodrat, woodland vole, Norway rat, house mouse, common gray fox, American mink, and northern river otter; and the Charleston Museum, in addition to the species listed above, has specimens of the star-nosed mole, meadow vole, red fox, American black bear, long-tailed weasel, and striped skunk. In addition, Golley (1966) provided a Charleston County record for the black rat.

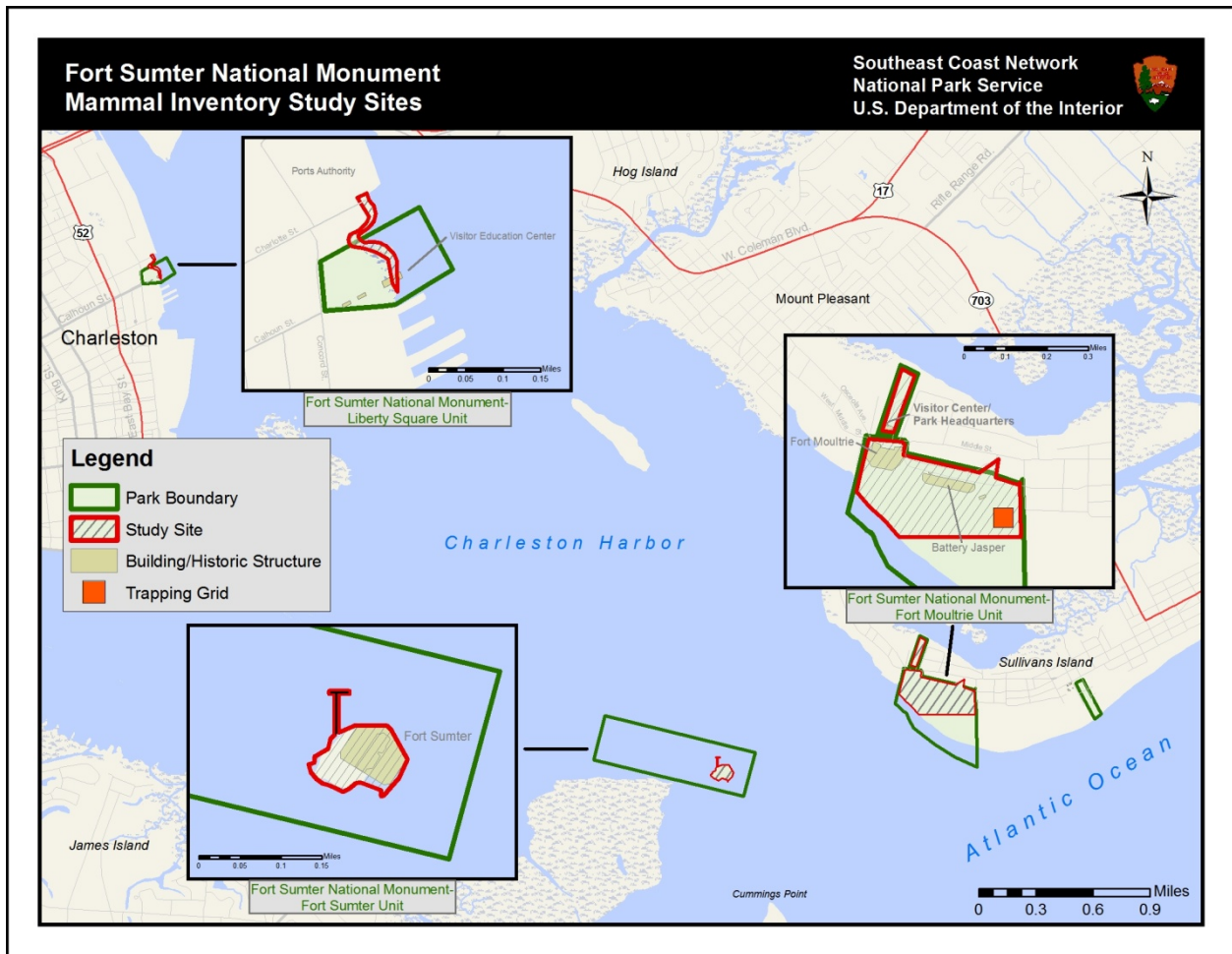


Figure 27. Mammal survey locations at Fort Sumter National Monument and Fort Moultrie National Monument.

Only five species of terrestrial mammals were documented on park property during the course of this project (Table 15). Three other species of mammals with widespread geographic distributions in the southeastern United States might occasionally make their way to the Fort Site from the adjacent mainland or periodically occupy the Aquarium Site (Table 15). Larger, more mobile mammals such as the Virginia opossum, common gray fox, and white-tailed deer might also sometimes wander over to the Fort Site, especially on a low tide, but there is insufficient habitat to support these species and they should not be considered as permanent residents. Mammalian diversity at FOSU is greatly diminished due to the isolated nature, small size, and lack of suitable habitat on Fort Sumter Island and at Liberty Square. The eight species of terrestrial mammals that were documented as occurring or thought to occur on park property are not considered to be imperiled by the U.S. Fish and Wildlife Service.

Table 15. Status of 8 terrestrial mammals at Fort Sumter National Monument. [¹Fort Site, ²Aquarium Site]

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Marsh rice rat	Present	X			X	Evidence in FOSU ¹
Black rat	Present	X			X	Evidence in FOSU ²
Northern raccoon	Present	X			X	Evidence in FOSU ^{1,2}
American mink	Present	X			X	Evidence in FOSU ¹
Northern river otter	Present	X			X	Evidence in FOSU ^{1,2}
Marsh rabbit	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region

Fort Moultrie Subunit (FOMO)

Fort Moultrie National Monument is located on Sullivans Island, Charleston County, South Carolina. The Monument, in conjunction with fortifications on nearby James Island (Fort Johnson) and Fort Sumter Island (Fort Sumter), were instrumental in defending Charleston Harbor, beginning in 1776. FOMO has been renovated several times and was last occupied during World War II. The site encompasses 60 acres, including the fort, parking and picnic areas, and adjacent barrier beach habitat. FOMO is part of Fort Sumter National Monument, but these parks were treated separately for the purposes of this investigation.

There apparently has been little effort to document the mammalian fauna of FOMO, and this investigation is the first comprehensive survey of the terrestrial mammalian fauna of FOMO. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but FOMO was not included as one of those parks. According to NPS data, there have been no species of mammals documented on park property on the basis of tangible evidence, so it is not surprising that no NPSpecies are listed as possibly occurring in the park (Table 2).

Fieldwork began on 3 October 2003 and ended on 19 November 2003, encompassing a total of nine man-days in the field and 910 trap-nights of sampling effort. Additional time was spent canvassing museum collections for specimens from Charleston County, South Carolina, and surrounding counties. No specimens have been taken from FOMO per se, but the Charleston area is one of the oldest centers of early natural history exploration in North America, dating back to Lawson (1718), Catesby (1732, 1743), Bachman (1837a, 1837b), and Audubon and Bachman (1841, 1842). As such, the mammals of the region are relatively well known, and there are specimens from Charleston County, South Carolina, in most major museums in North America. For example, the American Museum of Natural History has specimens of the cotton mouse, hispid cotton rat, eastern woodrat, woodland vole, and northern raccoon; Cornell University has one Virginia opossum, one least shrew, two southern short-tailed shrews, two southern flying squirrels, two cotton mice, and seven hispid cotton rats; the Florida Museum of Natural History has a marsh rice rat and northern raccoon; the Georgia Museum of Natural History has specimens of the least shrew, marsh rice rat, cotton mouse, hispid cotton rat, house mouse, and northern raccoon; the Louisianan State University Museum of Zoology has one southern short-tailed shrew, two eastern moles, five eastern fox squirrels, one southern flying squirrel, and one northern river otter; the Museum of Comparative Zoology has a least shrew, marsh rabbit, golden mouse, and six northern raccoons; the Museum at Texas Tech University has two eastern moles; the Museum of Vertebrate Zoology has specimens of the least shrew, eastern mole, eastern fox squirrel, marsh rice rat, cotton mouse, hispid cotton rat, eastern woodrat, and woodland vole; the Peabody Museum of Natural History has one northern raccoon; the Royal Ontario Museum has specimens of the Virginia opossum, least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, marsh rice rat, eastern harvest mouse, cotton mouse, golden mouse, hispid cotton rat, woodland vole, house mouse, and northern raccoon; the San Diego Natural History Museum has two least shrews and two hispid cotton rats; the Santa Barbara Museum of Natural History has two least shrews; the University of Kansas has specimens of the least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, marsh rice rat, eastern harvest mouse, cotton mouse, eastern woodrat, woodland vole, American mink, and bobcat; the Sternberg Museum of Natural History has one southeastern shrew, one marsh rice rat, and 13 cotton mice; the U.S. National Museum of Natural History has specimens of the Virginia opossum, southeastern shrew, least shrew, southern short-tailed shrew, eastern mole, marsh rabbit, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, marsh rice rat, eastern harvest mouse, cotton mouse, golden mouse, hispid cotton rat, eastern woodrat, woodland vole, Norway rat, house mouse, common gray fox, American mink, and northern river otter; and the Charleston Museum, in addition to the species listed above, has specimens of the star-nosed mole, meadow vole, red fox, American black bear, long-tailed weasel, and striped skunk. In addition, Golley (1966) provided a Charleston County record for the black rat.

Three terrestrial habitats were identified – intertidal community, upland dune community, and mechanically maintained open areas. The intertidal community has been fouled by bilge sludge from nearby boats and the open areas are mowed on a regular basis, but the upland dune community remains moderately intact. Given the small size of the park, the entire site was ground-truthed on several occasions. Grids of Sherman live-traps and pitfall traps were established in the dune community (Figure 27). Bats were not included in this investigation.

Only six species of terrestrial mammals were documented on park property during the course of this project (Table 16). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. Eight additional species of mammals with widespread geographic distributions in the southeastern United States probably inhabit Sullivans Island, South Carolina, and might be expected to occur at FOMO on occasion (Table 16). However, mammalian diversity on barrier islands is attenuated from that on the adjacent mainland, Sullivans Island is greatly developed, and feral cats inhabit the island, so some of these species may no longer inhabit Sullivans Island or FOMO. The marsh rice rat is encroaching on park property, and eight species occur elsewhere in Charleston County, South Carolina, including a record of an eastern fox squirrel from Isle of Palms, but suitable habitat is lacking at FOMO. In addition, the white-tailed deer likely inhabited Sullivans Island from time to time in the distant past, as this species easily swims long distances, but it no longer inhabits the island. Therefore, 14 species of terrestrial mammals were documented as occurring or probably occurring on park property. None of these species is considered to be imperiled by the U.S. Fish and Wildlife Service.

On a landscape scale, the 13 species of mammals considered to be or expected to be Present at FOMO have widespread geographic distributions in the eastern United States (Hall 1981; Webster et al. 1985; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy most, if not all, of the three habitats identified in this report. Species associated primarily with the intertidal community include the northern raccoon, American mink, and northern river otter. Species typically associated with the dune community at FOMO include the Virginia opossum, eastern gray squirrel, cotton mouse, hispid cotton rat, Norway rat, common gray fox, northern raccoon, and feral cat. Species associated primarily with the mechanically maintained areas and out-buildings include the eastern cottontail, black rat, house mouse, and feral cat. However, it is likely that some, if not many, of the species assumed potentially to occur at FOMO might in reality be extirpated from the region, thereby further decreasing estimates of mammalian diversity in the park.

Table 16. Status of 16 terrestrial mammals at Fort Moultrie National Monument.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Eastern cottontail	Present	X	X			Evidence in FOMO
Eastern gray squirrel	Present	X			X	Evidence in FOMO
Hispid cotton rat	Present	X	X			Evidence in FOMO
House mouse	Present	X	X			Evidence in FOMO
Domestic dog	Present	X			X	Evidence in FOMO
Northern raccoon	Present	X			X	Evidence in FOMO
Virginia opossum	Probably Present					Evidence in region
Cotton mouse	Probably Present					Evidence in region
Black rat	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
Common gray fox	Probably Present					Evidence in region
American mink	Probably Present					Evidence in region
Northern river otter	Probably Present					Evidence in region
Feral cat	Probably Present					Evidence in region
Marsh rice rat	Encroaching					Evidence in region
White-tailed deer	Absent					Extirpated

Charles Pickney National Historic Site (CHPI)

Charles Pickney National Historic Site is a 28-acre remnant of the historic Snee Farm, a 715-acre South Carolina Lowcountry rice and indigo plantation inherited by Charles Pickney in 1782. Charles Pickney was a prominent South Carolinian – he studied in Europe, practiced law in Charleston, assisted George Washington during the Revolutionary War, signed the U.S. Constitution, served four terms as governor of South Carolina, and was the unsuccessful Federalist candidate for President in 1804 and 1808. CHPI is located in Christ Church Parish, within the city limits of Mount Pleasant, Charelston County, South Carolina. Today, CHPI is tremendously impacted by Snee Farm Country Club on three (east, south, and west) sides, although the west boundary is somewhat insulated by a tidally-influenced marsh associated with Wampacheone Creek; the northern boundary, Long Point Road, will become a major bypass connecting U.S. Highway 17 and Interstate 526.

There apparently has been little effort to document the mammalian fauna of CHPI. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but CHPI was not included as one of those parks. According to NPS data, there have been no species of mammals documented on park property on the basis of tangible evidence, but 47 NPSpecies are listed as possibly occurring in the park (Table 2). It appears that this investigation is the first comprehensive survey of the terrestrial mammalian fauna of CHPI.

Fieldwork began on 3 October 2003 and ended on 19 November 2003, encompassing a total of 11 man-days in the field and 1,735 trap-nights of sampling effort. Additional time was spent

canvassing museum collections for specimens from Charleston County, South Carolina, and surrounding counties. No specimens have been taken from CHPI per se, but the Charleston area is one of the oldest centers of early natural history exploration, dating back to Lawson (1718), Catesby (1732, 1743), Bachman (1837a, 1837b), and Audubon and Bachman (1841, 1842). As such, the mammals of the region are relatively well known, and there are specimens from Charleston County, South Carolina, in most major museums in North America. For example, the American Museum of Natural History has specimens of the cotton mouse, hispid cotton rat, eastern woodrat, woodland vole, and northern raccoon; Cornell University has one Virginia opossum, one least shrew, two southern short-tailed shrews, two southern flying squirrels, two cotton mice, and seven hispid cotton rats; the Florida Museum of Natural History has a marsh rice rat and northern raccoon; the Georgia Museum of Natural History has specimens of the least shrew, marsh rice rat, cotton mouse, hispid cotton rat, house mouse, and northern raccoon; the Louisianan State University Museum of Zoology has one southern short-tailed shrew, two eastern moles, five eastern fox squirrels, one southern flying squirrel, and one northern river otter; the Museum of Comparative Zoology has a least shrew, marsh rabbit, golden mouse, and six northern raccoons; the Museum at Texas Tech University has two eastern moles; the Museum of Vertebrate Zoology has specimens of the least shrew, eastern mole, eastern fox squirrel, marsh rice rat, cotton mouse, hispid cotton rat, eastern woodrat, and woodland vole; the Peabody Museum of Natural History has one northern raccoon; the Royal Ontario Museum has specimens of the Virginia opossum, least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, marsh rice rat, eastern harvest mouse, cotton mouse, golden mouse, hispid cotton rat, woodland vole, house mouse, and northern raccoon; the San Diego Natural History Museum has two least shrews and two hispid cotton rats; the Santa Barbara Museum of Natural History has two least shrews; the University of Kansas has specimens of the least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, marsh rice rat, eastern harvest mouse, cotton mouse, eastern woodrat, woodland vole, American mink, and bobcat; the Sternberg Museum of Natural History has one southeastern shrew, one marsh rice rat, and 13 cotton mice; the U.S. National Museum of Natural History has specimens of the Virginia opossum, southeastern shrew, least shrew, southern short-tailed shrew, eastern mole, marsh rabbit, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, marsh rice rat, eastern harvest mouse, cotton mouse, golden mouse, hispid cotton rat, eastern woodrat, woodland vole, Norway rat, house mouse, common gray fox, American mink, and northern river otter; and the Charleston Museum, in addition to the species listed above, has specimens of the star-nosed mole, meadow vole, red fox, American black bear, long-tailed weasel, and striped skunk. In addition, Golley (1966) provided a Charleston County record for the black rat.

CHPI has been tremendously modified by human activities, and there is scant evidence of the natural community structure that existed here prior to European colonization. Four terrestrial habitats were identified – tidal creek and associated transition habitat, upland pine-hardwood forest, disturbed edges in various stages of early oldfield succession, and mechanically maintained open areas. Given the small size of the park, the entire site was ground-truthed on several occasions. Grids of Sherman livetraps and pitfall traps were established in the forest and disturbed grasslands, and Sherman livetraps were set around an abandoned house and maintenance facility (Figure 28). Bats were not included in this investigation.

Only 11 species of terrestrial mammals were documented on the park property during the course of this project (Table 17); however, the domestic dog, red fox, and white-tailed deer are not permanent residents and should not be included in subsequent park lists. Thirteen additional species of mammals with widespread geographic distributions in the southeastern United States probably inhabited Snee Farm during Pickney's lifetime, but they were not documented on park property during this investigation (Table 17); these species should be expected at CHPI from time to time, as would the red fox, but they are not permanent residents of the park. The red wolf, American black bear, and mountain lion certainly no longer inhabit the region, and the southeastern shrew, star-nosed mole, eastern fox squirrel, American beaver, oldfield mouse, golden mouse, eastern woodrat, common muskrat, long-tailed weasel, striped skunk, bobcat, and white-tailed deer no longer occur at CHPI today because suitable habitat is lacking; however, the majority of these species inhabited Snee Farm in the 1700s. Therefore, eight species of terrestrial mammals were documented as permanent residents and another 16 possibly frequent the park on an occasional basis, but not permanently.

The lack of mammalian diversity at CHPI can be attributed to the tremendously disturbed nature of the habitat in the region and the presence of a large population of feral cats. As the Mount Pleasant area continues to become more densely developed and corridors for movement of mammals become less available, extirpation of local populations increases, especially for species that have relatively large home ranges (for example, carnivores and deer). Species with relatively small home ranges (for example, shrews and mice) continue to exist in small isolated pockets, but these species are particularly susceptible to extirpation by feral cats. A cat removal program is recommended.

No terrestrial mammal species at CHPI is considered to be imperiled by the U.S. Fish and Wildlife Service. Three species of mammals that once were widely distributed in the eastern United States (red wolf, American black bear, and mountain lion) have been extirpated from the CHPI region. There are no records of red wolves from Charleston County, South Carolina, or the surrounding counties; however, there is a voucher specimen of a bear from Charleston, Charleston County, in the Charleston Museum and there is another from the "Santee River swamp" in the U.S. National Museum of Natural History. Young (1946) reported mountain lions from the "Santee River" of South Carolina, and Mills (1826) mentions a "panther" from Wamow Swamp in Charleston County, that was killed in 1796, so these large cats were in the region in historic times.

On a landscape scale, the 24 species of mammals considered to be or expected to be Present at CHPI have widespread geographic distributions in the eastern United States (Hall 1981; Webster et al. 1985; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy most, if not all, of the four habitats identified in this report. Species associated primarily with early successional habitats include the least shrew, southern short-tailed shrew, eastern mole, eastern cottontail, eastern harvest mouse, hispid cotton rat, woodland vole, house mouse, domestic dog, red fox, and feral cat. Species typically associated with the upland forests at CHPI include the Virginia opossum, southern short-tailed shrew, eastern mole, eastern gray squirrel, southern flying squirrel, cotton mouse, woodland vole, Norway rat, common gray fox, northern raccoon, feral cat, and white-tailed deer. Species typically associated with the tidal creek at CHPI include the marsh rabbit, marsh rice rat, northern raccoon, American mink, and northern river otter. Species associated primarily with the

mechanically maintained areas and out-buildings include the eastern mole, eastern cottontail, woodland vole, black rat, house mouse, red fox, common gray fox, feral cat, and white-tailed deer. Seventeen other species that currently are ascribed to the CHPI region or that once existed in the CHPI region either have insufficient segments of suitable habitat or have been extirpated from coastal South Carolina, and each does not exist or no longer exists at CHPI, respectively. However, it is likely that some, if not many, of the species assumed potentially to occur at CHPI, have been extirpated from the region, thereby further decreasing the estimate of mammalian diversity in the park.

Table 17. Status of 30 terrestrial mammals at Charles Pickney National Historic Site.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X			Evidence in CHPI
Eastern mole	Present	X			X	Evidence in CHPI
Eastern cottontail	Present	X			X	Evidence in CHPI
Eastern gray squirrel	Present	X			X	Evidence in CHPI
Hispid cotton rat	Present	X			X	Evidence in CHPI
House mouse	Present	X			X	Evidence in CHPI
Domestic dog	Present	X			X	Evidence in CHPI
Red fox	Present	X			X	Evidence at CHPI
Northern raccoon	Present	X	X			Evidence in CHPI
Feral cat	Present	X			X	Evidence in CHPI
White-tailed deer	Present	X	X			Evidence in CHPI
Least shrew	Probably Present					Evidence in region
Southern short-tailed shrew	Probably Present					Evidence in region
Marsh rabbit	Probably Present					Evidence in region
Southern flying squirrel	Probably Present					Evidence in region
Marsh rice rat	Probably Present					Evidence in region
Eastern harvest mouse	Probably Present					Evidence in region
Cotton mouse	Probably Present					Evidence in region
Woodland vole	Probably Present					Evidence in region
Black rat	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
Common gray fox	Probably Present					Evidence in region
American mink	Probably Present					Evidence in region
Northern river otter	Probably Present					Evidence in region
Covote	Encroaching					Evidence in region
Long-tailed weasel	Encroaching					Evidence in region
Bobcat	Encroaching					Evidence in region
Red wolf	Absent					Extirpated
American black bear	Absent					Extirpated
Mountain lion	Absent					Extirpated

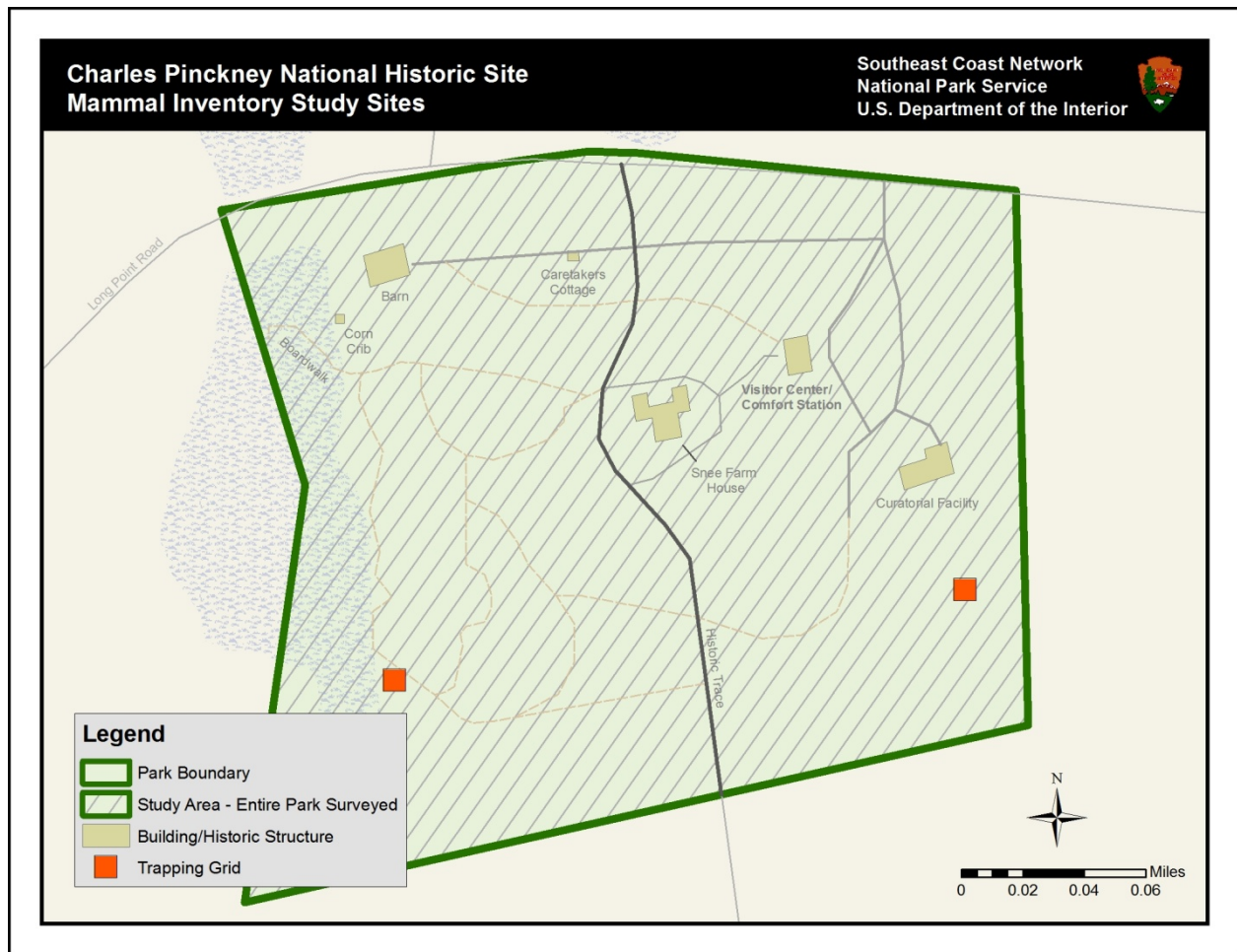


Figure 28. Mammal survey locations at Charles Pickney National Historic Site.

Horseshoe Bend National Military Park (HOBE)

Horseshoe Bend National Military Park consists of a horseshoe-shaped meander in the Tallapoosa River where, in 1814, the last major conflict of the Creek Indian War occurred. Situated near the southern end of the Piedmont Plateau in Tallapoosa County, Alabama, this 2,040-acre park includes 5.6 km (3.5 mi) of the Tallapoosa River and low rolling hills that reach elevations from 180-215 m (600-711 ft) above sea level. The climax beech-oak-hickory forest that existed in 1814, altered by human settlement, logging, and the introduction of exotic species, was cultivated extensively from 1832 until the establishment of the park in 1959. Many agricultural fields now consist of managed loblolly pine plantations or they are in the process of ecological succession, although some of the park is maintained mechanically as open grasslands.

There has been no effort to document the mammalian fauna of HOBE except for an old checklist (Freeman et al. 1974) that identified 47 species of mammals thought to occur in the area. A list of 44 potential species was provided to the NPS by staff at the University of California-Davis in 1992, but it did not include the nine-banded armadillo, red wolf, American black bear, or mountain lion. These earlier lists contained approximately the same number of species (35 terrestrial and nine bats). None of these species, however, has been documented from within park boundaries on the basis of tangible evidence, according to NPS data, although 47

NPSpecies are listed as possibly occurring in the park (Table 2). This investigation appears to be the first comprehensive survey of the terrestrial mammalian fauna of HOBE.

Fieldwork began on 13 August 2003 and ended on 9 October 2003, encompassing a total of 15 man-days in the field and 2,350 trap-nights of sampling effort. Additional time was spent canvassing museum collections for specimens from Tallapoosa County, Alabama, and surrounding counties. Two museums – Museum of Southwestern Biology and Georgia Museum of Natural History – have specimens from HOBE, and several other museums have small series of specimens from the surrounding counties. Material at the Museum of Southwestern Biology was collected in 1995 as part of a large survey to document the extent of hantavirus in rodents in the southeastern United States (Mills et al. 1998), and four species (marsh rice rat, white-footed mouse, cotton mouse, and hispid cotton rat) were collected from within park boundaries. Material at the Georgia Museum of Natural History includes small series of white-footed mice and cotton mice collected from within park boundaries in July 1990 by Jim Boone, who was working on his PhD at the University of Georgia at the time (Boone et al. 1999).

Five major terrestrial habitats were identified – creek and river edges, bottomland forest, upland mixed forest, upland managed pine forest, and regularly maintained road edges and fields. Most fieldwork (Sherman livetraps, pitfall traps, and extensive ground truthing for spoor) occurred in the remote (gated) northeast quarter of the park, which had adequate segments of each habitat, save for maintained road edges and fields (Figure 29). Many other areas of the park were visited at least once, including the gated property southeast of the Tallapoosa River and the extensively managed pine forests west of the park along Alabama Highway 49. Bats were not included in this investigation.

Twenty-four species of terrestrial mammals were documented on the park property during the course of this project; however, two of these species (domestic horse and domestic cattle) are not permanent residents of the park and should not be included in subsequent park lists (horse tracks and scat were observed only on the south side of the Tallapoosa River), and part of a cow femur was recovered from park property. In addition, the Virginia opossum was documented immediately adjacent to park property and it undoubtedly inhabits HOBE. Eleven other species of mammals that are widely distributed in the southeastern United States (Hall 1981; Choate et al. 1994; Trani et al. 2007) were not encountered on park property, but each would be expected at HOBE. Therefore, 22 species of terrestrial mammals currently inhabit HOBE on a permanent basis, and another 11 species likely inhabit HOBE on a permanent basis but were not documented during this investigation (Table 18). The domestic/feral dog and striped skunk might occur in the park on occasion, but evidence of their presence on the property was not collected during the course of this investigation. Despite recent reports to the contrary, evidence of mountain lions was not secured during the course of this investigation.

No terrestrial mammal species at HOBE are considered to be imperiled by the U.S. Fish and Wildlife Service. Only one terrestrial species known from HOBE, the long-tailed weasel, is considered to be rare at the state level; it is ranked S3 by the Alabama Department of Conservation and Natural Resources. Three species of mammals that once were widely distributed in the eastern United States (red wolf, American black bear, and mountain lion) have been extirpated from the HOBE region. Red wolves have been reported from the Tallapoosa River, “near Cooloma” (Bartram 1791), and 17 individuals from the Talladega Mountains of

Clay County, Alabama, were killed in 1896 (Howell 1921). The nearest record of a black bear is from Mount Weogufka in Coosa County, Alabama (Howell 1921), and there are no historic records of mountain lions from Tallapoosa County, Alabama, or counties adjacent to the park (Howell 1921). Conversely, since Howell's monograph *Mammals of Alabama* (Howell 1921), the nine-banded armadillo and coyote have emigrated into the park and its surrounding counties (Choate et al. 1994; Trani et al. 2007).

Five other species of mammals (eastern fox squirrel, oldfield mouse, eastern woodrat, meadow jumping mouse, and eastern spotted skunk) apparently are absent from HOBE because suitable habitat is lacking. Fox squirrels have been reported from the Talladega Mountains in Clay County, Mount Weogufka in Coosa County, and Seale in Russell County, Alabama (Howell 1921). The nearest records of oldfield mice are from Lee County (3 mi S Auburn and 5 mi NW Auburn – specimens deposited at Northeastern University), whereas the nearest records of the woodrat, jumping mouse, and spotted skunk are Clay County (Cedar Mountain – Howell 1921), Lee County (4 mi N Auburn – Sullivan 1954), and Clay County (Talladega Mountains – Howell 1921), respectively. One Gulf Coastal Plain species (southeastern pocket gopher) is found as far north as Macon County, Alabama (Avisé et al. 1979), and there also is a record from Seale in Russell County, Alabama (Howell 1921), but it does not occur in Tallapoosa County.

On a landscape scale, the 33 species of mammals considered to be or expected to be Present at HOBE have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy most, if not all, of the five habitats identified in this report. Species typically associated with the forested habitats at HOBE include the Virginia opossum, southeastern shrew, northern-short-tailed shrew, eastern mole, nine-banded armadillo, eastern chipmunk, eastern gray squirrel, southern flying squirrel, woodchuck, white-footed mouse, cotton mouse, golden mouse, woodland vole, Norway rat, coyote, common gray fox, northern raccoon, long-tailed weasel, American mink, feral cat, bobcat, and white-tailed deer. Species associated primarily with early successional and grassland-forest ecotonal habitats include the least shrew, eastern mole, eastern cottontail, eastern harvest mouse, hispid cotton rat, house mouse, red fox, long-tailed weasel, feral cat, and bobcat. Species associated primarily with aquatic habitats include the swamp rabbit, American beaver, marsh rice rat, common muskrat, and northern river otter. Nine other species that currently are ascribed to the HOBE region or that once existed in the HOBE region, either have insufficient segments of suitable habitat or have been extirpated from east-central Alabama, and each does not exist or no longer exists at HOBE, respectively.

The status of the domestic/feral dog and striped skunk was extremely difficult to ascertain. Feral dogs have been reported from several national parks throughout the country, including HOBE. Unfortunately, most of these anecdotal comments lie unappreciated in unpublished reports, so their significance remains unknown. There is one dog-coyote hybrid at the U.S. National Museum of Natural History that was collected in Macon County, Alabama, in 1936. Domestic dogs, although not observed at HOBE during this investigation, likely are temporary visitors. Striped skunks have been reported from the Talladega Mountains in Clay County and Auburn in Lee County, Alabama (Howell 1921), and they likely occur at HOBE on rare occasions; however, several park personnel did not recall smelling or seeing one in the region and there

appears to be insufficient habitat at HOBE and the surrounding region to support a sustainable population.

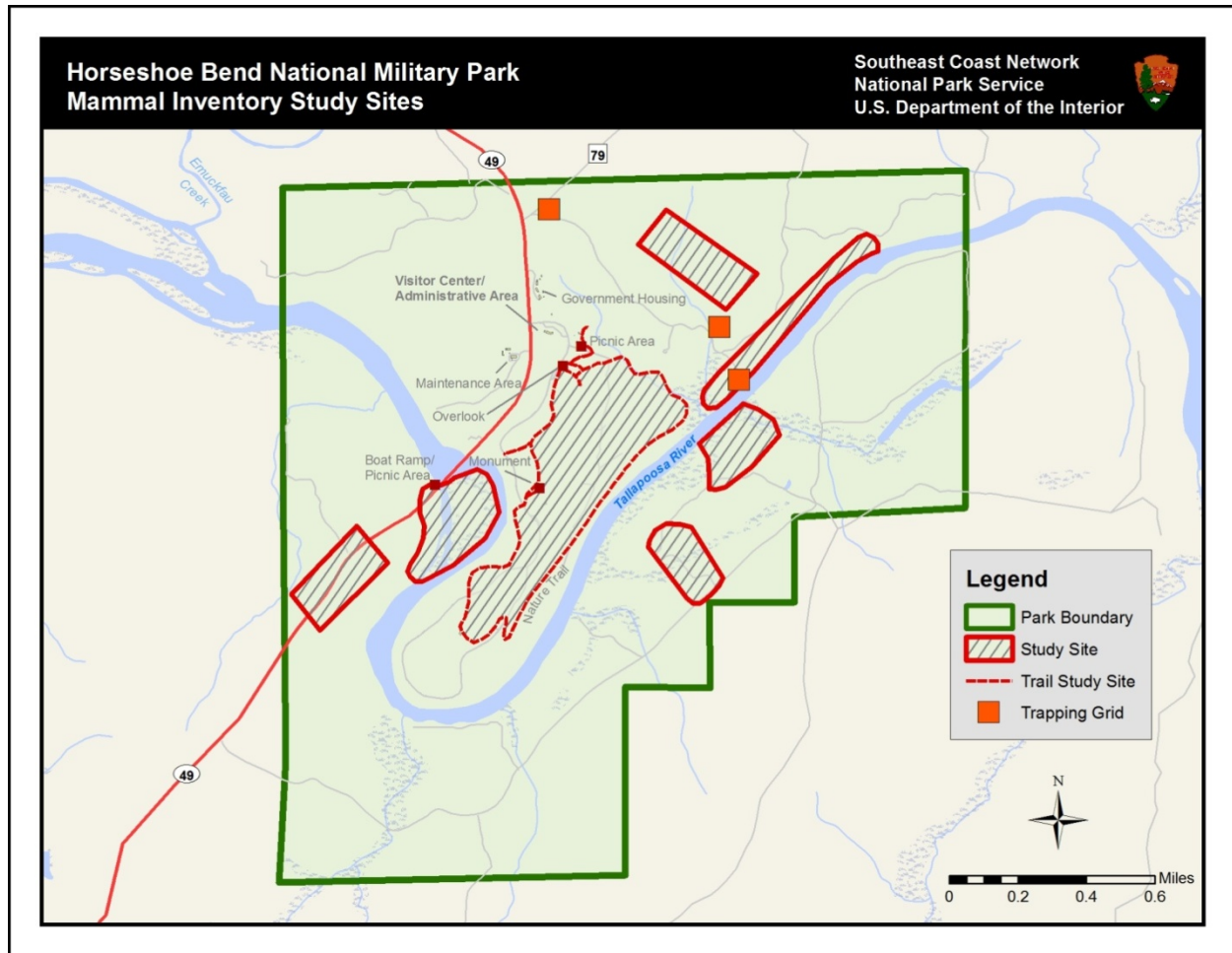


Figure 29. Mammal survey locations at Horseshoe Bend National Military Park.

Table 18. Status of 40 terrestrial mammals at Horseshoe Bend National Military Park.

Common Name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Southeastern shrew	Present	X	X	X		Evidence in HOBE
Least shrew	Present	X	X	X		Evidence in HOBE
Northern short-tailed shrew	Present	X	X	X		Evidence in HOBE
Eastern mole	Present	X		X	X	Evidence in HOBE
Nine-banded armadillo	Present	X	X			Evidence in HOBE
Eastern cottontail	Present	X	X	X		Evidence in HOBE
Woodchuck	Present	X		X	X	Evidence in HOBE
Eastern chipmunk	Present	X		X	X	Evidence in HOBE
Eastern gray squirrel	Present	X	X	X		Evidence in HOBE
American beaver	Present	X		X	X	Evidence in HOBE
Marsh rice rat	Present	X	X			Evidence in HOBE
White-footed mouse	Present	X	X			Evidence in HOBE
Cotton mouse	Present	X	X	X		Evidence in HOBE
Golden mouse	Present	X		X	X	Evidence in HOBE
Hispid cotton rat	Present	X	X	X		Evidence in HOBE
Woodland vole	Present	X	X	X		Evidence in HOBE
Coyote	Present	X		X	X	Evidence in HOBE
Common gray fox	Present	X		X	X	Evidence in HOBE
Northern raccoon	Present	X		X	X	Evidence in HOBE
Northern river otter	Present	X			X	Evidence in HOBE
Feral cat	Present	X			X	Evidence in HOBE
Domestic horse	Present	X			X	Evidence in HOBE
Domestic cattle	Present	X	X			Evidence in HOBE
White-tailed deer	Present	X	X	X		Evidence in HOBE
Virginia opossum	Probably Present					Evidence in region
Swamp rabbit	Probably Present					Evidence in region
Southern flying squirrel	Probably Present					Evidence in region
Eastern harvest mouse	Probably Present					Evidence in region
Common muskrat	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Red fox	Probably Present					Evidence in region
Long-tailed weasel	Probably Present					Evidence in region
American mink	Probably Present					Evidence in region
Bobcat	Probably Present					Evidence in region
Domestic/feral dog	Unconfirmed					
Striped skunk	Unconfirmed					
Red wolf	Absent					Extirpated
American black bear	Absent					Extirpated
Mountain lion	Absent					Extirpated

Kennesaw Mountain National Battlefield Park (KEMO)

Kennesaw Mountain National Battlefield Park consists of 2,888 acres of rolling hills, dominated by Kennesaw Mountain, Little Kennesaw Mountain, and Pigeon Hill in Cobb County, Georgia. This ridge formed a strategic defensive position for Confederate troops, under the direction of General Joseph E. Johnston, to defend Atlanta against advancing Union troops, under the direction of General William T. Sherman, during the Atlanta Campaign of the Civil War. In 1864, the Marietta-Atlanta area was largely devoid of dense forests, but today KEMO includes both hardwood and mixed pine-hardwood forests and large grassy fields, mechanically maintained to resemble the abandoned farm plots common in the region during the Civil War. Since 1993, thousands of pine trees have died from an infestation of the southern pine beetle and the mixed pine-hardwood forests are in transition to becoming dominated by hardwoods by attrition.

There has been no effort to document the mammalian fauna of KEMO. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but KEMO was not included as one of those parks. There is no voucher material from the park in museum collections and there are no internal park documents or records, save for one anecdotal reference to the American beaver in the *Southeast Coast Network Draft Study Plan*, which otherwise includes no NPSpecies. It is therefore not surprising that KEMO personnel designated the mammal inventory as its top priority for the Southeast Coast Network draft study plan. This investigation is the first comprehensive survey of the terrestrial mammalian fauna of KEMO.

Fieldwork began on 2 February 2003 and ended on 12 August 2003, encompassing a total of 18 man-days in the field and 2,350 trap-nights of sampling effort. Additional time was spent canvassing museum collections for specimens from Cobb County, Georgia, and surrounding counties. The American Museum of Natural History has one southeastern shrew; Cornell University has three eastern chipmunks; the Florida Museum of Natural History has a least shrew, four northern short-tailed shrews, an eastern mole, two golden mice, five hispid cotton rats, a house mouse, and a feral dog; the Georgia Museum of Natural History has a Virginia opossum, two southern flying squirrels, and two woodland voles; the Louisiana State University Museum of Zoology has one meadow jumping mouse; the University of Kansas has an eastern cottontail, four eastern gray squirrels, and four southern flying squirrels; the University of Michigan has series of the Virginia opossum, eastern mole, eastern cottontail, eastern chipmunk, eastern gray squirrel, southern flying squirrel, white-footed mouse, golden mouse, and hispid cotton rat; and the U.S. National Museum of Natural History has an eastern chipmunk, seven hispid cotton rats, and one Norway rat. Several other museums have series of specimens from the surrounding counties, and they are noted below where appropriate. In addition, Golley (1962) reported the white-footed mouse, and American mink from Cobb County, Packard (1969) reported the golden mouse from Cobb County, Hall (1951) reported the long-tailed weasel from Cobb County, Osowski et al. (1995) reported the American mink from Cherokee County, Georgia, and Young (1946) provided some historic records of mountain lions from an unspecified locality in Bartow County and northwest of Dahlonega in Lumpkin County, Georgia.

Five major terrestrial habitats were identified – creek edges, bottomland forest, upland hardwood forest, upland pine forest, and regularly maintained fields. Most fieldwork (Sherman livetraps, pitfall traps, and extensive ground truthing for spoor) occurred in the remote areas of the park so

as to avoid the areas most impacted by recreational visitors (Figure 30). Bats were not included in this investigation.

Eighteen species of terrestrial mammals were documented on the park property during the course of this project (Table 19); however, two of these species (domestic dog and domestic horse) are not permanent residents of KEMO and should not be included in subsequent park lists. Twelve other species of mammals that are widely distributed in the southeastern United States were not encountered on park property, but each would be expected at KEMO (Table 19). Three species (red wolf, American black bear, and mountain lion) have been extirpated and five others (common muskrat, American mink, striped skunk, eastern spotted skunk, and bobcat) are rare in the region, as encroaching development and habitat degradation has reduced the amount of suitable habitat in KEMO to levels that are no longer productive for these species; evidence of their presence on the property was not collected during the course of this investigation. Finally, five species of mammals (eastern fox squirrel, marsh rice rat, oldfield mouse, cotton mouse, and eastern woodrat) apparently are absent because suitable habitat is lacking. No terrestrial mammal species at KEMO are considered to be imperiled by the U.S. Fish and Wildlife Service.

On a landscape scale, the 28 species of terrestrial mammals considered to be or expected to be Present at KEMO have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy most, if not all, of the four habitats identified in this report. Species typically associated with the forested habitats at KEMO include the Virginia opossum, southeastern shrew, northern-short-tailed shrew, eastern mole, woodchuck, eastern chipmunk, eastern gray squirrel, southern flying squirrel, white-footed mouse, golden mouse, woodland vole, Norway rat, coyote, common gray fox, northern raccoon, long-tailed weasel, feral cat, and white-tailed deer. Species associated primarily with early successional and grassland-forest ecotonal habitats include the least shrew, eastern mole, eastern cottontail, eastern harvest mouse, hispid cotton rat, meadow vole, house mouse, meadow jumping mouse, red fox, long-tailed weasel, and feral cat. Species associated primarily with aquatic habitats include the swamp rabbit, American beaver, and northern raccoon. Fourteen other species that currently are ascribed to the KEMO region or that once existed in the KEMO region, either have insufficient segments of suitable habitat or have been extirpated from northwestern Georgia, and each does not exist or no longer exists at KEMO, respectively.

Despite the disproportionately large amount of fieldwork (given the acreage of KEMO), I was unable to secure tangible evidence of several species of mammals that were expected to be encountered. For example, evidence of white-footed mice, golden mice, woodland voles, and common gray foxes typically have been documented in parks where they occur. This was not the case in KEMO. Moreover, the large number of extant carnivores (American mink, northern river otter, striped skunk, eastern spotted skunk, and bobcat) that were not documented on park property was surprising.

It appears as though KEMO is suffering a reduction in species diversity for a number of related reasons. First, the park is relatively small and narrow and it has significantly sized inholdings of private property, meaning that it has a relatively large perimeter that encloses a relatively small area. The negative effect of this perimeter-to-area ratio is exacerbated by being surrounded by development, which prevents immigration and emigration (Heany and Patterson 1986;p

Rosenberg and Raphael 1986; Robinson and Wilcove 1994; Trani Griep 2002) and accelerates the debilitating internal effects of both external point and non-point sources of pollution. Species with large home ranges are disproportionately affected by these limitations (Matthiae and Stearns 1981), and carnivores typically have much larger home ranges than do, say, herbivores and omnivores. However, mammals with small home ranges such as eastern chipmunks and white-footed mice also can be extirpated if habitat patch size is too small (Fahrig and Merriam 1985). Contributing to this suite of limitations is the natural range extension of the coyote and the introduction of exotic feral cats, species of carnivores that are better able to live in close proximity to humans but that occupy, to some extent, niches that were previously occupied by the carnivores that have become extirpated from the region.

These issues portend that the list of 12 species expected to occur in the park, based on specimens previously collected in adjacent counties but not documented in KEMO during the course of this investigation, might be overly optimistic. For example, swamp rabbits were documented at several sites in Fulton County during this investigation, and additional specimens from Cherokee County are deposited in the U.S. National Museum of Natural History. White-footed mice have been taken from Cobb County (University of Michigan), Cherokee County (U.S. National Museum of Natural History), and several sites in Fulton County (Museum of Southwestern Biology and this investigation). Golden mice, now deposited at the University of Michigan and Georgia Museum of Natural History, have been taken in Cobb County and Fulton County, respectively. The Georgia Museum of Natural History also has meadow jumping mice from Fulton County and meadow voles from Gwinnett County. There is a red fox and an American mink from Fulton County, deposited in the Georgia Museum of Natural History and the U.S. National Museum of Natural History, respectively, and Golley (1962) reported the long-tailed weasel in Cherokee and Fulton counties. In addition, the common muskrat, common gray fox, American mink, and northern river otter were documented at several sites in Fulton County during this investigation. None of these species was documented in KEMO, even though each has been documented in the surrounding region. In conclusion, mammalian diversity at KEMO might be extremely low, consisting of only about 20 native species and five exotic species.

Table 19. Status of 38 terrestrial mammals at Kennesaw Mountain National Battlefield Park.

Common Name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X			X	Evidence in KEMO
Southeastern shrew	Present	X	X			Evidence in KEMO
Least shrew	Present	X	X			Evidence in KEMO
Northern short-tailed shrew	Present	X	X			Evidence in KEMO
Eastern mole	Present	X			X	Evidence in KEMO
Eastern cottontail	Present	X	X			Evidence in KEMO
Eastern chipmunk	Present	X			X	Evidence in KEMO
Eastern gray squirrel	Present	X	X			Evidence in KEMO
American beaver	Present	X			X	Evidence in KEMO
Eastern harvest mouse	Present	X			X	Evidence in KEMO
Hispid cotton rat	Present	X	X			Evidence in KEMO
Norway rat	Present	X	X			Evidence in KEMO
Coyote	Present	X			X	Evidence in KEMO
Domestic/feral dog	Present	X			X	Evidence in KEMO
Northern raccoon	Present	X			X	Evidence in KEMO
Feral cat	Present	X			X	Evidence in KEMO
Domestic horse	Present	X			X	Evidence in KEMO
White-tailed deer	Present	X	X			Evidence in KEMO
Swamp rabbit	Probably Present					Evidence in region
Woodchuck	Probably Present					Evidence in region
Southern flying squirrel	Probably Present					Evidence in region
White-footed mouse	Probably Present					Evidence in region
Golden mouse	Probably Present					Evidence in region
Meadow vole	Probably Present					Evidence in region
Woodland vole	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Meadow jumping mouse	Probably Present					Evidence in region
Red fox	Probably Present					Evidence in region
Common gray fox	Probably Present					Evidence in region
Long-tailed weasel	Probably Present					Evidence in region
Common muskrat	Encroaching					Evidence in region
American mink	Encroaching					Evidence in region
Striped skunk	Encroaching					Evidence in region
Eastern spotted skunk	Encroaching					Evidence in region
Bobcat	Encroaching					Evidence in region
Red wolf	Absent					Extirpated
American black bear	Absent					Extirpated
Mountain lion	Absent					Extirpated

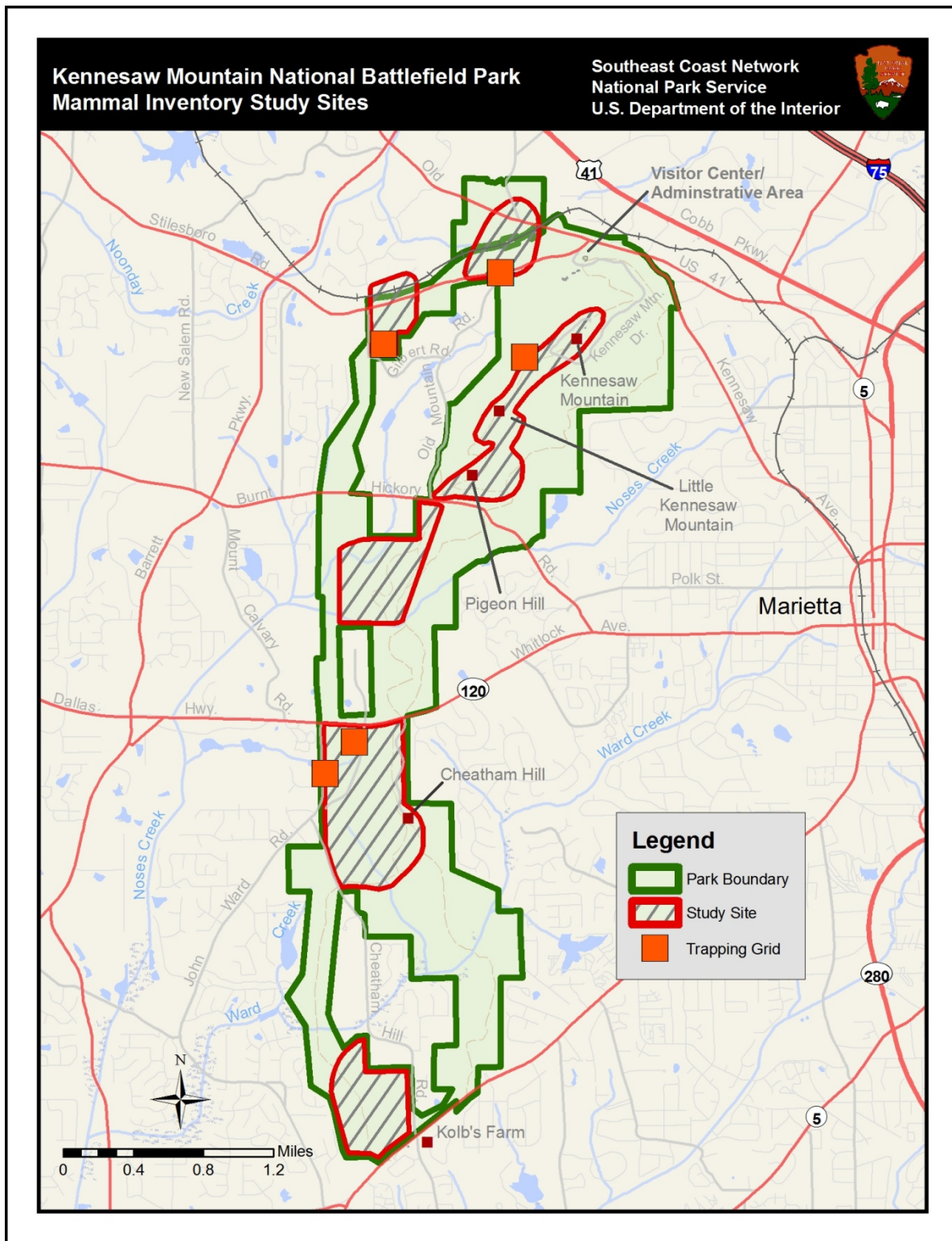


Figure 30. Mammal survey locations at Kennesaw Mountain National Battlefield Park.

Moore's Creek National Battlefield (MOCR)

Moore's Creek National Battlefield is the site of a brief but significant conflict between British loyalists and Colonial patriots. On the morning of 27 February 1776, loyalists attempted to cross the Moore's Creek bridge, which was the only avenue to cross the swampy terrain on Negro Head Point Road, near Currie, in Pender County, North Carolina. The patriots had established a defensive position by partially dismantling the bridge, greasing the remaining struts, and digging a low earthwork for fortification on the east side of the bridge. Only one patriot was killed during the brief struggle, but more than 30 loyalists were killed and another 40 were wounded; the loyalists retreated in disarray. Today, MOCR is an 88-acre mosaic of upland hardwood forest, upland pine forest, bottomland forest, a fire-maintained wet savanna, and Moore's Creek, termed a "black-water" creek because its tea-colored waters have been stained by the tannins released from decomposing wetland vegetation.

There apparently has been little effort to document the mammalian fauna of MOCR, other than unpublished lists provided on several occasions by students at the University of North Carolina Wilmington. A list of 13 potential species was provided to the NPS by staff at the University of California-Davis in 1992. This list included the mountain lion, which is thought to be extirpated from the MOCR region, but it did not include shrews, bats, or murid rodents. According to NPS data, 14 NPS species are listed as possibly occurring in the park (Table 2). Both of these estimates are woefully inadequate given the amount of mammalian diversity in the southeastern United States (Hall 1981; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007), and this investigation, the first comprehensive survey of the mammalian fauna of MOCR, is timely.

Fieldwork began on 26 February 2003 and ended on 24 August 2004, encompassing a total of 47 man-days in the field and 2,125 trap-nights of sampling effort. In addition, 10 man-nights were used to survey bats. Additional time was spent canvassing museum collections for specimens from Pender County, North Carolina, and surrounding counties. Personnel from the Museum of Southwestern Biology collected five cotton mice from MOCR in 1995 as part of a large survey to document the extent of hanta virus in rodents in the southeastern United States (Mills et al. 1998). Five museums have specimens from Pender County, North Carolina – the N.C. State Museum of Natural Sciences has specimens of the southeastern myotis, eastern pipistrelle, eastern red bat, Seminole bat, evening bat, Rafinesque's big-eared bat, eastern cottontail, eastern gray squirrel, southern flying squirrel, and cotton mouse; the Peabody Museum of Natural History has one eastern cottontail and one marsh rabbit; the U.S. National Museum of Natural History has a marsh rabbit; the University of Michigan has an eastern mole, a white-footed mouse, an American black bear, and three white-tailed deer; and the University of North Carolina Wilmington has specimens of the Virginia opossum, southeastern shrew, least shrew, northern short-tailed shrew, eastern mole, star-nosed mole, eastern red bat, Seminole bat, hoary bat, evening bat, eastern cottontail, marsh rabbit, eastern gray squirrel, eastern fox squirrel, American beaver, marsh rice rat, eastern harvest mouse, white-footed mouse, cotton mouse, golden mouse, hispid cotton rat, eastern woodrat, woodland vole, Norway rat, house mouse, common gray fox, American black bear, northern raccoon, northern river otter, bobcat, and white-tailed deer.

Five major terrestrial habitats were identified: upland hardwood forest, upland pine forest, wet savanna, creek edges, and mechanically maintained picnic areas and road edges. Given the relatively small size of the park and its accessibility, fieldwork (Sherman livetraps, pitfall traps,

and extensive ground truthing for spoor) was conducted throughout the entire park (Figure 6). Surveys for bats were conducted using SONOBAT in an open area adjacent to a young pine forest on park property and where Hwy 210 crosses Moores Creek, just southwest of the park boundary. In addition, the bridge at this site was examined for roosting bats on several occasions.

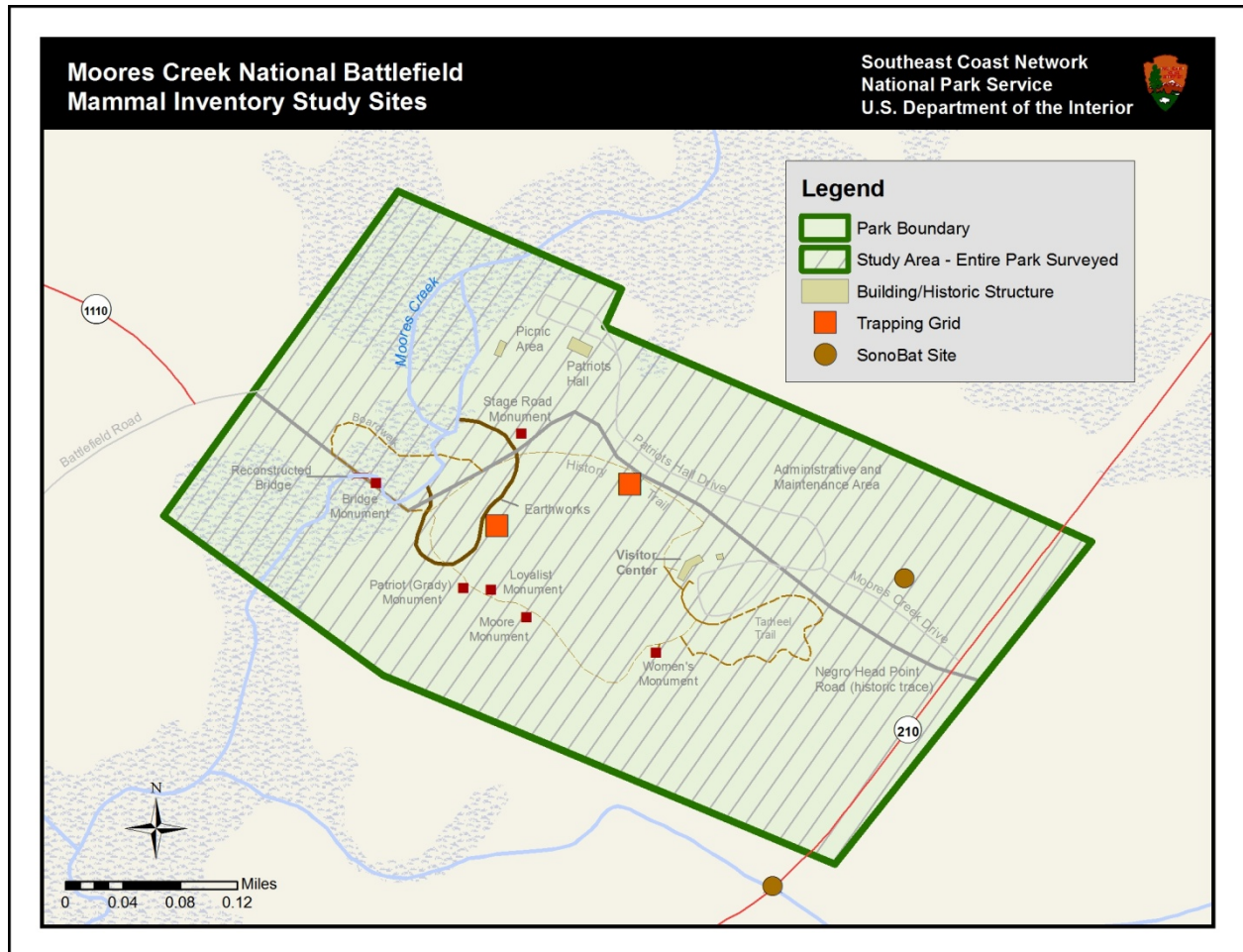


Figure 31. Mammal survey locations at Moores Creek National Battlefield.

Twenty-five species of terrestrial mammals were documented on park property during the course of this project, and another 16 species of mammals that are widely distributed in the southeastern United States but not encountered on park property, would be expected at MOCR (Table 20). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. The American black bear also is not a permanent resident of MOCR, but individuals occasionally stray through the park. The red wolf and mountain lion no longer inhabit the region, although reports of mountain lions continue to persist.

The nutria is encroaching on park property and might occur there occasionally and the southern short-tailed shrew, little brown myotis, big brown bat, northern yellow bat, Brazilian free-tailed bat, eastern fox squirrel, eastern woodrat, red fox, and striped skunk occur in the region surrounding MOCR, but they are not permanent residents of the park because suitable habitat is

lacking. The southern short-tailed shrew competes intensely with the northern short-tailed shrew and they almost never coexist, and when they do the southern short-tailed shrew inhabits coastal uplands and the northern short-tailed shrew inhabits bottomlands (Webster et al. 1985; Webster 1996; Webster et al. in prep). The little brown myotis and big brown bat rarely occur in southeastern North Carolina (Webster et al. in press a) and then only in migration. The northern yellow bat only recently has been reported from North Carolina (Webster 2002) and its range is likely expanding northward, but its preferred habitat – mixed forests laden with Spanish moss adjacent to open areas that serve as foraging sites (Barbour and Davis 1969; Webster et al. 1980) – is not present at MOCR. The Brazilian free-tailed bat inhabits the attics and lofts of large structures such as schools, churches, and buildings (Barbour and Davis 1969; Webster et al. 1985; Webster et al. in press a); these structures do not occur at MOCR. In the eastern United States, the eastern fox squirrel prefers mature long-leaf pine forests (Flyger and Gates 1982; Webster et al. 1985), which no longer exist at MOCR. Historically, fox squirrels inhabited the region when long-leaf pines were more abundant, and recent MOCR management plans to restore the long-leaf pine savanna, if applied beyond park property and throughout adjacent loblolly pine plantations, might provide the necessary acreage that would encourage recolonization by fox squirrels. There are records of the eastern woodrat from Pender County (Adams 1987), but this species occupies an extremely narrow habitat in eastern North Carolina (Webster et al. 1987) – palmetto forests on Grifton soils – that does not exist at MOCR. In addition, there are records of red foxes and striped skunks in Pender County, North Carolina (Lee et al. 1983) and nutria have been reported on the Black River in Pender County and in surrounding counties; these species are extremely mobile and should be expected to occur in the park from time to time, but they are not permanent residents. Therefore, 41 species of mammals were documented as occurring or probably occurring on park property.

Several species of mammals that inhabit or are thought to inhabit MOCR are considered to be imperiled by the U.S. Fish and Wildlife Service and the State of North Carolina (LeGrand et al. 2008). The red wolf and mountain lion once were widely distributed in the eastern United States, but both have been extirpated from the MOCR region and listed federally as Endangered; the former is listed at the state level as Significantly Rare and ranked S1 and the latter is listed as Endangered and ranked SH. The southeastern bat and Rafinesque's big-eared bat are listed federally as Species of Concern; the former is listed at the state level as Special Concern and ranked S3 and the latter is listed as Threatened and ranked S3. Also at the state level, the star-nosed mole is listed as Special Concern and ranked S2, the northern yellow bat is listed as Significantly Rare and ranked SU, and the eastern woodrat is listed as Threatened and ranked S1.

On a landscape scale, the 41 species of mammals considered to be or expected to be Present at MOCR have widespread geographic distributions in the southeastern United States (Hall 1981; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy most, if not all, of the five habitats identified in this report. Species typically associated with the upland hardwood and upland pine forests at MOCR include the Virginia opossum, southeastern shrew, northern short-tailed shrew, eastern mole, eastern gray squirrel, southern flying squirrel, white-footed mouse, cotton mouse, golden mouse, woodland vole, Norway rat, coyote, common gray fox, American black bear, northern raccoon, long-tailed weasel, feral cat, bobcat, and white-tailed deer. Species associated primarily with the wet savanna and savanna-forest ecotonal habitats include the least shrew, northern short-tailed shrew, eastern mole, eastern cottontail, eastern harvest mouse, hispid cotton

rat, woodland vole, house mouse, long-tailed weasel, feral cat, and bobcat. Species typically associated with the floodplain forest at MOCR include the Virginia opossum, northern short-tailed shrew, eastern gray squirrel, southern flying squirrel, cotton mouse, golden mouse, coyote, common gray fox, American black bear, northern raccoon, long-tailed weasel, American mink, northern river otter, feral cat, bobcat, and white-tailed deer. Species associated primarily with creek edges include the star-nosed mole, marsh rabbit, marsh rice rat, common muskrat, nutria, and northern river otter. Species associated primarily with aquatic habitats include the star-nosed mole, marsh rabbit, marsh rice rat, common muskrat, nutria, and northern river otter. Species associated with the maintained areas include black rat, house mouse, and feral cat. Eleven other species that currently are ascribed to the MOCR region or that once existed in the MOCR region either have insufficient segments of suitable habitat or have been extirpated from southeastern North Carolina, and each does not exist or no longer exists at MOCR, respectively.

Table 20. Status of 42 mammals at Moores Creek National Battlefield.

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X		X	X	Evidence in MOCR
Southeastern shrew	Present	X	X			Evidence in MOCR
Least shrew	Present	X	X			Evidence in MOCR
Northern short-tailed shrew	Present	X	X			Evidence in MOCR
Eastern mole	Present	X			X	Evidence in MOCR
Southeastern myotis	Present	X			X	Evidence in MOCR
Eastern pipistrelle	Present	X			X	Evidence in MOCR
Eastern red bat	Present	X			X	Evidence in MOCR
Evening bat	Present	X			X	Evidence in MOCR
Eastern gray squirrel	Present	X	X	X		Evidence in MOCR
American beaver	Present	X		X	X	Evidence in MOCR
Eastern harvest mouse	Present	X	X			Evidence in MOCR
White-footed mouse	Present	X	X			Evidence in MOCR
Cotton mouse	Present	X	X			Evidence in MOCR
Golden mouse	Present	X	X			Evidence in MOCR
Hispid cotton rat	Present	X	X			Evidence in MOCR
Covote	Present	X			X	Evidence in MOCR
Domestic/feral dog	Present	X			X	Evidence in MOCR
Common gray fox	Present	X			X	Evidence in MOCR
American black bear	Present	X			X	Evidence in MOCR
Northern raccoon	Present	X		X	X	Evidence in MOCR
American mink	Present	X			X	Evidence in MOCR
Northern river otter	Present	X		X	X	Evidence in MOCR
Feral cat	Present	X			X	Evidence in MOCR
White-tailed deer	Present	X	X	X		Evidence in MOCR
Star-nosed mole	Probably Present					Evidence in region
Silver-haired bat	Probably Present					Evidence in region
Seminole bat	Probably Present					Evidence in region
Hoary bat	Probably Present					Evidence in region
Rafinesque's big-eared bat	Probably Present					Evidence in region
Eastern cottontail	Probably Present					Evidence in region
Marsh rabbit	Probably Present					Evidence in region
Southern flying squirrel	Probably Present					Evidence in region
Marsh rice rat	Probably Present					Evidence in region
Woodland vole	Probably Present					Evidence in region
Common muskrat	Probably Present					Evidence in region
Black rat	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Long-tailed weasel	Probably Present					Evidence in region
Bobcat	Probably Present					Evidence in region
Nutria	Encroaching					Evidence in region

Ocmulgee National Monument (OCMU)

Ocmulgee National Monument is the only known site in the eastern United States that contains a continuous history of Native North Americans over the last 10,000 years. Beginning with the Early Mississippians (900-1200 AD) and extending into the Creek Indian Nation (1690-1715 AD), the earth lodges and large temple mounds contain a rich archeological history of the first agrarian civilization in eastern North America.

This 702-acre park is located adjacent to the city of Macon, Georgia, along the Fall Line, which is defined by an abrupt elevational change that separates the Piedmont and Coastal Plain physiographic provinces. Here, the characteristic Piedmont and Coastal Plain floras and faunas meet, so biological diversity tends to be greater than in surrounding regions. The Ocmulgee River forms the southwestern border of the Main Unit and Walnut Creek forms part of its southeastern border, providing excellent examples of floodplain forest, whereas the northern part of the park consists of upland hardwood and mixed hardwood-pine forest. Much of the Main Unit, those parts including the earthen works, has been cleared of trees and is maintained mechanically as open grasslands. The Lamar Mounds and Village Unit, located downriver on the Ocmulgee, consists primarily of river floodplain habitat and are not accessible to visitors.

There apparently has been no effort to document the mammalian fauna of OCMU. A list of 44 potential species (33 terrestrial and 11 bats) was provided to the NPS by staff at the University of California-Davis in 1992, but it did not include the nine-banded armadillo, eastern chipmunk, eastern gray squirrel, American beaver, eastern harvest mouse, woodland vole, common muskrat, red wolf, or mountain lion. A *Check List of Mammals Ocmulgee National Monument* is available at the Visitor Center – this includes 53 potential species (40 terrestrial and 13 bats). None of these species, however, has been documented from within park boundaries on the basis of tangible evidence, according to NPS data, although 63 NPSpecies are listed as possibly occurring in the park (Table 2). Part of a mountain lion skull is on display in the Visitor Center, but according to park personnel the provenance of this specimen is unknown. This investigation appears to be the first comprehensive survey of the terrestrial mammalian fauna of OCMU.

Fieldwork began on 5 August 2003 and ended on 9 October 2003, encompassing a total of 17 man-days in the Main Unit (2,325 trap-nights of sampling effort) and two man-days in the Lamar Unit. Park personnel were particularly interested in assessing the status of the American black bear at the Lamar Unit, since bears had been reported at Robins Air Force Base, about 16 km (10 mi) south of Macon along the Ocmulgee River. Additional time was spent canvassing museum collections for specimens from Bibb County, Georgia, and surrounding counties. No museums had specimens from OCMU per se, but three museums had specimens from Bibb County, Georgia – the Georgia Museum of Natural History has two eastern woodrats from “S of Macon,” the U.S. National Museum of Natural History has a chipmunk from “Rivali” and a common gray fox from Macon, and the Vertebrate Collections at Northeastern University have two eastern harvest mice and one cotton mouse from unspecified localities in Bibb County. Golley (1962) provided additional records from unspecified localities in Bibb County for the Virginia opossum, least shrew, eastern mole, nine-banded armadillo, eastern cottontail, marsh rabbit, eastern gray squirrel, eastern fox squirrel, southern flying squirrel, American beaver, golden mouse, common muskrat, Norway rat, American black bear, northern raccoon, northern river otter, and white-tailed deer. Furthermore, there are series of mammals from Crawford (southeastern pocket gopher, marsh rice rat, and oldfield mouse), Houston (southeastern pocket gopher, oldfield

mouse, and eastern woodrat), Jones (southeastern shrew, least shrew, oldfield mouse, golden mouse, and bobcat), Lamar (long-tailed weasel), Peach (eastern fox squirrel), Pike (white-footed mouse), Talbot (swamp rabbit, red fox, long-tailed weasel, American mink, striped skunk, eastern spotted skunk, and bobcat), Taylor (southeastern pocket gopher), Twiggs (oldfield mouse and golden mouse), and Upson (white-footed mouse) counties in the Florida Museum of Natural History, Georgia Museum of Natural History, Museum of Vertebrate Zoology, University of Kansas, and U.S. National Museum of Natural History. Moreover, Lowe (1958) provided a record of the swamp rabbit from Macon County and Golley (1962) provided records of the southern short-tailed shrew from Monroe and Crawford counties, marsh rice rat from Houston County, hispid cotton rat from Jones, Crawford, and Houston counties, house mouse from Jones and Houston counties, red fox from Monroe and Jones counties, eastern spotted skunk from Jones and Houston counties, and bobcat from Monroe County.

Five major terrestrial habitats were identified – creek and river edges, bottomland forest, upland oak-hickory forest, upland mixed hardwood-pine forest, and regularly maintained road edges and fields. Most fieldwork (Sherman livetraps, pitfall traps, and extensive ground truthing for spoor) occurred in the Main Unit, which had adequate segments of each habitat (Figure 32). Most areas of the park were visited on foot at least once, including the remote area east of Walnut Creek (Main Unit) and the Lamar Unit. Trapping was not conducted at the Lamar Unit due to the potential for flooding. Bats were not included in this investigation.

Twenty-three species of terrestrial mammals were documented on park property during the course of this project, 21 at the Main Unit and 11 at the Lamar Unit (Table 21). The domestic dog, however, is not a permanent resident of the park and should not be included in subsequent checklists. Eleven other species of mammals that are widely distributed in the southeastern United States were not encountered on park property, but each would be expected at OCMU (Table 21). The status of the swamp rabbit and marsh rabbit deserves comment. Both of these species occupy wetland habitat, and they likely compete for resources since they are mutually exclusive. Their ranges meet along the Fall Line, with swamp rabbits above the Fall Line in the Piedmont and marsh rabbits below the Fall Line in the Coastal Plain (Hall 1981; Choate et al. 1994; Trani et al. 2007), and both species have been reported from Bibb County, Georgia (Golley 1962). Unfortunately, documentation of these wetland denizens was not collected during the course of this investigation, and there are no literature records or voucher material from adjacent counties that provide ancillary information about their respective geographic distributions in the region. It is possible that both species inhabit OCMU since the park is situated on the Fall Line. Finally, evidence of the American black bear was not found at the Lamar Unit, but bears are extremely mobile and they should be expected to occur there from time to time. Therefore, 33 species of terrestrial mammals were documented as occurring or probably occurring on park property, but the status of the swamp and marsh rabbits remains enigmatic.

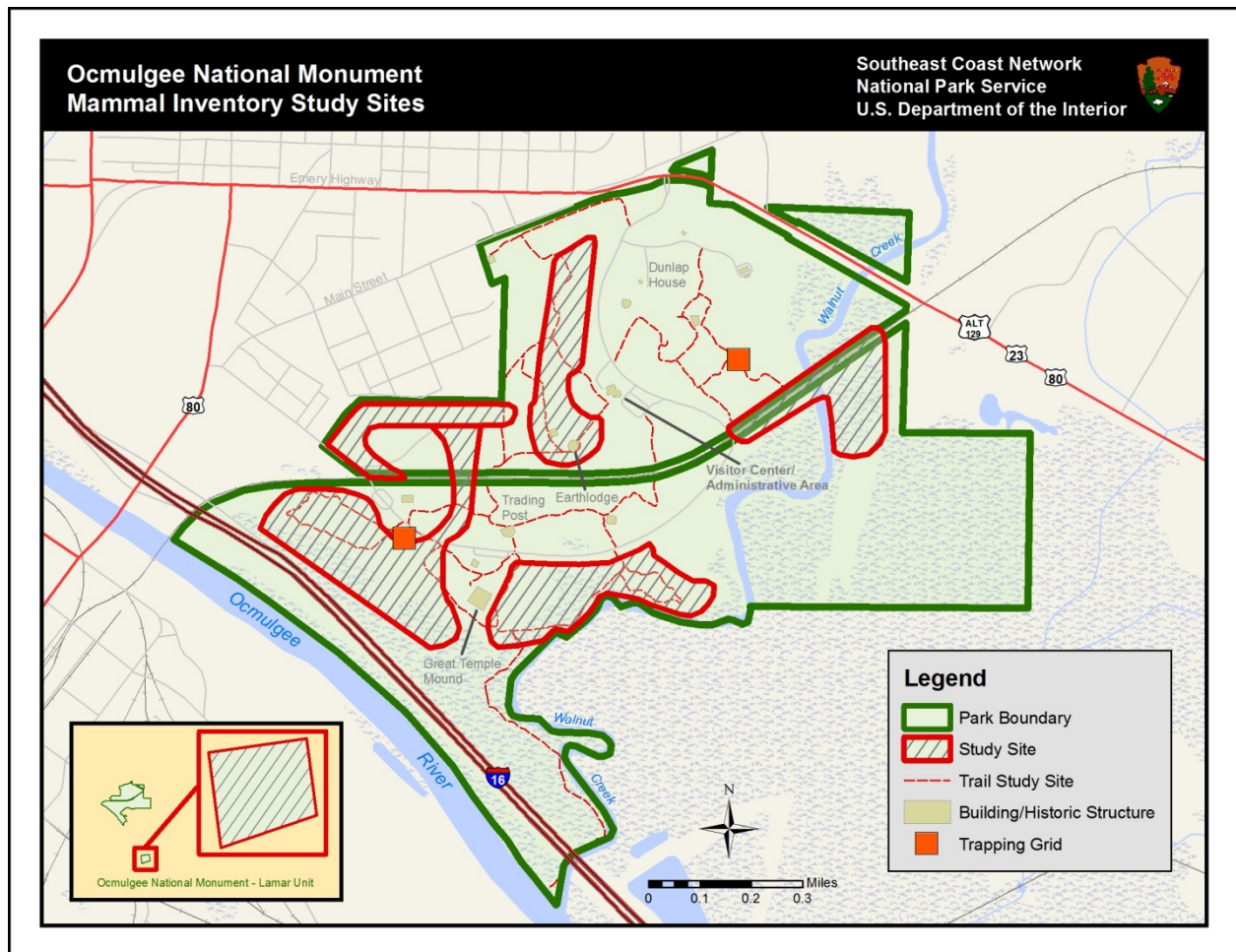


Figure 32. Mammal survey locations at Ocmulgee National Monument.

Several species of exotic mammals inhabit OCMU, and they should be carefully monitored to determine if they are affecting native species and community structure. In particular, feral pigs have caused extensive damage in the forested parts of OCMU by their foraging and wallowing activities, especially the wetlands east of Walnut Creek and in the Lamar Unit. Skeletal material procured during this investigation confirms that these animals are feral-boar hybrids, descendents of escaped and deliberately introduced individuals (Mayer and Brisbin 1991). Feral cats are another exotic species that actively preys on native birds, small mammals, and reptiles; the negative effect of feral cats is much more subtle and difficult to quantify without tremendous cost in labor and supplies. Likewise, the impact that nutria have on native plant communities has not been adequately assessed, but these large rodents can quickly reduce plant diversity in marshes through their foraging behavior. Active management of these species is recommended.

No terrestrial mammal species at OCMU is considered to be imperiled by the U.S. Fish and Wildlife Service, with the possible exception of the American black bear (discussed below). Three species of mammals that once were widely distributed in the eastern United States (red wolf, American black bear, and mountain lion) have been extirpated from the OCMU region.

There are no records of red wolves or mountain lions from Bibb County, Georgia, or the surrounding counties, but there is a historic record of bears from Bibb County (Golley 1962). If the black bear expands its range up the Ocmulgee River and recolonizes OCMU, it will be imperative to determine its taxonomic status because bears immigrating up the Altamaha, Ocmulgee, and Oconee rivers from more southerly sites might be referable to *Ursus americanus floridanus*, which is considered to be imperiled (rank of S2) in Georgia.

Four other species of mammals (nine-banded armadillo, eastern fox squirrel, oldfield mouse, and eastern spotted skunk) apparently are absent from OCMU because suitable habitat is lacking. Nine-banded armadillos have been reported from an unspecified location in Bibb County (Golley 1962) and one individual was observed on U.S. Highway 129 near the Jones County line (this investigation), and it is only a matter of time before armadillos colonize OCMU. There is a record of the fox squirrel from Bibb County, but the specific locality was not identified (Golley 1962). Oldfield mice have not been reported from Bibb County, but specimens deposited at the U.S. National Museum have come from Crawford, Jones, Twiggs, and possibly Wilkinson counties, and there is a specimen from Houston County that is deposited at the Florida Museum of Natural History. Spotted skunks also have not been reported from Bibb County, but Golley (1962) reported them from Houston and Jones counties, and there are specimens deposited at the Museum of Vertebrate Zoology, University of Kansas, and U.S. National Museum of Natural History Berkeley that were collected from Talbot County. One Piedmont species (white-footed mouse) is found to the immediate west of OCMU in Upson and Pike counties (University of Georgia specimens), but it does not occur in Bibb County, and one Gulf Coastal Plain species (southeastern pocket gopher) is found as far north as Taylor, Crawford, and Houston counties (Florida Museum of Natural History, Museum of Vertebrate Zoology, and U.S. National Museum specimens), but it does not occur in Bibb County.

On a landscape scale, the 33 species of mammals considered to be or expected to be Present at OCMU have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Terani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy most, if not all, of the five habitats identified in this report. Species typically associated with the forested habitats at OCMU include the Virginia opossum, southeastern shrew, southern short-tailed shrew, eastern mole, nine-banded armadillo, eastern chipmunk, eastern gray squirrel, southern flying squirrel, cotton mouse, golden mouse, woodland vole, Norway rat, coyote, common gray fox, northern raccoon, long-tailed weasel, American mink, feral cat, bobcat, feral pig, and white-tailed deer. Species associated primarily with early successional and grassland-forest ecotonal habitats include the least shrew, eastern mole, eastern cottontail, eastern harvest mouse, hispid cotton rat, house mouse, red fox, long-tailed weasel, striped skunk, feral cat, and bobcat. Species associated primarily with aquatic habitats include the swamp rabbit, marsh rabbit, American beaver, marsh rice rat, common muskrat, and northern river otter. Seven other species that currently are ascribed to the OCMU region or that once existed in the OCMU region, either have insufficient segments of suitable habitat or have been extirpated from central Georgia, and each does not exist or no longer exists at OCMU, respectively.

Table 21. Status of 39 terrestrial mammals at Ocmulgee National Monument. [¹Main Unit, ²Lamar Unit]

Common Name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X	X	X		Evidence in OCMU ¹
Southern short-tailed shrew	Present	X	X	X		Evidence in OCMU ¹
Eastern mole	Present	X		X	X	Evidence in OCMU ¹²
Eastern cottontail	Present	X		X	X	Evidence in OCMU ¹
Eastern chipmunk	Present	X		X	X	Evidence in OCMU ¹
Eastern gray squirrel	Present	X			X	Evidence in OCMU ¹²
American beaver	Present	X	X	X		Evidence in OCMU ¹²
Cotton mouse	Present	X	X	X		Evidence in OCMU ¹
Hispid cotton rat	Present	X	X	X		Evidence in OCMU ¹
Eastern woodrat	Present	X		X		Evidence in OCMU ²
Woodland vole	Present	X	X	X		Evidence in OCMU ¹
Common muskrat	Present	X		X	X	Evidence in OCMU ¹
Nutria	Present	X			X	Evidence in OCMU ¹
Coyote	Present	X		X	X	Evidence in OCMU ¹²
Domestic/feral dog	Present	X			X	Evidence in OCMU ¹²
Red fox	Present	X		X	X	Evidence in OCMU ¹
Common gray fox	Present	X		X	X	Evidence in OCMU ¹
Northern raccoon	Present	X	X	X		Evidence in OCMU ¹²
Northern river otter	Present	X		X	X	Evidence in OCMU ¹²
Feral cat	Present	X	X			Evidence in OCMU ¹
Bobcat	Present	X		X	X	Evidence in OCMU ²
Feral pig	Present	X	X		X	Evidence in OCMU ¹²
White-tailed deer	Present	X		X	X	Evidence in OCMU ¹²
Southeastern shrew	Probably Present					Evidence in region
Least shrew	Probably Present					Evidence in region
Southern flying squirrel	Probably Present					Evidence in region
Marsh rice rat	Probably Present					Evidence in region
Eastern harvest mouse	Probably Present					Evidence in region
Golden mouse	Probably Present					Evidence in region
Norway rat	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Long-tailed weasel	Probably Present					Evidence in region
American mink	Probably Present					Evidence in region
Striped skunk	Probably Present					Evidence in region
Swamp rabbit	Unconfirmed					Evidence in region
Marsh rabbit	Unconfirmed					Evidence in region
Red wolf	Absent					Extirpated
American black bear	Absent					Extirpated
Mountain lion	Absent					Extirpated

Timucuan Ecological and Historical Preserve (TIMU)

Timucuan Ecological and Historic Preserve is the largest Park in the Southeast Network, including over 46,000 acres primarily nestled between the Nassau and Saint Johns rivers in northeastern Florida. The majority of TIMU consists of a complex of non-forested wetland habitats, but there are also well-drained upland habitats in several parts of the Park. The rich assortment of coastal plants and animals in northeastern Florida formed the basis of the Timucuan Indian culture. Today, the Timucuan Indians are gone but their middens provide clues about their lifestyle.

There are no comprehensive checklists of the mammalian fauna of TIMU or northeastern Florida. Staff at the University of California-Davis provided lists of potential species of mammals inhabiting most parks to NPS personnel in 1992, but TIMU was not included as one of those Parks. According to NPS data, 10 species of mammals have been documented on Park property, although 32 NPS species are listed as possibly occurring in the Park (Table 2). In addition, there are two pieces of gray literature that provide information on the mammalian fauna of TIMU. The first, *Environmental assessment: Proposed visitor contact station at Cedar Point* (Wright et al. 2007), includes a checklist of 11 species of terrestrial mammals (Virginia opossum, eastern mole, nine-banded armadillo, eastern gray squirrel, cotton mouse, eastern woodrat, northern raccoon, northern river otter, bobcat, feral pig, and white-tailed deer) from Cedar Point. The second, *Resource assessment report of marsh islands in Northeast Florida* (McClung 2004), includes records for five species of terrestrial mammals (nine-banded armadillo, eastern gray squirrel, northern raccoon, feral pig, and white-tailed deer) in the Burton Island, Broward Island, Clapboard Creek, and Saint Johns River areas. Given the lack of systematic fieldwork and museum reconnaissance, there is no consensus about how many species of terrestrial mammals inhabit TIMU.

TIMU is a complex Park, with several subunits used in this investigation identified by name – Thomas Creek, Cedar Point, Kingsley Plantation, Fort George Island and the Ribault Club (which is owned by the Florida Park Service but jointly staffed by NPS and the Florida Park Service), Sohn Tract, Theodore Roosevelt Area (which due to its geographic proximity was included in the account for Fort Caroline National Memorial), all in Duval County, Florida, and American Beach – Sand Dune in Nassau County, Florida.

Fieldwork began on 29 January 2004 and ended on 17 July 2004, encompassing a total of 25 man-days in the field and 1,075 trap-nights of sampling effort. Additional time was spent canvassing museum collections for specimens from Duval County, Florida, and from surrounding counties. From Duval County, Florida, the American Museum of Natural History has specimens of the least shrew, marsh rice rat, hispid cotton rat, eastern woodrat, and striped skunk; the California Academy of Sciences has 10 house mice; the Florida Museum of Natural History has specimens of the eastern mole, nine-banded armadillo, southern flying squirrel, southeastern pocket gopher, cotton mouse, golden mouse, nutria, common gray fox, American black bear, long-tailed weasel, northern river otter, bobcat, and white-tailed deer; the Georgia Museum of Natural History has specimens of the southeastern pocket gopher, northern raccoon, and bobcat; the Louisiana State University Museum of Zoology has one eastern fox squirrel; the Museum of Comparative Zoology has specimens of the eastern cottontail, marsh rabbit, eastern gray squirrel, golden mouse, and hispid cotton rat; the Museum of Southwestern Biology has two southern short-tailed shrews, one southern flying squirrel, one southeastern pocket gopher, two

golden mice, and six hispid cotton rats; the Texas Cooperative Wildlife Collection has two southeastern pocket gophers; and the U.S. National Museum of Natural History has specimens of the eastern mole, eastern gray squirrel, southeastern pocket gopher, and Norway rat. In addition, the Florida Museum of Natural History has an eastern fox squirrel from Baker County, Florida, and there are series of southern short-tailed shrews, southeastern pocket gophers, cotton mice, hispid cotton rats, and house mice from Nassau County, Florida, in the American Museum of Natural History, Florida Museum of Natural History, and the Georgia Museum of Natural History.

Several major habitats were identified: early successional herbaceous, young pine forest, maritime scrub, maritime hammock forest, hardwood bottomland swamp, fresh to estuarine tidal creek, fresh to estuarine marsh, salt grass meadow, mud flat, and a variety of disturbed habitats. Fieldwork differed according to habitat, but all terrestrial habitats were ground truthed extensively for spoor and two man-days were spent kayaking in the tidal marshes adjacent to the boat ramp at Cedar Point (Figure 25). Pitfall traps were installed in a maritime hammock forest at Cedar Point, an early successional herbaceous site in Thomas Creek, and a bottomland hardwood forest in Thomas Creek. Sherman livetraps were set in a bottomland hardwood swamp at Thomas Creek, early successional herbaceous at Thomas Creek, the ecotone between salt marsh and maritime scrub habitats at Cedar Point. Two man-days were spent walking the abandoned golf course and environs on Fort George Island, and equal amounts of effort were spent at both the Sohn Tract and Kingsley Plantation; trapping was not conducted at these sites. Bats were not included in this investigation.

Twenty-three species of terrestrial mammals (Virginia opossum, southeastern shrew, least shrew, eastern mole, nine-banded armadillo, marsh rabbit, eastern gray squirrel, cotton mouse, golden mouse, hispid cotton rat, eastern woodrat, coyote, domestic dog, common gray fox, northern raccoon, American mink, northern river otter, feral cat, bobcat, domestic horse, feral pig, domestic cattle, and white-tailed deer) were documented on the Park property during the course of this project (Table 22). Eight other species of mammals (southern short-tailed shrew, eastern cottontail, southern flying squirrel, marsh rice rat, eastern harvest mouse, house mouse, red fox, and long-tailed weasel) that are widely distributed in the southeastern United States were not encountered on Park property, but would be expected at TIMU (Table 22). Three species – domestic dog, domestic horse, and domestic cattle – are not native to the region and only occur in TIMU on occasion, so they should not be considered a part of the Park's mammalian fauna. Therefore, 28 species of terrestrial mammals were documented as occurring or probably occurring on Park property. No terrestrial mammal species at TIMU is considered to be imperiled by the U.S. Fish and Wildlife Service.

On a landscape scale, the 28 species of terrestrial mammals considered to be or expected to be Present at TIMU have widespread geographic distributions in the eastern United States (Hall 1981; Choate et al. 1994; Trani et al. 2007). These species have broad habitat tolerances and occupy or would be expected to occupy many of the habitats identified in this report. Species typically associated with the early successional herbaceous habitat include the least shrew, eastern mole, eastern cottontail, eastern harvest mouse, hispid cotton rat, coyote, red fox, long-tailed weasel, feral cat, bobcat, and white-tailed deer. Species typically associated with the young pine forest include the southeastern shrew, southern short-tailed shrew, eastern mole, eastern cottontail, hispid cotton rat, coyote, red fox, common gray fox, northern raccoon, long-

tailed weasel, feral cat, bobcat, and white-tailed deer. Species typically associated with the maritime scrub habitat include the Virginia opossum, southeastern shrew, southern short-tailed shrew, eastern mole, nine-banded armadillo, cotton mouse, coyote, common gray fox, northern raccoon, long-tailed weasel, feral cat, bobcat, domestic horse, feral pig, domestic cattle, and white-tailed deer. Species typically associated with the maritime hammock forest include the Virginia opossum, southeastern shrew, southern short-tailed shrew, eastern mole, nine-banded armadillo, eastern gray squirrel, southern flying squirrel, cotton mouse, golden mouse, eastern woodrat, coyote, common gray fox, northern raccoon, long-tailed weasel, feral cat, bobcat, domestic horse, feral pig, domestic cattle, and white-tailed deer. Species typically associated with the hardwood bottomland swamp include the Virginia opossum, southeastern shrew, southern short-tailed shrew, nine-banded armadillo, eastern gray squirrel, southern flying squirrel, cotton mouse, golden mouse, eastern woodrat, coyote, common gray fox, northern raccoon, long-tailed weasel, feral cat, bobcat, feral pig, and white-tailed deer. Species typically associated with the fresh to estuarine creeks and marshes, salt grass meadow, and mud flat habitats include the marsh rabbit, marsh rice rat, northern raccoon, American mink, northern river otter, and white-tailed deer. Species typically associated with the disturbed habitats include the Virginia opossum, least shrew, southern short-tailed shrew, eastern mole, nine-banded armadillo, eastern cottontail, eastern harvest mouse, hispid cotton rat, house mouse, coyote, domestic dog, red fox, long-tailed weasel, feral cat, bobcat, domestic horse, and white-tailed deer.

Table 22. Status of 40 terrestrial mammals at Timucuan Ecological and Historic Preserve. [¹ Cedar Point; ² Ft George Island; ³ Kingsley Plantation; ⁴ Sohn Tract; ⁵ Thomas Creek]

Common name	Status in Park	Evidence in Park				Comments
		Current Study	Museum Record	Literature Record	Observed Only	
Virginia opossum	Present	X		X		Evidence in TIMU ³
Southeastern shrew	Present	X	X			Evidence in TIMU ⁵
Least shrew	Present	X	X			Evidence in TIMU ⁵
Eastern mole	Present	X		X	X	Evidence in TIMU ¹²³⁴⁵
Nine-banded armadillo	Present	X		X	X	Evidence in TIMU ¹²⁴⁵
Marsh rabbit	Present	X			X	Evidence in TIMU ¹
Eastern gray squirrel	Present	X		X	X	Evidence in TIMU ¹³⁵
Cotton mouse	Present	X		X	X	Evidence in TIMU ¹
Golden mouse	Present	X	X			Evidence in TIMU ¹⁵
Hispid cotton rat	Present	X	X			Evidence in TIMU ¹⁵
Eastern woodrat	Present	X		X	X	Evidence in TIMU ¹
Coyote	Present	X			X	Evidence in TIMU ²⁴⁵
Domestic dog	Present	X	X			Evidence in TIMU ¹
Common gray fox	Present	X			X	Evidence in TIMU ¹
Northern raccoon	Present	X		X	X	Evidence in TIMU ¹²³⁵
American mink	Present	X			X	Evidence in TIMU ¹³
Northern river otter	Present	X		X	X	Evidence in TIMU ³⁵
Feral cat	Present	X			X	Evidence in TIMU ¹⁵
Bobcat	Present	X		X	X	Evidence in TIMU ¹⁵
Domestic horse	Present	X			X	Evidence in TIMU ¹
Feral pig	Present	X		X	X	Evidence in TIMU ¹⁴⁵
Domestic cattle	Present	X	X			Evidence in TIMU ⁴
White-tailed deer	Present	X		X	X	Evidence in TIMU ³⁵
Southern short-tailed shrew	Probably Present					Evidence in region
Eastern cottontail	Probably Present					Evidence in region
Southern flying squirrel	Probably Present					Evidence in region
Marsh rice rat	Probably Present					Evidence in region
Eastern harvest mouse	Probably Present					Evidence in region
House mouse	Probably Present					Evidence in region
Red fox	Probably Present					Evidence in region
Long-tailed weasel	Probably Present					Evidence in region
Eastern fox squirrel	Encroaching					Evidence in region
Southeastern pocket gopher	Encroaching					Evidence in region
Nutria	Encroaching					Evidence in region
American black bear	Encroaching					Evidence in region
Striped skunk	Encroaching					Evidence in region
Mountain lion	Absent					Extirpated

Species Accounts

The following list of mammal species includes the general distribution for each species potentially occurring in at least one of the 19 national parks in the Southeast Coast Network, a more detailed description of the distribution and status of each species within each park, a comment about the federal and state listing and ranking for RTE species in the region, and other comments thought to be appropriate. Each account includes a list of specimens from areas in and around each park that currently are housed in museum collections, most of which were examined by the author, and each account includes a list of additional records from the same geographic areas in the literature or from NPS personnel. Accounts for bats focus solely on parks in North Carolina; those for other parks in the Southeast Coast Network have been prepared by other authors. Common and scientific names are from Baker et al. (2003). Accounts for imperiled species hypothetically thought to occur in the region also are included to document their status in each park.

State listings and rankings are from:

- <http://www.outdooralabama.com/watchable-wildlife/regulations/nongame-species.cfm> for Alabama mammals, updated 21 August 2006;
- <http://www.floridaendnageredspeciesnetwork.org>, for Florida mammals, updated 29 January 2004;
- <http://georgiawildlife.dnr.state.ga.us/content/specialconcernanimals.asp> for Georgia mammals, updated 14 April 2009;
- LeGrand et al. (2008) for North Carolina mammals; and
- http://www.dnr.state.sc.us/pls/heritage/county_species.select_county_map for South Carolina mammals, updated 17 January 2006.

Standard listing categories (Endangered, Threatened, and Special Concern) and ranking categories (S1, S2, S3, S4, S5) are defined as follows (LeGrand et al., 2008): Endangered – a taxon in danger of extinction throughout all or a significant portion of its range; Threatened – a taxon that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range; Special Concern – a taxon for which additional field study and biological research are needed to resolve its conservation status; S1 – critically imperiled because of extreme rarity or because of factor(s) that make it especially vulnerable to extirpation; S2 – imperiled because of rarity or because of factor(s) that make it very vulnerable to extirpation; S3 – rare or uncommon; S4 – apparently secure; S5 – secure. In addition, North and South Carolina also use the listing category of Significantly Rare for a taxon that exists in small numbers and needs monitoring, but is not listed as Endangered, Threatened, or Special Concern; however, this category has no status at the federal level. National ranking are from NatureServe (<http://www.natureserve.org>), last updated on 17 July 2009 and last accessed on 12-13 September 2009.

Virginia opossum (*Didelphis virginiana*)

The Virginia opossum is one of the most widely distributed mammals in eastern North America (McManus 1974; Hall 1981; Gardner 1973, 1982). It is widespread and common throughout the southeastern United States (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al.

1985; Choate et al. 1994; Trani et al. 2007), and is ranked S5 in Alabama, Georgia, North Carolina, and South Carolina but unranked in Florida (NatureServe 2009). Throughout its geographic distribution, population densities are greatest along the edges of reservoirs and along streams and rivers (Choate et al. 1994). The Virginia opossum prefers wooded habitats, but it also moves through open areas as it traverses its relatively large home range; it is common in residential areas as well. The Virginia opossum is generally common to abundant throughout the entire Southeast Coast Network, currently including 16 of the 19 parks included in this investigation (Table 23). The Virginia opossum is absent from CALO and FOSU, although it is common and widespread on the adjacent mainland, although there is one record from Shackleford Banks at CALO (Engels 1952); it occurs only as a rare transient at CASA. Its original status on CUIS is uncertain. Early reports attributed it to CUIS (White 1849; Ober 1880), but it was common in earlier days for natural historians to combine island and mainland sightings. Bangs (1898) did not report it from CUIS despite extensive fieldwork on the island, and Harris (1984) opined that the earlier reports were suspect. In 1993, the Virginia opossum was introduced intentionally to CUIS (Shoop and Ruckdeschel 2001), in part because it possibly had been extirpated from Cumberland Island; this population currently is thriving. The following ectoparasites have been recovered from Virginia opossums from Cumberland Island (Wilson and Durden 2003): a cat flea (*Ctenocephalides felis*), ticks (*Amblyomma americanum*, *Dermacentor variabilis*, and *Ixodes scapularis*), and mites (*Ornithonyssus wernecki* and *Didelphilichus serrifer*). There are two subspecies in the Southeast Coast Network region (Gardner 1973) – *D. v. virginiana* to the north and west (CAHA, WRBR, FORA, MOCR, FOMO, CHPI, CONG, HOBE, CHAT, KEMO, and OCMU) and *D. v. pigra* to the south and east (FOFR, TIMU, FOCA, and FOMA). The taxonomic status of the introduced population on CUIS has not been established.

Southeastern shrew (*Sorex longirostris*)

The southeastern shrew is widespread throughout the southeastern United States (French 1980; Hall 1981; Choate et al. 1994; Trani et al. 2007). It occupies a wide variety of habitats from early succession fields, powerline rights-of-way, and road cuts to dense forests comprised of various species of hardwoods and conifers. In the past, it was considered to be uncommon because it was seldom captured using traditional capture methods, but recent collection techniques, especially pitfall traps, have demonstrated that it is common to abundant in suitable habitat throughout the Southeast Coast Network (Golley 1966; French 1980; Lee et al. 1983; Webster et al. 1985; Webster et al. 2009b), and that it occupies a broader variety of habitats than previously understood. The southeastern shrew inhabits eight parks (MOCR, CONG, HOBE, CHAT, KEMO, OCMU, TIMU, and FOCA) in the Southeast Coast Network (Table 23). Despite its widespread distribution on the adjacent mainland, it does not inhabit the isolated insular parks (CAHA, WRBR, FORA, CALO, FOSU, FOMO, FOFR, CUIS, and FOMA) and it doubtfully occurs in CHPI and CASA due to an inadequate amount of suitable habitat. Two extralimital records from Hatteras Island deserve comment. The record of *S. longirostris* from Big Kinnakeet (Engels 1941) is based on two skulls removed from owl pellets, with the shrews ostensibly caught on the mainland and regurgitated at the roost on Hatteras Island. In addition, specimens from Pea Island (Lee et al. 1983) actually represent the least shrew, *Cryptotis parva*, which is common in the marshes on Hatteras Island. Moreover, three decades of fieldwork on the Outer Banks (Webster 1988; Parnell et al. 1992) has failed to document the presence of *S. longirostris* on these narrow barrier islands. Thus, *Sorex longirostris* does not inhabit the Outer Banks (from Currituck Banks southward to Ocracoke Island), and it apparently does not inhabit

Roanoke Island either (Parnell et al. 1992), so these records are not included below. Three subspecies of *S. longirostris* are distributed across the southeastern United States (Webster et al. 2009b) – *S. l. eionis* inhabits TIMU and FOCA, *S. l. fisheri* inhabits MOCR, and *S. l. longirostris* inhabits CONG, HOBE, CHAT, KEMO, and OCMU. *S. l. eionis* is listed as Special Concern and ranked S3 in Florida, *S. l. fisheri* is not listed but ranked S4 in North Carolina, and *S. l. longirostris* is not listed but ranked S4 in Alabama, Georgia, and North Carolina (NatureServe 2009). The southeastern shrew is not listed or ranked in South Carolina.

Least shrew (*Cryptotis parva*)

The least shrew is a denizen of early to mid-succession habitats throughout most of eastern United States and northern Mexico (Whitaker 1974; Hall 1981; Choate et al. 1994). Its abundance appears to vary dramatically across the southeastern United States. It is common to abundant in the Atlantic and Gulf Coast Plain, uncommon to common in the Piedmont, rare at lower elevations in the Mountains, and absent from higher elevations in the southern Appalachian Mountains (Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Trani et al. 2007). This widespread shrew inhabits 13 parks (CAHA, WRBR, FORA, CALO, MOCR, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, TIMU, and FOCA) in the Southeast Coast Network (Table 23). *Cryptotis parva* also has been reported from CUIS on the basis of skeletal material removed from an owl pellet (Neuhauser and Baker 1974), but the identity of this specimen has not been confirmed and additional specimens have not been secured from CUIS in over a century of fieldwork; it should not be considered part of the mammalian fauna of CUIS. The least shrew also does not inhabit the smallest and most isolated parks (FOSU, FOMO, FOFR, CASA, and FOMA). Following Hall (1981), two subspecies inhabit the parks included in the Southeast Coast Network. *C. p. parva* occurs in Alabama, most of Georgia, and the Carolinas, whereas *C. p. floridana* occurs in Florida and extreme southeastern Georgia. The least shrew is not listed by federal or state management agencies; it is ranked S5 in Alabama, Georgia, and North Carolina but unranked in Florida and South Carolina (NatureServe 2009).

Northern short-tailed shrew (*Blarina brevicauda*)

The status of short-tailed shrews (genus *Blarina*) is in great disarray, despite recent studies that have clearly demonstrated that the genus consists of four species, including *B. shermani* in west-central Florida (Genoways and Choate 1998; Benedict 2006; Webster et al. 2009a). The northern short-tailed shrew, *B. brevicauda*, is distributed east of the Rocky Mountains throughout southern Canada and the northern United States, from the northern Great Plains eastward to New England and the mid-Atlantic states (George et al. 1986; Webster et al. 2009a). Two tongues of distribution extend southward into the Southeast Coast Network area, each represented by a distinct subspecies. Along the Atlantic Coast, *B. b. knoxjonesi* inhabits MOCR (Webster 1996; Webster et al. in prep), whereas along the southern Appalachian Mountains, *B. b. churchi* (= *talpoides*, see Webster et al. in press b) inhabits HOBE, CHAT, and KEMO (Table 23). The northern short-tailed shrew and its close relative, the southern short-tailed shrew, *Blarina carolinensis*, are sibling species that are difficult to identify except by careful examination of their skulls. Fortunately, these species compete intensely along a lengthy zone of parapatry and they almost never coexist. Either one species or the other, but never both, inhabits the region surrounding each park in the Southeast Coast Network, and the southern short-tailed shrew does not inhabit the four parks mentioned above except at CHAT. The situation at CHAT is especially noteworthy, because *B. brevicauda* inhabits units on the west side of the Chattahoochee River and most units on the east side, except Suwanee Creek, where *B.*

carolinensis occurs. Elsewhere in the Southeast Coast Network, the zone of contact between these two sibling species divides Jones County, Georgia, with *B. brevicauda* occurring in the northern half of the county and *B. carolinensis* in the southern half (French 1981), which is relevant because Jones County abuts Bibb County, where OCMU is located (short-tailed shrews at OCMU clearly are assignable to *B. carolinensis*). The specimen from HOBE, coupled with the earlier report from Tallapoosa County by French (1981), clarifies the distribution of *B. brevicauda* and *B. carolinensis* in Alabama (Hall 1981; Choate et al. 1994; Trani et al. 2007). *B. brevicauda* is not listed by federal and state management agencies. It is ranked S5 in Alabama, Georgia, and North Carolina, but it is unranked in South Carolina and does not occur in Florida (NatureServe 2009).

Southern short-tailed shrew (*Blarina carolinensis*)

The southern short-tailed shrew is widespread in most terrestrial habitats throughout the southeastern United States, exclusive of higher elevations in the southern Appalachian Mountains (Genoways and Choate 1998; McCay 2001; Trani et al. 2007), so it is not considered to be imperiled by federal and state management agencies in that region. It is ranked S5 in Alabama, Georgia, and North Carolina but not ranked in Florida and South Carolina (NatureServe 2009). Both the southern and northern short-tailed shrews are fiercely competitive, so both species seldom exist sympatrically, and when they do, they are not syntopic (Webster et al. 1985; Webster 1996; Webster et al. 2009a). For example, *B. carolinensis* inhabits Roanoke (FORA) and Bodie (CAHA and WRBR) islands in Dare County, North Carolina, whereas *B. brevicauda* does not, and conversely *B. brevicauda* inhabits mainland adjacent to these counties and *B. carolinensis* does not. The report of *B. carolinensis* from “Hatteras North” (ca 2 mi SW Cape Hatteras lighthouse), North Carolina (Quarles 1974), almost certainly represents the least shrew, *Cryptotis parva*, but voucher material does not exist. Apparently, *B. carolinensis* inhabits Roanoke and Bodie islands, but not Hatteras or Ocracoke islands (Webster 1988). Similarly, *B. carolinensis* inhabits one unit in CHAT (Suwanee Creek), whereas *B. brevicauda* was taken at 10 other units on either side of the Chattahoochee River. In the Southeast Coast Network, *B. c. carolinensis* occurs at CAHA, WRBR, FORA, CHPI, CONG, CHAT, OCMU, and CUIS, *B. c. peninsulae* occurs at FOCA and FOMA, and intergrades between the two subspecies occur at TIMU (Benedict et al. 2006). *B. carolinensis* is not listed by federal and state management agencies.

Eastern mole (*Scalopus aquaticus*)

The eastern mole is distributed throughout much of eastern and central North America (Yates and Schmidly 1978; Hall 1981; Yates and Pedersen 1982), and it is widespread in the Carolinas, Georgia, Alabama, and Florida (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It is common to abundant at lower elevations throughout the region, but uncommon in rocky habitats above 610 m (2000 ft) in elevation. Tunnels of eastern moles were found at 16 parks (CAHA, WRBR, FORA, CALO, MOCR, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, FOFR, CUIS, TIMU, FOCA, and FOMA) in the Southeast Coast Network (Table 23), and in some cases large series of specimens exist in museum collections, most notably from Anastasia Island, Florida, the type locality of the endemic *Scalopus aquaticus anastasiae*. Evidence of moles was not found at FOSU, FOMO, or CASA, but they have been reported from Saint Augustine, Florida (Jackson 1915). Engels (1942) opined that moles were extirpated from Ocracoke Island, which is part of CAHA, but there is no evidence of an earlier occurrence there. The eastern mole has been recorded,

however, from Hatteras and Bodie islands, which are also part of CAHA. Furthermore, it has been recorded from Shackleford Banks, which is part of CALO, although it has not been recorded from Portsmouth Island or South Core Banks, which are also part of CALO. Three subspecies are found in the Southeast Coast Network – *S. a. howelli* inhabits CAHA, WRBR, FORA, CALO, MOCR, CHPI, CONG, HOBE, CHAT, KEMO, and OCMU; *S. a. australis* inhabits FOFR, CUIS, TIMU, and FOCA; and *S. a. anastasiae* inhabits FOMA. *S. a. howelli* and *S. a. australis* are not listed by federal and state management agencies, and they are ranked S5 throughout their respective ranges in Alabama, Georgia, and North Carolina (NatureServe 2009). The eastern mole is not ranked in South Carolina or Florida; however, *S. a. anastasiae* is ranked globally as critically imperiled (NatureServe 2009). According to Wilson and Durden (2003), eastern moles from CUIS serve as hosts for two species of mites (*Eulaelaps stabularis* and *Haemogamasus harperi*) and one tick (*Ixodes affinis*).

Star-nosed mole (*Condylura cristata*)

The star-nosed mole is a denizen of wetlands habitats throughout eastern North America and southward along the Appalachian Mountains to western North Carolina, northwestern South Carolina, and northern Georgia, and southward along the Atlantic Coast to southeastern Georgia (Golley 1962; Petersen and Yates 1980; Hall 1981; Yates and Pedersen 1982; Lee et al. 1983; Webster et al. 1985; Webster 1987b; Beane 1995; Trani et al. 2007). Throughout most of its range, this gregarious mole is locally common in suitable habitat and therefore is not considered to be imperiled federally. Its abundance wanes in the southern part of its range, however, and it is one of the rarest mammals in the parks included in the Southeast Coast Network, if it exists in any at all. Star-nosed moles likely inhabit MOCR in North Carolina, although voucher material has not been taken there. Star-nosed moles have been captured in Charleston County, South Carolina, near FOSU, FOMO, and CHPI, but suitable habitat is lacking in these parks. According to Golley (1966), who cited Coleman but without reference, star-nosed moles also inhabit Richland County, South Carolina, and CONG provides potential habitat, but the source of this record was not ascertained. Finally, star-nosed moles also have been taken in the Okefenokee Swamp, Charlton County, Georgia (Harper 1927), which is adjacent to both CUIS and TIMU; however, suitable habitat does not exist at either of these parks. Star-nosed moles in the southeastern United States are assignable to *C. c. parva*. It is listed as Special Concern and ranked S2 in North Carolina (LeGrand et al. 2008), Special Concern and ranked S3? in South Carolina (<http://www.dnr.state.sc.us/pls.heritage>), and not listed but ranked S2? in Georgia (<http://georgiawildlife.dnr.state.ga.us/content/specialconcernanimlas.asp>).

Little brown myotis (*Myotis lucifugus*)

The little brown myotis is widespread throughout most of North America, including the southern Appalachian Mountains (Barbour and Davis 1969; Fenton and Barclay 1980; Hall 1981; Trani et al. 2007). Within the restricted region in which bat surveys occurred (CAHA, WRBR, FORA, CALO, and MOCR), the few records from eastern North Carolina (Lee et al. 1983; Webster et al. 1985; Webster et al. in press a) represent migrating individuals rather than residents (Barbour and Davis 1969; Webster et al. in press a). The lone individual included below was taken on the mainland in Carteret County, in eastern North Carolina, adjacent to CALO (Table 23). The little brown myotis is not considered to be imperiled by federal and North Carolina management agencies. All specimens from North Carolina are referable to *M. l. lucifugus*.

Southeastern myotis (*Myotis austroriparius*)

The southeastern myotis is restricted to riverine habitats in the southeastern United States and northward along the Mississippi and lower Ohio River basins in the Midwest (Barbour and Davis 1969; Hall 1981; Jones and Manning 1989; Trani et al. 2007). In North Carolina, it occupies the Coastal Plain physiographic region (Lee et al. 1983; Webster et al. 1985; Webster et al. in press a), including MOCR, but not the barrier islands (Table 1). In the Atlantic and Gulf Coastal Plain in the southeastern United States, it is common in cypress-gum swamps and roosts in abandoned buildings adjacent to permanent sources of water, over which it forages. There is concern by federal and state management agencies that it is imperiled. At the federal level it is listed as a Species of Concern, and in North Carolina it is listed as Special Concern and ranked S2 (LeGrand et al. 2008).

Silver-haired bat (*Lasionycteris noctivagans*)

The silver-haired bat inhabits forested habitats throughout most of Canada and the United States (Barbour and Davis 1969; Hall 1981; Kunz 1982) and it is distributed throughout North Carolina (Lee et al. 1983; Webster et al. 1985; Trani et al. 2007; Webster et al. in press a). It is highly migratory (Cryan 2003), arriving in North Carolina in late summer and staying through late spring (Webster et al. in press a). Its abundance, therefore, varies throughout the year. It is not considered to be imperiled. It appears to migrate along the Outer Banks of North Carolina – two specimens from Ocracoke Island (CAHA) were collected in September during the southward autumnal migration and there are observations at various sites in CALO. It likely migrates throughout the remainder of CAHA and through WRBR, FORA, and MOCR northward during the spring and southward during the fall months (Table 23). I was unable to verify the record from Pea Island NWR (Lee et al. 1983), but it seems reasonable so it is included below.

Eastern pipistrelle (*Pipistrellus subflavus*)

The eastern pipistrelle is widely distributed across most of eastern North America (Barbour and Davis 1969; Hall 1981; Fujita and Kunz 1984), including all of North Carolina (Lee et al. 1983; Webster et al. 1985; Trani et al. 2007; Webster et al. in press a). It is common throughout much of its range and, therefore, is not considered to be imperiled by federal and state management agencies. It does not occur on the Outer Banks of North Carolina, but it is relatively common in coastal swamp forests on the adjacent mainland (Webster et al. in press a), including those at MOCR (Table 23). Eastern pipistrelles from North Carolina are assignable to *P. s. subflavus*.

Big brown bat (*Eptesicus fuscus*)

The big brown bat inhabits most of North America and the northern half of South America (Barbour and Davis 1969; Hall 1981; Humphrey 1982; Kurta and Baker 1990). It is the most commonly encountered bat in northeastern North America because it typically roosts in houses, buildings, and other man-made structures. In North Carolina, however, it is uncommon to rare in the Coastal Plain physiographic province and does not occur on the Outer Banks and probably not at MOCR (Lee et al. 1983; Webster et al. 1985; Trani et al. 2007; Webster et al. in press a). Because of its widespread distribution and abundance elsewhere in its range, it is not considered to be imperiled by federal or North Carolina management agencies. In North Carolina, big brown bats are assignable to *E. f. fuscus*.

Eastern red bat (*Lasiurus borealis*)

The eastern red bat is one of the most abundant and widely distributed bats in eastern and central North America (Barbour and Davis 1969; Hall 1981; Humphrey 1982; Shump and Shump 1982a), and it is the most common and widespread bat in all national parks in North Carolina (Table 1). It is common to abundant throughout North Carolina, including the Outer Banks (Lee et al. 1983; Webster et al. 1985; Trani et al. 2007; Webster et al. in press a), but roosts singly in trees except when nursing young so it is encountered much less frequently than are gregarious species that roost in buildings and houses (Webster et al. in press a). Most records from the Outer Banks are migrants moving south during the fall months. The eastern red bat is not considered to be imperiled by federal and North Carolina management agencies. All red bats in North Carolina are referable to *L. b. borealis*.

Seminole bat (*Lasiurus seminolus*)

The Seminole bat is a denizen of pine, *Pinus* spp, forests with dense mats of Spanish moss, *Tillandsia usenoides*, in the southeastern United States (Barbour and Davis 1969; Hall 1981; Wilkins 1987; Choate et al. 1994; Menzel et al. 2003; Trani et al. 2007). It generally is uncommon throughout the Lower Piedmont and Coastal Plain in North Carolina (Lee et al. 1983; Webster et al. 1985; Webster et al. in press a), including CALO and MOCR; however, its abundance wanes northward along the mid-Atlantic Coast and it is not known from farther up the Outer Banks (Table 23). Vagrants have been taken in Pennsylvania and New York. and there are records of autumnal migrants from the mountains of Pickens County, South Carolina (Neuhauser and DiSalvo 1972) and Buncombe County, North Carolina (Webster 2000). Its abundance also varies seasonally, as many individuals move southward out of North Carolina during the cooler months of the year (Webster et al. in press a). Federal and North Carolina management agencies do not consider this monotypic species to be imperiled.

Hoary bat (*Lasiurus cinereus*)

The hoary bat has the widest geographic distribution of any bat in the New World, extending from tree-line in the northern hemisphere to tree-line in the southern hemisphere and including the Hawaiian Islands (Barbour and Davis 1969; Hall 1981; Shump and Shump 1982b). Its abundance varies seasonally from absent to relatively abundant at any one site throughout the year because it is highly migratory (Cryan 2001, 2003). In North Carolina, it typically occurs during the fall, winter, and spring months, although there is some indication that a breeding population exists at higher elevations in the southern Appalachian Mountains (Lee et al. 1983; Trani et al. 2007; Webster et al. in press a). There are no reports from the Outer Banks, but it has been reported from the mainland adjacent to CALO and it likely occurs there and at MOCR during migration (Table 23). It is not considered to be imperiled. Hoary bats from North Carolina are assignable to *L. c. cinereus*.

Northern yellow bat (*Lasiurus intermedius*)

The northern yellow bat is a denizen of southern evergreen forests with dense clumps of Spanish moss, and its geographic distribution extends from North Carolina southward through Florida, and thence westward to Texas; vagrants have been recovered in Virginia and New Jersey (Barbour and Davis 1969; Webster et al. 1980; Hall 1981; Trani et al. 2007). There are two records from the southeastern Coastal Plain (New Hanover County) and one from the Piedmont (Mecklenburg County) of North Carolina (Webster 2002; Webster et al. in press a). Although the northern yellow bat is common to abundant in the Deep South, it is the rarest bat in North

Carolina and, of the parks included in this investigation, might eventually be found at MOCR (Table 23). The northern yellow bat is not considered to be imperiled at the federal level, but it is listed as Significantly Rare and ranked SU in North Carolina (LeGrand et al. 2008). Specimens from North Carolina are assignable to *L. i. floridana*.

Evening bat (*Nycticeius humeralis*)

The evening bat is locally common in woodlands in the southeastern United States and eastern Mexico (Barbour and Davis 1969; Watkins 1972; Hall 1981). Its abundance varies inversely to elevation, absent at higher elevations in the southern Appalachian Mountains but common in the Coastal Plain of North Carolina (Lee et al. 1983; Webster et al. 1985; Trani et al. 2007; Webster et al. in press a). It likely occurs regularly at FORA and MOCR, and occasionally at CAHA, WRBR and perhaps CALO (Table 23). Evening bats from North Carolina are referable to *N. h. humeralis*, which is not considered to be imperiled by federal and state management agencies.

Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)

Rafinesque's big-eared bat is another Gulf Coast species that is distributed primarily in the Deep South. Fingers of its distribution extend northward along the Atlantic Coast to southeastern Virginia, the southern Appalachian Mountains, and the Mississippi River (Barbour and Davis 1969; Jones 1977; Hall 1981; Trani et al. 2007). It is considered to be rare to uncommon throughout its range and is listed at the federal level as Species of Concern. In eastern North Carolina it is listed as Special Concern and ranked S3 (LeGrand et al. 2008). Rafinesque's big-eared bat does not occur on the Outer Banks, but it likely inhabits MOCR, at least occasionally. Specimens from eastern North Carolina are assignable to *C. r. macrotis*.

Brazilian free-tailed bat (*Tadarida brasiliensis*)

The Brazilian free-tailed bat is distributed throughout the Deep South and western United States, Central America, and much of South America; in addition, there are several recent disjunct records north of its range in the central and eastern United States that denote a relatively rapid northward range expansion (Barbour and Davis 1969; Lee and Marsh 1978; Hall 1981; Humphrey 1982; Wilkins 1989; Webster et al. in press a). This free-tailed bat occurs in the Coastal Plain and Piedmont of North Carolina (Lee et al. 1983; Webster et al. 1985; Trani et al. 2007; Webster et al. in press a). One such vagrant was captured in the CAHA lighthouse keeper's house on 22 December 2004 and individuals might forage over MOCR on occasion (Table 23). However, large colonies roost in the attics of buildings, churches, and houses, which do not exist at MOCR, and few such sites exist in the immediate area. Specimens from eastern North Carolina are referable to *T. b. cynocephala*. Federal and state management agencies do not consider the Brazilian free-tailed bat to be imperiled.

Nine-banded armadillo (*Dasypus novemcinctus*)

The nine-banded armadillo is distributed throughout much of South America and thence northward into the southern United States (Humphrey 1974; Hall 1981; Galbreath 1982; McBee and Baker 1982; Choate et al. 1994; Trani et al. 2007). Its range has been expanding rapidly in the Southeast, both as a result of deliberate introductions in the 1920s and 1930s and natural dispersal due to global warming, reaching northern Florida by 1954 and the Savannah River by 1970 (Fitch et al. 1952; Humphrey 1974). Along the South Atlantic Coast, it now occurs as far north as east-central South Carolina (Mayer 1989; Platt and Snyder 1995). Within the region encompassed by the Southeast Coast Network, it occurs at HOBE, FOFR, CUIS, TIMU, FOCA,

and FOMA; evidence of its presence was not found at OCMU, but it occurs in the immediate vicinity of both the Main and Lamar units (Golley 1962; this investigation). It did not occur in Alabama in the early 1920s (Howell 1921) or in the vicinity of HOBE in early 1940s when F. S. Barkalow, Jr., was collecting mammals in nearby Lee County, but it occurs there now. It was first discovered on CUIS in 1974 (Shoop and Ruckdeschel 2001). On the other hand, it likely has been extirpated from CASA in the last 50 years or so as the Saint Augustine region has become urbanized. The nine-banded armadillo is abundant in suitable habitat, and it is not considered to be imperiled by federal and state management agencies (NatureServe 2009). Armadillos from the southeastern United States are referable to *D. n. mexicanus*. Specimens from CUIS harbor two species of ticks (Wilson and Durden 2003) – *Amblyomma americanum* and *Ixodes scapularis* – and they are eaten by American alligators (Shoop and Ruckdeschel 1990).

Eastern cottontail (*Sylvilagus floridanus*)

The eastern cottontail is widespread throughout most of the eastern and central United States and Mexico (Chapman et al. 1980; Hall 1981; Chapman et al. 1982; Choate et al. 1994), and it is widespread in the region included in the Southeast Coast Network (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Trani et al. 2007). It inhabits a wide variety of early and mid-successional habitats and natural or maintained broken habitats that provide both cover and adequate forage in 15 parks (CAHA, WRBR, FORA, CALO, MOCR, FOMO, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, FOFR, TIMU, and FOCA) included in this investigation; it does not inhabit FOSU, CUIS, and FOMA (Table 23), and no longer inhabits CASA, although it did in the past (Nelson 1909). It is not considered to be imperiled by federal or state management agencies and is ranked S5 in Alabama, Georgia, and North Carolina; it is not ranked in Florida or South Carolina (NatureServe 2009). *S. f. mallurus* inhabits all parks in the Southeast Coast Network except CASA, which was inhabited by *S. f. floridanus*.

Swamp rabbit (*Sylvilagus aquaticus*)

The swamp rabbit inhabits wetland habitats throughout much of the lower Mississippi River drainage, from Texas eastward to Georgia and western South Carolina and northward to southern Illinois and Indiana (Howell 1921; Golley 1962, 1966; Chapman and Feldhamer 1981; Hall 1981; Chapman et al. 1982; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Three parks (HOBE, CHAT, and KEMO) clearly are within its geographic distribution (Table 23) and a fourth (OCMU) lies on the Fall Line in Georgia, where the geographic distribution of the swamp rabbit abuts that of the marsh rabbit, *Sylvilagus palustris*. Because these competitors occupy similar wetland habitats, it is unlikely that both species occur there together, and neither is successful in upland habitats (Chapman et al. 1980; Chapman and Willner 1981a), where a third rabbit – the eastern cottontail, *S. floridanus* – occurs. The swamp rabbit is common to abundant in suitable habitat and ranked S5 in Alabama and Georgia (NatureServe 2009), but it is extremely localized in western South Carolina, where it is listed as Special Concern and ranked S2S3 (<http://www.dnr.state.sc.us/pls/heritage>). Swamp rabbits from HOBE, CHAT, KEMO, and OCMU (if present) are referable to *S. a. aquaticus*.

Marsh rabbit (*Sylvilagus palustris*)

The marsh rabbit is found from southern Alabama westward throughout Florida and thence northward throughout eastern North Carolina to southeastern Virginia (Howell 1921; Golley 1962, 1966; Chapman and Willner 1981; Hall 1981; Chapman et al. 1982; Webster et al. 1985;

Choate et al. 1994; Trani et al. 2007). Its geographic distribution complements that of the swamp rabbit, *Sylvilagus aquaticus*, and they meet along the Fall Line in Georgia. Here, swamp rabbits occur above the Fall Line in wetlands that have a larger component of woody vegetation, while marsh rabbits occur below the Fall Line in wetlands that have a larger herbaceous component. The marsh rabbit inhabits 12 parks (CAHA, FORA, CALO, MOCR, FOSU, CHPI, CONG, FOFR, CUIS, TIMU, FOCA, and FOMA) in the Southeast Coast Network (Table 23); HOBE, CHAT, and KEMO are outside its geographic distribution, it no longer inhabits CASA (although it likely did prior to urban sprawl in the Saint Augustine area), appropriate habitat is lacking at WRBR, FOMO, and its status at OCMU is uncertain. The marsh rabbit is common in suitable habitat and not considered to be imperiled. It is ranked S3 in Alabama and S5 in Georgia and North Carolina; it is not ranked in South Carolina and Florida (NatureServe 2009). Marsh rabbits from CUIS serve as host to ticks (*Amblyomma americanum*, *A. maculatum*, *Dermacentor variabilis*, and *Haemaphysalis leporispalustris*) and a mite (*Androlaelaps fahrenheitsi*) (Wilson and Durden 2003), and they are consumed by American alligators (Shoop and Ruckdeschel 1990).

Woodchuck (*Marmota monax*)

The woodchuck is distributed across most of the northern coniferous and eastern deciduous forests of North America, extending as far south as central Alabama and northern Georgia (Howell 1921; Golley 1962; Hall 1981; Lee and Funderburg 1982; Choate et al. 1994; Trani et al. 2007). It was documented only at HOBE, but it probably occurs at CHAT and KEMO as well (Table 23). There are extralimital records from Fairfield County, in the Piedmont of South Carolina, and another from Charleston County, on the South Carolina coast, but these likely represent escaped individuals or nomads (Golley 1966) and are not included below. Woodchucks in the HOBE, CHAT, and KEMO regions are referable to *M. m. monax*. The woodchuck is ranked S5 in Alabama and S3 in Georgia (NatureServe 2009).

Eastern chipmunk (*Tamias striatus*)

The eastern chipmunk is one of the most widespread and recognizable mammals in eastern North America (Hall 1981; Snyder 1982). Its southernmost distribution includes the Piedmont and Mountain physiographic provinces in Alabama, Georgia, and the Carolinas, typically above the Fall Line (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It only inhabits four parks in the Southeast Coast Network – HOBE, CHAT, KEMO, and OCMU – although there is a dubious record from Fort Macon, on Bogue Banks in Carteret County, North Carolina (Coues and Yarrow 1878), which is not included below because it is well outside the known range of the species. Chipmunks from CHAT, KEMO, and OCMU are assignable to *T. s. striatus*, whereas those from HOBE represent *T. s. pipilans*. Federal and state management agencies do not consider the eastern chipmunk to be imperiled within the area included in this investigation; it is ranked S5 in Alabama and Georgia (NatureServe 2009).

Eastern gray squirrel (*Sciurus carolinensis*)

The eastern gray squirrel is a denizen of hardwood forests in eastern North American (Hall 1981; Koprowski 1994), and it is common to abundant in most forested habitats in Alabama, Georgia, Florida, and the Carolinas (Howell 1921; Golley 1962, 1966; Flyger and Gates 1982; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It inhabits 17 of 19 parks included in this study, all but CALO and FOSU (Table 23). Its distribution is sporadic on the

Outer Banks of North Carolina, and dependent on forest capable of producing sufficient mast. For example, on Hatteras Island it only inhabits Buxton Woods (CAHA). It was introduced without success to Ocracoke Village (Parnell et al. 1992). Gray squirrels in the Southeast Coast Network are assignable to *S. c. carolinensis*. Federal and state management agencies do not consider the eastern gray squirrel to be imperiled. It is ranked S5 in Alabama, Georgia, and North Carolina but is unranked in Florida and South Carolina (NatureServe 2009). Wilson and Durden (2003) examined 11 eastern gray squirrels from CUIS, and they were heavily parasitized by a chewing louse (*Neohaematopinus sciuri*), fleas (*Echidnophaga gallinacea* and *Orchopeas howardi*), ticks (*Amblyomma americanum*, *Dermacentro variabilis*, *Haemaphysalis leporispalustris*, *Ixodes affinis*, and *I. scapularis*), mites (*Androlaelaps casalis* and *Ornithonussus bacoti*), and a chigger (*Neotrombicula whartoni*).

Eastern fox squirrel (*Sciurus niger*)

The eastern fox squirrel is distributed throughout much of the eastern United States (Hall 1981; Flyger and Gates 1982). Numbers are declining in some areas in the southeastern United States, but it is locally common in remnant stands of long-leaf pine, *Pinus palustris*, in the Atlantic and Gulf Coastal Plain and locally uncommon to rare in mid-elevational hardwood forests in the Piedmont and Mountain physiographic provinces in the Deep South. Historical records exist throughout the region except along the Outer Banks and Piedmont of North Carolina and the Upper Piedmont of South Carolina (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Few records exist for the parks in the Southeast Coast Network, reflecting the deleterious effects of habitat fragmentation and the rarity of fox squirrels outside of suitable habitat (Weigl et al. 1989). NPS personnel have observed fox squirrels at the entrance to CONG, and there is a report of fox squirrels on Saint Simons Island (Neuhauser and Baker 1974). Fox squirrels encroach on CHAT and TIMU where suitable habitat exists. There have been a litany of fox squirrels introductions, some successful and some not, onto coastal islands in the southeastern United States, including Cape Romain NWR (see below) and Capers and Dewees islands (Penney 1950) in Charleston County, South Carolina; in addition, there is a record of the fox squirrel from Isle of Palms in Charleston County, which also might represent an introduced population. The Saint Simons Island report (Neuhauser and Baker 1974) likely represents an introduced population as well, but evidence of fox squirrels on Saint Simons Island was not secured during this investigation. Fox squirrels also were released on CUIS; this population failed to become established, but there is one voucher specimen deposited at the Carnegie Museum of Natural History. The eastern fox squirrel is ranked S3S4 in Alabama, S3 in Florida, and S5 in Georgia (NatureServe 2009); it is listed as Special Concern and ranked S4 in South Carolina (<http://www.dnr.state.sc.us/pls/heritage>), and it is listed as Significantly Rare and ranked S3 in North Carolina (LeGrand et al. 2008). Three subspecies exist in the Southeast Coast Network: *S. n. niger* inhabits the Carolinas and most of Georgia, *S. n. bachmani* is found throughout most of Alabama, and *S. n. shermani* inhabits southeastern Georgia and most of Florida.

Southern flying squirrel (*Glaucomys volans*)

The southern flying squirrel is a common to locally abundant inhabitant of forested habitats in the southeastern United States (Dolan and Carter 1977; Hall 1981; Choate et al. 1994). It has a statewide distribution in Alabama, Florida, Georgia, and the Carolinas, save for the remote islands off the Atlantic Coast in Florida, Georgia, and the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Trani et al. 2007). Although specimens were not

collected during the course of this investigation, southern flying squirrels likely inhabit the nine mainland parks (MOCR, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, TIMU, and FOCA) in the Southeast Coast Network; its status on Saint Simons Island (FOFR) was not confirmed during this investigation (Table 23). Three subspecies are known from the southeastern United States: *G. v. volans* occupies most of North Carolina; *G. v. saturatus* inhabits Alabama, South Carolina, and most of Georgia; and *G. v. querceti* inhabits Florida and coastal Georgia. Federal and state management agencies do not consider the southern flying squirrel to be imperiled. It is ranked S5 in Alabama, Georgia, and North Carolina but unranked in Florida and South Carolina (NatureServe 2009).

Southeastern pocket gopher (*Geomys pinetis*)

The southeastern pocket gopher is restricted to the Coastal Plain along the Gulf Coast of Alabama, Georgia, and Florida (Howell 1921; Golley 1962, 1966; Pembleton and Williams 1978; Hall 1981; Choate et al. 1994; Trani et al. 2007). Tangible evidence of its existence was not found in any park during this investigation. Nevertheless, it likely inhabits the Thomas Creek area of TIMU, and there are many museum specimens from northern Duval County, Florida, where Thomas Creek is located. The southeastern pocket gopher once occurred on Cumberland Island, Georgia, but that population was eliminated in the 1970s and is now extinct (Ford 1985). According to material examined during this investigation, the last museum specimen was taken on 19 April 1932, although Laerm (1981) mentions an individual taken in 1956 and, citing personal communication with Hans Neuhauser, makes a cryptic comment about a recently discovered population on Cumberland Island. Ford (1985), however, mentions that the last pocket gophers on Cumberland Island were collected in the 1970s. The taxonomy of the southeastern pocket gopher has been debated extensively (Avisé et al. 1979; Williams and Genoways 1980; Laerm 1981; Sudman et al. 2006), and two or three taxa are known from the region included in this investigation. *G. p. pinetis* is known primarily from Georgia (Hall 1981). *G. p. mobilensis* is found in Alabama and western Florida, and this taxon might be a distinct species (Sudman et al. 2006). *G. p. floridanus* is known from the remainder of northern Florida, although some (Williams and Genoways 1980; Laerm 1981) consider it indistinguishable from *G. p. pinetis*. The southeastern pocket gopher is ranked S3 in Alabama, S4 and listed as Threatened in Georgia, and S5 in Florida; *G. p. cumberlandius*, endemic to Cumberland Island in southeastern Georgia, is considered to be extinct and therefore unranked in Georgia (NatureServe 2009). The Cumberland Island pocket gopher was host to the chewing louse *Geomydoecus scleritus* (Ferris 1916; Price 1975). Sudman et al. 2006

American beaver (*Castor canadensis*)

The American beaver once was the most widely distributed rodent in North America (Hall 1981), but it was decimated by trappers in the 17th and 18th centuries. Since then, it has been successfully reintroduced into much of its former range, and it has adapted to living in close proximity to humans. Today, the American beaver is widespread in distribution and so abundant in some aquatic and wetland habitats that it is considered a nuisance (Jenkins and Busher 1979). It is found throughout Alabama, Georgia, and the Carolinas, and it is encroaching across much of western Florida (Howell 1921; Golley 1962, 1966; Hill 1982; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Most records in the Southeast Coast Network are from inland parks (MOCR, CONG, HOBE, CHAT, KEMO, and OCMU), but beavers have recently been active on CUIS (Shoop and Ruckdeschel 2001) as well (Table 23). Beavers probably visit TIMU on occasion, but proof of their presence was not secured during the course of this investigation and

Bangs (1898) did not consider it to be a resident of eastern Georgia and northeastern Florida. Throughout the Southeast Coast Network, beavers are assignable to *C. c. carolinensis*. It is not considered to be imperiled by federal and state management agencies and is ranked S5 in Alabama, Georgia, and North Carolina but unranked in Florida and South Carolina (NatureServe 2009).

Marsh rice rat (*Oryzomys palustris*)

The marsh rice rat is distributed throughout the southeastern United States (Hall 1981; Wolfe 1982), including the entire region included in the Southeast Coast Network (Howell 1921; Golley 1962, 1966; Webster et al. 1985; Choate et al. 1994; Trani et al. 2006). It inhabits 15 (CAHA, FORA, CALO, MOCR, FOSU, CHPI, CONG, HOBE, CHAT, OCMU, FOFR, CUIS, TIMU, FOCA, and FOMA) of the 19 parks included in this investigation, it may occur in WRBR and FOMO on occasion, and it does not occur at KEMO or CASA due to lack of habitat (Table 23). Rice rats from Alabama, Georgia, the Carolinas, and northern Florida are referable to *O. p. palustris*, whereas those from parks to the south of that are assignable to *O. p. natator*. Federal and state management agencies do not consider the marsh rice rat to be imperiled. It is ranked S5 in Alabama, Georgia, Florida, and North Carolina, but it is unranked in South Carolina (NatureServe 2009). Seven rice rats from Charleston County, South Carolina, tested negative for antibodies to Lyme disease, a tick-borne disease that causes illness in humans (Clark et al. 2002). Nine rice rats from CUIS had the following ectoparasites (Wilson and Durden 2003) – the sucking louse *Hoplopleura oryzomydis*; cat flea *Ctenocephalides felis*; the ticks *Amblyomma americanum*, *Dermacentor variabilis*, and *Ixodes affinis*; mites *Androlaelaps fahrenheitsi* and *Ornithonussus bacoti*; and chiggers *Euschoenagastia peromysci* and *E. setosa*. Marsh rice rats are consumed by American alligators at CUIS (Shoop and Ruskdeschel 1990).

Eastern harvest mouse (*Reithrodontomys humulis*)

The eastern harvest mouse is a rare to locally common denizen of early successional and mid-successional habitats in the southeastern United States (Hall 1981; Stalling 1997). It is distributed throughout Alabama, Georgia, Florida, and the Carolinas except at elevations above 610 m (2000) ft in the Mountain physiographic province, the Everglades in southern Florida and the sea islands along the South Atlantic Coast, and much of the Outer Banks in North Carolina (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Its distribution and abundance in the Southeast Coast Network varies based on the availability of early to mid-successional habitat, from locally common in poorly maintained fields to rare in adjacent forested habitats. Based on voucher material examined during this investigation (Table 23), harvest mice inhabit nine parks (WRBR, MOCR, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, and TIMU). There are no records from the sea islands in Glynn (FOFR) and Camden (CUIS) counties in southeastern Georgia, except for a single eastern harvest mouse skull that was recovered from an owl pellet discovered on Cumberland Island (Neuhauser and Baker 1974). This individual likely was captured on the mainland, as no specimens have been taken on Cumberland Island in over a century of fieldwork. There also is a dubious record from the south end of Ocracoke Island (CAHA), on the Outer Banks of North Carolina (Lee et al. 1983), which also is not included below (Parnell et al. 1992). All harvest mice from the Southeast Coast Network are referable to *R. h. humulis*, which has the type locality of Charleston, South Carolina. Federal and state management agencies do not consider the eastern harvest mouse to be imperiled. One harvest mouse from Charleston County, South

Carolina, tested negative for antibodies to Lyme disease, a tick-borne disease that causes illness in humans (Clark et al. 2002).

Oldfield mouse (*Peromyscus polionotus*)

The oldfield mouse is distributed throughout much of the southeastern United States (Howell 1921; Golley 1962, 1966; Webster et al. 1985; Hall 1981; Choate et al. 1994; Trani et al. 2007). It occupies sandier and more open habitats than do most other small rodent species, except for the eastern harvest mouse. The oldfield mouse inhabits several islands along the South Atlantic and Gulf coasts, and in these cases the insular populations have very specific common names. One such island form, the Anastasia Island beach mouse, inhabits Anastasia Island in Saint Johns County, Florida. Evidence of its presence (plugged entrances to underground burrows, tracks, and scat) was obvious in the dunes at the Main Unit of FOMA. No attempt was made to collect additional voucher material – 271 specimens from Anastasia Island, many of them from the south end (Point Romo) of Anastasia Island where FOMA is located, are deposited in 17 museums identified in this investigation, and surely more material exists in other collections. It does not inhabit Rattlesnake Island. Oldfield mice might occur in CHAT, although little if any appropriate habitat occurs there. Wright (1926) reported that the oldfield mouse inhabited Cumberland Island, Georgia, but later in the same publication he emended the geographic location to Anastasia Island, Florida, so it is not included below. The oldfield mouse exhibits tremendous geographic variation and is in dire need of systematic revision (Carleton 1989). Currently, 16 subspecies are recognized (Hall 1981), including four in the area encompassed within the Southeast Coast Network – those from above the Fall Line in Alabama, Georgia, and South Carolina represent *P. p. colemani*; those from remainder of South Carolina represent *P. p. lucubrans*; those from below the Fall Line in Georgia represent *P. p. polionotus*; and those from the islands along the northeast coast of Florida represent *P. p. phasma*. Mainland subspecies in Alabama, Georgia, Florida, and South Carolina are not imperiled (NatureServe 2009), but five insular subspecies in Alabama and Florida are considered to be Endangered by the U.S. Fish and Wildlife Service and another is considered Threatened. Included in this group of imperiled subspecies is the Anastasia Island beach mouse, *P. polionotus phasma*, which is listed as Endangered and ranked S1 in Florida (NatureServe 2009).

White-footed mouse (*Peromyscus leucopus*)

The white-footed mouse is widely distributed across much of eastern North America (Hall 1981; Lackey et al. 1985), and it is common to abundant in brush piles, hedgerows, thickets, and forests throughout North Carolina and the northern two-thirds of South Carolina, Georgia, and Alabama (Howell 1921; Golley 1962, 1966; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007); it does not occur in Florida. It inhabits seven parks in the Southeast Coast Network – CAHA, WRBR, FORA, MOCR, HOBE, CHAT, and KEMO (Table 23). It is distributed along the Outer Banks of North Carolina, reaching as far south as Hatteras (Webster 1988; Parnell et al. 1992; Shipp-Pennock et al. 2005). Engels (1942) considered it to be extirpated from Ocracoke Island (CAHA), but there are no data to indicate that it ever occurred on that island. Two subspecies are known in the region – *P. l. leucopus* inhabits most of the area described above but *P. l. buxtoni*, described in August 2005, is restricted to the south end of Hatteras Island in North Carolina (Shipp-Pennock et al. 2005). *P. l. buxtoni* is listed as a Species of Concern by the U.S. Fish and Wildlife Service, and in North Carolina it is listed as Special Concern and ranked S2 (LeGrand et al. 2008), whereas *P. l. leucopus* is ranked S4 in Alabama and S5 in Georgia and North Carolina, it does not occur in Florida, and it is not ranked in South Carolina

(NatureServe 2009). Fifty-five individuals of *P. l. buxtoni* did not contain antibodies to ehrlichia, a tick-borne disease that causes illness in humans (Magnarelli et al. 1999).

Cotton mouse (*Peromyscus gossypinus*)

The cotton mouse is distributed throughout the southeastern United States (Wolfe and Linzey 1977; Hall 1981), including all of Florida, Georgia, Alabama, and most of South Carolina, but it does not inhabit the Upper Piedmont and Mountain physiographic provinces of North Carolina (Howell 1921; Golley 1962, 1966; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It has been reported from the Outer Banks of North Carolina (Brimley 1944-46; Lee et al. 1983), but these specimens represent the closely related white-footed mouse, *Peromyscus leucopus* (Parnell et al. 1992; Shipp-Pennock et al. 2005), and are not included below. The cotton mouse is common to abundant in a wide variety of forested habitats, including relatively dry, mesic, riparian, and swampy environments. It inhabits 11 parks in the Southeast Coast Network (MOCR, FOMO, CHPI, CONG, HOBE, OCMU, FOFR, CUIS, TIMU, FOCA, and FOMA) and, in suitable habitat, might be expected at CHAT as well (Table 23). It was thought to be extirpated from Anastasia Island (Pournelle and Barrington 1953; Humphrey et al. 1988; Boone et al. 1993), but recent specimens have been captured by personnel at GMNH, MSB, and UF. Two subspecies inhabit the area included in the Southeast Coast Network (Hall 1981; Boone et al. 1993) – *P. g. gossypinus* inhabits the Carolinas, most of Georgia (including the sea islands), northern Florida (including the barrier islands), and the Gulf Coast of Alabama; *P. g. megacephalus* inhabits northwestern Georgia and most of Alabama. However, Boone et al. (1999) opined that cotton mice from the Carolinas were distinct genetically from Georgia mice, but they did not formally describe the former. Federal and state management agencies do not consider the cotton mouse to be imperiled in the Southeast Coast Network. Three of 14 cotton mice from CUIS contained serum antibodies to Lyme disease, a tick-borne disease that causes illness in humans, whereas none of 14 from HOBE had antibodies (Magnarelli et al. 1992), and 27 of 34 cotton mice from Charleston County, South Carolina, contained antibodies to Lyme disease (Clark et al. 2002). Cotton mice from CUIS did not contain serum antibodies to ehrlichia, another tick-borne disease that causes illness in humans (Magnarelli et al. 1999). Nine cotton mice from CUIS served as host to the following ectoparasites (Wilson and Durden 2003): a flea (*Orchopeas leucopus*), ticks (*Amblyomma americanum*, *Dermacentor variabilis*, *Ixodes affinis*, and *I. scapularis*), mites (*Androlaelaps fahrenheitsi*, *A. stabularis*, and *Ornithonyssus bacoti*), and a chigger (*Euschoengastia peromysci*).

Florida mouse (*Podomys floridanus*)

As its name implies, the Florida mouse has a geographic distribution that is confined to peninsular Florida (Hall 1981; Jones and Layne 1993; Trani et al. 2007), and within the region included in the Southeast Coast Network, it occurs only on Anastasia Island. There is no evidence that the Florida mouse inhabits FOMA per se, but specimens have been taken just a few miles north of the park. With respect to TIMU and FOCA, Florida mice have been taken in Clay County, one county southwest of Duval County where these parks occur. It is listed as a Species of Concern and ranked S3 in Florida (<http://floridaendangeredspeciesnetwork.org>). Subspecies are not recognized.

Golden mouse (*Ochrotomys nuttalli*)

The golden mouse is another rodent that is endemic to the southeastern United States (Packard 1969; Linzey and Packard 1977; Hall 1981), and it is found in forested habitats at all elevations

throughout the entire project area of the Southeast Coast Network, save for coastal islands (Howell 1921; Golley 1962, 1996; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It inhabits eight mainland parks (MOCR, CONG, HOBE, CHAT, KEMO, OCMU, TIMU, and FOCA) in the Southeast Coast Network (Table 23). Two subspecies occur in the region – *O. n. nuttalli* inhabits most of Alabama, Georgia, and the Carolinas, whereas *O. n. floridanus* inhabits peninsular Florida. Federal and state management agencies do not consider either to be imperiled.

Hispid cotton rat (*Sigmodon hispidus*)

The hispid cotton rat is a ubiquitous denizen of early to mid-successional habitats in the southern United States, Mexico, and Central America (Cameron and Spencer 1981; Hall 1981). It is locally abundant in early successional habitats and common in mid-successional habitats, but it is regularly encountered in forests as it disperses from densely populated areas. It is widespread throughout Alabama, Georgia, Florida, and the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007) and it is one of the most common mammals in the Southeast Coast Network. It inhabits 15 parks – WRBR, FORA, MOCR, FOMO, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, FOFR, CUIS, TIMU, FOCA, and FOMA (Table 23). The hispid cotton rat probably occurred on Hatteras Island, North Carolina – E. L. Green, Jr., collected four cotton rats in “sandy-shrub areas” at Cape Hatteras (CAHA) in 1936, but the specimens were not saved (Parnell et al. 1992) and other documentation has not been secured since that time; this record is not included below. Apparently, the hispid cotton rat does not occur along most of the Outer Banks (Hatteras, Ocracoke, Portsmouth, South Core, and Shackleford islands) in North Carolina, although it likely occurs north of Bodie Island and on Roanoke Island (Webster 1988; Parnell et al. 1992). Three subspecies are known from the Southeast Coast Network – *S. h. hispidus* inhabits the coastal regions of the Carolinas and Georgia; *S. h. komareki* inhabits the remainder of the Carolinas and Georgia; and *S. h. floridanus* inhabits most of peninsular Florida. The hispid cotton rat is not considered to be imperiled by federal and state management agencies. Ten of 14 cotton rats from Charleston County, South Carolina, contained antibodies to Lyme disease, a tick-borne disease that causes illness in humans (Clark et al. 2002). Five hispid cotton rats from CUIS served as host to the following ectoparasites (Wilson and Durden 2003): a sucking louse (*Hoplopleura hirsuta*), a flea (*Polygenis gwyni*), a tick (*Dermacentor variabilis*), a mite (*Ornithonyssus bacoti*), and a chigger (*Eutrombicula splendens*).

Eastern woodrat (*Neotoma floridana*)

The eastern woodrat has a geographic distribution that includes much of the Mississippi lowlands and the Gulf Coast eastward to central Florida and southeastern North Carolina (Wiley 1980; Ray 2000; Trani et al., 2007). It appears to be habitat specific, depending on coastal forests with dwarf palmetto, *Sabal minor*, or Piedmont sites with pronounced vertical relief. Evidence confirming the presence of eastern woodrats was secured at four parks (CONG, OCMU, FOFR, and TIMU) in the Southeast Coast Network and, although evidence was not found woodrats also might occur at FOCA (Table 23). Woodrats have been taken in more rugged habitat in several counties in Alabama distant to HOBE (Howell 1921), well north of CHAT and KEMO in northern Georgia (Golley 1962), and near MOCR in coastal North Carolina, but suitable woodrat habitat does not exist in these four parks. Populations in Alabama and Florida are not considered to be imperiled. The population inhabiting coastal North Carolina is declining in number (Webster et al. 1985; Adams 1987; Webster et al. 1987); it is listed as

Threatened and ranked S1 (LeGrand et al. 2008). It is listed as Special Concern and ranked S3S4 in South Carolina (<http://www.dnr.state.sc.us/pls/heritage>) and ranked S3 in Georgia (<http://georgiawildlife.dnr.state.ga.us/content/specialconcernanimals.asp>). *N. f. floridana* inhabits most of the region included in the Southeast Coast Network, including the Carolinas, Georgia, and Florida, whereas *N. f. illinoensis* inhabits Alabama. Fourteen of 18 eastern woodrats from Charleston County, South Carolina, contained antibodies to Lyme disease, a tick-borne disease that causes illness in humans (Clark et al. 2002).

Meadow vole (*Microtus pennsylvanicus*)

The meadow vole is locally abundant throughout most of Canada and the northern United States (Hall 1981; Reich 1981; Johnson and Johnson 1982). It is distributed southward along the Appalachian Mountains to upstate Georgia and the Carolinas and along the mid-Atlantic coast to the Outer Banks of North Carolina, and there is a disjunct coastal population in Charleston County, South Carolina (Golley 1962, 1966; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). The meadow vole prefers herbaceous habitats such as fallow fields, roadside ditches, meadows, bogs, and estuarine salt marshes. Because of its northern affinities, it only occurs in four parks (CAHA, FORA, CHAT, and KEMO) in the Southeast Coast Network (Table 23). Three subspecies are known from the region – *M. p. pennsylvanicus* is found throughout the southern Appalachian highlands, *M. p. nigricans* inhabits the coastal regions of the Carolinas, and *M. p. dukecampbelli* is found only in Waccasassa Bay in Levy County, Florida. Of these, *M. p. dukecampbelli* is listed by the U.S. Fish and Wildlife Service as Endangered; it is included herein because I focused much of my fieldwork at CUIS in Swamp Field, which was dominated by seashore saltgrass (*Distichlis spicata*), the prevailing vegetation at Waccasassa Bay; unfortunately the characteristic clippings and scat deposited by meadow voles were not found at this site. *M. p. nigrans* is ranked S3 in North Carolina (NatureServe 2009) and *M. p. pennsylvanicus* is ranked S3S4 in Georgia (<http://georgiawildlife.dnr.state.ga.us/content/specialconcernanimals.asp>). In South Carolina, the meadow vole exists in the western mountains and in Charleston County in the eastern part of the state; both populations are listed as Special Concern and ranked S? (http://www.dnr.state.sc.us/pls/heritage/county_species.select_county_map) and the disjunct coastal population may be extirpated. Coastal specimens have been taken at the mouth of the Santee River and Cape Romain from Barn Owl pellets (Nelson 1934, 1937). Based on my examination of specimens at the Charleston Museum, two additional specimens of *M. pennsylvanicus* were captured on Cape Island (Cape Romain NWR) by traditional trapping techniques.

Woodland vole (*Microtus pinetorum*)

The woodland vole is distributed throughout the eastern United States, but it does not inhabit barrier and sea islands along the South Atlantic Coast and it is absent from southeastern Georgia and northeastern Florida (Howell 1921; Golley 1962, 1966; Hall 1981; Smolen 1981; Johnson and Johnson 1982; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Despite its common name, it occurs in a wide variety of habitats, such as evergreen and deciduous forests, thickets and pocosins, coastal prairies, and early successional grasslands. It occurs in seven mainland parks (MOCR, CHPI, CONG, HOBE, CHAT, KEMO, and OCMU) in the Southeast Coast Network (Table 1), where it is uncommon to locally common. Woodland voles in the area included in this investigation are separated into two subspecies – *M. p. pinetorum* inhabits most of the Southeast Coast Network except in northwestern Georgia, where

M. p. auricularis occurs. Neither is considered to be imperiled by federal and state management agencies.

Round-tailed muskrat (*Neofiber alleni*)

The round-tailed muskrat does not inhabit any parks in the Southeast Coast Network, but it is included herein for the sake of completeness. Its distribution extends from the Okefenokee Swamp southward throughout much of Florida (Birkenholz 1972; Hall 1981; Perry 1982; Trani et al. 2007); its distribution does not overlap that of the common muskrat. Round-tailed muskrats in Georgia are assignable to *N. a. exoristus*, whereas those from north-central and east-central Florida are referable to *N. a. alleni*. Both are ranked S3 (NatureServe 2009).

Common muskrat (*Ondatra zibethicus*)

The common muskrat is a denizen of aquatic habitats throughout most of North America north of Mexico (Willner et al. 1980; Hall 1981; Perry 1982). It does not occur in Florida but it is found throughout North Carolina and most of South Carolina, Georgia, and Alabama, except along the South Atlantic and Gulf Coastal Plain (Howell 1921; Golley 1962, 1966; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It occurs in eight parks (CAHA, FORA, CALO, MOCR, CONG, HOBE, CHAT, and OCMU) in the Southeast Coast Network, and it is encroaching on KEMO (Table 23). Muskrats have been reported from Georgetown County (Golley 1966), immediately to the north of Charleston County, where FOSU, FOMO, and CHPI occur, and they were introduced into Charleston County (Cape Island, Cape Romain NWR) in 1950 but did not become established (Golley 1966); these records are not included below. Common muskrats in coastal North Carolina are assigned to *O. z. macrodon*, whereas those from the remainder of the region are referred to *O. z. zibethicus*. Federal and state management agencies do not consider either to be imperiled.

Black rat (*Rattus rattus*)

The black rat is an exotic species introduced by early European colonists, and its geographic distribution includes most of the southeastern United States (Hall 1981). It typically associates itself with humans and their buildings, barns, and houses. Nonetheless, museum collections seldom include exotic species since they are non-native and therefore viewed as being unimportant by most scientists. In the northern part of Southeast Coast Network, it is much less common than its relative, the Norway rat (*Rattus norvegicus*), primarily because the Norway rat is a superior competitor in temperate climates. In southern subtropical environments, however, the situation is reversed and the black rat appears to be more abundant. Therefore, the black rat rarely is encountered in the Piedmont and Mountain physiographic provinces in Alabama, Georgia, and the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007); however, it is common in southern coastal cities, where major shipping facilities provide a continued source of immigrants (Howell 1921; Webster et al. 1985). In the Southeast Coast Network, black rats inhabit CAHA, MOCR, FOSU, FOMO, CHPI, CONG, FOFR, CUIS, CASA, and FOMA, and they are encroaching on WRBR, FORA, and CHAT (Table 23). The CUIS population largely has been eliminated (Shoop and Ruckdeschel 2001). The black rat once occupied abandoned shacks on Ocracoke Island (CAHA), on the Outer Banks of North Carolina (Engels 1942), and additional specimens have been collected there since that time. The black rat is not considered to be imperiled by federal or state management agencies. One species of flea (*Echidnophaga gallinacea*) was recovered from black rats inhabiting CUIS (Wilson and Durden 2003).

Norway rat (*Rattus norvegicus*)

The Norway rat is another exotic species introduced into North America by European colonists, although at a time after the black rat was introduced. The Norway rat is larger and more aggressive, and it largely replaced the more tropical black rat in most locations other than along the South Atlantic and Gulf coasts. The Norway rat is widely distributed in northern Alabama, northern Georgia, and the Carolinas (Howell 1921; Golly 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al., 2007). It inhabits 13 parks (CAHA, WRBR, FORA, CALO, MOCR, FOSU, FOMO, CHPI, CONG, HOBE, KEMO, OCMU, and FOFR) in the Southeast Coast Network and it is encroaching on CHAT (Table 23). It is common to abundant around large cities and rural agricultural facilities (Howell 1921), and federal and state management agencies do not consider it to be imperiled.

House mouse (*Mus musculus*)

The house mouse is widespread throughout most of North America as a result of being repeatedly introduced by humans. It is widespread and locally abundant in Alabama, Georgia, Florida, and the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It and the two species of *Rattus* cause tremendous economic damage in the United States because of their close associations with humans. The house mouse, therefore, is not considered to be imperiled by federal and state management agencies. The few museum and literature records belie its widespread distribution and abundance in the Southeast Coast Network project area. It is locally abundant in early successional habitats and around haystacks, barns, and other man-made structures. The house mouse occupies 17 parks (CAHA, WRBR, FORA, CALO, MOCR, FOSU, FOMO, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, FOFR, TIMU, CASA, and FOMA) in the Southeast Coast Network and it is encroaching on FOCA (Table 23). Engels (1952) reported it from Shackleford Banks (CALO), but Webster (1987a, 1988) found no recent evidence of it there and suspected that feral cats extirpated it from that island.

Meadow jumping mouse (*Zapus hudsonius*)

The meadow jumping mouse is found throughout much of southern Canada and the northern United States, including the southern Appalachian Mountains (Whitaker 1972; Hall 1981). It is locally rare to uncommon to wet meadows and bogs in the Piedmont and Mountain physiographic provinces in Alabama, Georgia, and North Carolina, and the Mountain province in South Carolina (Golley 1962, 1966; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It likely occurs in only two parks (CHAT and KEMO) in the Southeast Coast Network, although its geographic distribution is encroaching on HOBE (Table 23). In the region included in this investigation, meadow jumping mice are referred to *Z. h. americanus*. It is ranked S3 in Alabama, Georgia, and North Carolina; it is unranked in South Carolina (NatureServe 2009) and does not occur in Florida.

Nutria (*Myocastor coypus*)

The nutria is originally from South America, but it has been introduced at several sites in the Deep South and along the mid-Atlantic coast and has dispersed widely since then (Willner 1982; Woods et al. 1992; Trani et al. 2007). It inhabits marine, estuarine, and freshwater marshes at CAHA, FORA, CALO, and OCMU and is encroaching on MOCR and TICU (Table 23). It was introduced on the Outer Banks of North Carolina in Hatteras Village area in 1941 (Quay 1959; Webster 1988); its distribution is expanding southward in coastal North Carolina (Webster et al.

1984; Webster 1988; Parnell et al. 1992) and it inhabits several sites in Pender and New Hanover counties, not far from MOCR. One specimen was taken in Jacksonville Bay in northeastern Florida, not far from TIMU. It also is established in southeastern Georgia and likely will colonize FOFR and CUIS eventually.

Coyote (*Canis latrans*)

The coyote has recently expanded its geographic distribution and now is distributed across most of North America (Fisher 1975; Bekoff 1977; Hall 1981), including Alabama, Georgia, the Carolinas, and most of Florida (Choate et al. 1994; DeBow et al. 1998; Trani et al. 2007). It was confined to the western United States prior to European colonization but moved eastward as wolves were extirpated from that region. Coyotes did not occur in Alabama when Howell (1921) surveyed the state's mammalian fauna, but they reached Florida by the early 1980s (Brady and Campbell 1983), both as a result of natural dispersal and deliberate introductions in Georgia (Fisher 1975) and Florida (Cunningham and Dunford 1970). During the course of this investigation, the coyote was documented at eight parks (MOCR, CONG, HOBE, CHAT, KEMO, OCMU, TIMU, and FOMA), it likely passes through CHPI on occasion, and it is encroaching on CAHA, WRBR, FORA, CALO, and FOCA (Table 23). Federal and state management agencies do not consider it to be imperiled.

Domestic/feral dog (*Canis familiaris*)

Evidence of feral dogs was not found at any park in the Southeast Coast Network, but evidence of the domestic dog was documented at 16 of the 19 parks included in this study, all but FOSU, HOBE, and CUIS (Table 1). Domestic dogs observed during this investigation typically were under voice or leash control in suburban parks (CHAT) but usually running unleashed in rural parks (CONG). Domestic dogs were incredibly abundant in parks adjacent to large metropolitan areas (CHAT and KEMO) and common in parks with heavy visitor usage (CAHA), but rare to absent in remote parks with scant acreage or inaccessibility (CASA and FOSU, respectively).

Red wolf (*Canis rufus*)

The red wolf once inhabited the southeastern United States and Gulf Coast region as far west as Texas (Paradiso and Nowak 1972; Hall 1981; Choate et al. 1994; Trani et al. 2007), but its distribution began to shrink as the southeastern United States was colonized after European colonization. The red wolf was extirpated from the Southeast during the late 1800s and early 1900s; the last remaining population, surviving in coastal Texas and Louisiana in the 1970s, was brought to a captive breeding program in an attempt to save the species from extinction. Red wolves have not been reintroduced into the parks included in the Southeast Coast Network, but they have been reintroduced over the last three decades into a few national wildlife refuges that are somewhat adjacent to parks in eastern North Carolina (Alligator NWR, which is adjacent to CAHA, WRBR, FORA, and CALO, and then Pocosin Lakes NWR) and coastal South Carolina (Cape Romain NWR, which is adjacent to FOSU, FOMO, and CHPI). It is unlikely that red wolves ever inhabited remote islands in the region included in the Southeast Coast Network because they would not have been able to have sufficient population size to avoid the deleterious effects of inbreeding and genetic bottlenecks; however, they likely inhabited mainland sites associated with each park before they were extirpated. There is virtually no historical information about the red wolf in the area included in the Southeast Coast Network. Bartram (1791) provided some natural history information in his description of the species, Howell (1921) gave a lengthy description of the status of red wolves in Alabama, mentioning that 17 red

wolves were killed Clay County during a two-day period in 1896 (Howell 1921), and Harper (1927) mentions its status in the Okefenokee Swamp of southeastern Georgia. The red wolf is extirpated throughout its geographic distribution and it is considered to be critically imperiled because captive breeding facilities and “non-essential experimental populations” only exist in a few states. The red wolf is listed by the U.S. Fish and Wildlife Service as Endangered and established reintroduced and propagation populations in North and South Carolina are ranked S1 (NatureServe 2009).

Red fox (*Vulpes vulpes*)

The red fox is a boreal species, and its recently expanded geographic distribution includes most of Canada and the United States (Hall 1981; Larivière and Pasitschniak-Arts 1996). It appears to have become established in the Deep South within historic times as forests were converted to farmland and individuals were released for sport hunting. It now occurs throughout Alabama, most of Georgia and the Carolinas, and extreme northernmost Florida (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). It does not inhabit the sea islands of South Carolina and Georgia, but it does venture southward along the Outer Banks of North Carolina (Webster 1988; Parnell et al. 1992), passing WRBR and eventually reaching Cape Point and Cape Hatteras lighthouse (CAHA) in 2000 and 2001 (Marcia Lyons personal communication), where it unfortunately preys on sea turtle eggs and hatchlings and colonial nesting waterbird and shorebirds eggs and chicks. It also was documented at CHIPI, CHAT (Orrs Ferry), OCMU, and FOCA, and it likely inhabits three other parks (HOBE, KEMO, and TIMU) in the Southeast Coast Network (Table 23). In addition, it occasionally might pass through another two parks (MOCR and CONG) where habitat is generally lacking. The red fox is common in open habitats, uncommon in broken forests, and rare in dense forests and therefore not considered to be imperiled by federal or state management agencies. Red foxes in the southeastern United States are referable to *V. v. fulva*.

Common gray fox (*Urocyon cinereoargenteus*)

The common gray fox is a denizen of broken to dense forests in the United States, Central America, and northern South America (Hall 1981; Fritzell and Haroldson 1982). It is widespread throughout the entire Southeastern United States (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). The common gray fox inhabits 14 parks (CAHA, WRBR, FORA, MOCR, FOMO, CHIPI, CONG, HOBE, CHAT, KEMO, OCMU, TIMU, FOCA, and FOMA) in the Southeast Coast Network (Table 23). It also has been reported from Cumberland Island (Bent 1940), which is not included below because it was not found there by Bangs (1898), despite his extensive survey of the island’s mammalian fauna, and it has not been recorded during surveys that have been conducted by scientists representing several universities, most notably GMNH, over the last four decades,. Moreover, the gray fox does not exist on other islands in Georgia (Neuhauser and Baker, 1974) and there is no archeological evidence that it ever did (Marrinan 1975; Reitz and Honerkamp 1983). Gray foxes from northern Alabama, Georgia, upland South Carolina, and all of North Carolina are assignable to *U. c. cinereoargenteus*, whereas those from the remainder of the region are assignable to *U. c. floridanus*. Neither subspecies is considered to be imperiled (NatureServe 2009).

American black bear (*Ursus americanus*)

The American black bear was distributed widely across most of North America before European colonists arrived (Hall 1981; Larivière 2001), but it now only occurs in remote mainland locations of sufficient size to support large healthy populations. In the region included in the Southeast Coast Network, healthy populations exist in remote coastal swamps and river floodplains (Pelton 1982; Trani et al. 2007), and some of these populations are increasing in size. However, much of the black bear's former habitat irrevocably has been converted for human occupation, and many existing records document historic occupation rather than current status. The only parks in the Southeast Coast Network that currently have sufficient habitat to support a sustainable bear population are CONG, OCMU, and TIMU, but only provided such populations are connected to adjacent populations along riverine corridors and swamp mosaics, critical habitats for black bears. Black bears are tremendously mobile, however, and occasionally they wander through MOCR and perhaps the northernmost units of CHAT. There is no evidence that bears occupied the Outer Banks of North Carolina, but individuals sometimes swim or their carcasses float to many of these islands, some of them quite remote – Bodie Island (Lee et al. 1983), Ocracoke Island (this investigation), and Shackleford and Core banks (Engels 1952). There are records of black bears from Saint Simons Island (Moore 1840; Leigh 1883) Cumberland Island (Bartram 1791; Ober 1880; Bangs 1898; Sprunt 1936), and Anastasia Island (Bangs 1898). Furthermore, black bears were released on Cumberland Island in 1914, but this introduction ultimately was unsuccessful (Shoop and Ruckdeschel 2001). These records are not included below because recent records from both Saint Simons and Cumberland islands are lacking (Harris 1984). Two subspecies inhabit the southeastern United States – *U. a. americanus* is found throughout the entire region except in Florida, southern Georgia, and southern Alabama, where *U. a. floridanus* occurs. *U. f. floridanus* is listed as Threatened (<http://www.floridaendangeredspeciesnetwork.org>) and ranked S2 in Florida, southern Georgia, and southern Alabama (NatureServe 2009). *U. a. americanus* is not considered to be imperiled federally or in North Carolina (LeGrand et al. 2008) and Georgia (NatureServe 2009), but it is listed as Special Concern and ranked S3? in South Carolina (http://www.dnr.state.sc.us/pls/heritage/county_species.select_county_map) and ranked S2 in Alabama (NatureServe 2009).

Northern raccoon (*Procyon lotor*)

The northern raccoon is a denizen of most terrestrial habitats in North America, although it is most abundant in habitats classified as wetlands (Lotze and Anderson 1979; Hall 1981; Kaufmann, 1982). It was found in all 19 parks included in the Southeast Coast Network (Table 23), and generally was common to abundant in each. Five subspecies occur throughout Alabama, Georgia, Florida, and the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007), none of which is considered to be imperiled by federal or state management agencies. *P. l. varius* inhabits Alabama and most of Georgia, *P. l. elucus* inhabits Florida and southern Georgia, *P. l. litoreus* inhabits eastern Georgia and its type locality is Saint Simons Island; *P. l. solutus* inhabits South Carolina; and *P. l. lotor* inhabits North Carolina. Almost half of 221 raccoons from Georgia and South Carolina that were tested carried *Trypanosoma cruzi*, which causes Chagas' disease in humans (Yabsley and Noblet 2002). A chewing louse (*Trichodectes octomaculatus*) and ticks (*Amblyomma americanum* and *Dermacentor variabilis*) have been removed from raccoons inhabiting CUIS (Wilson and Durden 2003). Northern raccoons are a major prey item for American alligators at CUIS (Shoop and Ruckdeschel 1990).

Long-tailed weasel (*Mustela frenata*)

The long-tailed weasel is found throughout most of North America and western South America (Hall 1981; Svendsen 1982; Sheffield and Thomas 1997), and it is distributed throughout all five states included in this investigation (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Its abundance is difficult to determine because of its secretive nature, and there are few museum and literature records from the southeastern United States. Nonetheless, the long-tailed weasel undoubtedly occurs in most parks other than parks on barrier and sea islands. It likely inhabits seven mainland parks (MOCR, CONG, HOBE, CHAT, KEMO, OCMU, and TIMU) in the Southeast Coast Network (Table 23) and encroaches on another two small parks (CHPI and FOCA), although suitable habitat in both has been severely despoiled by development. Two subspecies are found in the Southeast Coast Network – *M. f. olivacea* inhabits most of Alabama, Georgia, northern Florida, and Coast South Carolina, and *M. f. noveboracensis* inhabits the northern parts of Alabama, Georgia, South Carolina, and all of North Carolina. The long-tailed weasel is not considered to be imperiled federally; however, it is ranked S3 in Alabama and S3S4 in both North and South Carolina, and *M. f. olivacea* is ranked S3? in Florida (NatureServe 2009).

American mink (*Neovison vison*)

The American mink is a denizen of wetland habitats throughout most of Canada and the United States (Hall 1981; Larivière 1999). It is widely distributed throughout Alabama, Georgia, Florida, and the Carolinas (Howell 1921; Golley 1962, 1966; Linscombe et al. 1982; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007), but within this region its abundance varies tremendously based on water quality, reflecting habitat degradation. In particular, coastal populations have declined precipitously, and PCB and mercury concentrations have been implicated in severe reproductive dysfunction (Osowski et al. 1995). There are few records from the southeastern United States, but the American mink inhabits 11 of the 19 parks (CAHA, FORA, CALO, MOCR, FOSU, CONG, CHAT, FOFR, CUIS, TIMU, and FOMA) in the Southeast Coast Network (Table 23). Furthermore, the mink likely occupies four other parks (FOMO, CHPI, HOBE, and OCMU), it encroaches on KEMO and FOCA, and it likely inhabited the CASA region prior to its urbanization. Mink from coastal regions from Charleston, South Carolina, southward through Anastasia Island, Florida, are referable to *M. v. lutensis*, which is ranked S3 in Florida but unranked in Georgia and South Carolina; mink from the remainder of the five-state region are referable to *M. v. mink*, which is not considered to be imperiled by federal and state management agencies (NatureServe 2009). Mink are consumed by American alligators at CUIS (Shoop and Ruckdeschel 1990).

Northern river otter (*Lontra canadensis*)

The northern river otter is a top-level aquatic carnivore, so it is an excellent bioindicator of healthy wetland habitats throughout the extent of its geographic distribution, which includes most of North American north of Mexico (Hall 1981; Toweill and Tabor 1982; Lariviere and Walton 1998). Its distribution ranges throughout Alabama, Georgia, Florida, and the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Parks in the Southeast Coast Network include a plethora of wetland habitats and river otters occur, at least occasionally, in 16 of 19 parks (CAHA, FORA, CALO, MOCR, FOSU, FOMO, CHPI, CONG, HOBE, CHAT, OCMU, FOFR, CUIS, TIMU, FOCA, and FOMA) in the Southeast Coast Network (Table 23). Records at both FOSU sites (Aquarium and Fort), in particular, demonstrate how tolerant otters are of disturbed habitat. Because they have

large home ranges, otters might visit CASA on rare occasions as well, but there is not enough suitable habitat at KEMO or the surrounding region to support otters. All otters in the Southeast Coast Network are assigned to *L. c. lataxina*, which is not considered to be imperiled by federal and state management agencies. American alligators prey on northern river otters on CUIS (Shoop and Ruckdeschel 1990).

Striped skunk (*Mephitis mephitis*)

The striped skunk inhabits most of southern Canada, the United States, and northern Mexico (Hall 1981; Godin 1982; Wade-Smith and Verts 1982), and it is distributed throughout Alabama, Georgia, Florida, South Carolina, and most of North Carolina (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Its abundance ranges from uncommon along the western edge of the Southeast Coast Network to rare along the eastern edge. Striped skunks occur at CONG, CHAT, OCMU, and TIMU, and they likely visit HOBE and KEMO on occasion as well (Table 23). Striped skunks from the Carolinas, eastern Georgia, and Florida are referable to *M. m. elongata*, whereas those from western Georgia and most of Alabama are referable to *M. m. nigra*. Neither is considered to be imperiled by federal and state management agencies.

Eastern spotted skunk (*Spilogale putorius*)

The eastern spotted skunk inhabits the central United States and northeastern Mexico, including Alabama, most of Georgia and Florida, and western South and North Carolina; it does not inhabit northeastern Florida or coastal Georgia (Howell 1921; Van Gelder 1959; Golley 1962, 1966; Hall 1981; Howard and Marsh 1982; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Kinlaw 1995; Trani et al. 2007). It is poorly known throughout much of this range but it is not considered to be imperiled federally. It is ranked S2S3 in Alabama, S3 in North Carolina, and S4 in Georgia (NatureServe 2009) and in South Carolina it is listed as Special Concern (https://www.dnr.sc.gov/pls/heritage/county_species.select_county_map) and ranked S4 (NatureServe 2009). Records of spotted skunks from the Charleston, South Carolina, region (Van Gelder 1959), attributed to oral reports from Albert Schwartz, are dubious and not included below. Currently, the spotted skunk does not appear to occur in any parks in the Southeast Coast Network; however, there are historic records from several counties in Georgia that either have parks or are adjacent to counties that have parks, including CHAT and KEMO (Table 23). Spotted skunks from Alabama, Georgia, and the Carolinas are referable to *S. p. putorius*, whereas those from peninsular Florida are referable to *S. p. ambarvalis*.

Feral cat (*Felis catus*)

Domesticated cats have been introduced throughout much of the world, and they are widespread in the entire region included in the Southeast Coast Network. Once abandoned, these cats quickly establish feral populations, causing two major problems – cats consume native wildlife, species that are not accustomed to this exotic predator, and they deprive native predators of that prey base. Thus, their impact on native ecosystems is profound. Cats were documented in 18 parks (Table 23), all but FOSU, usually on the basis of bone fragments, teeth, hair, and claws removed from coyote scat or from tracks and sightings. Feral individuals form the bulk of those eaten by coyotes, but in suburban settings domestic pets probably are consumed as well. A cat removal program should be an ongoing priority in all parks. Feral cats on CUIS serve as hosts for the following ectoparasites (Wilson and Durden 2003): fleas (*Ctenocephalides felis* and

Echidnophaga gallinacea) and ticks (*Amblyomma americanum*, *Dermacentor variabilis*, and *Ixodes scapularis*).

Mountain lion (*Puma concolor*)

The mountain lion, or panther as it is called in the southeastern United States, was once the most widely distributed mammal in the Western Hemisphere, ranging from northern Canada to southern South America (Hall 1981; Dixon 1982; Currier 1983). Its distribution has become much reduced as a result of relentless human persecution and loss of habitat (Lee 1987; Choate et al. 1994), although recently mountain lions have been recolonizing parts of their former range in the Plains States. In the eastern North America, it currently exists in southern Florida and northeastern Canada. Despite numerous reports to the contrary, it has not recolonized Alabama, Georgia, or the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). During the course of this investigation, without systematically attempting to interview a variety of people familiar with each park, personnel associated with CAHA, MOCR, HOBE, and CUIS vouched for the panther's presence in those parks. MOCR and HOBE are within the historic range of this large cat, but CAHA and CUIS do not have sufficient acreage to support viable population numbers. Bangs (1898), who described the Florida panther, *Puma concolor coryi*, never mentioned panthers on Cumberland Island or the adjacent mainland, Harris (1984) did not consider it to be extirpated from Cumberland Island, and Neuhauser and Baker (1974) did not report it from any of the other islands on the Georgia coast. White (1849) mentioned panthers on Saint Simons Island in Glynn County, Georgia, Mills (1826) mentions a 8.5-ft long "panther" from Wambow Swamp in Charleston County, South Carolina, that was killed in 1796, and Sanders (1978) provided a lengthy discussion about presumptive mountain lion evidence at Cape Romain NWR in Charleston County and Belle Baruch Field Laboratory in Georgetown County, South Carolina; the Mills (1826) record appears credible and is included below. The mountain lion is listed as Endangered by federal and state management agencies, although it is ranked as either historic or extirpated in all southeastern states but Florida, where it is ranked S1. It is noteworthy that the population in southwestern Florida appears to be growing and some individuals have dispersed well north of this stronghold. One panther, for example, was killed by an automobile in 2005 on a highway bridge that crosses the Saint Johns River along the Saint Johns-Duval county line (David Reed personal communication). This record is not included below.

Bobcat (*Lynx rufus*)

The bobcat is distributed widely across southern Canada, the United States, and most of Mexico (Hall 1981; McCord and Cardoza 1982; Larivière and Walton 1997), and it has a statewide distribution in North Carolina and South Carolina (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Its abundance varies according to that of its prey base, but in general the bobcat is uncommon to common throughout its range. There are few museum specimens and literature records from the 19 parks included in this investigation, but the bobcat inhabits nine parks (MOCR, CONG, HOBE, CHAT, OCMU, CUIS, TIMU, FOCA, and FOMA) in the Southeast Coast Network, and it might also occur in KEMO (Table 23). The history of bobcats on Cumberland Island is particularly interesting. Apparently, bobcats inhabited Cumberland Island until about 1907, when disease eliminated the population (Harper 1927). Five bobcats were introduced to Cumberland Island in 1972 and 1973 (Carol Ruckdeschel personal communication), and another 32 were brought in 1989-1990 (Ragsdale 1993). This population, which now numbers over 100 individuals according to recent NPS

estimates, primarily survives on the island's marsh rabbits and deer (Baker 1991). In fact, there is some evidence that bobcats have depleted the rabbit population (Shoop and Ruckdeschel 2001). There is a dubious sight record from Collington Island, on the Outer Banks of North Carolina (Lee et al. 1983), and a dead individual washed up on CALO, but these records are not included below. Two species of fleas (*Cediopsylla simplex* and *Ctenocephalides felis*) and one species of tick (*Dermacentor variabilis*) have been found on bobcats from CUIS (Wilson and Durden 2003). All bobcats in the southeastern United States are assignable to *L. r. floridanus*. Federal and state management agencies do not consider it to be imperiled.

Domestic/feral horse (*Equus caballus*)

The feral horse is a native of the Old World; it has been introduced and allowed to roam throughout much of North America. Today it is locally abundant in the western United States but extremely localized in the east (Slade and Godfrey 1982). For example, it once occurred widely along the Outer Banks of North Carolina and it still roams throughout Shackleford Banks (CALO), but it has been removed from the remainder of the Outer Banks, save for a small herd occupying one enclosure on Ocracoke Island (CAHA) and a free-ranging herd in Currituck County, North Carolina, well to the north of WRBR. Horses on the Outer Banks are thought to be descendants of Spanish mustangs, but those on CUIS are thought to be descended from "a train-car load of mustangs from Arizona [that] was released on the island in the 1920" (Shoop and Ruckdeschel 2001). Wilson and Durden (2003) found two species of ticks (*Amblyomma americanum* and *Ixodes scapularis*) on the horses at CUIS. One burro, or African wild ass, (*E. asinus*) wandered CUIS with the horses until recently, when it died (Carol Ruckdeschel personal communication); it is not afforded a separate species account. Evidence of horses was collected at five other parks (CONG, HOBE, CHAT, KEMO, and TIMU) in the Southeast Coast Network (Table 23), but their presence in each was solely recreational.

Feral pig (*Sus scrofa*)

The feral pig is another Old World species that has been widely introduced into North America; it also has escaped from captivity and is free-ranging throughout much of the United States, especially in the Deep South (Sweeney and Sweeney 1982; Mayer and Brisbin, 1991). Evidence of feral pigs was found at CONG, OCMU, CUIS, and TIMU (Table 23). In parks where they occur, the detrimental effect of their rooting was severe; a removal program is recommended. Pigs in Florida and coastal Georgia are predominantly feral, whereas those inhabiting river floodplains in central Georgia and South Carolina are feral-boar hybrids resulting from deliberate introductions along the Ocmulgee River in Houston County, Georgia, and the Congaree Swamp in Richland and Calhoun counties, South Carolina, respectively (Mayer and Brisbin 1991). Once widely distributed along Outer Banks (Parnell et al. 1992), it now seldom ventures from Currituck County southward into Dare County (Parnell et al. 1992), so a relatively recent extralimital record from WRBR is not included below. Historic accounts from CALO (Engels 1952) are not included below since they have been extirpated at least as far back as the mid-1980s (Webster 1987a). A sucking louse (*Haematopinus suis*) and ticks (*Amblyomma americanum*, *A. maculatum*, *Dermacentor variabilis*, and *Ixodes scapularis*) parasitize (Wilson and Durden 2003) and American alligators prey (Shoop and Ruckdeschel 1990) on the pigs inhabiting CUIS.

Goat (*Capra hircus*)

Goats have been widely introduced onto many islands in the southeastern United States, and they once were distributed along Outer Banks of North Carolina (Engels 1952; Webster 1987a; Webster 1988; Parnell et al. 1992). Seven goats were removed from Shackleford Banks (CALO) in 1986 and the last remaining individuals were removed in 1987. No evidence of this exotic domesticated species was collected in the parks included during this investigation, but one mature ram was killed by an automobile on Buford Dam Road, near the entrance to Bowmans Island (CHAT) in northern Georgia. As with other livestock species, goats were released on islands because they required no fencing and scant monitoring, they survived largely on the native vegetation and did not require large amounts of supplemental feeding, and the barrier islands did not have large predators.

European mouflon sheep (*Ovis aries*)

The European mouflon sheep has been released on many islands in the southeastern United States, especially along the Outer Banks in North Carolina (Webster 1988; Parnell et al. 1992). This exotic inhabited Shackleford Banks (CALO), North Carolina (Engels 1952; Webster, 1987a), until 1986, when 320 sheep were removed from the island. No evidence of its existence was found during this investigation, and the species should be considered as an introduced exotic that is now extirpated from CAHA and CALO.

Domestic cattle (*Bos taurus*)

Domestic cattle represent another exotic that has been released on several islands in the southeastern United States, including for example the Outer Banks of North Carolina (CAHA, WRBR, and CALO), including Shackleford Banks (Engels 1952; Webster 1987), and Cumberland Island (CUIS) in Georgia. One skeleton was recovered from Mullet Pond on Shackleford Banks (CALO) in March 1986, the same year that 110 cattle were removed from the island. Cattle also have been removed from CAHA and WRBR. The cattle introduced to CUIS became established on the island in a feral state; they were removed from Cumberland Island in the mid-1980s (Shoop and Ruckdeschel 2001). Therefore, the species now should be considered an introduced exotic that has been extirpated from CAHA, WRBR, CALO, and CUIS. Skeletal material recovered at HOBE and TIMU likely represent animals that were slaughtered for human consumption. Two species of sucking lice (*Linognathus vituli* and *Solenopotes capillatus*) were found on cattle from CUIS (Wilson and Durden 2003).

White-tailed deer (*Odocoileus virginianus*)

The white-tailed deer is found throughout most North America and northern South America (Hall 1981; Hesselton and Hesselton 1982; Smith 1991). Its numbers declined significantly as a result of unregulated harvest in the early 20th Century, but it has recovered since game laws became established and it is now widespread throughout Alabama, Georgia, Florida, and the Carolinas (Howell 1921; Golley 1962, 1966; Lee et al. 1983; Webster et al. 1985; Choate et al. 1994; Trani et al. 2007). Deer inhabit 14 parks (CAHA, WRBR, MOCR, CHPI, CONG, HOBE, CHAT, KEMO, OCMU, FOFR, CUIS, TIMU, FOCA, and FOMA) in the Southeast Coast Network (Table 1). The white-tailed deer is uncommon to abundant in suitable habitat, and it is not considered to be imperiled by federal or state management agencies. Specimens from Alabama, Georgia (except Blackbeard Island), and the Carolinas (except Hilton Head, Hunting, and Bulls islands) are referable to *O. v. virginianus*, whereas those from most of peninsular Florida are referable to *O. v. seminola*. Deer at CUIS are parasitized heavily (Wilson and Durden

2003) by chewing lice (*Damalinia* sp.), a louse-fly (*Lipoptena mazamae*), ticks (*Amblyomma americanum*, *Ixodes affinis*, and *I. scapularis*), a chigger (*Eutrombicula batatas*), and a scab mite (*Psoroptes cuniculi*), and they are consumed by American alligators (Shoop and Ruckdeschel 1990). Some deer at CUIS apparently are albino or they have white pelage – on 1 March 2005 I observed a doe with a daughter; both appeared albino, but park staff opined that the daughter had spots. The European fallow deer was introduced on Little Saint Simons Island and some of those individuals colonized Saint Simons Island (Neuhauser and baker 1974); this species is not afforded a separate species account and I mention it here for the sake of completeness.

Discussion

A total of 48 terrestrial mammals was documented as Present or Probably Present at 19 parks in the Southeast Coast Network (Table 23). In addition, nine species of bats were documented as Present or Probably Present in five parks in North Carolina. Eight (black rat, Norway rat, house mouse, nutria, domestic dog, feral cat, horse, and feral pig) of the 48 terrestrial species (16.7%) are exotic; that is, they were introduced either deliberately or incidentally by humans. Moreover, another five species that have been introduced widely into the southeastern United States (African wild ass, goat, European mouflon sheep, domestic cattle, and European fallow deer) have since been removed from park properties or adjacent regions. The most frequently encountered mammal species (followed by the number of occupied parks in parentheses) were the northern raccoon (19), feral cat (18), eastern gray squirrel (17), house mouse (17), Virginia opossum (16), eastern mole (16), domestic dog (16), northern river otter (16), eastern cottontail (15), marsh rice rat (15), hispid cotton rat (15), American mink (15), and white-tailed deer (15). Of these 13 widespread species, the feral cat, house mouse, and domestic dog are exotics; dogs typically usually were under voice or leash control, but feral cats and house mice are not, so they move about park properties with impunity. Three native species (nine-banded armadillo, coyote, and red fox) have expanded their geographic distributions into the SECN region, both naturally and with the assistance of introductions into the southeastern United States, and three others (red wolf, American black bear, and mountain lion) have been extirpated at the landscape scale, although the black bear has recolonized part of its former geographic distribution. One other species deserves comment at this time – the southeastern pocket gopher recently was extirpated from Cumberland Island, including CUIS, and this is the only park in the SECN where this species occurred. All told, mammalian species composition in the southeastern United States has changed dramatically over the last 400 years, and in fact the faunal assemblages in some parks changed during the course of this six-year investigation.

There are two large-scale generalizations that can be made about the mammalian faunas of the SECN parks. First, large inland parks (CONG, HOBE, CHAT, and OCMU) have the greatest number of terrestrial mammal species, whereas small coastal parks (FOSU, FOMO, and CASA) have the least (Table 23). This is not surprising inasmuch as large areas tend to have greater topographic relief, habitat diversity, and community structure; they sometimes include more than one physiographic province or they are adjacent to areas where two physiographic provinces meet. Also, large inland parks have similar mammalian faunas – each typically includes the 13 widespread species mentioned above and they also share a dominant secondary group of 15 species that are characteristic of the southeastern United States, including the southeastern shrew, least shrew, a short-tailed shrew (either northern or southern, but not both), another rabbit (either swamp or marsh, but not both), southern flying squirrel, American beaver, eastern harvest mouse, golden mouse, another mouse (either white-footed or cotton, but not both), woodland vole, common muskrat, coyote, common gray fox, long-tailed weasel, and bobcat. Conversely, small coastal parks have degraded habitats and the only species common to all are the black rat, house mouse, and northern raccoon.

Mammalian diversity in the 19 parks in the SECN varies greatly on the basis of directional and stochastic temporal changes in mammalian faunas over time, the introduction of exotic mammalian and non-mammalian species that alter community structure via competition and predator-prey relationships, and habitat alteration via mechanical or climate-induced means.

When describing the mammalian fauna over a landscape as large as the Southeast Coast Network, these three agents of change – temporal, introduction of exotic species, and habitat alteration – are intermingled (e.g. differential shifts in the geographic distributions of species reflects climate change and habitat alteration). However, when describing the mammalian fauna on a local level or when describing one particular species over a large landscape, one category of change generally is more important than another (e.g. loss of native habitat associated with the building of Castillo de San Marcos or the introduction of feral cats, respectively). In some cases the change in community structure occurs over time in such a way that biologists do not perceive its significance. In others, the change occurs so quickly that the significance is readily apparent to most.

As it has around the globe, the mammalian fauna in the region encompassed by the Southeast Coast Network has changed throughout geologic time. However, in the last 400 years, or since Europeans colonized North America, changes in species composition are perceived to have accelerated tremendously. In many cases the shifts in mammalian faunas have been clearly documented. One paradigm shift reflects the introduction of commensal rodents (black rat, Norway rat, and house mouse) or the commensurate introduction of predators to control these rodents (house cat). These changes began when Europeans brought the black rat to eastern North America in the early 1600s (Webster et al. 1985), but they continue today as freighters arrive from around the World, continually bringing exotic species to North America. Exotic rodents despoil grains and spread disease directly (e.g. hanta virus and hemorrhagic fever) or indirectly through their parasites (e.g. plague and typhus), they cause damage to edificarian structures due to their gnawing, and due to their ability to colonize ephemeral habitats, exotic rodents outcompete native species that once colonized early successional communities, such as eastern harvest mice in agrarian communities. Likewise, the house cat has acquired the reputation as a cunning predator of native small to squirrel-sized rodents, birds, lizards, and just about anything else it can capture; house cats also spread toxoplasmosis and cat scratch disease. Parks that are dominated by natural habitats (CUIS and TIMU) tend to have lower densities of commensal rodents and feral cats, whereas parks that are greatly modified, either naturally via frequent storms (CAHA and WRBR) or as a result of human activities via urbanization (CHPI and CASA), tend to have higher densities of commensal rodents and feral cats.

Another shift in mammalian biodiversity relates to the introduction of livestock as a source of hides, food, warfare, beasts of burden, or companionship (nutria, horse, pig, goat, sheep, and cow, and dog). Too often these species became feral, although the implications of free-ranging populations of exotic species were not fully comprehended in the past. For example, the nutria was introduced in 1941 at Hatteras Island, North Carolina (Quay 1959), as a source of fur, but the experiment failed miserably (Willner 1982). The fur never became marketable, and escaped animals became the source population for its current distribution, which ranges along the East Coast from the mid-Atlantic States to northeastern Florida (Willner 1982; Woods et al. 1992). Several species of livestock were introduced widely when Europeans colonized North America. It was common in those days to release livestock on islands because they required no fencing, there was little competition for forage, and large predators did not exist on islands (Littleton 1979). As an aside, it is interesting to note that the latter fact largely escapes those who opine that wolves and panthers once inhabited barrier islands and sea islands in the southeastern United States. Livestock alter community structure through their foraging activities (Sweeney and Sweeney 1982; Mayer and Brisbin 1991; Rheinhardt and Rheinhardt 2004; Wilcox and Van

Vuren 2009). For example, horses graze and trample native vegetation on Shackleford Banks (CALO) and Cumberland Island (CUIS), which favors for example ground-nesting shorebirds rather than colonial nesting waterbirds that nest in wrack (Levin et al. 2002). Likewise, the rooting, foraging, and trampling activities of pigs alters community structure and greatly diminished ground dwelling vertebrates (Wilcox and Van Vuren 2009), especially at CONG, OCMU, CUIS, and TIMU. The domestic dog was brought with European settlers to provide protection, companionship, and help in hunting. Some became feral, but this problem is obsolete now, as free-ranging populations of feral dogs have largely been replaced by coyotes; dogs encountered during this investigation were domesticated and typically under voice or leash control. The nine-banded armadillo is unusual because the reason for its introduction into Florida, beginning in 1924 and continuing into the 1930s, is obscure. Nonetheless, it now inhabits much of the southeastern United States, including six SECN parks. Its rooting and predatory behavior negatively affects community structure (McBee and Baker 1982; Engeman et al. 2002), especially in CUIS and TIMU.

Another cause of change in the mammalian faunas in the SECN region relates to the tendency of species to changes their geographic distributions as a result of changes in climate. Included in this category are Gulf Coast species that have expanded their geographic distributions northward (southern short-tailed shrew, northern yellow bat, Brazilian free-tailed bat, and nine-banded armadillo) and New England – Great Lakes species that have retracted their geographic distributions northward (northern short-tailed shrew, meadow vole, and meadow jumping mouse) in response to climate change. These species typically are small bodied and their home ranges tend to be small, so changes in climate have a more pronounced effect on their geographic distributions; larger-bodied species are more adaptable and more widespread geographically, and they have not demonstrated noticeable shifts in their geographic distributions. In particular, the northward range expansion of the northern yellow bat, Brazilian free-tailed bat, and nine-banded armadillo have occurred rapidly during the last four decades as climates have warmed. Conversely, the disjunct populations of the meadow vole in Charleston County, South Carolina, and on the Gulf Coast of Florida, clearly indicate that the meadow vole was more widely distributed in the southeastern United States during a climatic optimum. The taxonomic status of the Charleston County voles is uncertain but the Florida Gulf Coast population, recognized as the distinct *Microtus pennsylvanicus dukecampbelli*, is listed as Endangered by the U.S. Fish and Wildlife Service. Likewise, the meadow jumping mouse once inhabited the Upper Piedmont and Mountain physiographic provinces in the Carolinas, Georgia, and Alabama, but it is now restricted to the mountains in these states, and was only encountered at CHAT and KEMO.

Another shift in species composition in the mammals of the SECN parks related to changes in the landscape by either natural or human-induced mechanisms. Coastal parks have low mammalian diversity in part because they are very susceptible to weather-related change of catastrophic scale. Hurricanes and nor'easters can move inlets, sweep vegetation off of islands, and shift huge quantities of sand, creating washover terraces. Island parks with greater relief and habitat complexity, CAHA and CUIS for example, tend to be more protected from storm surges and have greater mammalian diversity when compared to islands with low relief and less habitat complexity (Webster and Reese 1992), but even these large parks have less diversity than mainland sites of comparable acreage. One the most pronounced natural change in landscape involves the movement of inlets along the Outer Banks of North Carolina. Along the Outer Banks, inlets move from north to south as long-shore drift moves sand southward, following the

Labrador Current. Eventually, inland sources of water force the formation of a new inlet, which opens at the original inlet site, relieving the ebb- and flood-tide pressure on the inlet that had migrated to a more southerly location. As these inlets shift southward, terrestrial mammals have the opportunity to move southward along the Outer Banks in a conveyor belt fashion. In this regard, the hispid cotton rat reached Buxton Woods (CAHA), where it was documented in 1936; it no longer exists there (Quay 1959; Webster 1988; Parnell et al. 1992). Likewise, several other species are moving southward along the Outer Banks (eastern mole, eastern gray squirrel, eastern harvest mouse, meadow vole, and red fox), and the Buxton Woods white-footed mouse has become isolated on the south end of Hatteras Island (CAHA) for a long enough period of time that it is genetically distinct from white-footed mice to the north on Bodie Island (CAHA) and Kitty Hawk (WRBR).

Human-induced alterations in the southeastern United States to habitat include, among other things, clear-cutting for agricultural purposes, roadways, and urbanization. Mammal species that have taken advantage of less forested habitat include the coyote and red fox, two species that prefer open habitats in which to forage. Neither species was found in the southeastern United States when Bangs (1898) conducted his seminal work in the region. However, human alterations to the terrestrial environment has had a negative effect on the eastern fox squirrel, long-tailed weasel, striped skunk, and eastern spotted skunk; none of these species are as abundant as they were based on capture data spanning the last 120 years. Small parks that are particularly affected by habitat alteration, CASA for example, have scant mammalian biodiversity. In both estuarine and freshwater habitats, declining water quality has been implicated in the decreasing abundance of the American mink and northern river otter. Another human-induced alteration is related to widespread persecution against top-level carnivores, most notably the red wolf, American black bear, and mountain lion. These species were extirpated on a landscape scale by European and then early American colonists, although the black bear has recovered substantially and has recolonized parts of its former geographic distribution, including MOCR. It is difficult to imagine, but the white-tailed deer also was hunted relentlessly in the southeastern United States, and its demise led in part to the formation of state wildlife management agencies; deer have recovered remarkably and were recorded in 15 of the 19 SECN parks. Finally, persecution and over-collecting by enthusiastic mammalogists led to the extirpation of the southeastern pocket gopher on Cumberland Island (CUIS).

Moving forward, the results of this investigation provide tantalizing clues as to what might happen to mammalian biodiversity in the 19 SECN parks in the near future. Already, the coyote has colonized Cumberland Island (CUIS) and Anastasia Island (FOMA) and it will continue to colonize the easternmost parks in the near future. Armadillos will continue to move northward, next colonizing CONG and perhaps CHPI. Red foxes will continue moving southeastward and colonize FORA, CALO, and FOMO. White-tailed deer will continue to swim to island parks on occasion and perhaps become established, as they recently have at CALO.

The results of this investigation also identify some management recommendations that would counterbalance some of the negative effects that exotic species have on park habitats or that would restore mammalian biodiversity. For example, two of the most destructive exotic species, the feral cat and feral pig, can be controlled by active removal programs. This is especially important on Anastasia Island (FOMA), where the Anastasia Island beach mouse – the most critically imperiled mammal in the Southeast Coast Network – is restricted to both ends of the

island. Feral cats could easily eradicate one or both of these populations and the cat removal program used on this island needs to continue. Finally, the National Park Service needs to assess a proposal to reintroduce southeastern pocket gophers to Cumberland Island (CUIS). The best available science (Williams and Genoways 1980; Laerm 1981) indicates that the mainland and island gophers are indistinguishable, at least based on morphology. A genetic analysis would provide an excellent test of this hypothesis.

Conclusions

This investigation determined that 48 species of terrestrial mammals, and nine species of bats in the North Carolina, comprised the mammalian fauna of 19 national parks in the Southeast Coast Network. Large inland parks (CONG, HOBE, CHAT, and OCMU) had the greatest mammalian diversity, whereas small coastal parks (FOSU, FOMO, and CASA) had the least. The northern raccoon inhabits all 19 parks, and 12 other species (feral cat, eastern gray squirrel, house mouse, Virginia opossum, eastern mole, domestic dog, northern river otter, eastern cottontail, marsh rice rat, hispid cotton rat, American mink, and white-tailed deer) are denizens of at least 15 parks. Eight (of 48, 16.7%) species are exotics, introduced either deliberately or accidentally by humans, and three of these (feral cat, domestic dog, and house mouse) inhabit at least 15 parks. Mammalian diversity at 19 national parks in the SECN is in a constant state of flux. Gone are the red wolf and mountain lion. The American black bear and white-tailed deer were hunted almost to extirpation, but both have recolonized part or most of their former ranges, respectively. The southeastern pocket gopher has been extirpated from Cumberland Island (CUIS), and the armadillo, coyote, and red fox have expanded their geographic distributions and now occupy many SECN parks. The Anastasia Island beach mouse, considered to be Endangered by the U.S. Fish and Wildlife Service, is the most critically imperiled mammal species existing in the Southeast Coast Network; it only occurs at FOMA. Two species of bats that inhabit MOCR, the southeastern myotis and Rafinesque's big-eared bat, and one rodent that inhabits CAHA, the Buxton Woods white-footed mouse, are listed as to be Species of Concern by the U.S. Fish and Wildlife Service. The negative effects of feral cats, feral pigs, and other exotic species on native landscapes are profound; cat and pig eradication programs should be a high management priority.

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Appendix A. Specimens and other evidence examined for status of SECN mammals.

Virginia opossum (*Didelphis virginiana*)

CAHA: North Carolina – *Dare County*: Avon (1 UNCW); [CAHA] Bodie Island (Boone 1988; Parnell et al. 1992); [CAHA] between Buxton and Hatteras (Parnell et al. 1992); [CAHA] Hatteras Island (Webster 1988; Parnell et al. 1992); [CAHA] Pea Island NWR (Parnell et al. 1992); Frisco (roadkill); Hatteras (4 AMNH); between Kitty Hawk and Whalebone Junction (Parnell et al. 1992); 7 mi N Oregon Inlet (1 AMNH); FORA, Roanoke Island, Hwy 64 at Croatan Sound (roadkill); Manteo (Lee et al. 1983); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); Rodanthe (roadkill); WRBR (roadkill). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: Avon (1 UNCW); [CAHA] Bodie Island (Boone 1988; Parnell et al. 1992); [CAHA] between Buxton and Hatteras (Parnell et al. 1992); [CAHA] Hatteras Island (Webster 1988; Parnell et al. 1992); [CAHA] Pea Island NWR (Parnell et al. 1992); Frisco (roadkill); Hatteras (4 AMNH); between Kitty Hawk and Whalebone Junction (Parnell et al. 1992); 7 mi N Oregon Inlet (1 AMNH); FORA, Roanoke Island, Hwy 64 at Croatan Sound (roadkill); Manteo (Lee et al. 1983); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); Rodanthe (roadkill); WRBR (roadkill).

FORA: North Carolina – *Dare County*: Avon (1 UNCW); [CAHA] Bodie Island (Boone 1988; Parnell et al. 1992); [CAHA] between Buxton and Hatteras (Parnell et al. 1992); [CAHA] Hatteras Island (Webster 1988; Parnell et al. 1992); [CAHA] Pea Island NWR (Parnell et al. 1992); Frisco (roadkill); Hatteras (4 AMNH); between Kitty Hawk and Whalebone Junction (Parnell et al. 1992); 7 mi N Oregon Inlet (1 AMNH); FORA, Roanoke Island, Hwy 64 at Croatan Sound (roadkill); Manteo (Lee et al. 1983); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); Rodanthe (roadkill); WRBR (roadkill).

CALO: North Carolina – *Carteret County*: Bogue, Hwy 24 (1 UNCW); CALO, Shackleford Banks (Engels 1952).

MOCR: North Carolina – *Pender County*: 6 mi E Burgaw (1 UNCW); Hampstead (1 UNCW); MOCR (observation); 1 mi N Scotts Hill (1 UNCW); Willard (1 UNCW); no specific locality (1 UNCW).

FOSU: South Carolina – *Charleston County*: Adams Run (2 ChM); Charleston (2 ChM, 1 CUMV); 15 mi W Charleston, Hwy 17 at Rantowles (1 ChM); CHPI (1 UNCW); Edisto Island (Marrinan 1975); FOSU, no evidence; James Island (2 ChM); Mount Pleasant (1 ChM, 1 ROM); 4 mi NNW Mount Pleasant (1 ChM); 11 N Mount Pleasant (1 ChM); Saint Andrews Parish (2 ChM); Saint Andrews Parish, Merry Mede (10 ChM); Sullivans Island (1 ChM); Wadmalaw Island (1 ChM).

FOMO: South Carolina – *Charleston County*: Adams Run (2 ChM); Charleston (2 ChM, 1 CUMV); 15 mi W Charleston, Hwy 17 at Rantowles (1 ChM); CHPI (1 UNCW); Edisto Island

(Marrinan 1975); FOMO, no evidence; James Island (2 ChM); Mount Pleasant (1 ChM, 1 ROM); 4 mi NNW Mount Pleasant (1 ChM); 11 N Mount Pleasant (1 ChM); Saint Andrews Parish (2 ChM); Saint Andrews Parish, Merrymede (10 ChM); Sullivans Island (1 ChM); Wadmalaw Island (1 ChM).

CHPI: South Carolina – *Charleston County*: Adams Run (2 ChM); Charleston (2 ChM, 1 CUMV); 15 mi W Charleston, Hwy 17 at Rantowles (1 ChM); CHPI (1 UNCW); Edisto Island (Marrinan 1975); James Island (2 ChM); Mount Pleasant (1 ChM); 4 mi NNW Mount Pleasant (1 ChM, 1 ROM); 11 N Mount Pleasant (1 ChM); Saint Andrews Parish (2 ChM); Saint Andrews Parish, Merrymede (10 ChM); Sullivans Island (1 ChM); Wadmalaw Island (1 ChM).

CONG: South Carolina – *Richland County*: CONG (1 UNCW); no specific locality (Golley 1966).

HOBE: Alabama – *Lee County*: Auburn (1 UMMZ). *Tallapoosa County*: HOBE, no evidence; 6 mi S New Site, adjacent to HOBE on Hwy 49 (roadkill).

CHAT: Georgia – *Cobb County*: CHAT, no evidence; KEMO (roadkill); Marietta (1 UMMZ); near Vinings (1 GMNH); Woodstock (1 UMMZ). *DeKalb County*: 2 mi N South River (1 GMNH). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; no specific locality (Golley 1962). *Gwinnett County*: CHAT, Medlock Bridge (tracks); CHAT, Suwanee Creek (1 UNCW).

KEMO: Georgia – *Cobb County*: KEMO (roadkill); Marietta (1 UMMZ); near Vinings (1 GMNH); Woodstock (1 UMMZ).

OCMU: Georgia – *Bibb County*: adjacent to OCMU, Main Unit, Hwy 80 (1 UNCW); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: adjacent to FOFR, Frederica Site (1 UNCW); Jekyll Island (Neuhauser and Baker 1974); Saint Simons Island (2 USNM; roadkill; Marrinan 1975; Reitz and Honerkamp 1983); Sterling (Bangs 1898).

CUIS: Georgia – *Camden County*: CUIS (2 UNCW; observation; Wilson and Durden 2003); Saint Marys (2 MCZ).

TIMU: Florida – *Duval County*: FOCA (1 UNCW); New Berlin (1 FMNH; Bangs 1898); TIMU, Kinsley Plantation (scat); TIMU, Theodore Roosevelt Area (1 UNCW).

FOCA: Florida – *Duval County*: FOCA (1 UNCW); New Berlin (1 FMNH; Bangs 1898); TIMU, Kinsley Plantation (scat); TIMU, Theodore Roosevelt Area (1 UNCW).

CASA: Florida – *Saint Johns County*: Anastasia Island, Espanita (1 FMNH); CASA, no evidence; FOMA, Main Unit (2 UNCW); marsh east of Tolomato River (1 UF); Palm Valley (3 MSB).

FOMA: Florida – *Saint Johns County*: Anastasia Island, Espanita (1 FMNH); FOMA, Main Unit (2 UNCW); marsh east of Tolomato River (1 UF); Palm Valley (3 MSB).

Southeastern shrew (*Sorex longirostris*)

CAHA: North Carolina – *Dare County*: 1 km N Buffalo City (1 UNCW); CAHA, no evidence; 7 km WNW Stumpy Point (6 UNCW); 17 km W Stumpy Point (7 UNCW). *Hyde County*: 9 km NW Engelhard (1 UNCW); 10 km NE Engelhard (3 UNCW); 9 km SSE New Holland (7 UNCW). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: 1 km N Buffalo City (1 UNCW); 7 km WNW Stumpy Point (6 UNCW); 17 km W Stumpy Point (7 UNCW); WRBR, no evidence. *Hyde County*: 9 km NW Engelhard (1 UNCW); 10 km NE Engelhard (3 UNCW); 9 km SSE New Holland (7 UNCW).

FORA: North Carolina – *Dare County*: 1 km N Buffalo City (1 UNCW); FORA, no evidence; 7 km WNW Stumpy Point (6 UNCW); 17 km W Stumpy Point (7 UNCW). *Hyde County*: 9 km NW Engelhard (1 UNCW); 10 km NE Engelhard (3 UNCW); 9 km SSE New Holland (7 UNCW).

CALO: North Carolina – *Carteret County*: CALO, no evidence. *Hyde County*: 9 km NW Engelhard (1 UNCW); 10 km NE Engelhard, Hwy 264 (3 UNCW); 9 km SSE New Holland (7 UNCW).

MOCR: North Carolina – *Pender County*: 5 km S Burgaw, I-40 (4 UNCW); 7 km SE Burgaw, I-40 (5 UNCW); 6 km NNE Castle Hayne, I-40 (5 UNCW); Holly Shelter Gamelands (22 UNCW); MOCR (1 UNCW); Scotts Hill (10 UNCW); 3 km E Willard, I-40 (2 UNCW).

FOSU: South Carolina – *Charleston County*: 4 km SW Awendaw, Iron Swamp (8 USNM); Camp Seewee (Sanders 1978); 16 mi N Charleston (Coleman 1940); 2 7/8 mi N, 8 mi W McClellansville (1 MHP); Fairlawn Plantation (Sanders 1978); FOSU, no evidence; Goose Creek (1 ChM); 3.3 km NW McClellansville (42 USNM).

FOMO: South Carolina – *Charleston County*: 4 km SW Awendaw, Iron Swamp (8 USNM); Camp Seewee (Sanders 1978); 16 mi N Charleston (Coleman 1940); 2 7/8 mi N, 8 mi W McClellansville (1 MHP); Fairlawn Plantation (Sanders 1978); FOMO, no evidence; Goose Creek (1 ChM); 3.3 km NW McClellansville (42 USNM).

CHPI: South Carolina – *Charleston County*: 4 km SW Awendaw, Iron Swamp (8 USNM); Camp Seewee (Sanders 1978); 16 mi N Charleston (Coleman 1940); CHPI, no evidence; 2 7/8 mi N, 8 mi W McClellansville (1 MHP); Fairlawn Plantation (Sanders 1978); Goose Creek (1 ChM); 3.3 km NW McClellansville (42 USNM).

CONG: South Carolina – *Richland County*: CONG (1 UNCW; Cromer et al. 2007).

HOBE: Alabama – *Tallapoosa County*: HOBE, specimens (5 UNCW).

CHAT: Georgia – *Cobb County*: CHAT, Gold Branch (1 UNCW); KEMO (9 UNCW). *Forsyth County*: CHAT, no evidence. *Fulton County*: [CHAT] Chattahoochee River at Long Island Creek (14 GMNH); Roswell (1 AMNH). *Gwinnett County*: CHAT, Level Creek (2 UNCW); CHAT, Settles Bridge (1 UNCW); CHAT, Suwanee Creek (3 UNCW).

KEMO: Georgia – *Cobb County*: CHAT, Gold Branch (1 UNCW); KEMO (9 UNCW). Fulton County: Roswell (1 AMNH).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Jones County*: Round Oak (1 USNM).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Baker County*: no specific locality (1 UF). *Duval County*: TIMU, Thomas Creek (1 UNCW).

FOCA: Florida – *Baker County*: no specific locality (1 UF). *Duval County*: FOCA, no evidence; TIMU, Thomas Creek (1 UNCW).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Least shrew (*Cryptotis parva*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (13 UNCW); [CAHA] Buxton (2 UMMZ, 1 UNCW); [CAHA] Frisco (Parnell et al. 1992); [CAHA] Hatteras (1 UNCW); [CAHA] ca 2 mi SW Cape Hatteras lighthouse (Quarles 1974, as *Blarina carolinensis*); [CAHA] Pea Island (Lee et al. 1983, as *Sorex longirostris*); Hatteras (1 AMNH); Little Kinnakeet (4 UNCW); Nags Head (3 UNCW). *Hyde County*: CAHA, Ocracoke Island, no evidence; 9 km NW Engelhard (10 UNCW); 10 mi NE Engelhard (2 USNM); 3 mi W Lake Landing (7 USNM); Lake Mattamuskeet NWR (1 UNCW); 4 km N Scranton, Hwy 264 (6 UNCW).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (13 UNCW); [CAHA] Buxton (2 UMMZ, 1 UNCW); [CAHA] Frisco (Parnell et al. 1992); [CAHA] Hatteras (1 UNCW); [CAHA] ca 2 mi SW Cape Hatteras lighthouse (Quarles 1974, as *Blarina carolinensis*); [CAHA] Pea Island (Lee et al. 1983, as *Sorex longirostris*); Hatteras (1 AMNH); Little Kinnakeet (4 UNCW); Nags Head (3 UNCW); WRBR, no evidence. *Hyde County*: 9 km NW Engelhard (10 UNCW); 10 mi NE Engelhard (2 USNM); 3 mi W Lake Landing (7 USNM); Lake Mattamuskeet NWR (1 UNCW); 4 km N Scranton, Hwy 264 (6 UNCW).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (13 UNCW); [CAHA] Buxton (2, UMMZ, 1 UNCW); [CAHA] Frisco (Parnell et al. 1992); FORA, no evidence; [CAHA] Hatteras (1 UNCW); [CAHA] ca 2 mi SW Cape Hatteras lighthouse (Quarles 1974, as *Blarina carolinensis*); [CAHA] Pea Island (Lee et al. 1983, as *Sorex longirostris*); Hatteras (1 AMNH); Little Kinnakeet (4 UNCW); Nags Head (3 UNCW). *Hyde County*: 9 km NW Engelhard (10 UNCW); 10 mi NE Engelhard (2 USNM); 3 mi W Lake Landing (7 USNM); Lake Mattamuskeet NWR (1 UNCW); 4 km N Scranton, Hwy 264 (6 UNCW).

CALO: North Carolina – *Carteret County*: 6 mi NE Beaufort (2 USNM); CALO, Cape Lookout (1 CALO); CALO, Guthries Hammock (1 CALO); CALO, Portsmouth Island (1 UMA); Morehead City, Bogue Island (2 USNM). *Hyde County*: 9 km NW Engelhard (10 UNCW); 10

mi NE Engelhard (2 USNM); 3 mi W Lake Landing (7 USNM); Lake Mattamuskeet NWR (1 UNCW); 4 km N Scranton, Hwy 264 (6 UNCW).

MOCR: North Carolina – *Pender County*: 3 km NE Burgaw, I-40 (4 UNCW); 7 km SE Burgaw, I-40 (16 UNCW); 8 km SSE Burgaw, I-40 (14 UNCW); 6 km NNE Castle Hayne, I-40 (3 UNCW); Holly Shelter Gamelands (10 UNCW); MOCR (3 UNCW); 2 km E Watha, I-40 (8 UNCW); 3 km E Willard, I-40 (13 UNCW).

FOSU: South Carolina – *Charleston County*: Charleston (2 ROM); 3.5 mi W Charleston (1 KU); 15 mi S Charleston (1 KU); FOSU, no evidence; Johns Island (2 GMNH); Little Goose Creek (1 SDNHM); McClellansville (9 USNM); 3.3 km NW McClellansville (1 USNM); 3.3 km NW McClellansville (8 USNM); Mount Pleasant (1 MCZ, 1 USNM); Porchers Bluff (3 ROM, 1 SDNHM); Saint Andrews Parish (1 CUMV, 2 KU, 1 MVZ); Woodland Shores (1 ROM).

FOMO: South Carolina – *Charleston County*: Charleston (2 ROM); 3.5 mi W Charleston (1 KU); 15 mi S Charleston (1 KU); FOMO, no evidence; Johns Island (2 GMNH); Little Goose Creek (1 SDNHM); McClellansville (9 USNM); 3.3 km NW McClellansville (1 USNM); 3.3 km NW McClellansville (8 USNM); Mount Pleasant (1 MCZ, 1 USNM); Porchers Bluff (3 ROM, 1 SDNHM); Saint Andrews Parish (1 CUMV, 2 KU, 1 MVZ); Woodland Shores (1 ROM).

CHPI: South Carolina – *Charleston County*: Charleston (2 ROM); 3.5 mi W Charleston (1 KU); 15 mi S Charleston (1 KU); CHPI, no evidence; Johns Island (2 GMNH); Little Goose Creek (1 SDNHM); McClellansville (9 USNM); 3.3 km NW McClellansville (1 USNM); 3.3 km NW McClellansville (8 USNM); Mount Pleasant (1 MCZ, 1 USNM); Porchers Bluff (3 ROM, 1 SDNHM); Saint Andrews Parish (1 CUMV, 2 KU, 1 MVZ); Woodland Shores (1 ROM).

CONG: South Carolina – *Richland County*: CONG (2 UNCW).

HOBE: Alabama – *Clay County*: Talladega National Forest (1 CUMV). *Lee County*: Auburn (1 UMMZ). *Tallapoosa County*: HOBE (1 UNCW).

CHAT: Georgia – *Cobb County*: CHAT, no evidence; KEMO (2 UNCW); Powder Springs (1 UF). *DeKalb County*: Atlanta (1 GMNH); Clarkston (2 GMNH). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, Abbotts Bridge (2 UNCW).

KEMO: Georgia – *Cobb County*: KEMO (2 UNCW); Powder Springs (1 UF).

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (Golley 1962). *Jones County*: Round Oak (1 USNM)

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence; Saint Marys (2 MCZ). *Charlton County*: Cowhouse Island, Union Camp (1 GMNH).

TIMU: Florida – *Duval County*: 4 mi N Jacksonville (1 AMNH); 5 mi W Jacksonville (6 AMNH); TIMU, Thomas Creek (1 UNCW).

FOCA: Florida – *Duval County*: FOCA, no evidence; 4 mi N Jacksonville (1 AMNH); 5 mi W Jacksonville (6 AMNH); TIMU, Thomas Creek (1 UNCW).

CASA: Florida – *Saint Johns County*: Carterville (Bangs 1898); CASA, no evidence; Palm Valley (1 MSB); Tolomato River (1 UF).

FOMA: Florida – *Saint Johns County*: Carterville (Bangs 1898); Palm Valley (1 MSB); Tolomato River (1 UF).

Northern short-tailed shrew (*Blarina brevicauda*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence; Straits (1 UNCW).

MOCR: North Carolina – *Pender County*: 8 km SSE Burgaw, I-40 (8 UNCW); 6 km NNE Castle Hayne, I-40 (2 UNCW); Holly Shelter Gamelands (8 UNCW); MOCR (6 UNCW); Scotts Hill (13 UNCW); 2 km E Watha, I-40 (7 UNCW); 3 km E Willard, I-40 (4 UNCW).

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE (1 UNCW); no specific locality (French 1981).

CHAT: Georgia – *Cobb County*: CHAT, Gold Branch (2 UNCW); CHAT, Palisades West (2 UNCW); KEMO (7 UNCW); no specific locality (4 UF). *DeKalb County*: no specific locality (Golley 1962; French 1981). *Forsyth County*: CHAT, Bowmans Island, dam access (1 UNCW). *Fulton County*: Atlanta (1 GMNH); [CHAT] Chattahoochee River at Long Island Creek (1 GMNH); Fairburn, Browns Lake (1 GMNH); CHAT, Holcomb Bridge (2 UNCW); CHAT, Island Ford (2 UNCW); CHAT, Jones Bridge (1 UNCW); CHAT, Palisades East (2 UNCW). *Gwinnett County*: CHAT, Abbotts Bridge (3 UNCW); CHAT, Bowmans Island, Richland Creek (2 UNCW); Chattahoochee River (1 GMNH); Duluth (1 GMNH); 2 mi W Duluth (2 GMNH); CHAT, Level Creek (2 UNCW); CHAT, Medlock Bridge (1 UNCW); CHAT, Orrs Ferry (1 UNCW).

KEMO: Georgia – *Cobb County*: CHAT, Gold Branch (2 UNCW); CHAT, Palisades West (2 UNCW); KEMO (7 UNCW); no specific locality (4 UF).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Jones County*: no specific locality (French 1981).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Southern short-tailed shrew (*Blarina carolinensis*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); 3.5 km NNW Kitty Hawk (Webster (1988); Manteo (1 UNCW); 1 mi N Wanchese (1 UNCW). *Hyde County*: CAHA, Ocracoke Island, no evidence; 4 km N Scranton, Hwy 264 (8 UNCW); 6 km N Scranton, Hwy 264 (6 UNCW).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); 3.5 km NNW Kitty Hawk (Webster (1988); Manteo (1 UNCW); 1 mi N Wanchese (1 UNCW); WRBR, no evidence. *Hyde County*: 4 km N Scranton, Hwy 264 (8 UNCW); 6 km N Scranton, Hwy 264 (6 UNCW).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); 3.5 km NNW Kitty Hawk (Webster (1988); Manteo (1 UNCW); FORA, no evidence; 1 mi N Wanchese (1 UNCW). *Hyde County*: 4 km N Scranton, Hwy 264 (8 UNCW); 6 km N Scranton, Hwy 264 (6 UNCW).

CALO: North Carolina – *Carteret County*: CALO, no evidence. *Hyde County*: 4 km N Scranton, Hwy 264 (8 UNCW); 6 km N Scranton, Hwy 264 (6 UNCW).

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: 4 km SW Awendaw, Iron Swamp (13 USNM); Drayton (1 CUMV); FOSU, no evidence; James Island (1 LSU); McClellansville (1 USNM); 3.3 km NW McClellansville (17 USNM); 3.4 km NE McClellansville (2 USNM); Porchers Bluff (3 ROM); Saint Andrews Parish (1 CUMV, 4 MVZ); Saint Andrews Parish, Merrymede (1 KU).

FOMO: South Carolina – *Charleston County*: 4 km SW Awendaw, Iron Swamp (13 USNM); Drayton (1 CUMV); FOMO, no evidence; James Island (1 LSU); McClellansville (1 USNM); 3.3 km NW McClellansville (17 USNM); 3.4 km NE McClellansville (2 USNM); Porchers Bluff (3 ROM); Saint Andrews Parish (1 CUMV, 4 MVZ); Saint Andrews Parish, Merrymede (1 KU).

CHPI: South Carolina – *Charleston County*: 4 km SW Awendaw, Iron Swamp (13 USNM); CHPI, no evidence; Drayton (1 CUMV); James Island (1 LSU); McClellansville (1 USNM); 3.3

km NW McClellansville (17 USNM); 3.4 km NE McClellansville (2 USNM); Porchers Bluff (3 ROM); Saint Andrews Parish (1 CUMV, 4 MVZ); Saint Andrews Parish, Merrymede (1 KU).

CONG: South Carolina – *Richland County*: Columbia (1 UNCW); CONG (4 UNCW; Cromer et al. 2007); Fort Jackson (16 MHP).

HOBE: Alabama – *Lee County*: Auburn (3 UMMZ). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, Suwanee Creek (1 UNCW).

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (3 UNCW); no specific locality (Golley 1962). *Crawford County*: no specific locality (French 1981). *Jones County*: no specific locality (French 1981). *Monroe County*: no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Jekyll Island (1 GMNH).

CUIS: Georgia – *Camden County*: CUIS (1 GMNH; Shoop and Ruckdeschel 2001); Saint Marys (1 MCZ).

TIMU: Florida – *Duval County*: Julington Creek (1 MSB); TIMU, no evidence; Yukon (1 MSB). *Nassau County*: Amelia Island, 5.4 mi SSE Amelia City (1 ANMH); Amelia Island, 5.6 mi SSE Amelia City (3 AMNH).

FOCA: Florida – *Duval County*: FOCA, no evidence; Julington Creek (1 MSB); Yukon (1 MSB). *Nassau County*: Amelia Island, 5.4 mi SSE Amelia City (1 ANMH); Amelia Island, 5.6 mi SSE Amelia City (3 AMNH).

CASA: Florida – *Saint Johns County*: Anastasia Island (1 USNM, specimen attributed to AMNH by Benedict et al. 2006); CASA, no evidence; Palm Valley (1 MSB).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 USNM, specimen attributed to AMNH by Benedict et al. 2006); FOMA, no evidence; Palm Valley (1 MSB).

Eastern mole (*Scalopus aquaticus*)

CAHA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Parnell et al. 1992); CAHA, Buxton (1 UNCW; tunnels); [CAHA] Cape Hatteras (Brimley 1944-46); CAHA, Frisco (Parnell et al. 1992); FORA (tunnels); 1.2 mi NNW Kitty Hawk fishing pier (1 USNM); Nags Head Woods (Webster 1988); WRBR (tunnels). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Parnell et al. 1992); CAHA, Buxton (1 UNCW; tunnels); [CAHA] Cape Hatteras (Brimley 1944-46); CAHA, Frisco (Parnell et al. 1992); FORA (tunnels); 1.2 mi NNW Kitty Hawk fishing pier (1 USNM); Nags Head Woods (Webster 1988); WRBR (tunnels).

FORA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Parnell et al. 1992); CAHA, Buxton (1 UNCW; tunnels); [CAHA] Cape Hatteras (Brimley 1944-46); CAHA, Frisco (Parnell et al. 1992); FORA (tunnels); 1.2 mi NNW Kitty Hawk fishing pier (1 USNM); Nags Head Woods (Webster 1988); WRBR (tunnels).

CALO: North Carolina – *Carteret County*: CALO, Shackleford Banks (1 CALO; tunnels; Engels 1952; Webster 1987a); CALO, South Core Banks and Portsmouth Island, no evidence.

MOCR: North Carolina – *Pender County*: 7 km SE Burgaw, I 40 (1 UNCW); NE Cape Fear River, Hwy 133 (2 UNCW); MOCR (tunnels); Willard (1 UMMZ); no specific locality (1 UNCW).

FOSU: South Carolina – *Charleston County*: Charleston (1 KU, 1 USNM); 2.5 mi N Charleston (3 KU); 3 mi W Charleston (1 KU); 4 mi W Charleston (2 KU); 6.4 mi S Charleston (6 KU); CHPI (tunnels); Edisto Island (Sanders 1978); FOSU, no evidence; Charleston, Goose Creek (1 KU); Goose Creek (2 KU); near Goose Creek Church (1 KU); Hanckles Place (2 ROM); James Island (2 LSU); Saint Andrews Parish (3 KU, 1 MVZ); no specific locality (2 TTU).

FOMO: South Carolina – *Charleston County*: Charleston (1 KU, 1 USNM); 2.5 mi N Charleston (3 KU); 3 mi W Charleston (1 KU); 4 mi W Charleston (2 KU); 6.4 mi S Charleston (6 KU); CHPI (tunnels); Edisto Island (Sanders 1978); FOMO, no evidence; Charleston, Goose Creek (1 KU); Goose Creek (2 KU); near Goose Creek Church (1 KU); Hanckles Place (2 ROM); James Island (2 LSU); Saint Andrews Parish (3 KU, 1 MVZ); no specific locality (2 TTU).

CHPI: South Carolina – *Charleston County*: Charleston (1 KU, 1 USNM); 2.5 mi N Charleston (3 KU); 3 mi W Charleston (1 KU); 4 mi W Charleston (2 KU); 6.4 mi S Charleston (6 KU); CHPI (tunnels); Edisto Island (Sanders 1978); Charleston, Goose Creek (1 KU); Goose Creek (2 KU); near Goose Creek Church (1 KU); Hanckles Place (2 ROM); James Island (2 LSU); Saint Andrews Parish (3 KU, 1 MVZ); no specific locality (2 TTU).

CONG: South Carolina – *Richland County*: CONG (tunnels); no specific locality (Golley 1966).

HOBE: Alabama – *Lee County*: Auburn (4 UMMZ). *Tallapoosa County*: HOBE (tunnels).

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals, Sope Creek (tunnels); CHAT, Johnson Ferry North (tunnels); CHAT, Johnson Ferry South (tunnels); KEMO (tunnels); Marietta (1 UMMZ); 1 mi N Powder Springs (1 UF). *Forsyth County*: CHAT, Bowmans Island, dam access (tunnels). *Fulton County*: CHAT, Holcomb Bridge (tunnels); CHAT, McGinnis Ferry (tunnels); CHAT, Palisades East (tunnels); CHAT, Vickery Creek (tunnels); [CHAT] Chattahoochee River at Long Island Creek (2 GMNH); NW Atlanta (2 GMNH); Roswell (1 AMNH). *Gwinnett County*: CHAT, Abbotts Bridge (tunnels); CHAT, Bowmans Island, Richland Creek (tunnels); CHAT, Johnson Ferry North (tunnels); CHAT, Johnson Ferry South (tunnels); CHAT, Level Creek (tunnels); CHAT, Medlock Bridge (tunnels); CHAT, Orrs Ferry (tunnels); CHAT, Settles Bridge (tunnels); CHAT, Suwanee Creek (tunnels).

KEMO: Georgia – *Cobb County*: CHAT, Cochran Shoals, Sope Creek (tunnels); CHAT, Johnson Ferry North (tunnels); CHAT, Johnson Ferry South (tunnels); KEMO (tunnels); Marietta (1 UMMZ); 1 mi N Powder Springs (1 UF).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (tunnels); OCMU, Lamar Unit (tunnels); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, Bloody Marsh Site (tunnels); FOFR, Frederica Site (tunnels); FOFR, Bloody Marsh Site (tunnels); Jekyll Island (3 GMNH); Saint Simons Island (1 USNM); Sterling (Bangs 1898).

CUIS: Georgia – *Camden County*: CUIS (at least 1 CIM, 14 GMNH, 2 MCZ; tunnels; Wilson and Durden 2003).

TIMU: Florida – *Duval County*: FOCA (tunnels); Jacksonville (1 UF, 2 USNM); New Berlin (3 FMNH; Bangs 1898); Saint Charles Creek (1 FMNH); South Jacksonville (1 UMMZ); TIMU, Cedar Point (tunnels); TIMU, Fort George Island (tunnels); TIMU, Kingsley Plantation (tunnels); TIMU, Sohn Tract (tunnels); TIMU, Spanish Pond (tunnels); TIMU, Theodore Roosevelt Area (tunnels); TIMU, Thomas Creek (tunnels). *Nassau County*: Amelia Island (1 AMNH, 1 UMMZ); Amelia Island, 5.2 mi SSE Amelia City (1 AMNH); Amelia Island, 5.6 mi SSE Amelia City (1 AMNH); Fort Clinch State Park, north end Amelia Island (1 AMNH).

FOCA: Florida – *Duval County*: FOCA (tunnels); Jacksonville (1 UF, 2 USNM); New Berlin (3 FMNH; Bangs 1898); Saint Charles Creek (1 FMNH); South Jacksonville (1 UMMZ); TIMU, Cedar Point (tunnels); TIMU, Fort George Island (tunnels); TIMU, Kingsley Plantation (tunnels); TIMU, Sohn Tract (tunnels); TIMU, Spanish Pond (tunnels); TIMU, Theodore Roosevelt Area (tunnels); TIMU, Thomas Creek (tunnels). *Nassau County*: Amelia Island (1 AMNH, 1 UMMZ); Amelia Island, 5.2 mi SSE Amelia City (1 AMNH); Amelia Island, 5.6 mi SSE Amelia City (1 AMNH); Fort Clinch State Park, north end Amelia Island (1 AMNH).

CASA: Florida – *Saint Johns County*: Anastasia Island (1 UF); Anastasia Island, Espanita (4 FMNH); Anastasia Island, 11 mi N Marineland (1 KU); 0.5 mi W Anastasia Island State Park (1 UF); Anastasia Island, 4 mi S and 0.5 mi W Saint Augustine (1 UF); Anastasia Island, 5 mi S and 1 mi W Saint Augustine (1 UF); Anastasia Island, Saint Augustine Alligator Farm, Hwy A1A (1 UF); [FOMA] Anastasia Island, Point Romo (3 MCZ, 1 UF, 1 USNM); [FOMA] 15 mi S Saint Augustine (5 UF); CASA, no evidence; FOMA, Main Unit (tunnels); FOMA, Rattlesnake Island (tunnels); Saint Augustine (1 ROM).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 UF); [Anastasia Island, Espanita (4 FMNH); Anastasia Island, 11 mi N Marineland (1 KU); 0.5 mi W Anastasia Island State Park (1 UF); Anastasia Island, 4 mi S and 0.5 mi W Saint Augustine (1 UF); Anastasia Island, 5 mi S and 1 mi W Saint Augustine (1 UF); Anastasia Island, Saint Augustine Alligator Farm, Hwy A1A (1 UF); FOMA] Anastasia Island, Point Romo (3 MCZ, 1 UF, 1 USNM); [FOMA] 15 mi S Saint Augustine (5 UF); FOMA, Main Unit (tunnels); FOMA, Rattlesnake Island (tunnels); Saint Augustine (1 ROM).

Star-nosed mole (*Condylura cristata*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: 7 km SE Burgaw, I-40 (1 UNCW); 8 km SSE Burgaw, I-40 (2 UNCW); MOCR, no evidence.

FOSU: South Carolina – *Beaufort County*: no specific locality (Jackson 1915). *Charleston County*: vicinity of Charleston? (1 ChM); FOSU, no evidence. *Colleton County*: no specific locality (Golley 1966). *Georgetown County*: Georgetown (Grimm 1955); 2.5 mi S Georgetown (1 ChM); no specific locality (Jackson 1915).

FOMO: South Carolina – *Beaufort County*: no specific locality (Jackson 1915). *Charleston County*: vicinity of Charleston? (1 ChM); FOMO, no evidence. *Colleton County*: no specific locality (Golley 1966). *Georgetown County*: Georgetown (Grimm 1955); 2.5 mi S Georgetown (1 ChM); no specific locality (Jackson 1915).

CHPI: South Carolina – *Beaufort County*: no specific locality (Jackson 1915). *Charleston County*: vicinity of Charleston? (1 ChM); CHPI, no evidence. *Colleton County*: no specific locality (Golley 1966). *Georgetown County*: Georgetown (Grimm 1955); 2.5 mi S Georgetown (1 ChM); no specific locality (Jackson 1915).

CONG: South Carolina – *Kershaw County*: no specific locality (Golley 1966). *Richland County*: CONG, no evidence; no specific locality (Golley 1966).

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence. *Charlton County*: Okefenokee Swamp, The Pocket, Mixons Ferry (1 CUMV).

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Little brown myotis (*Myotis lucifugus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: Beaufort (1 USNM); CALO, no evidence.

MOCR: North Carolina – *New Hanover County*: no specific locality (1 UNCW). *Pender County*: MOCR, no evidence.

Southeastern myotis (*Myotis austroriparius*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: NE Cape Fear River, 5 mi N Hwy 210 (1 NCSM); MOCR (Sonobat). *Sampson County* (Webster et al. in press a): ca 30 mi N Wilmington, Cape Fear River (Davis and Rippy 1968).

Silver-haired bat (*Lasionycteris noctivagans*)

CAHA: North Carolina – *Dare County*: CAHA, Pea Island NWR (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island (2 ANSP).

WRBR: North Carolina – *Dare County*: [CAHA] Pea Island NWR (Lee et al. 1983); WRBR, no evidence. *Hyde County*: CAHA, Ocracoke Island (2 ANSP).

FORA: North Carolina – *Dare County*: [CAHA] Pea Island NWR (Lee et al. 1983); FORA, no evidence. *Hyde County*: CAHA, Ocracoke Island (2 ANSP).

CALO: North Carolina – *Carteret County*: CALO, ubiquitous (Cape Lookout National Seashore 1977). *Hyde County*: CAHA, Ocracoke Island (2 ANSP).

MOCR: North Carolina – *Bladen County*: Kelly (2 NCSM). *Brunswick County*: 17.8 km N Supply, Hwy 211 (Clark et al. 1985). *New Hanover County*: no specific locality (1 UNCW). *Pender County*: MOCR, no evidence.

Eastern pipistrelle (*Pipistrellus subflavus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: NE Cape Fear River, ca 5.5 mi ESE Burgaw (3 NCSM); Holly Shelter (1 NCSM); MOCR (Sonobat).

Big brown bat (*Eptesicus fuscus*)

CAHA: North Carolina – *Dare County*: Buffalo City (1 NCSM); CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: Buffalo City (1 NCSM); WRBR, no evidence.

FORA: North Carolina – *Dare County*: Buffalo City (1 NCSM); FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence; no specific locality (1 UNCW).

MOCR: North Carolina – *Bladen County*: ca Rowan (1 NCSM). *New Hanover County*: 3 km W Castle Hayne, Prince Georges Creek (1 UNCW). *Pender County*: MOCR, no evidence.

Eastern red bat (*Lasiurus borealis*)

CAHA: North Carolina – *Dare County*: Buffalo City (2 NCSM); CAHA, Bodie Island (1 UNCW; observation; Boone 1988; Webster 1988); [CAHA] Buxton (observation; Parnell et al. 1992); [CAHA] Hatteras (Parnell et al. 1992); [CAHA] Oregon Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR (Lee et al. 1983); FORA, pond on Old Hwy 64/264 (observation); Nags Head (Webster 1988); Roanoke Island, 3 mi N Manteo (1 CM); WRBR, Colington Rd (observation); no specific locality (1 NCSM, 5 UNCW). *Hyde County*: CAHA, Ocracoke Island, no evidence; Swan Quarter, SR 1132 (1 ASU).

WRBR: North Carolina – *Dare County*: Buffalo City (2 NCSM); CAHA, Bodie Island (1 UNCW; observation; Boone 1988; Webster 1988); [CAHA] Buxton (observation; Parnell et al. 1992); [CAHA] Hatteras (Parnell et al. 1992); [CAHA] Oregon Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR (Lee et al. 1983); FORA, pond on Old Hwy 64/264 (observation); Nags Head (Webster 1988); Roanoke Island, 3 mi N Manteo (1 CM); WRBR, Colington Rd (observation); no specific locality (1 NCSM, 5 UNCW). *Hyde County*: CAHA, Ocracoke Island, no evidence; Swan Quarter, SR 1132 (1 ASU).

FORA: North Carolina – *Dare County*: Buffalo City (2 NCSM); CAHA, Bodie Island (1 UNCW; observation; Boone 1988; Webster 1988); [CAHA] Buxton (observation; Parnell et al. 1992); [CAHA] Hatteras (Parnell et al. 1992); [CAHA] Oregon Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR (Lee et al. 1983); FORA, pond on Old Hwy 64/264 (observation); Nags Head (Webster 1988); Roanoke Island, 3 mi N Manteo (1 CM); WRBR, Colington Rd

(observation); no specific locality (1 NCSM, 5 UNCW). *Hyde County*: CAHA, Ocracoke Island, no evidence; Swan Quarter, SR 1132 (1 ASU).

CALO: North Carolina – *Carteret County*: Beaufort (4 USNM); CALO, ubiquitous (Cape Lookout National Seashore 1977); Fort Macon (1 MCZ, 2 USNM); no specific locality (9 UNCW).

MOCR: North Carolina – *Pender County*: 8 mi E Burgaw (1 NCSM); Green Channel (4 NCSM, 9 UNCW); Hampstead (2 UNCW); Island Creek (1 UNCW); MOCR (observation); NE Cape Fear River (2 NCSM); Scotts Hill (1 UNCW); no specific locality (7 UNCW).

Seminole bat (*Lasiurus seminolus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, ubiquitous (Cape Lookout National Seashore 1977); no specific locality (2 UNCW).

MOCR: North Carolina – *Pender County*: Green Channel (1 NCSM); Hampstead (1 UNCW); MOCR, no evidence.

Hoary bat (*Lasiurus cinereus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: Beaufort (1 NCSM); CALO, no evidence; Fort Macon (Coues 1871).

MOCR: North Carolina – *Pender County*: Hampstead (1 UNCW); MOCR, no evidence.

Northern yellow bat (*Lasiurus intermedius*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *New Hanover County*: no specific locality (2 UNCW). *Pender County*: MOCR, no evidence.

Evening bat (*Nycticeius humeralis*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence; Kitty Hawk, near Hwy 158 bridge (1 USNM); Manteo (1 NCSM). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: Kitty Hawk, near Hwy 158 bridge (1 USNM); Manteo (1 NCSM); WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence; Kitty Hawk, near Hwy 158 bridge (1 USNM); Manteo (1 NCSM).

CALO: North Carolina – *Carteret County*: CALO, no evidence; no specific locality (2 UNCW).

MOCR: North Carolina – *Pender County*: 8 mi E Burgaw (1 NCSM); Island Creek (2 UNCW); Long Creek (4 NCSM); MOCR (observation); Northeast Cape Fear River (3 NCSM).

Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence; ca East Lake (Clark et al. 1985). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: ca East Lake (Clark et al. 1985); WRBR, no evidence.

FORA: North Carolina – *Dare County*: ca East Lake (Clark et al. 1985); FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: near Holly Shelter (2 NCSM); ca 1.25 mi WSW Maple Hill (1 NCSM); MOCR, no evidence.

Brazilian free-tailed bat (*Tadarida brasiliensis*)

CAHA: North Carolina – *Dare County*: CAHA, Buxton, CAHA lighthouse keeper's house (photographs). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: CAHA, Buxton, CAHA lighthouse keeper's house (photographs). WRBR, no evidence.

FORA: North Carolina – *Dare County*: CAHA, Buxton, CAHA lighthouse keeper's house (photographs). FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *New Hanover County*: Wilmington (1 NCSM); no specific locality (2 UNCW). *Pender County*: MOCR, no evidence.

Nine-banded armadillo (*Dasypus novemcinctus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Beaufort County*: no specific locality (Sanders 1978). *Berkeley County*: Bonneau (1 ChM). *Charleston County*: FOSU, no evidence; no specific locality (Sanders 1978).

FOMO: South Carolina – *Beaufort County*: no specific locality (Sanders 1978). *Berkeley County*: Bonneau (1 ChM). *Charleston County*: FOMO, no evidence; no specific locality (Sanders 1978).

CHPI: South Carolina – *Beaufort County*: no specific locality (Sanders 1978). *Berkeley County*: Bonneau (1 ChM). *Charleston County*: CHPI, no evidence; no specific locality (Sanders 1978).

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE (burrows and tracks); HOBE (1 UNCW); 2 mi New Site, Hwy 49 (1 UNCW).

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence; Hwy 129, near Jones County line (roadkill); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, Bloody Marsh Site (burrows); FOFR, Frederica Site burrows and tracks).

CUIS: Georgia – *Camden County*: CUIS (observations, burrows, tracks, scat; Shoop and Ruckdeschel 1990; Wilson and Durden 2003).

TIMU: Florida – *Duval County*: FOCA (burrows and tracks); 2 mi SW Jacksonville Beach (1 UF); TIMU, Cedar Point (1 UNCW); TIMU, Fort George Island (burrows and tracks); TIMU, marsh island NPS32 (McClung 2004); TIMU, Sohn Tract (tracks); TIMU, Theodore Roosevelt Area (tracks); TIMU, Thomas Creek (observations).

FOCA: Florida – *Duval County*: FOCA (burrows and tracks); 2 mi SW Jacksonville Beach (1 UF); TIMU, Cedar Point (1 UNCW); TIMU, Fort George Island (burrows and tracks); TIMU, marsh island NPS32 (McClung 2004); TIMU, Sohn Tract (tracks); TIMU, Theodore Roosevelt Area (tracks); TIMU, Thomas Creek (observations).

CASA: Florida – *Saint Johns County*: CASA, no evidence. FOMA, Main Site (tracks); FOMA, Rattlesnake Island (burrows and tracks).

FOMA: Florida – *Saint Johns County*: FOMA, Main Site (tracks); FOMA, Rattlesnake Island (burrows and tracks).

Eastern cottontail (*Sylvilagus floridanus*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (1 NCSM; Boone 1988); CAHA, Buxton (5 UMMZ, 4 UNCW; scat); CAHA, 1 mi S Buxton (1 UMMZ); CAHA, Cape Hatteras (2 UMMZ); CAHA, Frisco (2 UNCW); CAHA, Hatteras Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR (1 NCSM); Duck (Lee et al. 1983); Frisco (1 NCSU); Hatteras (1 AMNH); Nags Head Woods (3 NCSM); Roanoke Island (Lee et al. 1983); Salvo (1 UNCW); WRBR (scat; Parnell et al. 1992). *Hyde County*: CAHA, Ocracoke Island (1 UNCW, 2 YPM); Mattamuskeet Farms (1 NCSM); 3 mi W New Holland, Hwy 264 (1 UNCW).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (1 NCSM; Boone 1988); CAHA, Buxton (5 UMMZ, 4 UNCW; scat); CAHA, 1 mi S Buxton (1 UMMZ); CAHA, Cape Hatteras (2 UMMZ); CAHA, Frisco (2 UNCW); CAHA, Hatteras Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR (1 NCSM); Duck (Lee et al. 1983); Frisco (1 NCSU); Hatteras (1 AMNH); Nags Head Woods (3 NCSM); Roanoke Island (Lee et al. 1983); Salvo (1 UNCW); WRBR (scat; Parnell et al. 1992).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (1 NCSM; Boone 1988); CAHA, Buxton (5 UMMZ, 4 UNCW; scat); CAHA, 1 mi S Buxton (1 UMMZ); CAHA, Cape Hatteras (2 UMMZ); CAHA, Frisco (2 UNCW); CAHA, Hatteras Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR (1 NCSM); Duck (Lee et al. 1983); Frisco (1 NCSU); FORA, no evidence; Hatteras (1 AMNH); Nags Head Woods (3 NCSM); Roanoke Island (Lee et al. 1983); Salvo (1 UNCW); WRBR (scat; Parnell et al. 1992).

CALO: North Carolina – *Carteret County*: CALO, ubiquitous (Cape Lookout National Seashore 1977); CALO, South Core Banks (observation and scat); CALO, Portsmouth Island (1 UMA; observation and scat); CALO, Shackleford Banks (observation and scat; Coues 1871; Webster 1987a); Harlowe (1 NCSM); Ocean, Hwy 24 (1 UNCW).

MOCR: North Carolina – *Pender County*: Burgaw (1 NCSU); Castle Hayne (1 UNCW); Hampstead (1 UNCW); Holly Shelter Gamelands (1 NCSU); MOCR, no evidence; 2 mi SE Rocky Point, I-40 (1 UNCW); Topsail Island (1 YPM).

FOSU: South Carolina – *Charleston County*: CHPI (scat); Christ Church Parish (1 ROM); FOMO (1 UNCW); FOSU, no evidence; Johns Island, 7.2 mi WSW Charleston (1 KU).

FOMO: South Carolina – *Charleston County*: CHPI (scat); Christ Church Parish (1 ROM); FOMO (1 UNCW); Johns Island, 7.2 mi WSW Charleston (1 KU).

CHPI: South Carolina – *Charleston County*: CHPI (scat); Christ Church Parish (1 ROM); FOMO (1 UNCW); Johns Island, 7.2 mi WSW Charleston (1 KU).

CONG: South Carolina – *Richland County*: CONG (2 UNCW).

HOBE: Alabama – *Lee County*: Auburn (23 UMMZ); Loachapoka (1 UMMZ); 5 mi S Opelika (1 UMMZ). *Tallapoosa County*: HOBE (1 UNCW).

CHAT: Georgia – *Cherokee County*: 5 mi N Canton (1 USNM). *Cobb County*: CHAT, Cochran Shoals (2 UNCW); KEMO (1 UNCW). *Forsyth County*: CHAT, no evidence. *Fulton County*: Atlanta (1 GMNH); Roswell (1 KU, 3 UMMZ). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cherokee County*: 5 mi N Canton (1 USNM). *Cobb County*: CHAT, Cochran Shoals (2 UNCW); KEMO (1 UNCW). *Fulton County*: Atlanta (1 GMNH); Roswell (1 KU, 3 UMMZ).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (observation); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, Frederica Site (scat); Jekyll Island (1 GMNH); Saint Simons Island (15 USNM).

CUIS: Georgia – *Camden County*: CUIS, no evidence; Saint Marys (4 MCZ); Saint Marys, probably (2 GMNH). *Charlton County*: Okefenokee Swamp, Billys Island (1 USNM); Okefenokee Swamp, Chessers Island (1 CUMV); Okefenokee Swamp, 2 mi E Chessers Island (2 CUMV).

TIMU: Florida – *Duval County*: Jacksonville (3 MCZ); New Berlin (1 FMNH); 3 km E Oceanway (1 UNCW); TIMU, no evidence. *Nassau County*: Saint Marys River, 2 mi NE Saint George (1 CUMV).

FOCA: Florida – *Duval County*: FOCA, no evidence; Jacksonville (3 MCZ); New Berlin (1 FMNH); 3 km E Oceanway (1 UNCW).

CASA: Florida – *Saint Johns County*: CASA, no evidence; Saint Augustine (1 MCZ).

FOMA: Florida – *Saint Johns County*: FOMA, no evidence; Saint Augustine (1 MCZ).

Swamp rabbit (*Sylvilagus aquaticus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Coosa County*: Weogufka (Howell 1921). *Lee County*: Auburn (1 UMMZ, 6 USNM). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals, Sope Creek (tracks); CHAT, Cochran Shoals, Powers Island (tracks); CHAT, Johnson Ferry North (observation); CHAT, Johnson Ferry South (1 UNCW). *Fulton County*: CHAT; McGinnis Ferry (1 UNCW); CHAT, Palisades East (observation); no specific locality (Golley 1962). *Gwinnett County*: CHAT, Abbotts Bridge (1 UNCW); CHAT, Medlock Bridge (1 UNCW); CHAT, Orrs Ferry (observation); CHAT, Settles Bridge (scat); CHAT, Suwanee Creek (observation).

KEMO: Georgia – *Cherokee County*: 9 mi NW Roswell (2 USNM). *Cobb County*: CHAT, Cochran Shoals, Sope Creek (tracks); CHAT, Cochran Shoals, Powers Island (tracks); CHAT, Johnson Ferry North (observation); CHAT, Johnson Ferry South (1 UNCW); KEMO, no evidence. *Fulton County*: CHAT; McGinnis Ferry (1 UNCW); CHAT, Palisades East (observation); no specific locality (Golley 1962).

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (Golley 1962). *Macon County*: no specific locality (Lowe 1958). *Talbot County*: 4.5 mi E Junction City (2 KU); 2 mi W Geneva, Little Creek (2 MVZ); 1.5 mi SE Juniper, Juniper Pond (1 MVZ).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Marsh rabbit (*Sylvilagus palustris*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (Boone 1988; Parnell et al. 1992); Hatteras Island (Boone 1988); Manteo (Lee et al. 1983); 2 mi E Manteo (1 MSB); Nags Head Woods (Webster 1988); Roanoke Island (observation; Parnell et al. 1992); Stumpy Point (1 NCSU, 4 UMMZ). *Hyde County*: CAHA, Ocracoke Island (Engels 1942; Boone 1988; Parnell et al. 1992); Swan Quarter (1 NCSM).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (Boone 1988; Parnell et al. 1992); Hatteras Island (Boone 1988); Manteo (Lee et al. 1983); 2 mi E Manteo (1 MSB); Nags Head Woods (Webster 1988); Roanoke Island (observation; Parnell et al. 1992); Stumpy Point (1 NCSU, 4 UMMZ); WRBR, no evidence.

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (Boone 1988; Parnell et al. 1992); FORA, no evidence; Hatteras Island (Boone 1988); Manteo (Lee et al. 1983); 2 mi E Manteo (1 MSB); Nags Head Woods (Webster 1988); Roanoke Island (observation; Parnell et al. 1992); Stumpy Point (1 NCSU, 4 UMMZ).

CALO: North Carolina – *Carteret County*: Bogue Banks (Lee et al. 1983); CALO, South Core Banks (tracks and scat; Coues 1871); CALO, Portsmouth Island (observation and scat); CALO, Shackleford Banks (observation; Engels 1952; Webster 1987a); east side of North River (1 NCSM); Fort Macon (5 USNM).

MOCR: North Carolina – *Pender County*: Coke (=Hutaff) Island (3 UNCW); Lea Island (3 UNCW); MOCR, no evidence; Rhone Island (1 USNM); Topsail Island (1 YPM).

FOSU: South Carolina – *Charleston County*: Cape Romain NWR (1 USNM); Charleston (1 MCZ); FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: Cape Romain NWR (1 USNM); Charleston (1 MCZ); FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: Cape Romain NWR (1 USNM); Charleston (1 MCZ); CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence; no specific locality (Golley 1966).

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR (tracks and scat); Jekyll Island (1 GMNH); Sea Island (1 GMNH); Saint Simons Island (1 MCZ, 8 UMMZ).

CUIS: Georgia – *Camden County*: CUIS (5 GMNH, 3 MCZ; Shoop and Ruckdeschel 1990; Wilson and Durden 2003); Saint Marys (9 MCZ).

TIMU: Florida – *Duval County*: FOCA (tracks and scat); Jacksonville (2 MCZ); New Berlin (1 FMNH); TIMU, Cedar Point (observation and scat); TIMU, Theodore Roosevelt Area (observation and tracks).

FOCA: Florida – *Duval County*: FOCA (scat); Jacksonville (2 MCZ); New Berlin (1 FMNH); TIMU, Cedar Point (observation and scat); TIMU, Theodore Roosevelt Area (observation and tracks).

CASA: Florida – *Saint Johns County*: Anastasia Island (3 MCZ); Anastasia Island, Crescent Beach (1 UNCW); [Anastasia] State Park (1 UF); CASA, no evidence; [FOMA] Anastasia Island, Matanzas Inlet, 15 mi S Saint Augustine (1 AMNH); [FOMA] Anastasia Island, Point Romo (1 KU); FOMA, Main Unit (observation and scat); FOMA, Rattlesnake Island (2 UNCW).

FOMA: Florida – *Saint Johns County*: Anastasia Island (3 MCZ); Anastasia Island, Crescent Beach (1 UNCW); [Anastasia] State Park (1 UF); [FOMA] Anastasia Island, Matanzas Inlet, 15 mi S Saint Augustine (1 AMNH); [FOMA] Anastasia Island, Point Romo (1 KU); FOMA, Main Unit (observation and scat); FOMA, Rattlesnake Island (2 UNCW).

Woodchuck (*Marmota monax*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Coosa County*: Mount Weogufka (Howell 1921). *Tallapoosa County*: HOBE (observation).

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence

Eastern chipmunk (*Tamias striatus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. Hyde County: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Clay County* (Howell 1921): Dean, Talladega Mountains. *Coosa County*: Mount Weogufka (Howell 1921). *Lee County*: Auburn (1 ROM, 3 UMMZ); 5.5 mi NW Auburn (1 UMMZ); 10 mi S Auburn (1 ROM). *Tallapoosa County*: HOBE (observation).

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals, Powers Island (observation); CHAT, Johnson Ferry North (observation); Marietta (3 CUMV, 7 UMMZ, 1 USNM). *DeKalb County*: Emory (1 UF). *Forsyth County*: CHAT, Bowmans Island, dam access (observation). *Fulton County*: Atlanta (4 GMNH); Atlanta Zoo (1 MSB); CHAT, Island Ford (1 UNCW); CHAT, Jones Bridge (observation); CHAT, Palisades East (observation); CHAT, Vickery Creek (observation); Conway Drive (1 GMNH). *Gwinnett County*: CHAT, Medlock Bridge (observation); CHAT, Orrs Ferry (observation); CHAT, Settles Bridge (observation); CHAT, Suwanee Creek (1 UNCW); J White Farm (1 GMNH). *County unknown*: Atlanta (2 USNM); near Roswell (1 USNM).

KEMO: Georgia – *Cobb County*: CHAT, Cochran Shoals, Powers Island (observation); CHAT, Johnson Ferry North (observation); KEMO (observation); Marietta (3 CUMV, 7 UMMZ, 1 USNM). *Fulton County*: Atlanta (4 GMNH); Atlanta Zoo (1 MSB); CHAT, Island Ford (1 UNCW); CHAT, Jones Bridge (observation); CHAT, Palisades East (observation); CHAT, Vickery Creek (observation); Conway Drive (1 GMNH). *County unknown*: Atlanta (2 USNM); near Roswell (1 USNM).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (observation); Rivali (1 USNM). *Talbot County*: no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Eastern gray squirrel (*Sciurus carolinensis*)

CAHA: North Carolina – *Dare County*: CAHA, Buxton (2 UMMZ; observation); CAHA, 1 mi SE Buxton (1 NCSU); CAHA, 1.2 mi E Buxton (2 UMMZ); CAHA, 3 mi S Cape Hatteras (Parnell et al. 1992); CAHA, Frisco (1 UMMZ); Dare City (1 UMMZ); Duck (Lee et al. 1983); FORA (observation); Kitty Hawk Woods (1 NCSM); Nags Head Woods (Webster 1988); Roanoke Island (1 UNCW); WRBR (observation and chewed cones); no specific locality (1 NCSU). *Hyde County*: CAHA, Ocracoke Island, no evidence; 1 mi NE Engelhard (2 USNM).

WRBR: North Carolina – *Dare County*: CAHA, Buxton (2 UMMZ; observation); CAHA, 1 mi SE Buxton (1 NCSU); CAHA, 1.2 mi E Buxton (2 UMMZ); CAHA, 3 mi S Cape Hatteras (Parnell et al. 1992); CAHA, Frisco (1 UMMZ); Dare City (1 UMMZ); Duck (Lee et al. 1983); FORA (observation); Kitty Hawk Woods (1 NCSM); Nags Head Woods (Webster 1988); Roanoke Island (1 UNCW); WRBR (observation and chewed cones); no specific locality (1 NCSU).

FORA: North Carolina – *Dare County*: CAHA, Buxton (2 UMMZ; observation); CAHA, 1 mi SE Buxton (1 NCSU); CAHA, 1.2 mi E Buxton (2 UMMZ); CAHA, 3 mi S Cape Hatteras (Parnell et al. 1992); CAHA, Frisco (1 UMMZ); Dare City (1 UMMZ); Duck (Lee et al. 1983); FORA (observation); Kitty Hawk Woods (1 NCSM); Nags Head Woods (Webster 1988); Roanoke Island (1 UNCW); WRBR (observation and chewed cones); no specific locality (1 NCSU).

CALO: North Carolina – *Carteret County*: Bogue Banks (Lee et al. 1983); CALO, no evidence; Straits (2 UNCW). *Hyde County*: 1 mi NE Engelhard (2 USNM).

MOCR: North Carolina – *Pender County*: Atkinson (1 NCSU); Burgaw (2 UNCW); Castle Hayne (1 UNCW); Hampstead (1 UNCW); Holly Ridge (1 UNCW); Holly Shelter Creek, Hwy 53 (1 UNCW); Holly Shelter Gamelands (1 NCSU); Long Creek (1 UNCW); MOCR (observation and leaf nests); Rocky Point (1 UNCW); Topsail Beach, Hwy 50 (1 UNCW); no specific locality (Lee et al. 1983).

FOSU: South Carolina – *Charleston County*: Charleston (1 USNM); Christ Church Parish (4 USNM); CHPI (observation); 2.5 mi WSW Charleston (1 KU); 7.5 mi W Charleston (1 KU); FOMO (observation); FOSU, no evidence; Porchers Bluff (1 USNM).

FOMO: South Carolina – *Charleston County*: Charleston (1 USNM); Christ Church Parish (4 USNM); CHPI (observation); 2.5 mi WSW Charleston (1 KU); 7.5 mi W Charleston (1 KU); FOMO (observation); Porchers Bluff (1 USNM).

CHPI: South Carolina – *Charleston County*: Charleston (1 USNM); Christ Church Parish (4 USNM); CHPI (observation); 2.5 mi WSW Charleston (1 KU); 7.5 mi W Charleston (1 KU); FOMO (observation); Porchers Bluff (1 USNM).

CONG: South Carolina – *Richland County*: Columbia (1 MCZ); CONG (observations; 1 UNCW).

HOBE: Alabama – *Lee County*: Waverly (1 TTU). *Tallapoosa County*: HOBE (1 UNCW; observation).

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals, rec area (observation); CHAT, Cochran Shoals, Powers Island (observation); CHAT, Cochran Shoals, Sope Creek (tracks); CHAT, Gold Branch (observation); CHAT, Johnson Ferry North (tracks); CHAT, Johnson Ferry South (tracks); Marietta (1 UMMZ); no specific locality (1 KU). *Forsyth County*: CHAT, Bowmans Island, dam access (observation). *Fulton County*: Atlanta (2 GMNH); NE Atlanta (2 GMNH); CHAT, Holcomb Ford (observation); CHAT, Island Ford (observation); CHAT, Jones Bridge (observation); CHAT, McGinnis Ferry (observation); CHAT, Palisades East (tracks); CHAT, Vickery Creek (observation); Mount Paran at Hwy 41 (1 GMNH); Roswell (3 KU, 1 UMMZ). *Gwinnett County*: CHAT, Abbotts Bridge (observation); CHAT, Level Creek (tracks); CHAT, Medlock Bridge (observation); CHAT, Orrs Ferry (tracks); CHAT, Suwanee Creek (observation).

KEMO: Georgia – *Cobb County*: CHAT, Cochran Shoals, rec area (observation); CHAT, Cochran Shoals, Powers Island (observation); CHAT, Cochran Shoals, Sope Creek (tracks); CHAT, Gold Branch (observation); CHAT, Johnson Ferry North (tracks); CHAT, Johnson Ferry South (tracks); Marietta (1 UMMZ); no specific locality (1 KU).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (observation and leaf nests); OCMU, Lamar Unit (observation and leaf nests); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, Bloody Marsh Site (observation); FOFR, Frederica Site (observation and chewed cones); Jekyll Island (1 GMNH); Sea Island (1 UMMZ).

CUIS: Georgia – *Camden County*: CUIS (at least 1 CIM, 6 GMNH, 18 MCZ; observation; Wilson and Durden 2003); Saint Marys (4 MCZ; Elliot 1901).

TIMU: Florida – *Duval County*: Saint Charles Creek (1 FMNH); FOCA (observation); Jacksonville (4 MCZ, 1 TTU, 7 USNM); New Berlin (2 FMNH; Bangs 1898); Orange Grove (1 MCZ); Saint Charles Creek (Elliot 1901); TIMU, Cedar Point (observation); TIMU, Kingsley Plantation (observation); TIMU, marsh island NPS32 (McClung 2004); TIMU, Theodore Roosevelt Area (observation); TIMU, Thomas Creek (observation); 0.5 mi entrance to TIMU, Fort Caroline Rd (1 UNCW); no specific locality (1 MCZ). *Nassau County*: Rose Bluff (Bangs 1898).

FOCA: Florida – *Duval County*: Saint Charles Creek (1 FMNH); FOCA (observation); Jacksonville (4 MCZ, 1 TTU, 7 USNM); New Berlin (2 FMNH; Bangs 1898); Orange Grove (1 MCZ); Saint Charles Creek (Elliot 1901); TIMU, Cedar Point (observation); TIMU, Kingsley Plantation (observation); TIMU, marsh island NPS32 (McClung 2004); TIMU, Theodore

Roosevelt Area (observation); TIMU, Thomas Creek (observation); 0.5 mi entrance to TIMU, Fort Caroline Rd (1 UNCW); no specific locality (1 MCZ). *Nassau County*: Rose Bluff (Bangs 1898).

CASA: Florida – *Saint Johns County*: CASA (observation); FOMA, Main Unit (observation); Saint Augustine Beach (1 KU); 8 mi N Saint Augustine (4 UF); Palm Valley (1 MSB).

FOMA: Florida – *Saint Johns County*: CASA (observation); FOMA, Main Unit (observation); Saint Augustine Beach (1 KU); 8 mi N Saint Augustine (4 UF); Palm Valley (1 MSB).

Eastern fox squirrel (*Sciurus niger*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: 3.5 mi NW Atkinson (1 UNCW); MOCR, no evidence; no specific locality (Lee et al. 1983).

FOSU: South Carolina – *Charleston County*: Bulls Island (2 LSU); Bulls Island, Cape Romain NWR (6 USNM); near Charleston (1 MVZ); FOSU, no evidence; Isle of Palms (1 LSU); 6 mi NE McClellansville (1 KU).

FOMO: South Carolina – *Charleston County*: Bulls Island (2 LSU); Bulls Island, Cape Romain NWR (6 USNM); near Charleston (1 MVZ); FOMO, no evidence; Isle of Palms (1 LSU); 6 mi NE McClellansville (1 KU).

CHPI: South Carolina – *Charleston County*: Bulls Island (2 LSU); Bulls Island, Cape Romain NWR (6 USNM); near Charleston (1 MVZ); CHPI, no evidence; Isle of Palms (1 LSU); 6 mi NE McClellansville (1 KU).

CONG: South Carolina – *Kershaw County*: no specific locality (SC Department of Natural Resources observation). *Richland County*: Columbia, Fort Jackson (1 USNM); CONG (NPS observation); no specific locality (Golley 1966).

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Coosa County*: Mount Weogufka (Howell 1921). *Lee County*: Auburn (3 UMMZ); 10 mi N Auburn (1 UMMZ). *Russell County*: Seale (Howell 1921). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *DeKalb County*: no specific locality (Golley 1962). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; no specific locality (Golley 1962). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (Golley 1962). *Jones County*: 3 mi SE Gray (1 LSU). *Peach County*: Fort Valley (1 KU).

FOFR: Georgia – *Glynn County*: 4 mi S Brunswick (1 UF); FOFR, no evidence; Saint Simons Island (Neuhauser and Baker 1974).

CUIS: Georgia – *Camden County*: CUIS, no evidence; Saint Marys (2 MCZ); Saint Marys, probably (7 GMNH). *Charlton County*: Okefenokee Swamp, Billys Island (2 USNM); Okefenokee Swamp, 0.5 mi E Chessers Island (1 CUMV); Okefenokee Swamp, 1 mi E Chessers Island (1 CUMV); Okefenokee Swamp, 1.5 mi E Chessers Island (1 CUMV); Okefenokee Swamp, 2 mi E Chessers Island (1 CUMV); Okefenokee Swamp, 2.5 mi E Chessers Island (1 CUMV); Okefenokee Swamp, 2 mi ENE Chessers Island (1 CUMV); Okefenokee Swamp, Race Pond (1 CUMV); Perimeter Rd, 0.25 mi N Sawfly Rd (1 GMNH).

TIMU: Florida – *Baker County*: no specific locality (1 UF). *Duval County*: 20 mi W Jacksonville, I-10 (1 LSU); New Berlin (1 FMNH; Bangs 1898); TIMU, no evidence. *Nassau County*: 10 mi NNE Bryceville (1 KU); no specific locality (Moore 1956).

FOCA: Florida – *Baker County*: no specific locality (1 UF). *Duval County*: FOCA, no evidence; 20 mi W Jacksonville, I-10 (1 LSU); New Berlin (1 FMNH; Bangs 1898). *Nassau County*: 10 mi NNE Bryceville (1 KU); no specific locality (Moore 1956).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Southern flying squirrel (*Glaucomys volans*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: Atkinson (1 NCSU); MOCR, no evidence; no specific locality (1 UNCW).

FOSU: South Carolina – *Charleston County*: 2.9 mi N Charleston (4 KU); 8 mi SW Charleston (1 KU); 15 mi NE Charleston, Penny Dam (1 KU); FOSU, no evidence; Goose Creek (1 CUMV); Saint Andrews Parish (1 CUMV, 4 KU). *County unknown*: Santee (1 USNM).

FOMO: South Carolina – *Charleston County*: 2.9 mi N Charleston (4 KU); 8 mi SW Charleston (1 KU); 15 mi NE Charleston, Penny Dam (1 KU); FOMO, no evidence; Goose Creek (1 CUMV); Saint Andrews Parish (1 CUMV, 4 KU). *County unknown*: Santee (1 USNM).

CHPI: South Carolina – *Charleston County*: 2.9 mi N Charleston (4 KU); 8 mi SW Charleston (1 KU); 15 mi NE Charleston, Penny Dam (1 KU); CHPI, no evidence; Goose Creek (1 CUMV); Saint Andrews Parish (1 CUMV, 4 KU). *County unknown*: Santee (1 USNM).

CONG: South Carolina – *Kershaw County*: Camden (1 KU). *Richland County*: CONG (NPS observation); no specific locality (Golley 1966).

HOBE: Alabama – *Lee County*: Auburn (6 UMMZ). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence; Vinings (1 GMNH); 1 mi NW Vinings (1 GMNH); no specific locality (2 UMMZ). *Forsyth County*: CHAT, no evidence. *Fulton County*: Atlanta (4 GMNH, 1 MSB); NE Atlanta (1 GMNH); CHAT, no evidence; Roswell (4 KU, 2 UMMZ); 2 mi N Roswell (3 CUMV). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence; Vinings (1 GMNH); 1 mi NW Vinings (1 GMNH); no specific locality (2 UMMZ). *Fulton County*: Atlanta (4 GMNH, 1 MSB); NE Atlanta (1 GMNH); Roswell (4 KU, 2 UMMZ); 2 mi N Roswell (3 CUMV).

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Saint Simons Island (Neuhauser and Baker 1974).

CUIS: Georgia – *Camden County*: CUIS, no evidence; Saint Marys (9 MCZ, 1 MVZ). *Charlton County*: Okefenokee Swamp, Billys Island (1 CUMV); Okefenokee Swamp, 4 mi E Chessers Island (2 CUMV); Okefenokee Swamp, Floyds Island (2 USNM).

TIMU: Florida – *Duval County*: Jacksonville (1 UF); north of Jacksonville (1 MSB); New Berlin (Bangs 1898); TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence; Jacksonville (1 UF); north of Jacksonville (1 MSB); New Berlin (Bangs 1898).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Southeastern pocket gopher (*Geomys pinetis*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Macon County*: no specific locality (Avisé et al. 1979). *Russell County*: Seale (Howell 1921); no specific locality (Avisé et al. 1979). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Crawford County*: Roberta (3 USNM); 7 mi S Roberta (3 USNM); no specific locality (1 UF). *Houston County*: no specific locality (1 UF). *Taylor County*: no specific locality (1 MVZ).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Sterling (Bangs 1898); no specific locality (21 MCZ).

CUIS: Georgia – *Camden County*: CUIS (1 GMNH, 26 MCZ, 4 MVZ, 4 UMMZ, 11 USNM); 0.5 mi E Kingsland (7 UIMNH); 0.5 mi N, 4 mi E Kingsland (1 UIMNH); Saint Marys (Bangs 1898); Saint Marys, Ano Plantation (3 FMNH)..

TIMU: Florida – *Duval County*: 4 mi W Atlantic Beach (1 UF); 1 mi NW Bayard (2 TTU); 2 mi W Bayard (1 UF); Jacksonville (3 FMNH, 1 USNM, 1 YPM); Jacksonville, north along Hwy 17 (5 USNM); Jacksonville, west of Saint Johns (1 MSB); 6 mi S Jacksonville, near San Jose CC (1 UF); New Berlin (6 FMNH, 2 TCWC; Bangs 1898); Oceanview, Hwy 17 (9 USNM); Saint Charles Creek (Elliot 1901); 0.5 mi N Saint Johns County line (1 UF); TIMU, no evidence; 13 mi S, 2 mi W Yulee, I-95 (5 GMNH). *Nassau County*: Crandall (9 USNM); 1 mi E Crandall (1 CUMV); Rose Bluff (Bangs 1898); Saint Marys River, 2 mi NE Saint George (1 CUMV); 1.6 mi S Saint Marys River on Hwy 1 (3 UF); 1 mi E Yulee, Hwy 200A (1 USNM); 1.1 mi NE Yulee, Hwy A1A at C-220A (1 GMNH); 1.2 mi NE Yulee, Hwy A1A at C-220A (1 GMNH); 1.2 mi E Yulee, Hwy 200A (1 USNM); 1.35 mi NE Yulee, Hwy A1A at C-220A (2 GMNH); 1.4 mi NE Yulee, Hwy A1A at C-220A (1 GMNH); 1.8 mi E Yulee, Hwy A1A (1 USNM); 2 mi E Yulee, Hwy 200A (1 USNM); 2 mi S Yulee (4 KU, 1 UF); 2 mi NE Yulee (2 GMNH); 2.1 mi E Yulee, Hwy 200A (1 USNM); 2.4 mi S Yulee, Hwy 17 (1 USNM); 2.5 mi E Yulee, Hwy 200A (1 USNM); 2.5 mi S Yulee, Hwy 17 (1 USNM); 3 mi E Yulee (1 GMNH); 3.3 mi E Yulee (1 GMNH); 3.6 mi E Yulee (1 GMNH).

FOCA: Florida – *Duval County*: FOCA, no evidence (habitat lacking); 4 mi W Atlantic Beach (1 UF); 1 mi NW Bayard (2 TTU); 2 mi W Bayard (1 UF); Jacksonville (3 FMNH, 1 USNM, 1 YPM); Jacksonville, north along Hwy 17 (5 USNM); Jacksonville, west of Saint Johns (1 MSB); 6 mi S Jacksonville, near San Jose CC (1 UF); New Berlin (6 FMNH, 2 TCWC; Bangs 1898);

Oceanview, Hwy 17 (9 USNM); Saint Charles Creek (Elliot 1901); 0.5 mi N Saint Johns County line (1 UF); 13 mi S, 2 mi W Yulee, I-95 (5 GMNH). *Nassau County*: Crandall (9 USNM); 1 mi E Crandall (1 CUMV); Rose Bluff (Bangs 1898); Saint Marys River, 2 mi NE Saint George (1 CUMV); 1.6 mi S Saint Marys River on Hwy 1 (3 UF); 1 mi E Yulee, Hwy 200A (1 USNM); 1.1 mi NE Yulee, Hwy A1A at C-220A (1 GMNH); 1.2 mi NE Yulee, Hwy A1A at C-220A (1 GMNH); 1.2 mi E Yulee, Hwy 200A (1 USNM); 1.35 mi NE Yulee, Hwy A1A at C-220A (2 GMNH); 1.4 mi NE Yulee, Hwy A1A at C-220A (1 GMNH); 1.8 mi E Yulee, Hwy A1A (1 USNM); 2 mi E Yulee, Hwy 200A (1 USNM); 2 mi S Yulee (4 KU, 1 UF); 2 mi NE Yulee (2 GMNH); 2.1 mi E Yulee, Hwy 200A (1 USNM); 2.4 mi S Yulee, Hwy 17 (1 USNM); 2.5 mi E Yulee, Hwy 200A (1 USNM); 2.5 mi S Yulee, Hwy 17 (1 USNM); 3 mi E Yulee (1 GMNH); 3.3 mi E Yulee (1 GMNH); 3.6 mi E Yulee (1 GMNH).

CASA: Florida – *Saint Johns County*: CASA, no evidence; 1 mi N Flagler County line (1 UF); 1.7 mi N Flagler County line (1 UF); Mandarin (1 UF); Rt 204, 1 mi W jct I-10 and Hwy 1 (4 FMNH); Saint Augustine (1 UF); Saint Augustine, 3.9 mi W Jct ? (1 UF); 4 mi S Saint Augustine (1 UF); 4 mi SW Saint Augustine (1 FMNH, 1 KU); 5.9 mi W Saint Augustine, Hwy 1 (1 UF); 6.5 mi S Saint Augustine (1 UF); Switzerland (1 UF).

FOMA: Florida – *Saint Johns County*: 1 mi N Flagler County line (1 UF); 1.7 mi N Flagler County line (1 UF); FOMA, no evidence; Mandarin (1 UF); Rt 204, 1 mi W jct I-10 and Hwy 1 (4 FMNH); Saint Augustine (1 UF); Saint Augustine, 3.9 mi W Jct ? (1 UF); 4 mi S Saint Augustine (1 UF); 4 mi SW Saint Augustine (1 FMNH, 1 KU); 5.9 mi W Saint Augustine, Hwy 1 (1 UF); 6.5 mi S Saint Augustine (1 UF); Switzerland (1 UF).

American beaver (*Castor canadensis*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: 4 mi S Atkinson (3 UNCW); 5.5 mi SE Atkinson (1 UNCW); MOCR (tracks and gnawed trees).

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Calhoun County*: no specific locality (Golley 1966). *Richland County*: CONG (observation).

HOBE: Alabama – *Lee County*: 2 mi N Notasulga (1 LSU). *Tallapoosa County*: HOBE (tracks and gnawed trees).

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals, rec area (gnawed trees); CHAT, Johnson Ferry North (observation); CHAT, Johnson Ferry South (gnawed trees); KEMO (NPS observation). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, Holcomb Bridge (gnawed trees); CHAT, Jones Bridge (gnawed trees); CHAT, McGinnis Ferry (gnawed trees); CHAT, Palisades East (gnawed trees); CHAT, Vickery Creek (tracks). *Gwinnett County*: CHAT, Abbotts Bridge (gnawed trees); CHAT, Bowmans Island, Richland Creek (1 UNCW); CHAT, Medlock Bridge (gnawed trees); CHAT, Orrs Ferry (observation).

KEMO: Georgia – *Cobb County*: CHAT, Cochran Shoals, rec area (gnawed trees); CHAT, Johnson Ferry North (observation); CHAT, Johnson Ferry South (gnawed trees); KEMO (NPS observation).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (1 UNCW; gnawed trees); OCMU, Lamar Unit (gnawed trees); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; no specific locality (Golley 1962). *McIntosh County*: Sapelo Island (1 GMNH).

CUIS: Georgia – *Camden County*: CUIS (Shoop and Ruckdeschel 2001). *County unknown*: Okefenokee Swamp, 1 mi E Floyds Island (Harper, 1927).

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Marsh rice rat (*Oryzomys palustris*)

CAHA: North Carolina – *Dare County*: Avon (2 MSB); CAHA, Bodie Island (8 UNCW); CAHA, Buxton (1 NCSM, 2 UNCW); CAHA, Cape Hatteras (2 UNCW); CAHA (2 UNCW); CAHA, Frisco (1 UMMZ); CAHA, Hatteras Inlet (1 NCSM); [CAHA] Pea Island (1 AMNH, 2 MCZ); [CAHA] Pea Island NWR, 4 mi S Oregon Inlet (4 UNCW); [CAHA] Pea Island NWR, Oregon Inlet (1 VCU); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (3 UNCW); Hatteras (1 UMMZ); Nags Head (1 NCSU, 1 UMMZ); 1 mi E Nags Head (2 UNCW); Nags Head Woods (Webster 1988); Roanoke Island (Lee et al. 1983; Parnell et al. 1992); Rodanthe (Parnell et al. 1992); 2 mi S Salvo (1 AMNH, 1 MSB). *Hyde County*: CAHA, Ocracoke Island (4 UMA, 4 UNCW).

WRBR: North Carolina – *Dare County*: Avon (2 MSB); CAHA, Bodie Island (8 UNCW); CAHA, Buxton (1 NCSM, 2 UNCW); CAHA, Cape Hatteras (2 UNCW); CAHA (2 UNCW); CAHA, Frisco (1 UMMZ); CAHA, Hatteras Inlet (1 NCSM); [CAHA] Pea Island (1 AMNH, 2 MCZ); [CAHA] Pea Island NWR, 4 mi S Oregon Inlet (4 UNCW); [CAHA] Pea Island NWR, Oregon Inlet (1 VCU); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (3 UNCW); Hatteras (1 UMMZ); Nags Head (1 NCSU, 1 UMMZ); 1 mi E Nags Head (2 UNCW); Nags Head Woods (Webster 1988); Roanoke Island (Lee et al. 1983; Parnell et al. 1992); Rodanthe (Parnell et al. 1992); 2 mi S Salvo (1 AMNH, 1 MSB); WRBR, no evidence.

FORA: North Carolina – *Dare County*: Avon (2 MSB); CAHA, Bodie Island (8 UNCW); CAHA, Buxton (1 NCSM, 2 UNCW); CAHA, Cape Hatteras (2 UNCW); CAHA (2 UNCW); FORA, no evidence; CAHA, Frisco (1 UMMZ); CAHA, Hatteras Inlet (1 NCSM); [CAHA] Pea Island (1 AMNH, 2 MCZ); [CAHA] Pea Island NWR, 4 mi S Oregon Inlet (4 UNCW); [CAHA] Pea Island NWR, Oregon Inlet (1 VCU); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (3 UNCW); Hatteras (1 UMMZ); Nags Head (1 NCSU, 1 UMMZ); 1 mi E Nags Head (2 UNCW); Nags Head Woods (Webster 1988); Roanoke Island (Lee et al. 1983; Parnell et al. 1992); Rodanthe (Parnell et al. 1992); 2 mi S Salvo (1 AMNH, 1 MSB).

CALO: North Carolina – *Carteret County*: Bird Shoal (3 KU); CALO, Cape Lookout (1 CALO, 2 UMA); CALO, South Core Banks (tracks and scat); CALO, South Core Banks, 1 mi S Drum Inlet (1 CALO); CALO, Portsmouth Island (12 UMA; tracks and scat); CALO, Portsmouth Village (2 CALO); CALO, Shackleford Banks (1 CALO, 10 UNCW; Engels 1952; Webster 1987a); Cedar Island NWR (31 UNCW); no specific locality (Lee et al. 1983).

MOCR: North Carolina – *Pender County*: 3 km NE Burgaw, I-40 (1 UNCW); 8 km SSE Burgaw, I-40 (5 UNCW); 7 km SE Burgaw, I-40 (2 UNCW); MOCR, no evidence; Topsail Beach (2 UNCW); 2 km E Watha, I-40 (7 UNCW); 3 km E Willard, I-40 (1 UNCW).

FOSU: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (6 USNM); Cape Island (2 KU); 6.4 mi S Charleston (1 KU); 9 mi W Charleston, Rantowles Creek (1 KU); Edisto Island (1 ROM); FOSU, no evidence; Goose Creek (1 MVZ); Hwy 45 at Berkeley County line (2 GMNH); Johns Island (1 GMNH); 2 7/8 mi N, 8 mi W McClellansville, Coffee Creek Swamp (1 MHP); Mount Pleasant, Porchers Bluff (1 UF); 13.5 mi NE Mount Pleasant (1 MVZ); Otranto (2 KU); Porchers Bluff (4 ROM); Stono River (2 MVZ); Wedge Plantation (Clark et al. 2002); Woodland Shores (1 ROM); no specific locality (4 MVZ).

FOMO: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (6 USNM); Cape Island (2 KU); 6.4 mi S Charleston (1 KU); 9 mi W Charleston, Rantowles Creek (1 KU); Edisto Island (1 ROM); FOMO, no evidence; Goose Creek (1 MVZ); Hwy 45 at Berkeley County line (2 GMNH); Johns Island (1 GMNH); 2 7/8 mi N, 8 mi W McClellansville, Coffee Creek Swamp (1 MHP); Mount Pleasant, Porchers Bluff (1 UF); 13.5 mi NE Mount Pleasant (1 MVZ); Otranto (2 KU); Porchers Bluff (4 ROM); Stono River (2 MVZ); Wedge Plantation (Clark et al. 2002); Woodland Shores (1 ROM); no specific locality (4 MVZ).

CHPI: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (6 USNM); Cape Island (2 KU); CHPI, no evidence; 6.4 mi S Charleston (1 KU); 9 mi W Charleston, Rantowles Creek (1 KU); Edisto Island (1 ROM); Goose Creek (1 MVZ); Hwy 45 at Berkeley County line (2 GMNH); Johns Island (1 GMNH); 2 7/8 mi N, 8 mi W McClellansville, Coffee Creek Swamp (1 MHP); Mount Pleasant, Porchers Bluff (1 UF); 13.5 mi NE Mount Pleasant (1 MVZ); Otranto (2 KU); Porchers Bluff (4 ROM); Stono River (2 MVZ); Wedge Plantation (Clark et al. 2002); Woodland Shores (1 ROM); no specific locality (4 MVZ).

CONG: South Carolina – *Richland County*: CONG (1 MSB); Hwy 601, 1 mi N Congaree River (1 GMNH).

HOBE: Alabama – *Coosa County*: Weogufka (Howell 1921). *Tallapoosa County*: HOBE (2 MSB).

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; no specific locality (Golley 1962). *Gwinnett County*: CHAT, Suwanee Creek (3 UNCW).

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Crawford County*: Roberta (1 USNM). *Houston County*: no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, Frederica Site (1 UNCW); Jekyll Island (4 GMNH).

CUIS: Georgia – *Camden County*: CUIS (3 AMNH, at least 1 CIM, 11 GMNH, 11 MCZ; Shoop and Ruckdeschel 1990; Wilson and Durden 2003); Saint Marys (Bangs 1898; Elliot 1901).

TIMU: Florida – *Duval County*: Burnside Beach (Bangs 1898); FOCA (observation); 5 mi W Jacksonville, Hwy 90 (1 AMNH); New Berlin (8 FMNH; Bangs 1898); TIMU, no evidence. *Nassau County*: Amelia Island (1 AMNH); White Oak Conservation Center (1 UF).

FOCA: Florida – *Duval County*: Burnside Beach (Bangs 1898); FOCA (observation); 5 mi W Jacksonville, Hwy 90 (1 AMNH); New Berlin (8 FMNH; Bangs 1898). *Nassau County*: Amelia Island (1 AMNH); White Oak Conservation Center (1 UF).

CASA: Florida – *Saint Johns County*: Anastasia Island (2 MCZ, 4 UF); Anastasia Island, Espanita (3 FMNH); Anastasia Island, 3.5 mi S Saint Augustine (2 AMNH); Anastasia Island, 4 mi S Saint Augustine (1 AMNH); Anastasia Island, 12 mi S Saint Augustine (3 AMNH); Anastasia State Park (1 UF); Carterville (Bangs 1898); CASA, no evidence; FOMA, Rattlesnake Island (3 UNCW); Palm Valley (1 UF); near Palm Valley bridge (1 UF); 1 mi S Palm Valley bridge (1 UF).

FOMA: Florida – *Saint Johns County*: Anastasia Island (2 MCZ, 4 UF); Anastasia Island, Espanita (3 FMNH); Anastasia Island, 3.5 mi S Saint Augustine (2 AMNH); Anastasia Island, 4 mi S Saint Augustine (1 AMNH); Anastasia Island, 12 mi S Saint Augustine (3 AMNH); Anastasia State Park (1 UF); Carterville (Bangs 1898); FOMA, Rattlesnake Island (3 UNCW); Palm Valley (1 UF); near Palm Valley bridge (1 UF); 1 mi S Palm Valley bridge (1 UF).

Eastern harvest mouse (*Reithrodontomys humulis*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence; 4 mi NNW Duck (2 USNM); 0.7 mi NNW Kitty Hawk fishing pier (1 USNM). *Hyde County*: CAHA, Ocracoke Island, no evidence; Lake Mattamuskeet NWR (9 USNM).

WRBR: North Carolina – *Dare County*: 4 mi NNW Duck (2 USNM); 0.7 mi NNW Kitty Hawk fishing pier (1 USNM); WRBR, no evidence. *Hyde County*: Lake Mattamuskeet NWR (9 USNM).

FORA: North Carolina – *Dare County*: CAHA, no evidence; 4 mi NNW Duck (2 USNM); FOR A, no evidence; 0.7 mi NNW Kitty Hawk fishing pier (1 USNM). *Hyde County*: Lake Mattamuskeet NWR (9 USNM).

CALO: North Carolina – *Carteret County*: CALO, no evidence; no specific locality (Lee et al. 1983).

MOCR: North Carolina – *Pender County*: 7 km SE Burgaw, I-40 (3 UNCW); 8 km SSE Burgaw, I-40 (6 UNCW); 6 km NNE Castle Hayne, I-40 (6 UNCW); Holly Shelter Gamelands (15 UNCW); MOCR (1 UNCW); 2 km E Watha, I-40 (9 UNCW); 3 km E Willard, I-40 (2 UNCW).

FOSU: South Carolina – *Charleston County*: Drayton (1 ROM); 0.75 mi W Drayton (1 ROM); FOSU, no evidence; McClellansville (1 USNM); 3.4 km NE McClellansville (4 USNM); Porchers Bluff (2 ROM); Saint Andrews Parish, Legares Farm (2 KU); Wedge Plantation (Clark et al. 2002).

FOMO: South Carolina – *Charleston County*: Drayton (1 ROM); 0.75 mi W Drayton (1 ROM); FOMO, no evidence; McClellansville (1 USNM); 3.4 km NE McClellansville (4 USNM); Porchers Bluff (2 ROM); Saint Andrews Parish, Legares Farm (2 KU); Wedge Plantation (Clark et al. 2002).

CHPI: South Carolina – *Charleston County*: CHPI, no evidence; Drayton (1 ROM); 0.75 mi W Drayton (1 ROM); McClellansville (1 USNM); 3.4 km NE McClellansville (4 USNM); Porchers Bluff (2 ROM); Saint Andrews Parish, Legares Farm (2 KU); Wedge Plantation (Clark et al. 2002).

CONG: South Carolina – *Richland County*: CONG (5 UNCW); Fort Jackson (1 MHP).

HOBE: Alabama – *Clay County*: Dean (Howell 1921). *Lee County*: Auburn (3 UMMZ). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence; KEMO (observation). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; south of College Rd (1 GMNH). *Gwinnett County*: CHAT, Abbotts Bridge (1 UNCW); CHAT, Suwanee Creek (2 UNCW); Chattahoochee River (2 GMNH).

KEMO: Georgia – *Cobb County*: KEMO (observation). *Fulton County*: south of College Rd (1 GMNH).

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (2 NUV).

FOFR: Georgia – *Camden County*: no specific locality (Golley 1962). *Charlton County*: Cowhouse Island, Union Camp (2 GMNH). *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence; no specific locality (Golley 1962). *Charlton County*: Cowhouse Island, Union Camp (2 GMNH); Okefenokee Swamp, Billys Island (1 CUMV).

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Oldfield mouse (*Peromyscus polionotus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Calhoun County*: Saint Matthews (Schwartz 1954). *Kershaw County*: no specific locality (Golley 1966). *Richland County*: CONG, no evidence; 10 mi E Columbia, Fort Jackson (3 KU, 11 MHP); no specific locality (Golley 1966).

HOBE: Alabama – *Lee County*: Auburn (1 UMMZ); 3 mi S Auburn (1 NUVIC); 5 mi NW Auburn (1 NUVIC). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cherokee County*: 5 mi N Canton (Schwartz 1954). *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; no specific locality (Golley 1962). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cherokee County*: 5 mi N Canton (Schwartz 1954). *Cobb County*: KEMO, no evidence. *Fulton County*: no specific locality (Golley 1962).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Crawford County*: Roberta (1 USNM). *Houston County*: no specific locality (1 UF). *Jones County*: James (2 USNM); 7 mi N Macon, Hwy 129 (Schwartz 1954). *Jones or Wilkinson County*: James or Gordon, respectively (1 USNM). *Twiggs County*: Fitzpatrick (4 USNM).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: Ponte Vedra Beach (1 MSB); TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: Anastasia Island (1 ChM, 2 CUMV, 1 KU, 2 LSU, 27 MCZ, 1 MSB, 12 ROM, 7 UF, 4 UMMZ); Anastasia Island, Anastasia State Park (4 CUMV, 13 UF, 8 PSM, 1 UIMNH, 1 UMMZ); Anastasia Island, Anastasia State Park, south end (28 OMNH); Anastasia Island, Espanita (3 AMNH, 25 FMNH, 14 USNM); Anastasia Island, Frank Butler State Park (1 OMNH); Anastasia Island, 11 mi N Marineland (12 KU); Anastasia Island, north end (15 OMNH); Anastasia Island, 12 mi S Saint Augustine (1 AMNH); Island, 0.5 mi N FOMA (2 UF); Anastasia Island, 2.3 mi N FOMA (1 UF); Anastasia Island, 2.4 mi N FOMA (2 UF); Anastasia Island, Saint Augustine Beach (2 MSU); [Anastasia Island] Augustine Beach (9 KU, 1 UMMZ); CASA, no evidence; FOMA, Main Unit (tracks, scat, and plugged tunnels); [FOMA, Anastasia Island] Matanzas Inlet, south end (4 OMNH, 1 UF); [FOMA] Anastasia Island, Matanzas Inlet, 15 mi S Saint Augustine (17 AMNH); [FOMA] Anastasia Island, [Matanzas Inlet] 15 mi S Saint Augustine (5 AMNH); [FOMA] Anastasia Island, south end (2 UF); [FOMA] Anastasia Island, Point Romo (2 AMNH, 2 ChM, 2 CUMV, 11 KU, 6 UF, 1 UIMNH); Anastasia Island, 9 mi N Point Romo (2 UF); Micklers Pier (3 UF); Palm Valley (2 MSB); Ponte Vedra (6 MSB); R30E, T7S, Sec 22 (3 UF); R30E, T8S, Sec 3 (3 UF); Saint Augustine (1 YPM); Summer Haven (1 UF); Vilano Beach (6 UF); no specific locality (1 ChM).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 ChM, 2 CUMV, 1 KU, 2 LSU, 27 MCZ, 1 MSB, 12 ROM, 7 UF, 4 UMMZ); Anastasia Island, Anastasia State Park (4 CUMV, 13 UF, 8 PSM, 1 UIMNH, 1 UMMZ); Anastasia Island, Anastasia State Park, south end (28 OMNH); Anastasia Island, Espanita (3 AMNH, 25 FMNH, 14 USNM); Anastasia Island, Frank Butler State Park (1 OMNH); Anastasia Island, 11 mi N Marineland (12 KU); Anastasia Island, north end (15 OMNH); Anastasia Island, 12 mi S Saint Augustine (1 AMNH); Anastasia Island, 0.5 mi N FOMA (2 UF); Anastasia Island, 2.3 mi N FOMA (1 UF); Anastasia Island, 2.4 mi N FOMA (2 UF); Anastasia Island, Saint Augustine Beach (2 MSU); [Anastasia Island] Augustine Beach (9 KU, 1 UMMZ); FOMA, Main Unit (tracks, scat, and plugged tunnels); FOMA, Rattlesnake Island, no evidence; [FOMA, Anastasia Island] Matanzas Inlet, south end (4 OMNH, 1 UF); [FOMA] Anastasia Island, Matanzas Inlet, 15 mi S Saint Augustine (17 AMNH); [FOMA] Anastasia Island, [Matanzas Inlet] 15 mi S Saint Augustine (5 AMNH); [FOMA] Anastasia Island, south end (2 UF); [FOMA] Anastasia Island, Point Romo (2 AMNH, 2 ChM, 2 CUMV, 11 KU, 6 UF, 1 UIMNH); Anastasia Island, 9 mi N Point Romo (2 UF); Micklers Pier (3 UF); Palm Valley (2 MSB); Ponte Vedra (6 MSB); R30E, T7S, Sec 22 (3 UF); R30E, T8S, Sec 3 (3 UF); Saint Augustine (1 YPM); Summer Haven (1 UF); Vilano Beach (6 UF); no specific locality (1 ChM).

White-footed mouse (*Peromyscus leucopus*)

CAHA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (10 UNCW); CAHA, Buxton (4 NCSM, 20 UNCW, 1 USNM); CAHA, 1 km S Buxton (7 UNCW); CAHA, Cape Hatteras (4 GMNH, 10 UNCW); CAHA, 5 m (4 KU); CAHA, 3.9 km N Chicomacomico (4 UNCW); CAHA, Frisco (13 UNCW); CAHA, 2.5 km S Hatteras (2 UNCW); CAHA, South Nags Head (5 UNCW); Coquina Beach (Parnell et al. 1992); near Duck (4 USNM); Frisco (2 UMMZ); Hatteras Island (3 UMA); 0.5 mi NNW Kitty Hawk fishing pier (19 USNM); Manteo (2 USNM); Nags Head Woods (5 UNCW); Prulean Farms (2 NCSM);

Roanoke Island (Parnell et al. 1992); Salvo (Parnell et al. 1992); WRBR (1 UNCW). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (10 UNCW); CAHA, Buxton (4 NCSM, 20 UNCW, 1 USNM); CAHA, 1 km S Buxton (7 UNCW); CAHA, Cape Hatteras (4 GMNH, 10 UNCW); CAHA, 5 m (4 KU); CAHA, 3.9 km N Chicomacomico (4 UNCW); CAHA, Frisco (13 UNCW); CAHA, 2.5 km S Hatteras (2 UNCW); CAHA, South Nags Head (5 UNCW); Coquina Beach (Parnell et al. 1992); near Duck (4 USNM); Frisco (2 UMMZ); Hatteras Island (3 UMA); 0.5 mi NNW Kitty Hawk fishing pier (19 USNM); Manteo (2 USNM); Nags Head Woods (5 UNCW); Prulean Farms (2 NCSM); Roanoke Island (Parnell et al. 1992); Salvo (Parnell et al. 1992); WRBR (1 UNCW).

FORA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (10 UNCW); CAHA, Buxton (4 NCSM, 20 UNCW, 1 USNM); CAHA, 1 km S Buxton (7 UNCW); CAHA, Cape Hatteras (4 GMNH, 10 UNCW); CAHA, 5 m (4 KU); CAHA, 3.9 km N Chicomacomico (4 UNCW); CAHA, Frisco (13 UNCW); CAHA, 2.5 km S Hatteras (2 UNCW); CAHA, South Nags Head (5 UNCW); Coquina Beach (Parnell et al. 1992); near Duck (4 USNM); FORA, no evidence; Frisco (2 UMMZ); Hatteras Island (3 UMA); 0.5 mi NNW Kitty Hawk fishing pier (19 USNM); Manteo (2 USNM); Nags Head Woods (5 UNCW); Prulean Farms (2 NCSM); Roanoke Island (Parnell et al. 1992); Salvo (Parnell et al. 1992); WRBR (1 UNCW).

CALO: North Carolina – *Carteret County*: CALO, no evidence. *Craven County*: corner of Schull Rd and Braxton Rd (3 UNCW).

MOCR: North Carolina – *Pender County*: Atkinson (1 UMMZ); 7 km SE Burgaw, I-40 (1 UNCW); 6 km NNE Castle Hayne, I-40 (3 UNCW); Holly Shelter Gamelands (1 UNCW); MOCR (1 UNCW); Scotts Hill (1 NCSM).

CONG: South Carolina – *Fairfield County*: no specific locality (Golley 1966). *Richland County*: CONG, no evidence; Fort Jackson (5 MHP).

HOBE: Alabama – *Tallapoosa County*: HOBE (12 MSB, 1 UNCW); HOBE, Hwy 79 at Tallapoosa River (4 GMNH).

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals (observation); Marietta (4 UMMZ). *DeKalb County*: no specific locality (1 USNM). *Forsyth County*: CHAT, no evidence. *Fulton County*: Atlanta Metro (5 MSB); Atlanta, 1 mi W Buckhead (1 GMNH); CHAT, McGinnis Ferry (3 UNCW); Jimmy Carter Center (2 MSB). *Gwinnett County*: CHAT, Level Creek (1 UNCW); CHAT, Orrs Ferry (1 UNCW). *County unknown*: Atlanta (1 USNM).

KEMO: Georgia – *Cherokee County*: 5 mi W Canton (1 USNM); 15 mi NW Canton (2 USNM). *Cobb County*: CHAT, Cochran Shoals (observation); KEMO, no evidence; Marietta (4 UMMZ). *Fulton County*: Atlanta Metro (5 MSB); Atlanta, 1 mi W Buckhead (1 GMNH); CHAT, McGinnis Ferry (3 UNCW); Jimmy Carter Center (2 MSB). *County unknown*: Atlanta (1 USNM).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Pike County*: no specific locality (1 GMNH). *Upson County*: no specific locality (1 GMNH).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Cotton mouse (*Peromyscus gossypinus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence; no specific locality (Lee et al. 1983).

MOCR: North Carolina – *Pender County*: Castle Hayne (1 UNCW); 6 km NNE Castle Hayne, I-40 (1 UNCW); Hampstead (1 UNCW); Holly Shelter Gamelands (6 UNCW); MOCR (5 MSB); Rocky Point (1 UNCW); Scotts Hill (8 UNCW); Topsail Beach (2 UNCW); Watha (4 UNCW); 14.4 mi N Wilmington, I-40 (6 UNCW); 15 mi N Wilmington (1 UNCW).

FOSU: South Carolina – *Charleston County*: 6 mi NW Awendaw (1 AMNH); 9 mi NE Awendaw (2 AMNH); Bees Ferry Road (2 CUMV, 3 KU); Bulls Island (1 KU); Bulls Island, Cape Romain NWR (5 USNM); 7.2 mi WSW Charleston, Rantowles Creek (1 KU); 7.5 mi W Charleston (4 KU); 8.3 mi W Charleston (1 KU); Edisto Island (3 GMNH); FOSU, no evidence; Hwy 45 at Berkeley County line 17 (GMNH); 4.5 mi S, 6.5 mi W McClellansville, Buck Hall Campground (3 MHP); 2 7/8 mi N, 8 mi W McClellansville, Coffee Creek Swamp (10 MHP); Mount Pleasant (Clark et al. 2002); Murphy Island (1 KU); Porchers Bluff (2 ROM); Saint Andrews Parish (1 KU, 3 MVZ); Seabrook Beach (1 KU); Wedge Plantation (Clark et al. 2002); no specific locality (1 KU).

FOMO: South Carolina – *Charleston County*: 6 mi NW Awendaw (1 AMNH); 9 mi NE Awendaw (2 AMNH); Bees Ferry Road (2 CUMV, 3 KU); Bulls Island (1 KU); Bulls Island, Cape Romain NWR (5 USNM); 7.2 mi WSW Charleston, Rantowles Creek (1 KU); 7.5 mi W Charleston (4 KU); 8.3 mi W Charleston (1 KU); Edisto Island (3 GMNH); FOMO, no evidence; Hwy 45 at Berkeley County line 17 (GMNH); 4.5 mi S, 6.5 mi W McClellansville, Buck Hall Campground (3 MHP); 2 7/8 mi N, 8 mi W McClellansville, Coffee Creek Swamp (10 MHP); Mount Pleasant (Clark et al. 2002); Murphy Island (1 KU); Porchers Bluff (2 ROM); Saint

Andrews Parish (1 KU, 3 MVZ); Seabrook Beach (1 KU); Wedge Plantation (Clark et al. 2002); no specific locality (1 KU).

CHPI: South Carolina – *Charleston County*: 6 mi NW Awendaw (1 AMNH); 9 mi NE Awendaw (2 AMNH); Bees Ferry Road (2 CUMV, 3 KU); Bulls Island (1 KU); Bulls Island, Cape Romain NWR (5 USNM); CHPI, no evidence; 7.2 mi WSW Charleston, Rantowles Creek (1 KU); 7.5 mi W Charleston (4 KU); 8.3 mi W Charleston (1 KU); Edisto Island (3 GMNH); Hwy 45 at Berkeley County line 17 (GMNH); 4.5 mi S, 6.5 mi W McClellansville, Buck Hall Campground (3 MHP); 2 7/8 mi N, 8 mi W McClellansville, Coffee Creek Swamp (10 MHP); Mount Pleasant (Clark et al. 2002); Murphy Island (1 KU); Porchers Bluff (2 ROM); Saint Andrews Parish (1 KU, 3 MVZ); Seabrook Beach (1 KU); Wedge Plantation (Clark et al. 2002); no specific locality (1 KU).

CONG: South Carolina – *Richland County*: CONG (16 MSB, 4 UNCW); Hwy 601, 1 mi N Congaree River (22 GMNH); Fort Jackson (62 MHP).

HOBE: Alabama – *Tallapoosa County*: HOBE (6 MSB); HOBE, Hwy 79 at Tallapoosa River (20 GMNH).

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (1 UNCW); no specific locality (1 NUVC).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Jekyll Island (38 GMNH, 1 UIMNH); Saint Simons Island (1 GMNH); Sterling (Bangs 1898).

CUIS: Georgia – *Camden County*: CUIS (8 AMNH, at least 1 CIM, 3 GMNH, 7 MSB, 29 MCZ, 2 MVZ, 1 UF, 2 UMMZ; Magnarelli et al. 1999; Wilson and Durden 2003); CUIS, Dungeness (16 GMNH); CUIS, 1.5 mi E Stafford House (3 GMNH); Griffins Neck (1 MVZ); 0.5 mi N, 4 mi E Kingsland (1 UIMNH); Little Cumberland Island (6 GMNH); Saint Marys (Bangs 1898).

TIMU: Florida – *Duval County*: Burnside Beach (Bangs 1898); Lake Ashbury (1 UF); New Berlin (3 FMNH, Bangs 1898); Saint Charles Creek (1 FMNH); TIMU, no evidence. *Nassau County*: Amelia Island (2 AMNH, 11 GMNH); Amelia Island, 0.5 mi E Hwy A1A bridge (2 AMNH); Amelia Island, 1.5 mi E Hwy A1A bridge (1 AMNH); Amelia Island, south end of Hwy A1A bridge (1 AMNH); Amelia Island, 1.8 mi SSE Amelia City (5 AMNH); Amelia Island, 2 mi SSE Amelia City (8 AMNH); Amelia Island, 2.3 mi SSE Amelia City (5 AMNH); Amelia Island, 2.9 mi SSE Amelia City (5 AMNH); Amelia Island, 4 mi SSE Amelia City (3 AMNH); Amelia Island, 4.5 mi SSE Amelia City (2 AMNH); Amelia Island, 4.6 mi SSE Amelia City (1 AMNH); Amelia Island, 4.8 mi SSE Amelia City (1 AMNH); Amelia Island, 5.2 mi SSE Amelia City (1 AMNH); Amelia Island, 5.4 mi SSE Amelia City (2 AMNH); Amelia Island, 5.6 mi SSE Amelia City (2 AMNH); Amelia Island, American Beach (1 AMNH); Hwy 2 at Saint Marys River (3 GMNH); Hwy 121A, 0.6 mi N Hwy 108 (4 GMNH); Hwy 121A, 2.3 mi N Hwy 108 (3 GMNH); Hwy 121A, 9.1 mi N Hwy 108 (1 GMNH); Hwy 121A, 11.8 mi N Hwy 108 (4 GMNH); Hwy 108, 0.2 mi W Hwy 115A (1 GMNH); Hwy 108, 2 mi E Hwy 121A (1 GMNH);

Hwy 108, 3.5 mi E Hwy 115A (1 GMNH); 1.5 mi W Hwy 17, Agriculture Experimental Station (2 GMNH); 0.25 mi S Mulberry Landing, Hwy 121 (1 GMNH); Saint Marys River, 2 mi NE Saint George (1 CUMV).

FOCA: Florida – *Duval County*: Burnside Beach (Bangs 1898); FOCA, no evidence; Lake Ashbury (1 UF); New Berlin (3 FMNH, Bangs 1898); Saint Charles Creek (1 FMNH). *Nassau County*: Amelia Island (2 AMNH, 11 GMNH); Amelia Island, 0.5 mi E Hwy A1A bridge (2 AMNH); Amelia Island, 1.5 mi E Hwy A1A bridge (1 AMNH); Amelia Island, south end of Hwy A1A bridge (1 AMNH); Amelia Island, 1.8 mi SSE Amelia City (5 AMNH); Amelia Island, 2 mi SSE Amelia City (8 AMNH); Amelia Island, 2.3 mi SSE Amelia City (5 AMNH); Amelia Island, 2.9 mi SSE Amelia City (5 AMNH); Amelia Island, 4 mi SSE Amelia City (3 AMNH); Amelia Island, 4.5 mi SSE Amelia City (2 AMNH); Amelia Island, 4.6 mi SSE Amelia City (1 AMNH); Amelia Island, 4.8 mi SSE Amelia City (1 AMNH); Amelia Island, 5.2 mi SSE Amelia City (1 AMNH); Amelia Island, 5.4 mi SSE Amelia City (2 AMNH); Amelia Island, 5.6 mi SSE Amelia City (2 AMNH); Amelia Island, American Beach (1 AMNH); Hwy 2 at Saint Marys River (3 GMNH); Hwy 121A, 0.6 mi N Hwy 108 (4 GMNH); Hwy 121A, 2.3 mi N Hwy 108 (3 GMNH); Hwy 121A, 9.1 mi N Hwy 108 (1 GMNH); Hwy 121A, 11.8 mi N Hwy 108 (4 GMNH); Hwy 108, 0.2 mi W Hwy 115A (1 GMNH); Hwy 108, 2 mi E Hwy 121A (1 GMNH); Hwy 108, 3.5 mi E Hwy 115A (1 GMNH); 1.5 mi W Hwy 17, Agriculture Experimental Station (2 GMNH); 0.25 mi S Mulberry Landing, Hwy 121 (1 GMNH); Saint Marys River, 2 mi NE Saint George (1 CUMV).

CASA: Florida – *Saint Johns County*: Anastasia Island (1 CUMV, 8 MCZ, 5 ROM); Anastasia Island, 2.6 mi W Crescent Beach (4 UF); Anastasia Island, Espanita (9 FMNH, 2 USNM); Carterville (Bangs 1898); CASA, no evidence; FOMA (16 MSB); [FOMA] Anastasia Island, south end (2 USNM); Guano River NWA, 10.7 mi N Vilano Beach access rd (2 UF); Palm Valley (1 UF); 2 mi N Saint Augustine (1 UF); Vedra Beach, 10.7 mi N Vilano Beach access rd (1 UF); Vedra Beach, 12.5 mi N Vilano Beach access rd (1 UF).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 CUMV, 8 MCZ, 5 ROM); Anastasia Island, 2.6 mi W Crescent Beach (4 UF); Anastasia Island, Espanita (9 FMNH, 2 USNM); F Carterville (Bangs 1898); FOMA (16 MSB); [FOMA] Anastasia Island, south end (2 USNM); Guano River NWA, 10.7 mi N Vilano Beach access rd (2 UF); Palm Valley (1 UF); 2 mi N Saint Augustine (1 UF); Vedra Beach, 10.7 mi N Vilano Beach access rd (1 UF); Vedra Beach, 12.5 mi N Vilano Beach access rd (1 UF).

Florida mouse (*Podomys floridanus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FORR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Clay County*: no specific locality (2 UF). *Duval County*: TIMU, no evidence.

FOCA: Florida – *Clay County*: no specific locality (2 UF). *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: Anastasia Island (2 ChM, 2 UF); Anastasia Island, Espanita (8 FMNH); Anastasia Island, 5.5 mi S Saint Augustine (4 AMNH); Anastasia Island, 6 mi S Saint Augustine (1 AMNH); Anastasia Island, 12 mi S Saint Augustine (3 AMNH); Anastasia Island, 5.5 mi S Saint Augustine (4 AMNH); Anastasia Island, 6 mi S Saint Augustine (1 AMNH); Anastasia Island, Saint Augustine Beach (5 UMMZ); Anastasia Island, 1 mi S Saint Augustine Beach (3 UMMZ); Anastasia Island, 0.3 mi W Saint Augustine Beach (1 UF); Anastasia Island, 0.8 mi W Saint Augustine Beach (1 UF); Anastasia Island, 1.0 mi WNW Saint Augustine Beach (1 UF); Anastasia Island, 8.2 mi N FOMA (1 ChM); CASA, no evidence.

FOMA: Florida – *Saint Johns County*: Anastasia Island (2 ChM, 2 UF); Anastasia Island, Espanita (8 FMNH); Anastasia Island, 5.5 mi S Saint Augustine (4 AMNH); Anastasia Island, 6 mi S Saint Augustine (1 AMNH); Anastasia Island, 12 mi S Saint Augustine (3 AMNH); Anastasia Island, Saint Augustine Beach (5 UMMZ); Anastasia Island, 1 mi S Saint Augustine Beach (3 UMMZ); Anastasia Island, 0.3 mi W Saint Augustine Beach (1 UF); Anastasia Island, 0.8 mi W Saint Augustine Beach (1 UF); Anastasia Island, 1.0 mi WNW Saint Augustine Beach (1 UF); Anastasia Island, 8.2 mi N FOMA (1 ChM); FOMA, no evidence.

Golden mouse (*Ochrotomys nuttalli*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: Holly Shelter Gamelands (1 UNCW); MOCR (1 UNCW); Scotts Hill (12 UNCW).

FOSU: South Carolina – *Charleston County*: Charleston (1 MCZ, 2 USNM); 0.75 mi W Drayton, Hwy 62 (2 ROM); 3.75 mi W Drayton, Hwy 62 (1 ROM); FOSU, no evidence; Porchers Bluff (Sanders 1978).

FOMO: South Carolina – *Charleston County*: Charleston (1 MCZ, 2 USNM); 0.75 mi W Drayton, Hwy 62 (2 ROM); 3.75 mi W Drayton, Hwy 62 (1 ROM); FOMO, no evidence; Porchers Bluff (Sanders 1978).

CHPI: South Carolina – *Charleston County*: Charleston (1 MCZ, 2 USNM); CHPI, no evidence; 0.75 mi W Drayton, Hwy 62 (2 ROM); 3.75 mi W Drayton, Hwy 62 (1 ROM); Porchers Bluff (Sanders 1978).

CONG: South Carolina – *Richland County*: Columbia (1 USNM); CONG, no evidence; Fort Jackson (3 MHP).

HOBE: Alabama – *Clay County*: Talladega National Forest (2 CUMV). *Lee County*: Auburn (1 ROM, 2 UMMZ); 4 mi N Auburn (1 ROM). *Tallapoosa County*: HOBE (observation).

CHAT: Georgia – *Cobb County*: CHAT, no evidence; Marietta (2 UMMZ); Woodstock (4 UMMZ); no specific locality (2 UF). *DeKalb County*: no specific locality (1 USNM). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; [CHAT] Chattahoochee River at Long Island Creek (2 GMNH); Roswell (1 AMNH, 1 UMMZ); 2 mi N Roswell (1 CUMV); 3 mi N Roswell (1 CUMV). *Gwinnett County*: CHAT, Bowmans Island, Richland Creek (1 UNCW); CHAT, Suwanee Creek (1 UNCW). *County unknown*: Atlanta (2 USNM).

KEMO: Georgia – *Cobb County*: KEMO, no evidence; Marietta (2 UMMZ); Woodstock (4 UMMZ); no specific locality (2 UF). *Fulton County*: [CHAT] Chattahoochee River at Long Island Creek (2 GMNH); Roswell (1 AMNH, 1 UMMZ); 2 mi N Roswell (1 CUMV); 3 mi N Roswell (1 CUMV). *County unknown*: Atlanta (2 USNM).

OCMU: Georgia – *Bibb County*: 5 mi NE Macon (1 LSU); OCMU, no evidence. *Jones County*: Round Oak (1 USNM). *Twiggs County*: no specific locality (7 UF).

FOFR: Georgia – *Glynn County*: FOFR, no evidence. *Charlton County*: Okefenokee Swamp, Billys Bay (3 CUMV); Okefenokee Swamp, Chessers Island (1 CUMV).

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: Jacksonville (1 MCZ, 1 MSB); New Berlin (Bangs 1898); TIMU, Cedar Point (1 UNCW); TIMU, Theodore Roosevelt Area (1 UNCW); TIMU, Thomas Creek (1 UNCW); Yukon (1 MSB); no specific locality (2 UF).

FOCA: Florida – *Duval County*: FOCA, no evidence; Jacksonville (1 MCZ, 1 MSB); New Berlin (Bangs 1898); TIMU, Cedar Point (1 UNCW); TIMU, Theodore Roosevelt Area (2 UNCW); TIMU, Thomas Creek (1 UNCW); Yukon (1 MSB); no specific locality (2 UF).

CASA: Florida – *Saint Johns County*: CASA, no evidence; 2 mi W Crescent Beach (1 UF); Hastings (1 UF); Palm Valley (3 MSB, 1 UF); 10.7 mi N Vilano Beach access rd (1 UF).

FOMA: Florida – *Saint Johns County*: 2 mi W Crescent Beach (1 UF); FOMA, no evidence; Hastings (1 UF); Palm Valley (3 MSB, 1 UF); 10.7 mi N Vilano Beach access rd (1 UF).

Hispid cotton rat (*Sigmodon hispidus*)

CAHA: North Carolina – *Carteret County*: 3 mi W Smyrna (1 UNCW). *Dare County*: Head Woods (Lee et al. 1983; Webster 1988; Parnell et al. 1992); Roanoke Island (Lee et al. 1983; Webster 1988; Parnell et al. 1992). *Hyde County*: CAHA, Ocracoke Island, no evidence; Lake Mattamuskeet NWR (2 USNM).

WRBR: North Carolina – *Dare County*: Nags Head Woods (Lee et al. 1983; Webster 1988; Parnell et al. 1992); Roanoke Island (Lee et al. 1983; Webster 1988; Parnell et al. 1992); WRBR, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence; Lake Mattamuskeet NWR (2 USNM).

FORA: North Carolina – *Dare County*: FORA, no evidence; Nags Head Woods (Lee et al. 1983; Webster 1988; Parnell et al. 1992); Roanoke Island (Lee et al. 1983; Webster 1988; Parnell et al. 1992). *Hyde County*: CAHA, Ocracoke Island, no evidence; Lake Mattamuskeet NWR (2 USNM).

CALO: North Carolina – *Carteret County*: Beaufort (1 UMA); 0.5 mi N Beaufort (2 AMNH); CALO, no evidence; 3 mi W Smyrna (1 UNCW); no specific locality (Lee et al. 1983). *Hyde County*: Lake Mattamuskeet NWR (2 USNM).

MOCR: North Carolina – *Pender County*: 3 km NE Burgaw, I-40 (2 UNCW); 7 km SE Burgaw, I-40 (1 UNCW); 8 km SSE Burgaw, I-40 (4 UNCW); 6 km NNE Castle Hayne, I-40 (5 UNCW); MOCR (3 UNCW); 1 mi N Scotts Hill (2 UNCW); Topsail Beach (2 UNCW); 5 km S Warsaw, I-40 (1 UNCW); 2 km E Watha, I-40 (34 UNCW); 3 km E Willard, I-40 (10 UNCW).

FOSU: South Carolina – *Charleston County*: Bulls Island (Andre 1981); Charleston (1 USNM); Charleston (6 GMNH); 3.5 mi S Charleston (1 GMNH); 9 mi W Charleston, Rantowles Creek (2 KU); CHPI (clippings); Folly Beach (1 AMNH); FOMO (1 UNCW); FOSU, no evidence; Hanckles Place (1 SBMNH); 3.4 mi NE McClellansville (2 USNM); 4 mi N McClellansville (1 USNM); Mount Pleasant (Clark et al. 2002); Porchers Bluff (3 ROM); Saint Andrews Parish (3 CUMV, 1 KU, 3 MVZ); Stono River (1 MVZ); Wedge Plantation (Clark et al. 2002); Woodland Shores (4 ROM, 1 SBMNH, 2 SDNHM); Yongas Island (1 USNM).

FOMO: South Carolina – *Charleston County*: Bulls Island (Andre 1981); Charleston (1 USNM); Charleston (6 GMNH); 3.5 mi S Charleston (1 GMNH); 9 mi W Charleston, Rantowles Creek (2 KU); CHPI (clippings); Folly Beach (1 AMNH); FOMO (1 UNCW); Hanckles Place (1 SBMNH); 3.4 mi NE McClellansville (2 USNM); 4 mi N McClellansville (1 USNM); Mount Pleasant (Clark et al. 2002); Porchers Bluff (3 ROM); Saint Andrews Parish (3 CUMV, 1 KU, 3

MVZ); Stono River (1 MVZ); Wedge Plantation (Clark et al. 2002); Woodland Shores (4 ROM, 1 SBMNH, 2 SDNHM); Yongas Island (1 USNM).

CHPI: South Carolina – *Charleston County*: Bulls Island (Andre 1981); Charleston (1 USNM); Charleston (6 GMNH); 3.5 mi S Charleston (1 GMNH); 9 mi W Charleston, Rantowles Creek (2 KU); CHPI (clippings); Folly Beach (1 AMNH); FOMO (1 UNCW); Hanckles Place (1 SBMNH); 3.4 mi NE McClellansville (2 USNM); 4 mi N McClellansville (1 USNM); Mount Pleasant (Clark et al. 2002); Porchers Bluff (3 ROM); Saint Andrews Parish (3 CUMV, 1 KU, 3 MVZ); Stono River (1 MVZ); Wedge Plantation (Clark et al. 2002); Woodland Shores (4 ROM, 1 SBMNH, 2 SDNHM); Yongas Island (1 USNM).

CONG: South Carolina – *Richland County*: CONG (clippings); Fort Jackson (8 MHP).

HOBE: Alabama – *Clay County*: Talladega National Forest (5 CUMV). *Tallapoosa County*: HOBE (1 MSB).

CHAT: Georgia – *Cobb County*: CHAT, Johnson Ferry North (1 UNCW); CHAT, Johnson Ferry South (3 UNCW); KEMO (1 UNCW); Marietta (2 UMMZ, 7 USNM); 1 mi N Powder Springs (5 UF); no specific locality (1 UF). *DeKalb County*: no specific locality (Golley 1962). *Forsyth County*: CHAT, no evidence; Lake Lanier (Schnell 1964). *Fulton County*: Atlanta (3 MSB); Atlanta Zoo (25 MSB); Atlanta Metro (12 MSB); CHAT, no evidence; East Point (1 USNM); Roswell (1 AMNH, 5 UMMZ). *Gwinnett County*: CHAT, no evidence; Chattahoochee River (1 GMNH); Lawrenceville (1 MSB); Peachtree Industrial Blvd, 1 mi NE Pleasant Hill Rd (2 GMNH). *County unknown*: Atlanta (1 USNM).

KEMO: Georgia – *Cobb County*: CHAT, Johnson Ferry North (1 UNCW); CHAT, Johnson Ferry South (3 UNCW); KEMO (1 UNCW); Marietta (2 UMMZ, 7 USNM); 1 mi N Powder Springs (5 UF); no specific locality (1 UF). *Fulton County*: Atlanta (3 MSB); Atlanta Zoo (25 MSB); Atlanta Metro (12 MSB); East Point (1 USNM); Roswell (1 AMNH, 5 UMMZ). *County unknown*: Atlanta (1 USNM).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (3 UNCW).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Jekyll Island (1 GMNH); Sea Island (Wilson and Durden 2003); Saint Simons Island (3 CUMV); Sterling (Bangs 1898).

CUIS: Georgia – *Camden County*: CUIS (3 AMNH, at least 1 CIM, 14 GMNH, 18 MCZ, 1 MSB; Wilson and Durden 2003); Saint Marys (Bangs 1898; Elliot 1901).

TIMU: Florida – *Duval County*: Burnside Beach (Bangs 1898); Camp Yellow Water (1 MSB); Jacksonville (17 MCZ); north of Jacksonville (3 MSB); 4 mi N Jacksonville (2 AMNH); 5 mi W Jacksonville (4 AMNH); New Berlin (2 FMNH; Bangs 1898); TIMU, Cedar Point (observation); TIMU, Theodore Roosevelt Area (http://www.nps.gov/timu/naturescience/upload/tra_wildlifelist.pdf); TIMU, Thomas Creek (4 UNCW); Yukon (2 MSB). *Nassau County*: Amelia Island, 2 mi SSE Amelia City (3 AMNH); Amelia Island, 2 mi NE Fernandina (9 AMNH); 2 mi SE Hillard, Hwy 301 (1 UF); White Oak Conservation Center (observation).

FOCA: Florida – *Duval County*: Burnside Beach (Bangs 1898); Camp Yellow Water (1 MSB); FOCA, no evidence; Jacksonville (17 MCZ); north of Jacksonville (3 MSB); 4 mi N Jacksonville (2 AMNH); 5 mi W Jacksonville (4 AMNH); New Berlin (2 FMNH; Bangs 1898); TIMU, Cedar Point (observation); TIMU, Theodore Roosevelt Area (http://www.nps.gov/timu/naturescience/upload/tra_wildlifelist.pdf); TIMU, Thomas Creek (4 UNCW); Yukon (2 MSB). *Nassau County*: Amelia Island, 2 mi SSE Amelia City (3 AMNH); Amelia Island, 2 mi NE Fernandina (9 AMNH); 2 mi SE Hillard, Hwy 301 (1 UF); White Oak Conservation Center (observation).

CASA: Florida – *Saint Johns County*: Anastasia Island (1 CUMV, 1 KU, 14 MCZ, 15 UF); [Anastasia Island] 2 mi W Crescent Beach (1 MSU); Anastasia Island, 2.6 mi W Crescent Beach (4 UF); Anastasia Island, Espanita (8 FMNH); Anastasia Island, 2 mi N Matanzas Inlet (1 CUMV); Anastasia Island, Saint Augustine Beach (1 KU); Anastasia Island, 1 mi WNW Saint Augustine Beach (13 UF); Anastasia Island, 0.8 mi W Saint Augustine Beach (4 UF); Anastasia Island, 11.5 mi S Saint Augustine Beach (1 AMNH); Anastasia Island, 12.5 mi S Saint Augustine Beach (1 AMNH); Anastasia Island, 12 mi S Saint Augustine Beach (16 AMNH); Anastasia State Park (2 UF); Carterville (Bangs 1898); CASA, no evidence; [FOMA] Anastasia Island, Matanzas Inlet, 15 mi S Saint Augustine Beach (10 AMNH); FOMA, Main Unit (Humphrey et al., 1988); [FOMA] Anastasia Island, Point Romo (1 KU); FOMA, Rattlesnake Island (3 UNCW); [FOMA] Anastasia Island, 15 mi S Saint Augustine Beach (3 AMNH); [FOMA] Anastasia Island, south end (1 CUMV); Palm Valley (16 MSB); Saint Augustine (1 ROM); 4 mi SW Saint Augustine (2 KU).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 CUMV, 1 KU, 14 MCZ, 15 UF); [Anastasia Island] 2 mi W Crescent Beach (1 MSU); Anastasia Island, 2.6 mi W Crescent Beach (4 UF); Anastasia Island, Espanita (8 FMNH); Anastasia Island, 2 mi N Matanzas Inlet (1 CUMV); Anastasia Island, Saint Augustine Beach (1 KU); Anastasia Island, 1 mi WNW Saint Augustine Beach (13 UF); Anastasia Island, 0.8 mi W Saint Augustine Beach (4 UF); Anastasia Island, 11.5 mi S Saint Augustine Beach (1 AMNH); Anastasia Island, 12.5 mi S Saint Augustine Beach (1 AMNH); Anastasia Island, 12 mi S Saint Augustine Beach (16 AMNH); Anastasia State Park (2 UF); Carterville (Bangs 1898); [FOMA] Anastasia Island, Matanzas Inlet, 15 mi S Saint Augustine Beach (10 AMNH); FOMA, Main Unit (Humphrey et al., 1988); [FOMA] Anastasia Island, Point Romo (1 KU); FOMA, Rattlesnake Island (3 UNCW); [FOMA] Anastasia Island, 15 mi S Saint Augustine Beach (3 AMNH); [FOMA] Anastasia Island, south end (1 CUMV); Palm Valley (16 MSB); Saint Augustine (1 ROM); 4 mi SW Saint Augustine (2 KU).

Eastern woodrat (*Neotoma floridana*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence; 14.4 mi N Wilmington, I-40 (2 UNCW); no specific locality (Lee et al. 1983; Adams 1987).

FOSU: South Carolina – *Charleston County*: 6 mi NW Awendaw (1 AMNH); Charleston (1 USNM); 7.2 mi WSW Charleston (1 KU); 7 mi W Charleston (1 ChM); 7.5 mi W Charleston (1 KU); 12 mi W Charleston (1 ChM); FOSU, no evidence; near Goose Creek Causeway (1 ChM); Johns Island (1 ChM); 6 mi N McClellansville (2 KU); opposite Middleton Garden (1 ChM); Mount Pleasant (Clark et al. 2002); 9 mi NE Mount Pleasant (1 ChM); Otranta (8 ChM); 12 mi W Rantowles (1 ChM); Saint Andrews Parish (2 KU, 1 MVZ); Seabrook Beach (18 ChM); Wedge Plantation (Clark et al. 2002).

FOMO: South Carolina – *Charleston County*: 6 mi NW Awendaw (1 AMNH); Charleston (1 USNM); 7.2 mi WSW Charleston (1 KU); 7 mi W Charleston (1 ChM); 7.5 mi W Charleston (1 KU); 12 mi W Charleston (1 ChM); FOMO, no evidence; near Goose Creek Causeway (1 ChM); Johns Island (1 ChM); 6 mi N McClellansville (2 KU); opposite Middleton Garden (1 ChM); Mount Pleasant (Clark et al. 2002); 9 mi NE Mount Pleasant (1 ChM); Otranta (8 ChM); 12 mi W Rantowles (1 ChM); Saint Andrews Parish (2 KU, 1 MVZ); Seabrook Beach (18 ChM); Wedge Plantation (Clark et al. 2002).

CHPI: South Carolina – *Charleston County*: 6 mi NW Awendaw (1 AMNH); Charleston (1 USNM); 7.2 mi WSW Charleston (1 KU); 7 mi W Charleston (1 ChM); 7.5 mi W Charleston (1 KU); 12 mi W Charleston (1 ChM); CHPI, no evidence; near Goose Creek Causeway (1 ChM); Johns Island (1 ChM); 6 mi N McClellansville (2 KU); opposite Middleton Garden (1 ChM); Mount Pleasant (Clark et al. 2002); 9 mi NE Mount Pleasant (1 ChM); Otranta (8 ChM); 12 mi W Rantowles (1 ChM); Saint Andrews Parish (2 KU, 1 MVZ); Seabrook Beach (18 ChM); Wedge Plantation (Clark et al. 2002).

CONG: South Carolina – *Richland County*: CONG (3 MSB, 1 UNCW); Fort Jackson (1 MHP).

HOBE: Alabama – *Clay County*: Cedar Mountain, 1500-2000 feet (Howell 1921). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, Lamar Unit (stick nests); south of Macon (2 GMNH); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, Frederica Site (2 UNCW); Saint Simons Island (1 CUMV, 3 USNM).

CUIS: Georgia – *Camden County*: CUIS, no evidence; Saint Marys (4 AMNH, 18 MCZ, 2 MVZ); Saint Marys, probably (1 GMNH). *Charlton County*: Okefenokee Swamp, Floyds Island (1 AMNH, 1 USNM); Okefenokee Swamp, Suwanee Canal (2 USNM).

TIMU: Florida – *Duval County*: 4 mi N Jacksonville, Panama Park (1 AMNH); 5 mi W Jacksonville (1 AMNH); New Berlin (Bangs 1898); TIMU, Cedar Point (observation, tunnels, and scat).

FOCA: Florida – *Duval County*: FOCA, no evidence; 4 mi N Jacksonville, Panama Park (1 AMNH); 5 mi W Jacksonville (1 AMNH); New Berlin (Bangs 1898); TIMU, Cedar Point (observation, tunnels, and scat).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Meadow vole (*Microtus pennsylvanicus*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (5 UNCW); CAHA, Buxton (1 UNCW); CAHA, Cape Hatteras (1 UNCW); CAHA, Hatteras Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (1 UNCW); Nags Head (1 UNCW); Roanoke Island (Parnell et al. 1992); no specific locality (2 NCSU). *Hyde County*: CAHA, Ocracoke Island, no evidence; Wyesocking Bay (1 NCSU).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (5 UNCW); CAHA, Buxton (1 UNCW); CAHA, Cape Hatteras (1 UNCW); CAHA, Hatteras Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (1 UNCW); Nags Head (1 UNCW); Roanoke Island (Parnell et al. 1992); WRBR, no evidence; no specific locality (2 NCSU). *Hyde County*: CAHA, Ocracoke Island, no evidence; Wyesocking Bay (1 NCSU).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (5 UNCW); CAHA, Buxton (1 UNCW); CAHA, Cape Hatteras (1 UNCW); CAHA, Hatteras Inlet (Parnell et al. 1992); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (1 UNCW); FORA, no evidence; Nags Head (1 UNCW); Roanoke Island (Parnell et al. 1992); no specific locality (2 NCSU). *Hyde County*: CAHA, Ocracoke Island, no evidence; Wyesocking Bay (1 NCSU).

CALO: North Carolina – *Carteret County*: CALO, no evidence. *Hyde County*: Wyesocking Bay (1 NCSU).

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: Cape Island, Cape Romain NWR (6 ChM); FOSU, no evidence. *County unknown*: near the Santee River (Nelson 1934).

FOMO: South Carolina – *Charleston County*: Cape Island, Cape Romain NWR (6 ChM); FOMO, no evidence. *County unknown*: near the Santee River (Nelson 1934).

CHPI: South Carolina – *Charleston County*: Cape Island, Cape Romain NWR (6 ChM); CHPI, no evidence. *County unknown*: near the Santee River (Nelson 1934).

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence; Chattahoochee River (2 GMNH); 2 mi W Duluth (2 GMNH). *Polk County*: no specific locality (Golley 1962).

KEMO: Georgia – *Cobb County*: KEMO, no evidence. *Polk County*: no specific locality (Golley 1962).

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Woodland vole (*Microtus pinetorum*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: 8 km SSE Burgaw, I-40 (1 UNCW); Holly Shelter Gamelands (4 UNCW); MOCR, no evidence; Scotts Hill (2 UNCW); 2 km E Watha, I-40 (1 UNCW).

FOSU: South Carolina – *Charleston County*: Charleston (1 ChM); Charleston, Porchers Bluff (5 ChM, 1 MVZ); Charleston, Woodland Shores (7 ChM); 6 mi NW Charleston (1 ChM); 12 mi N Charleston (1 ChM); 3 mi W Drayton St, Hwy 62 (1 ChM); FOSU, no evidence; James Island (1 AMNH); Little Goose Creek (1 ChM); Magnolia Gardens (1 ChM); Old Fort Bull (1 KU); Saint Andrews Parish (6 ChM, 1 KU); Saint Andrews Parish, Legares Farm (3 KU); Saint Helena (3 USNM); Woodland Shores (4 ROM).

FOMO: South Carolina – *Charleston County*: Charleston (1 ChM); Charleston, Porchers Bluff (5 ChM, 1 MVZ); Charleston, Woodland Shores (7 ChM); 6 mi NW Charleston (1 ChM); 12 mi N Charleston (1 ChM); 3 mi W Drayton St, Hwy 62 (1 ChM); FOMO, no evidence; James Island (1 AMNH); Little Goose Creek (1 ChM); Magnolia Gardens (1 ChM); Old Fort Bull (1 KU); Saint Andrews Parish (6 ChM, 1 KU); Saint Andrews Parish, Legares Farm (3 KU); Saint Helena (3 USNM); Woodland Shores (4 ROM).

CHPI: South Carolina – *Charleston County*: Charleston (1 ChM); Charleston, Porchers Bluff (5 ChM, 1 MVZ); Charleston, Woodland Shores (7 ChM); 6 mi NW Charleston (1 ChM); 12 mi N Charleston (1 ChM); CHPI, no evidence; 3 mi W Drayton St, Hwy 62 (1 ChM); James Island (1 AMNH); Little Goose Creek (1 ChM); Magnolia Gardens (1 ChM); Old Fort Bull (1 KU); Saint Andrews Parish (6 ChM, 1 KU); Saint Andrews Parish, Legares Farm (3 KU); Saint Helena (3 USNM); Woodland Shores (4 ROM).

CONG: South Carolina – *Kershaw County*: no specific locality (Golley 1966). *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE (1 UNCW).

CHAT: Georgia – *Cobb County*: CHAT, no evidence; Lake Alatoona, Hwy 41 (2 GMNH). *DeKalb County*: no specific locality (Golley 1962). *Forsyth County*: CHAT, Bowmans Island, dam access (2 UNCW). *Fulton County*: CHAT, Island Ford (1 UNCW); [CHAT] Chattahoochee River at Long Island Creek (2 GMNH); East Point (1 USNM). *Gwinnett County*: CHAT, Abbotts Bridge (1 UNCW); CHAT, Bowmans Island, Island Ford Rd (2 UNCW); CHAT, Level Creek (1 UNCW); Chattahoochee River (8 GMNH); 2 mi NW Duluth (6 GMNH). *County unknown*: Atlanta (1 AMNH).

KEMO: Georgia – *Cobb County*: KEMO, no evidence; Lake Alatoona, Hwy 41 (2 GMNH). *Fulton County*: CHAT, Island Ford (1 UNCW); [CHAT] Chattahoochee River at Long Island Creek (2 GMNH); East Point (1 USNM). *County unknown*: Atlanta (1 AMNH).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (1 UNCW).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Round-tailed muskrat (*Neofiber alleni*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence; no specific locality (Golley 1962). *Charlton County*: Okefenokee Swamp, Floyds Island (2 AMNH, 1 CUMV, 3 GMNH); Okefenokee Swamp, Billys Island (1 CUMV); Okefenokee Swamp, Chessers Island (4 CUMV); Okefenokee Swamp, 23 mi SE Waycross (1 MSB); 23 mi SE Waycross, Kings Landing (5 GMNH); no specific locality (1 MVZ).

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Flagler County*: 1.8 mi W Flagler Beach (4 KU). *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Flagler County*: 1.8 mi W Flagler Beach (4 KU). *Saint Johns County*: FOMA, no evidence.

Common muskrat (*Ondatra zibethicus*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); CAHA, Buxton Woods (1 UNCW); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Pea Island NWR (4 NCSM, 1 UNCW); [CAHA] Pea Island Refuge (1 CUMV); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (1 UNCW); FORA (observation); Nags Head, Hwy 158 (1 USNM); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992). *Hyde County*: CAHA, Ocracoke Island (Webster 1988; Parnell et al. 1992); no specific locality (4 MCZ).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); CAHA, Buxton Woods (1 UNCW); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Pea Island NWR (4 NCSM, 1 UNCW); [CAHA] Pea Island Refuge (1 CUMV); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (1 UNCW); FORA (observation); Nags Head, Hwy 158 (1 USNM); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR, no evidence.

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); CAHA, Buxton Woods (1 UNCW); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Pea Island NWR (4 NCSM, 1 UNCW); [CAHA] Pea Island Refuge (1 CUMV); [CAHA] Pea Island NWR, 5 mi S Oregon Inlet (1 UNCW); FORA (observation); Nags Head, Hwy 158 (1 USNM); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992).

CALO: North Carolina – *Carteret County*: CALO, South Core Banks (tracks); CALO, Portsmouth Island (tracks); CALO, Shackleford Banks (tracks and scat; Webster 1987a). *Hyde County*: CAHA, Ocracoke Island (Webster 1988; Parnell et al. 1992); no specific locality (4 MCZ).

MOCR: North Carolina – *Pender County*: MOCR, no evidence; no specific locality (Funderburg 1961a). *New Hanover County*: Wilmington (1 UNCW; Webster et al. 1984).

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Calhoun County*: no specific locality (Golley, 1966). *Richland County*: CONG, no evidence; no specific locality (Golley 1966).

HOBE: Alabama – *Clay County*: Auburn (1 LSU, 3 UMMZ); Erin (Howell 1921). *Coosa County*: Mount Weogufka (Howell 1921). *Lee County*: 2 mi N Notasulga (1 LSU). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: Ben Hill, Owl Rock Church (1 GMNH); CHAT, Vickery Creek (tracks); Roswell (1 NYSM). *Gwinnett County*: Albion Farm (1 GMNH); CHAT, Medlock Bridge (tracks).

KEMO: Georgia – *Cobb County*: KEMO, no evidence. *Fulton County*: Ben Hill, Owl Rock Church (1 GMNH); CHAT, Vickery Creek (tracks); Roswell (1 NYSM).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (tracks); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Black rat (*Rattus rattus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island (2 UMA; Engels 1942).

WRBR: North Carolina – *Dare County*: WRBR, no evidence. *Hyde County*: CAHA, Ocracoke Island (2 UMA; Engels 1942).

FORA: North Carolina – *Dare County*: FORA, no evidence. *Hyde County*: CAHA, Ocracoke Island (2 UMA; Engels 1942).

CALO: North Carolina – *Carteret County*: CALO, no evidence. *Hyde County*: CAHA, Ocracoke Island (2 UMA; Engels 1942).

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence; no specific locality (Golley 1962).

FOMO: South Carolina – *Charleston County*: FOMO, no evidence; no specific locality (Golley 1962).

CHPI: South Carolina – *Charleston County*: CHPI, no evidence; no specific locality (Golley 1962).

CONG: South Carolina – *Richland County*: CONG, no evidence. *Sumter County*: Poinsett State Park (Clark et al. 2002).

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: Atlanta Zoo (1 MSB); Atlanta Metro (35 MSB); Atlanta Farmers Market (3 MSB); SE Atlanta (1 GMNH); CHAT, no evidence; East Point (2 GMNH); no specific locality (1 MSB). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence. *Fulton County*: Atlanta Zoo (1 MSB); Atlanta Metro (35 MSB); Atlanta Farmers Market (3 MSB); SE Atlanta (1 GMNH); East Point (2 GMNH); no specific locality (1 MSB).

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Sterling (70 MCZ, 5 USNM); Jekyll Island (Neuhauser and Baker 1974).

CUIS: Georgia – *Camden County*: CUIS (4 MCZ; Wilson and Durden 2003); Saint Marys (6 GMNH, 2 MVZ); Saint Marys, probably (3 GMNH).

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: Anastasia Island (1 MCZ, 1 UF; Pournelle and Barrington 1953); FOMA, Anastasia Island, (2 UF); Anastasia Island State Park (1 UF); [Anastasia Island] 0.5 mi W Anastasia State Park (1 UF); [Anastasia Island] Espanita (1 FMNH); CASA, no evidence; FOMA, Main Unit (Humphrey et al. 1988); FOMA, Rattlesnake Island (1 UNCW; Humphrey et al. 1988); 3 mi W Saint Augustine (1 GMNH).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 MCZ, 1 UF; Pournelle and Barrington 1953); FOMA, Anastasia Island (2 UF); Anastasia Island State Park (1 UF); [Anastasia Island] 0.5 mi W Anastasia State Park (1 UF); [Anastasia Island] Espanita (1 FMNH); FOMA, Main Unit (Humphrey et al. 1988); FOMA, Rattlesnake Island (1 UNCW; Humphrey et al. 1988); 3 mi W Saint Augustine (1 GMNH).

Norway rat (*Rattus norvegicus*)

CAHA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Boone 1988; Webster 1988); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Hatteras Island, Pea Island NWR (2 NCSU, 1 VCU); Frisco (Parnell et al. 1992); Roanoke Island (observation).
Hyde County: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Boone 1988; Webster 1988); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Hatteras Island, Pea Island NWR (2 NCSU, 1 VCU); Frisco (Parnell et al. 1992); Roanoke Island (observation); WRBR, no evidence.

FORA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Boone 1988; Webster 1988); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Hatteras Island, Pea Island NWR (2 NCSU, 1 VCU); FORA, no evidence; Frisco (Parnell et al. 1992); Roanoke Island (observation).

CALO: North Carolina – *Carteret County*: CALO, Portsmouth Village (1 CALO).

MOCR: North Carolina – *Pender County*: MOCR, no evidence; no specific locality (1 UNCW).

FOSU: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (1 USNM); Cape Island, Cape Romain NWR (Sanders 1978); FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (1 USNM); Cape Island, Cape Romain NWR (Sanders 1978); FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (1 USNM); Cape Island, Cape Romain NWR (Sanders 1978); CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence; KEMO (1 UNCW); [Marietta] 1200 ft (1 USNM). *Forsyth County*: CHAT, no evidence. *Fulton County*: Atlanta Farmers Market (1

MSB); Atlanta Metro (10 MSB); CHAT, no evidence; no specific locality (3 MSB). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO (1 UNCW); [Marietta] 1200 ft (1 USNM). *Fulton County*: Atlanta Farmers Market (1 MSB); Atlanta Metro (10 MSB); no specific locality (3 MSB).

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Sterling (1 MCZ).

CUIS: Georgia – *Camden County*: CUIS, no evidence. *Charlton County*: Okefenokee Swamp, Billys Island (1 CUMV).

TIMU: Florida – *Duval County*: Jacksonville (1 USNM; Bangs 1898); TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence; Jacksonville (1 USNM; Bangs 1898);

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

House mouse (*Mus musculus*)

CAHA: North Carolina – *Dare County*: Avon (1 MSB); CAHA, Bodie Island (1 NCSU, 58 UNCW), CAHA, Buxton (1 NCSM); CAHA, Cape Hatteras (1 UNCW, 2 USNM); CAHA, Frisco (Parnell et al. 1992); [CAHA] Little Kinnakeet (1 UNCW); [CAHA] Oregon Inlet Coast Guard Station (1 USNM); [CAHA] Pea Island NWR (1 NCSM, 18 VCU); Manteo (Lee et al. 1983); Roanoke Island (observation); Rodanthe (Parnell et al. 1992). *Hyde County*: CAHA, Ocracoke Island (Engels 1942; Webster 1988); Lake Landing (2 USNM).

WRBR: North Carolina – *Dare County*: Avon (1 MSB); CAHA, Bodie Island (1 NCSU, 58 UNCW), CAHA, Buxton (1 NCSM); CAHA, Cape Hatteras (1 UNCW, 2 USNM); CAHA, Frisco (Parnell et al. 1992); [CAHA] Little Kinnakeet (1 UNCW); [CAHA] Oregon Inlet Coast Guard Station (1 USNM); [CAHA] Pea Island NWR (1 NCSM, 18 VCU); Manteo (Lee et al. 1983); Roanoke Island (observation); Rodanthe (Parnell et al. 1992); WRBR, no evidence.

FORA: North Carolina – *Dare County*: Avon (1 MSB); CAHA, Bodie Island (1 NCSU, 58 UNCW), CAHA, Buxton (1 NCSM); CAHA, Cape Hatteras (1 UNCW, 2 USNM); CAHA, Frisco (Parnell et al. 1992); FORA, no evidence; [CAHA] Little Kinnakeet (1 UNCW); [CAHA] Oregon Inlet Coast Guard Station (1 USNM); [CAHA] Pea Island NWR (1 NCSM, 18 VCU); Manteo (Lee et al. 1983); Roanoke Island (observation); Rodanthe (Parnell et al. 1992).

CALO: North Carolina – *Carteret County*: CALO, Cape Lookout (tracks and scat); CALO, Core Banks (1 CALO); CALO, Core Banks, 12 mi N lighthouse (1 CALO); CALO, Portsmouth Island (1 UMA); CALO, Portsmouth Village (1 CALO, 1 UMA); CALO, Shackleford Banks (Engels 1952); Fort Macon (2 USNM); Morehead City (7 KU, 2 USNM); no specific locality (Lee et al. 1983).

MOCR: North Carolina – *Pender County*: Holly Shelter Gamelands (1 UNCW); MOCR, no evidence; 2 km E Watha, I-40 (2 UNCW).

FOSU: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (2 USNM); 3 mi W Charleston (5 GMNH); CHPI (observation); Edisto Island (1 GMNH, 1 ROM); Folly Island (1 ROM); FOMO (2 UNCW); FOSU, no evidence; 3.4 mi NE McClellansville (1 USNM); Seabrook Island, mouth of Edisto River (1 USNM).

FOMO: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (2 USNM); 3 mi W Charleston (5 GMNH); CHPI (observation); Edisto Island (1 GMNH, 1 ROM); Folly Island (1 ROM); FOMO (2 UNCW); 3.4 mi NE McClellansville (1 USNM); Seabrook Island, mouth of Edisto River (1 USNM).

CHPI: South Carolina – *Charleston County*: Bulls Island, Cape Romain NWR (2 USNM); 3 mi W Charleston (5 GMNH); CHPI (observation); Edisto Island (1 GMNH, 1 ROM); Folly Island (1 ROM); FOMO (2 UNCW); 3.4 mi NE McClellansville (1 USNM); Seabrook Island, mouth of Edisto River (1 USNM).

CONG: South Carolina – *Richland County*: CONG, no evidence; no specific locality (Golley 1966).

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence; no specific locality (1 UF). *Forsyth County*: CHAT, no evidence. *Fulton County*: Atlanta Metro (7 MSB); Atlanta Zoo (3 MSB); Browns Lake (1 GMNH); CHAT, no evidence; Jimmy Carter Center (10 MSB). *Gwinnett County*: CHAT, no evidence; Chattahoochee River (2 GMNH); Lawrenceville (3 MSB).

KEMO: Georgia – *Cherokee County*: Canton (1 USNM). *Cobb County*: KEMO, no evidence; no specific locality (1 UF). *Fulton County*: Atlanta Metro (7 MSB); Atlanta Zoo (3 MSB); Browns Lake (1 GMNH); Jimmy Carter Center (10 MSB).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Houston County*: no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Sterling (5 MCZ).

CUIS: Georgia – *Camden County*: CUIS, no evidence. *Charlton County*: Billys Island (3 CUMV).

TIMU: Florida – *Duval County*: 5 mi N Jacksonville (10 CAS); TIMU, no evidence. *Nassau County*: Fernandina Beach, 3 mi N pier (3 UF).

FOCA: Florida – *Duval County*: FOCA, no evidence; 5 mi N Jacksonville (10 CAS). *Nassau County*: Fernandina Beach, 3 mi N pier (3 UF).

CASA: Florida – *Saint Johns County*: Anastasia Island (1 USNM); Anastasia State Park, south end (2 OMNH); Anastasia Island State Recreation Area (2 UF); Anastasia Island, Espanita

(Elliot 1901); CASA, no evidence; FOMA, Rattlesnake Island (observation); Palm Valley (1 MSB); Vedra Beach, 3.3 mi N Vilano Beach assess rd (1 UF).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 USNM); Anastasia State Park, south end (2 OMNH); Anastasia Island State Recreation Area (2 UF); Anastasia Island, Espanita (Elliot 1901); FOMA, Rattlesnake Island (observation); Palm Valley (1 MSB); Vedra Beach, 3.3 mi N Vilano Beach assess rd (1 UF).

Meadow jumping mouse (*Zapus hudsonius*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Lee County*: 4 mi N Auburn (Sullivan 1954). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Dawson County*: no specific locality (Golley 1962). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; [CHAT] Chattahoochee River at Long Island Creek (4 GMNH); 3 mi SW Roswell (1 LSU). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence. *Fulton County*: [CHAT] Chattahoochee River at Long Island Creek (4 GMNH).

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Nutria (*Myocastor coypus*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (observation, tracks, and scat; Boone 1988; Webster 1988; Parnell et al. 1992); CAHA, Buxton (1 NCSM, 4 NCSU; observation); CAHA, Hatteras (1 UNCW); [CAHA] Pea Island NWR (1 NCSM, 1 UNCW); [CAHA] Pea Island NWR, 0.5 mi S Oregon Inlet (1 UNCW); Duck (1 USNM); FORA (tracks and scat); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); no specific locality (1 UF). *Hyde County*: CAHA, Ocracoke Island (1 UMA; tracks and scat; Parnell et al. 1992).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (observation, tracks, and scat; Boone 1988; Webster 1988; Parnell et al. 1992); CAHA, Buxton (1 NCSM, 4 NCSU; observation); CAHA, Hatteras (1 UNCW); [CAHA] Pea Island NWR (1 NCSM, 1 UNCW); [CAHA] Pea Island NWR, 0.5 mi S Oregon Inlet (1 UNCW); Duck (1 USNM); FORA (tracks and scat); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR, no evidence; no specific locality (1 UF).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (observation, tracks, and scat; Boone 1988; Webster 1988; Parnell et al. 1992); CAHA, Buxton (1 NCSM, 4 NCSU; observation); CAHA, Hatteras (1 UNCW); [CAHA] Pea Island NWR (1 NCSM, 1 UNCW); [CAHA] Pea Island NWR, 0.5 mi S Oregon Inlet (1 UNCW); Duck (1 USNM); FORA (tracks and scat); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); no specific locality (1 UF).

CALO: North Carolina – *Carteret County*: Bogue Banks (tracks and scat; Webster 1988); CALO, Core Banks (Webster et al. 1984); CALO, Portsmouth Island (tracks and scat); CALO, Shackleford Banks (tracks and scat; Webster et al., 1984; Webster 1987a); CALO, South Core Banks (2 CALO; tracks and scat); Cedar Island NWR (Webster et al. 1984); island between Harkers Island and Shackleford Banks (1 UNCW; Webster et al. 1984).

MOCR: North Carolina – *New Hanover County*: Wilmington (1 UNCW). *Pender County*: MOCR, no evidence; Northeast Cape Fear River (observation).

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (observation).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: Jacksonville Bay (1 UF); TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Coyote (*Canis latrans*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR (tracks); 3 km SE Watha, I-40 (1 UNCW).

FOSU: South Carolina – *Charleston County*: Edisto Island (Golley 1966); FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: Edisto Island (Golley 1966); FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: Edisto Island (Golley 1966); CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG (tracks and scat).

HOBE: Alabama – *Macon County*: (*C. latrans* X *C. familiaris* hybrid) no specific locality (1 USNM). *Tallapoosa County*: HOBE (tracks).

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals (scat); CHAT, Gold Branch (tracks); CHAT, Johnson Ferry North (scat); CHAT, Johnson Ferry South (scat); CHAT, Palisades West (scat); KEMO (tracks). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, Jones Bridge (tracks); CHAT, McGinnis Ferry (scat); CHAT, Palisades East (scat). *Gwinnett County*: CHAT, Abbotts Bridge (tracks and scat); CHAT, Bowmans Island, Richland Creek (tracks); CHAT, Cochran Shoals, parking area (scat); CHAT, Settles Bridge (tracks); CHAT, Suwanee Creek (tracks and scat).

KEMO: Georgia – *Cobb County*: CHAT, Cochran Shoals (scat); CHAT, Gold Branch (tracks); CHAT, Johnson Ferry North (scat); CHAT, Johnson Ferry South (scat); CHAT, Palisades West

(scat); KEMO (tracks). *Fulton County*: CHAT, Jones Bridge (tracks); CHAT, McGinnis Ferry (scat); CHAT, Palisades East (scat).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (tracks and scat); OCMU, Lamar Unit (tracks).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, Fort George Island (tracks and scat); TIMU, Sohn Tract (tracks and scat); TIMU, Thomas Creek (scat).

FOCA: Florida – *Duval County*: FOCA, no evidence; TIMU, Fort George Island (tracks and scat); TIMU, Sohn Tract (tracks); TIMU, Thomas Creek (scat).

CASA: Florida – *Saint Johns County*: CASA, no evidence; FOMA, Main Unit (tracks); FOMA, Rattlesnake Island (tracks and scat).

FOMA: Florida – *Saint Johns County*: FOMA, Main Unit (tracks); FOMA, Rattlesnake Island (tracks and scat).

Domestic/feral dog (*Canis familiaris*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (observation and tracks); CAHA, Hatteras Island (observation and tracks); FORA (observation and tracks); WRBR (observation and tracks). *Hyde County*: CAHA, Ocracoke Island (observation and tracks).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (observation and tracks); CAHA, Hatteras Island (observation and tracks); FORA (observation and tracks); WRBR (observation and tracks).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (observation and tracks); CAHA, Hatteras Island (observation and tracks); FORA (observation and tracks); WRBR (observation and tracks).

CALO: North Carolina – *Carteret County*: CALO, Portsmouth Island (tracks); CALO, Shackleford Banks (tracks); CALO, South Core Banks (tracks).

MOCR: North Carolina – *Pender County*: MOCR (tracks).

FOSU: South Carolina – *Charleston County*: CHPI (tracks); FOMO (tracks); FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: CHPI (tracks); FOMO (tracks).

CHPI: South Carolina – *Charleston County*: CHPI (tracks); FOMO (tracks).

CONG: South Carolina – *Richland County*: CONG (tracks).

HOBE: Alabama – *Macon County*: (*C. latrans* X *C. familiaris* hybrid) no specific locality (1 USNM). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals (observation, tracks, and scat); CHAT, Gold Branch (observation and tracks); CHAT, Johnson Ferry North (observation and tracks); CHAT, Johnson Ferry South (observation, tracks, and scat); CHAT, Palisades West (observation, tracks, and scat); KEMO (observation, tracks, and scat); 1 mi N Powder Springs (1 UF). *Forsyth County*: CHAT, Bowmans Island, dam access (observation, tracks, and scat). *Fulton County*: CHAT, Abbotts Bridge (observation and tracks); CHAT, Holcomb Bridge (tracks); CHAT, Island Ford (observation, tracks, and scat); CHAT, Jones Bridge (observation, tracks, and scat); CHAT, McGinnis Ferry (tracks and scat); CHAT, Palisades East (tracks); CHAT, Vickery Creek (tracks). *Gwinnett County*: CHAT, Abbotts Bridge (observation and tracks); CHAT, Bowmans Island, Island Ford Rd (tracks); CHAT, Level Creek (tracks); CHAT, Medlock Bridge (observation and tracks); CHAT, Orrs Ferry (tracks); CHAT, Settles Bridge (tracks); CHAT, Suwanee Creek (tracks).

KEMO: Georgia – *Cobb County*: CHAT, Cochran Shoals (observation, tracks, and scat); CHAT, Gold Branch (observation and tracks); CHAT, Johnson Ferry North (observation and tracks); CHAT, Johnson Ferry South (observation, tracks, and scat); CHAT, Palisades West (observation, tracks, and scat); KEMO (observation, tracks, and scat); 1 mi N Powder Springs (1 UF).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (tracks); OCMU, Lamar Unit (tracks).

FOFR: Georgia – *Glynn County*: FOFR, Main Unit (tracks).

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: 2 km W entrance to Cedar Point (1 UNCW); TIMU, Cedate Point (tracks); TIMU, Theodore Roosevelt Area (observation and tracks). *Nassau County*: no specific locality (1 UF).

FOCA: Florida – *Duval County*: 2 km W entrance to Cedar Point (1 UNCW); FOCA (observation); TIMU, Cedate Point (tracks); TIMU, Theodore Roosevelt Area (observation and tracks). *Nassau County*: no specific locality (1 UF).

CASA: Florida – *Saint Johns County*: CASA, Main Unit (observation); FOMA, Main Unit (observation and tracks).

FOMA: Florida – *Saint Johns County*: CASA, Main Unit (observation); FOMA, Main Unit (observation and tracks).

Red wolf (*Canis rufus*)

CAHA: North Carolina – *Dare County*: Alligator National Wildlife Refuge (1 PSM); CAHA, no evidence. *Hyde County*: Alligator National Wildlife Refuge (1 PSM); CAHA, Ocracoke Island, no evidence. *County unknown*: Alligator National Wildlife Refuge (1 PSM).

WRBR: North Carolina – *Dare County*: Alligator National Wildlife Refuge (1 PSM); CAHA, no evidence. *Hyde County*: Alligator National Wildlife Refuge (1 PSM); CAHA, Ocracoke Island, no evidence. *County unknown*: Alligator National Wildlife Refuge (1 PSM).

FORA: North Carolina – *Dare County*: Alligator National Wildlife Refuge (1 PSM); CAHA, no evidence. *Hyde County*: Alligator National Wildlife Refuge (1 PSM); CAHA, Ocracoke Island, no evidence. *County unknown*: Alligator National Wildlife Refuge (1 PSM).

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Tallapoosa County*: HOBE, no evidence. *Unknown county*: Tallapoosa River, near Cooloma (Bartram 1791).

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence. *Charlton County*: Okefenokee Swamp (Harper 1927).

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Putnam County*: 12 mi S Platka, Horse Landing, Saint Johns River (1 USNM). *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Putnam County*: 12 mi S Platka, Horse Landing, Saint Johns River (1 USNM). *Saint Johns County*: FOMA, no evidence.

Red fox (*Vulpes vulpes*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (observation); CAHA, Hatteras Island (1 CAHA; observation); WRBR (observation); no specific locality (Lee et al. 1983).

Hyde County: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (observation); CAHA, Hatteras Island (1 CAHA; observation); WRBR (observation); no specific locality (Lee et al. 1983).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (observation); CAHA, Hatteras Island (1 CAHA; observation); FORA, no evidence; WRBR (observation); no specific locality (Lee et al. 1983).

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence; no specific locality (Lee et al. 1983).

FOSU: South Carolina – *Charleston County*: CHPI (observation); FOSU, no evidence; no specific locality (Golley 1966).

FOMO: South Carolina – *Charleston County*: CHPI (observation); FOMO, no evidence; no specific locality (Golley 1966).

CHPI: South Carolina – *Charleston County*: CHPI (observation); no specific locality (Golley 1966).

CONG: South Carolina – *Fairfield County*: no specific locality (Golley 1966). *Richland County*: CONG, no evidence.

HOBE: Alabama – *Coosa County*: Mount Weogufka (Howell 1921). *Lee County*: Loachapoka (1 UMMZ). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; Roswell (1 GMNH). *Gwinnett County*: CHAT, Orrs Ferry (observation); no specific locality (Golley 1962).

KEMO: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: KEMO, no evidence. *Fulton County*: Roswell (1 GMNH).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (observation). *Jones County*: no specific locality (Golley 1962). *Monroe County*: no specific locality (Golley 1962). *Talbot County*: 1.5 mi E Geneva (2 KU); no specific locality (9 MVZ).

FOFR: Georgia – *Brantley County*: no specific locality (Golley 1962). *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Brantley County*: no specific locality (Golley 1962). *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: FOCA (observation); TIMU, Theodore Roosevelt Area (observation).

FOCA: Florida – *Duval County*: FOCA (observation); TIMU, Theodore Roosevelt Area (observation).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Common gray fox (*Urocyon cinereoargenteus*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); CAHA, Buxton Woods (roadkill); CAHA, near Frisco (tracks); CAHA, 0.5 mi S Whalebone Junction, Hwy 12 (1 UNCW); [CAHA] Pea Island NWR (Lee et al. 1983); Kill Devil Hills (1 UNCW); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (1 UNCW; Parnell et al. 1992); no specific evidence (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); CAHA, Buxton Woods (roadkill); CAHA, near Frisco (tracks); CAHA, 0.5 mi S Whalebone Junction, Hwy 12 (1 UNCW); [CAHA] Pea Island NWR (Lee et al. 1983); Kill Devil Hills (1 UNCW); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (1 UNCW; Parnell et al. 1992); no specific evidence (Lee et al. 1983).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (1 UNCW); CAHA, Buxton Woods (roadkill); CAHA, near Frisco (tracks); CAHA, 0.5 mi S Whalebone Junction, Hwy 12 (1 UNCW); [CAHA] Pea Island NWR (Lee et al. 1983); FORA, no evidence; Kill Devil Hills (1 UNCW); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (1 UNCW; Parnell et al. 1992); no specific evidence (Lee et al. 1983).

CALO: North Carolina – *Carteret County*: Bogue Banks (Lee et al. 1983); CALO, no evidence; Morehead City (1 UNCW).

MOCR: North Carolina – *Pender County*: MOCR (tracks); Ogden (1 UNCW); Rocky Point (1 UNCW); no specific locality (1 UNCW).

FOSU: South Carolina – *Charleston County*: 4.3 mi SW Awendaw (1 ChM); Hwy 17 between Awendaw and McClellansville (1 USNM); Charleston (Golley 1966); 5 mi W Charleston, Hwy 17 (1 ChM); ca 20 mi NE Charleston (1 ChM); Edisto Island (Golley 1966); FOSU, no evidence; Johns Island (1 ChM); McClellansville (1 USNM); no specific locality (1 ChM). *County unknown*: Santee River swamp (1 USNM).

FOMO: South Carolina – *Charleston County*: 4.3 mi SW Awendaw (1 ChM); Hwy 17 between Awendaw and McClellansville (1 USNM); Charleston (Golley 1966); 5 mi W Charleston, Hwy 17 (1 ChM); ca 20 mi NE Charleston (1 ChM); Edisto Island (Golley 1966); FOMO, no

evidence; Johns Island (1 ChM); McClellansville (1 USNM); no specific locality (1 ChM).
County unknown: Santee River swamp (1 USNM).

CHPI: South Carolina – *Charleston County*: 4.3 mi SW Awendaw (1 ChM); Hwy 17 between Awendaw and McClellansville (1 USNM); Charleston (Golley 1966); 5 mi W Charleston, Hwy 17 (1 ChM); ca 20 mi NE Charleston (1 ChM); CHPI, no evidence; Edisto Island (Golley 1966); Johns Island (1 ChM); McClellansville (1 USNM); no specific locality (1 ChM). *County unknown*: Santee River swamp (1 USNM).

CONG: South Carolina – *Kershaw County*: no specific locality (Golley 1966). *Richland County*: CONG (tracks); no specific locality (Golley 1966). *Sumter County*: Rembert (1 LSU); 10 mi N Rembert (1 LSU).

HOBE: Alabama – *Tallapoosa County*: HOBE (tracks).

CHAT: Georgia – *Bartow County*: no specific locality (Golley 1962). *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, Vickery Creek (tracks); no specific locality (Golley 1962). *Gwinnett County*: CHAT, no evidence; no specific locality (Golley 1962). *Paulding County*: no specific locality (Golley 1962).

KEMO: Georgia – *Bartow County*: no specific locality (Golley 1962). *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: KEMO, no evidence. *Fulton County*: CHAT, Vickery Creek (tracks); no specific locality (Golley 1962). *Paulding County*: no specific locality (Golley 1962).

OCMU: Georgia – *Bibb County*: Macon (1 USNM); OCMU, Main Unit (tracks).

FOFR: Georgia – *Glynn County*: 1 mi N Brunswick (1 UF); FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence. *Glynn County*: 1 mi N Brunswick (1 UF).

TIMU: Florida – *Duval County*: FOCA (tracks); Huguenot State Park, 5 mi W Mayport (1 UF); TIMU, Cedar Point (tracks); TIMU, Theodore Roosevelt Area (tracks). *County unknown*: northeast Florida (1 KU).

FOCA: Florida – *Duval County*: FOCA (tracks); Huguenot State Park, 5 mi W Mayport (1 UF); TIMU, Cedar Point (tracks); TIMU, Theodore Roosevelt Area (tracks). *County unknown*: northeast Florida (1 KU).

CASA: Florida – *Flagler County*: 8 mi S Marineland (2 UMMZ). *Saint Johns County*: CASA, no evidence; FOMA, Main Unit (tracks).

FOMA: Florida – *Flagler County*: 8 mi S Marineland (2 UMMZ). *Saint Johns County*: FOMA, Main Unit (tracks).

American black bear (*Ursus americanus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence; Manns Harbor (1 NCSU, 1 USNM); no specific locality (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence; Manns Harbor (1 NCSU, 1 USNM); no specific locality (Lee et al. 1983).

FORA: North Carolina – *Dare County*: FORA, no evidence; Manns Harbor (1 NCSU, 1 USNM); no specific locality (Lee et al. 1983).

CALO: North Carolina – *Carteret County*: CALO, no evidence; no specific locality (Lee et al. 1983).

MOCR: North Carolina – *Pender County*: 4 mi N Atkinson (2 UNCW); 6 mi SW Camp Davis (1 UMMZ); MOCR (observation); no specific locality (1 UNCW).

FOSU: South Carolina – *Charleston County*: Charleston (1 ChM); FOSU, no evidence; James Island (Golley 1966); Wambow Swamp (Golley 1966).

FOMO: South Carolina – *Charleston County*: Charleston (1 ChM); FOMO, no evidence; James Island (Golley 1966); Wambow Swamp (Golley 1966).

CHPI: South Carolina – *Charleston County*: Charleston (1 ChM); CHPI, no evidence; James Island (Golley 1966); Wambow Swamp (Golley 1966).

CONG: South Carolina – *Richland County*: CONG, no evidence; no specific locality (Golley 1966).

HOBE: Alabama – *Coosa County*: Mount Weogufka (Howell 1921). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence. *Walton County*: no specific locality (Golley 1962).

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence; no specific locality (Golley 1962). *Houston County*: swamp adjacent to Robins AFB (observation).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; no specific locality (Golley 1962).

CUIS: Georgia – *Camden County*: CUIS, no evidence. *County unknown*: Okefenokee Swamp (3 USNM).

TIMU: Florida – *Duval County*: Jacksonville (1 UF); I-10, 1 mi east of Hwy 301 (1 UF); SR A1A at Lofton Creek (1 UF); TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence; Jacksonville (1 UF); I-10, 1 mi east of Hwy 301 (1 UF); SR A1A at Lofton Creek (1 UF).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Northern raccoon (*Procyon lotor*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (roadkill; Boone 1988; Parnell et al. 1992); CAHA, Buxton Woods (1 NCSU, 1 UNCW); CAHA, Cape Hatteras (Parnell et al. 1992); CAHA, Frisco (1 UNCW); [CAHA] Hatteras Inlet (1 YPM); CAHA, Frisco (1 UNCW); Duck (Lee et al. 1983); FORA (tracks); Hatteras (1 MCZ, 2 UMA); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (observation and tracks); no specific locality (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island (tracks).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (roadkill; Boone 1988; Parnell et al. 1992); CAHA, Buxton Woods (1 NCSU, 1 UNCW); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Hatteras Inlet (1 YPM); CAHA, Frisco (1 UNCW); Duck (Lee et al. 1983); FORA (tracks); Hatteras (1 MCZ, 2 UMA); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (observation and tracks); no specific locality (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island (tracks).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (roadkill; Boone 1988; Parnell et al. 1992); CAHA, Buxton Woods (1 NCSU, 1 UNCW); CAHA, Cape Hatteras (Parnell et al. 1992); [CAHA] Hatteras Inlet (1 YPM); CAHA, Frisco (1 UNCW); Duck (Lee et al. 1983); FORA (tracks); Hatteras (1 MCZ, 2 UMA); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (observation and tracks); no specific locality (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island (tracks).

CALO: North Carolina – *Carteret County*: CALO, Portsmouth Island (tracks); CALO, Shackleford Banks (1 NCSU; tracks and scat; Webster 1987a); CALO, South Core Banks (tracks); Harkers Island (1 UNCW); CALO, no specific locality (1 CALO); no specific locality (Lee et al. 1983).

MOCR: North Carolina – *Pender County*: Burgaw (Funderburg 1961b); Hampstead (2 UNCW); MOCR (tracks and scat); 2 mi S Porters Neck, Hwy 17 (1 UNCW); 1 mi SE Rocky Point, SR 1632 (2 UNCW); 14.4 mi N Wilmington, I-40 (2 UNCW); no specific locality (2 UNCW).

FOSU: South Carolina – *Charleston County*: Awendaw (1 AMNH); 6 mi NW Awendaw (1 AMNH); Ashley River (2 GMNH); Bulls Island (1 KU); Bulls Island, Cape Romain NWR (1 GMNH, 1 MCZ); near Charleston (1 UF); CHPI (2 UNCW); Edisto Island (5 MCZ); FOMO (tracks); FOSU, Aquarium Site (tracks); FOSU, Fort Site (observation); Hog Pen Island (1 ChM); Hunting Island (1 USNM); Log Branch Creek (1 GMNH); Mount Pleasant (2 ROM); South Island (1 GMNH); Toogoodoo Creek (3 GMNH); no specific locality (Yabsley and Noblet 2002).

FOMO: South Carolina – *Charleston County*: Awendaw (1 AMNH); 6 mi NW Awendaw (1 AMNH); Ashley River (2 GMNH); Bulls Island (1 KU); Bulls Island, Cape Romain NWR (1

GMNH, 1 MCZ); near Charleston (1 UF); CHPI (2 UNCW); Edisto Island (5 MCZ); FOMO (tracks); FOSU, Aquarium Site (tracks); FOSU, Fort Site (observation); Hog Pen Island (1 ChM); Hunting Island (1 USNM); Log Branch Creek (1 GMNH); Mount Pleasant (2 ROM); South Island (1 GMNH); Toogoodoo Creek (3 GMNH); no specific locality (Yabsley and Noblet 2002).

CHPI: South Carolina – *Charleston County*: Awendaw (1 AMNH); 6 mi NW Awendaw (1 AMNH); Ashley River (2 GMNH); Bulls Island (1 KU); Bulls Island, Cape Romain NWR (1 GMNH, 1 MCZ); near Charleston (1 UF); CHPI (2 UNCW); Edisto Island (5 MCZ); FOMO (tracks); FOSU, Aquarium Site (tracks); FOSU, Fort Site (observation); Hog Pen Island (1 ChM); Hunting Island (1 USNM); Log Branch Creek (1 GMNH); Mount Pleasant (2 ROM); South Island (1 GMNH); Toogoodoo Creek (3 GMNH); no specific locality (Yabsley and Noblet 2002).

CONG: South Carolina – *Richland County*: Columbia (1 MCZ); CONG (tracks and scat); no specific locality (Yabsley and Noblet 2002).

HOBE: Alabama – *Tallapoosa County*: HOBE (tracks).

CHAT: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: CHAT, Cochran Shoals, rec area (tracks); CHAT, Cochran Shoals, Powers Island (tracks); CHAT, Cochran Shoals, Sope Creek (tracks); CHAT, Gold Branch (1 UNCW); CHAT, Johnson Ferry North (tracks); CHAT, Palisades West (1 UNCW). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, Holcomb Bridge (tracks); CHAT, Island Ford (tracks); CHAT, Jones Bridge (tracks); CHAT, McGinnis Ferry (tracks); CHAT, Palisades East (tracks); CHAT, Vickery Creek (tracks). *Gwinnett County*: CHAT, Abbotts Bridge (tracks); CHAT, Bowmans Island, Richland Creek (1 UNCW); CHAT, Medlock Bridge (tracks); CHAT, Settles Bridge (tracks); CHAT, Suwanee Creek (tracks).

KEMO: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: CHAT, Cochran Shoals, rec area (tracks); CHAT, Cochran Shoals, Powers Island (tracks); CHAT, Cochran Shoals, Sope Creek (tracks); CHAT, Gold Branch (1 UNCW); CHAT, Johnson Ferry North (tracks); CHAT, Palisades West (1 UNCW); KEMO (tracks). *Fulton County*: CHAT, Holcomb Bridge (tracks); CHAT, Island Ford (tracks); CHAT, Jones Bridge (tracks); CHAT, McGinnis Ferry (tracks); CHAT, Palisades East (tracks); CHAT, Vickery Creek (tracks).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (1 UNCW); OCMU, Lamar Site (tracks); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: Brunswick (1 UNCW); FOFR, Frederica Site (tracks and scat); FOFR, Bloody Marsh Site (tracks); near Jekyll Island (1 USNM); Little Saint Simons Island (1 USNM); Saint Simons Island (1 UNCW, 13 USNM).

CUIS: Georgia – *Camden County*: CUIS (1 GMNH, 1 MCZ, 2 UNCW; Shoop and Ruckdeschel 1990; Wilson and Durden 2003); Little Cumberland Island (5 GMNH); Saint Marys (Bangs 1898; Elliot 1901).

TIMU: Florida – *Duval County*: FOCA, tracks and scat; Jacksonville (8 GMNH); Jacksonville Beach (1 GMNH); Jacksonville Naval Air Station (11 GMNH); New Berlin (4 ROM); Seminole Beach (27 GMNH); TIMU, Cedar Point (tracks and scat); TIMU, Fort George Island (tracks and scat); TIMU, Kingsley Plantation (tracks); TIMU, marsh islands NPS1, NPS2, NPS32, NPS45, and NPS52 (McClure, 2004); TIMU, Theodore Roosevelt Area (tracks and scat); TIMU, Thomas Creek (tracks and scat); no specific locality (3 GMNH). *Nassau County*: Amelia Island, trail to McRory Point (1 AMNH); no specific locality (2 GMNH).

FOCA: Florida – *Duval County*: FOCA, tracks and scat; Jacksonville (8 GMNH); Jacksonville Beach (1 GMNH); Jacksonville Naval Air Station (11 GMNH); New Berlin (4 ROM); Seminole Beach (27 GMNH); TIMU, Cedar Point (tracks and scat); TIMU, Fort George Island (tracks and scat); TIMU, Kingsley Plantation (tracks); TIMU, marsh islands NPS1, NPS2, NPS32, NPS45, and NPS52 (McClure, 2004); TIMU, Theodore Roosevelt Area (tracks and scat); TIMU, Thomas Creek (tracks and scat); no specific locality (3 GMNH). *Nassau County*: Amelia Island, trail to McRory Point (1 AMNH); no specific locality (2 GMNH).

CASA: Florida – *Saint Johns County*: Anastasia Island (1 YPM); Anastasia Island, Point Romo (Pournelle and Barrington 1953); [Anastasia Island] 9 mi N Marineland (1 KU); Cabbage Swamp, Ivey Rd (1 UF); CASA (observation); [FOMA] Matanzas (7 MCZ); FOMA, Main Unit (tracks and scat); FOMA, Rattlesnake Island (1 UNCW); Guano River (4 USNM); Palm Valley (4 MSB); marsh east of Tolomato River (1 UF); no specific locality (1 GMNH). *County unknown*: Matanzas Inlet (1 USNM).

FOMA: Florida – *Saint Johns County*: Anastasia Island (1 YPM); Anastasia Island, Point Romo (Pournelle and Barrington 1953); [Anastasia Island] 9 mi N Marineland (1 KU); Cabbage Swamp, Ivey Rd (1 UF); CASA (observation); [FOMA] Matanzas (7 MCZ); FOMA, Main Unit (tracks and scat); FOMA, Rattlesnake Island (1 UNCW); Guano River (4 USNM); Palm Valley (4 MSB); marsh east of Tolomato River (1 UF); no specific locality (1 GMNH). *County unknown*: Matanzas Inlet (1 USNM).

Long-tailed weasel (*Mustela frenata*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence; no specific locality (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence; no specific locality (Lee et al. 1983).

FORA: North Carolina – *Dare County*: FORA, no evidence; no specific locality (Lee et al. 1983).

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: 8 mi N Charleston (1 ChM); FOSU, no evidence; Johns Island (4 ChM); Pierpont (1 ChM); Rantowles (1 ChM).

FOMO: South Carolina – *Charleston County*: 8 mi N Charleston (1 ChM); FOMO, no evidence; Johns Island (4 ChM); Pierpont (1 ChM); Rantowles (1 ChM).

CHPI: South Carolina – *Charleston County*: 8 mi N Charleston (1 ChM); CHPI, no evidence; Johns Island (4 ChM); Pierpont (1 ChM); Rantowles (1 ChM).

CONG: South Carolina – *Calhoun County*: Saint Matthews (2 ChM). *Richland County*: CONG, no evidence; no specific locality (Golley 1966). *Sumter County*: Mayesville (1 ChM).

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Lee County*: Auburn (1 UMMZ). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: CHAT, no evidence. *DeKalb County*: no specific locality (Golley 1962). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence; Roswell (Hall 1951). *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: KEMO, no evidence. *Fulton County*: Roswell (Hall 1951).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Lamar County*: no specific locality (1 MVZ). *Talbot County*: Geneva (1 MCZ); 2 mi S Geneva (1 MCZ); 2 mi E Junction City (1 MCZ); 2.5 mi SW Junction City (1 KU); no specific locality (10 MVZ).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence. *Charlton County*: Okefenokee Swamp (1 CUMV); Okefenokee Swamp, Billys Island (1 USNM); Okefenokee Swamp, Camp Cornelia (1 USNM); Okefenokee Swamp, 0.5 mi E Chessers Island (1 CUMV).

TIMU: Florida – *Duval County*: Jacksonville, 1 mi east of zoo (1 UF); TIMU, no evidence. *Nassau County*: 2 mi SE Hillard, Hwy 301 (1 UF).

FOCA: Florida – *Duval County*: FOCA, no evidence; Jacksonville, 1 mi east of zoo (1 UF). *Nassau County*: 2 mi SE Hillard, Hwy 301 (1 UF).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

American mink (*Neovison vison*)

CAHA: North Carolina – *Dare County*: CAHA, Buxton (Lee et al. 1983); CAHA, Hatteras Island (2 UNCW); FORA (tracks); Nags Head Woods (Webster 1988); no specific locality (Osowski et al. 1995). *Hyde County*: CAHA, Ocracoke Island (1 UNCW; Engels 1942); Judith Island (2 MCZ); no specific locality (4 MCZ).

WRBR: North Carolina – *Dare County*: CAHA, Buxton (Lee et al. 1983); CAHA, Hatteras Island (2 UNCW); FORA (tracks); Nags Head Woods (Webster 1988); WRBR, no evidence; no

specific locality (Osowski et al. 1995). *Hyde County*: CAHA, Ocracoke Island (1 UNCW); Judith Island (2 MCZ); no specific locality (4 MCZ).

FORA: North Carolina – *Dare County*: CAHA, Buxton (Lee et al. 1983); CAHA, Hatteras Island (2 UNCW); FORA (tracks); Nags Head Woods (Webster 1988); no specific locality (Osowski et al. 1995). *Hyde County*: CAHA, Ocracoke Island (1 UNCW); Judith Island (2 MCZ); no specific locality (4 MCZ).

CALO: North Carolina – *Carteret County*: CALO, Portsmouth Island (tracks); CALO, Shackleford Banks (tracks; Webster 1987a); CALO, South Core Banks (tracks); no specific locality (Osowski et al. 1995). *Hyde County*: CAHA, Ocracoke Island (1 UNCW); Judith Island (2 MCZ); no specific locality (4 MCZ).

MOCR: North Carolina – *Pender County*: MOCR (observation).

FOSU: South Carolina – *Charleston County*: Charleston (2 ChM, 3 USNM); 8 mi SW Charleston, James Island (1 KU); 15 mi below [S] Charleston, James Island (1 ChM); James Island (2 ChM); Church Creek near Ravens Point (1 ChM); Edgewater Park (2 ChM); Folly Island (2 ChM); FOSU (observation); Johns Island (1 ChM); Kiawah Island (1 ChM); Morris Island (1 ChM); Mount Pleasant, Copahee Sound (1 USNM); no specific locality (Osowski et al. 1995).

FOMO: South Carolina – *Charleston County*: Charleston (2 ChM, 3 USNM); 8 mi SW Charleston, James Island (1 KU); 15 mi below [S] Charleston, James Island (1 ChM); James Island (2 ChM); Church Creek near Ravens Point (1 ChM); Edgewater Park (2 ChM); Folly Island (2 ChM); FOMO, no evidence; FOSU (observation); Johns Island (1 ChM); Kiawah Island (1 ChM); Morris Island (1 ChM); Mount Pleasant, Copahee Sound (1 USNM); no specific locality (Osowski et al. 1995).

CHPI: South Carolina – *Charleston County*: Charleston (2 ChM, 3 USNM); 8 mi SW Charleston, James Island (1 KU); 15 mi below [S] Charleston, James Island (1 ChM); James Island (2 ChM); CHPI, no evidence; Church Creek near Ravens Point (1 ChM); Edgewater Park (2 ChM); Folly Island (2 ChM); FOSU (observation); Johns Island (1 ChM); Kiawah Island (1 ChM); Morris Island (1 ChM); Mount Pleasant, Copahee Sound (1 USNM); no specific locality (Osowski et al. 1995).

CONG: South Carolina – *Richland County*: CONG (tracks); no specific locality (Golley 1966; Osowski et al. 1995).

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Coosa County*: Mount Weogufka (Howell 1921). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, Gold Branch (tracks); CHAT, Johnson Ferry South (1 UNCW); no specific locality (Golley 1962). *Dawson County*: no specific locality (Golley 1962). *DeKalb County*: no specific locality (Golley 1962). *Forsyth County*: CHAT, no evidence; Lake Lanier (Schnell 1964); no specific locality (Osowski et al. 1995). *Fulton County*: CHAT, Vickery Creek (tracks); Roswell (1 USNM). *Gwinnett County*: CHAT, Settles Bridge (tracks); no specific locality (Osowski et al. 1995).

KEMO: Georgia – *Cherokee County*: no specific locality (Osowski et al. 1995). *Cobb County*: CHAT, Gold Branch (tracks); CHAT, Johnson Ferry South (1 UNCW); KEMO, no evidence; no specific locality (Golley 1962). *Fulton County*: CHAT, Vickery Creek (tracks); Roswell (1 USNM).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Monroe County*: no specific locality (Golley 1962). *Talbot County*: 1.5 mi W Box Springs (1 KU); no specific locality (20 MVZ).

FOFR: Georgia – *Glynn County*: 2 mi S Brunswick, between Jekyll Island and mainland (1 UF); FOFR (tracks); Jekyll Island (1 UF); Jekyll Island causeway (1 GMNH); near Jekyll Island (1 GMNH); Saint Simons Island (1 UF, 1 USNM); no specific locality (Golley 1962; Osowski et al. 1995).

CUIS: Georgia – *Camden County*: CUIS (Shoop and Ruckdeschel 1990); CUIS, north end (2 GMNH; tracks); Saint Marys (6 MCZ).

TIMU: Florida – *Duval County*: TIMU, Cedar Point (tracks); TIMU, Kingsley Plantation (tracks).

FOCA: Florida – *Duval County*: FOCA, no evidence; TIMU, Cedar Point (tracks); TIMU, Kingsley Plantation (tracks).

CASA: Florida – *Saint Johns County*: CASA, no evidence; FOMA, Main Unit (tracks); [FOMA] Matanzas Inlet (7 MCZ).

FOMA: Florida – *Saint Johns County*: FOMA, Main Unit (tracks); [FOMA] Matanzas Inlet (7 MCZ).

Northern river otter (*Lontra canadensis*)

CAHA: North Carolina – *Dare County*: CAHA, Bodie Island (roadkill); CAHA, Buxton (roadkills); CAHA, Hatteras (roadkill); [CAHA] Pea Island NWR (2 NCSM, 1 UNCW); FORA (tracks); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992). *Hyde County*: CAHA, Ocracoke Island (tracks; Parnell et al. 1992); no specific locality (3 NCSM, 1 UMA).

WRBR: North Carolina – *Dare County*: CAHA, Bodie Island (roadkill); CAHA, Buxton (roadkills); CAHA, Hatteras (roadkill); [CAHA] Pea Island NWR (2 NCSM, 1 UNCW); FORA (tracks); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR, no evidence. *Hyde County*: CAHA, Ocracoke Island (tracks; Parnell et al. 1992); no specific locality (3 NCSM, 1 UMA).

FORA: North Carolina – *Dare County*: CAHA, Bodie Island (roadkill); CAHA, Buxton (roadkills); CAHA, Hatteras (roadkill); [CAHA] Pea Island NWR (2 NCSM, 1 UNCW); FORA (tracks); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992). *Hyde County*: CAHA, Ocracoke Island (tracks; Parnell et al. 1992); no specific locality (3 NCSM, 1 UMA).

CALO: North Carolina – *Carteret County*: Bogue Banks (Lee et al. 1983); CALO, Portsmouth Island (tracks); CALO, Shackleford Banks (tracks; Webster 1987a); CALO, South Core Banks

(tracks); CALO, ubiquitous (Cape Lookcut National Seashore 1977). *Hyde County*: CAHA, Ocracoke Island (tracks; Parnell et al. 1992); no specific locality (3 NCSM).

MOCR: North Carolina – *Pender County*: MOCR (tracks); Hampstead (1 UNCW); 1 mi S Wallace, I-40 exit 387 (1 UNCW).

FOSU: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (1 USNM); 2 mi S Charleston, Hwy 17 (2 ChM); FOSU, Aquarium Site (tracks); FOSU, Fort Site (observation); James Island (1 ChM, 1 LSU); Mount Pleasant (1 USNM); Plum Island (2 ChM); 7.5 mi E Rockville, SR 700 (1 ChM).

FOMO: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (1 USNM); 2 mi S Charleston, Hwy 17 (2 ChM); FOMO, no evidence; FOSU, Aquarium Site (tracks); FOSU, Fort Site (observation); James Island (1 ChM, 1 LSU); Mount Pleasant (1 USNM); Plum Island (2 ChM); 7.5 mi E Rockville, SR 700 (1 ChM).

CHPI: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (1 USNM); 2 mi S Charleston, Hwy 17 (2 ChM); CHPI, no evidence; FOSU, Aquarium Site (tracks); FOSU, Fort Site (observation); James Island (1 ChM, 1 LSU); Mount Pleasant (1 USNM); Plum Island (2 ChM); 7.5 mi E Rockville, SR 700 (1 ChM).

CONG: South Carolina – *Richland County*: CONG (tracks and scat); no specific locality (Golley 1966).

HOBE: Alabama – *Tallapoosa County*: HOBE (tracks).

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, Jones Bridge (tracks); CHAT, Palisades East (tracks); CHAT, Vickery Creek (tracks). *Gwinnett County*: CHAT, Abbotts Bridge (tracks); CHAT, Medlock Bridge (scat).

KEMO: Georgia – *Cobb County*: KEMO, no evidence. *Fulton County*: CHAT, Jones Bridge (tracks); CHAT, Palisades East (tracks); CHAT, Vickery Creek (tracks).

OCMU: Georgia – *Bibb County*: OCMU (tracks); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR (tracks); no specific locality (Golley 1962).

CUIS: Georgia – *Camden County*: CUIS (tracks, Shoop and Ruckdeschel 1990). *Charlton County*: Okefenokee Swamp (1 USNM); Okefenokee Swamp, Mud Lake (1 USNM); Okefenokee Swamp, Floyds Island (1 USNM).

TIMU: Florida – *Duval County*: FOCA (tracks); Fort George Island (1 UF); TIMU, Kingsley Plantation (tracks); TIMU, Theodore Roosevelt Area (observation); TIMU, Thomas Creek (observation).

FOCA: Florida – *Duval County*: FOCA (tracks); Fort George Island (1 UF); TIMU, Kingsley Plantation (tracks); TIMU, Theodore Roosevelt Area (observation); TIMU, Thomas Creek (observation).

CASA: Florida – *Saint Johns County*: CASA, no evidence; FOMA, Main Unit (tracks); FOMA, Rattlesnake Island (observation).

FOMA: Florida – *Saint Johns County*: FOMA, Main Unit (tracks); FOMA, Rattlesnake Island (observation).

Striped skunk (*Mephitis mephitis*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence; no specific locality (Lee et al. 1983).

FOSU: South Carolina – *Charleston County*: Awendaw (1 ChM); FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: Awendaw (1 ChM); FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: Awendaw (1 ChM); CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG (observation).

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Lee County*: Auburn (Howell 1921). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, Bowmans Island (observation). *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Talbot County*: 3 mi E Junction City (1 KU); no specific locality (8 MVZ).

FOFR: Georgia – *Glynn County*: FOFR, no evidence. *McIntosh County*: no specific locality (1 USNM).

CUIS: Georgia – *Camden County*: CUIS, no evidence; Saint Marys (3 MCZ). *Charlton County*: Okefenokee Swamp, Billy Island (4 CUMV); Okefenokee Swamp, 2 mi SW Folkston, near

Spanish Creek (1 CUMV). *Ware County*: Okefenokee Swamp, Honey Island (1 CUMV, 1 USNM).

TIMU: Florida – *Duval County*: Burnside Beach (Bangs 1898); Jacksonville (1 AMNH); New Berlin (Bangs 1898); TIMU, no evidence. *Nassau County*: Keene (2 UIMNH).

FOCA: Florida – *Duval County*: Burnside Beach (Bangs 1898); FOCA, no evidence; Jacksonville (1 AMNH); New Berlin (Bangs 1898). *Nassau County*: Keene (2 UIMNH).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Eastern spotted skunk (*Spilogale putorius*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FOR A: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Lee County*: Auburn (3 UMMZ); 4 mi N Auburn (Sullivan 1954). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Bartow County*: no specific locality (Michael Mengak and Steven Castleberry personal communication). *Cherokee County*: no specific locality (Michael Mengak and Steven Castleberry personal communication). *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: Atlanta, Warner Robbins Plant, Gate 1 (Van Gelder 1959); CHAT, no evidence; Fort McPherson (Van Gelder 1959). *Gwinnett County*: CHAT, no evidence. *Hall County*: no specific locality (Michael Mengak and Steven Castleberry personal communication).

KEMO: Georgia – *Bartow County*: no specific locality (Michael Mengak and Steven Castleberry personal communication). *Cherokee County*: no specific locality (Michael Mengak and Steven Castleberry personal communication). *Cobb County*: KEMO, no evidence. *Fulton County*: Atlanta, Warner Robbins Plant, Gate 1 (Van Gelder 1959); Fort McPherson (Van Gelder 1959).

OCMU: Georgia – *Bibb County*: OCMU, no evidence. *Houston County*: no specific locality (Golley 1962). *Jones County*: no specific locality (Golley 1962). *Talbot County*: 4.5 mi W Geneva (Van Gelder 1959); 4 mi N Junction City (2 KU); no specific locality (3 MVZ).

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Feral cat (*Felis catus*)

CAHA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Boone 1988; Parnell et al. 1992); CAHA, Buxton (tracks; Boone 1988; Parnell et al. 1992); CAHA, near Frisco (tracks); [CAHA] Little Kinnakeet (Boone 1988; Parnell et al. 1992); CAHA, Oregon Inlet, north side (Boone 1988); Coquina Beach (Parnell et al. 1992); FORA (observation, tracks, and roadkill); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (tracks). *Hyde County*: CAHA, Ocracoke Island (observation; Engels 1952; Webster 1988; Parnell et al. 1992).

WRBR: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Boone 1988; Parnell et al. 1992); CAHA, Buxton (tracks; Boone 1988; Parnell et al. 1992); CAHA, near Frisco (tracks); [CAHA] Little Kinnakeet (Boone 1988; Parnell et al. 1992); CAHA, Oregon Inlet, north side (Boone 1988); Coquina Beach (Parnell et al. 1992); FORA (observation, tracks, and roadkill); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (tracks).

FORA: North Carolina – *Dare County*: Avon (Parnell et al. 1992); CAHA, Bodie Island (Boone 1988; Parnell et al. 1992); CAHA, Buxton (tracks; Boone 1988; Parnell et al. 1992); CAHA, near Frisco (tracks); [CAHA] Little Kinnakeet (Boone 1988; Parnell et al. 1992); CAHA, Oregon Inlet, north side (Boone 1988); Coquina Beach (Parnell et al. 1992); FORA (observation, tracks, and roadkill); Nags Head Woods (Webster 1988); Roanoke Island (Parnell et al. 1992); WRBR (tracks).

CALO: North Carolina – *Carteret County*: CALO, Core Banks (1 CALO); CALO, Portsmouth Island (photograph and tracks); CALO, Shackleford Banks (observation and tracks; Engels 1952; Webster 1987a); CALO, South Core Banks (tracks); CALO, ubiquitous (Cape Lookout National Seashore 1977); Fort Macon (1 USNM).

MOCR: North Carolina – *Pender County*: MOCR (observation).

FOSU: South Carolina – *Charleston County*: CHPI (observation); FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: CHPI (observation); FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI (observation).

CONG: South Carolina – *Richland County*: CONG (observation and tracks).

HOBE: Alabama – *Lee County*: Auburn (Howell 1921). *Tallapoosa County*: HOBE (hair removed from coyote scat).

CHAT: Georgia – *Cobb County*: CHAT, Cochran Shoals (observation); CHAT, Johnson Ferry North (2 UNCW). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, Jones Bridge (tracks); CHAT, Palisades East (1 UNCW). *Gwinnett County*: CHAT, Abbotts Bridge (3 UNCW); CHAT, Suwanee Creek (tracks).

KEMO: Georgia – *Cobb County*: CHAT, Cochran Shoals (observation); CHAT, Johnson Ferry North (2 UNCW); KEMO (observation). *Fulton County*: CHAT, Jones Bridge (tracks); CHAT, Palisades East (1 UNCW).

OCMU: Georgia – *Bibb County*: OCMU (observation).

FOFR: Georgia – *Glynn County*: FOFR, Frederica Site (observation).

CUIS: Georgia – *Camden County*: CUIS (Wilson and Durden 2003).

TIMU: Florida – *Duval County*: TIMU, Cedar Point (observation); TIMU, Thomas Creek (1 UNCW).

FOCA: Florida – *Duval County*: FOCA, no evidence; TIMU, Cedar Point (observation); TIMU, Thomas Creek (1 UNCW).

CASA: Florida – *Saint Johns County*: CASA, no evidence; FOMA, Main Unit (observation).

FOMA: Florida – *Saint Johns County*: FOMA, Main Unit (observation).

Mountain lion (*Puma concolor*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence; Wambow Swamp (Mills 1826).

FOMO: South Carolina – *Charleston County*: FOMO, no evidence; Wambow Swamp (Mills 1826).

CHPI: South Carolina – *Charleston County*: CHPI, no evidence; Wambow Swamp (Mills 1826).

CONG: South Carolina – *Richland County*: CONG, no evidence. *County unknown*: “Congaree section” (Lawson, 1718); Santee River (Young 1946).

HOBE: Alabama – *Jackson County*: Crow Island, Indian refuse heap (1 UMMZ). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Bartow County*: no specific locality (Young 1946). *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence. *Lumpkin County*: northwest of Dahlonega (Young 1946).

KEMO: Georgia – *Bartow County*: no specific locality (Young 1946). *Cobb County*: KEMO, no evidence. *Lumpkin County*: northwest of Dahlonega (Young 1946).

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence; no specific locality (Young 1946).

CUIS: Georgia – *Camden County*: CUIS, no evidence. *Glynn County*: no specific locality (Young 1946).

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Bobcat (*Lynx rufus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence; no specific locality (Lee et al. 1983). *Hyde County*: CAHA, Ocracoke Island, no evidence; no specific locality (Lee et al. 1983).

WRBR: North Carolina – *Dare County*: WRBR, no evidence; no specific locality (Lee et al. 1983).

FORA: North Carolina – *Dare County*: FORA, no evidence; no specific locality (Lee et al. 1983).

CALO: North Carolina – *Carteret County*: Bogue Banks (Lee et al. 1983); CALO, no evidence; Camp Bryan, Craven County line (1 NCSU).

MOCR: North Carolina – *Pender County*: 10 mi N Maple Hill (1 UNCW); MOCR, no evidence; 3 mi S Wards Corner, Hwy 421 (1 UNCW); no specific locality (Lee et al. 1983).

FOSU: South Carolina – *Charleston County*: near Charleston (2 ChM); Dorchester Rd (1 ChM); FOSU, no evidence; Johns Island (1 ChM); Ravenel, 17 mi S Charleston (1 ChM); 1 mi E Summerville (1 ChM). *County unknown*: Santee NWR, 8 mi SW Summerton (3 USNM).

FOMO: South Carolina – *Charleston County*: near Charleston (2 ChM); Dorchester Rd (1 ChM); FOMO, no evidence; Johns Island (1 ChM); Ravenel, 17 mi S Charleston (1 ChM); 1 mi E Summerville (1 ChM). *County unknown*: Santee NWR, 8 mi SW Summerton (3 USNM).

CHPI: South Carolina – *Charleston County*: near Charleston (2 ChM); CHPI, no evidence; Dorchester Rd (1 ChM); Johns Island (1 ChM); Ravenel, 17 mi S Charleston (1 ChM); 1 mi E Summerville (1 ChM). *County unknown*: Santee NWR, 8 mi SW Summerton (3 USNM).

CONG: South Carolina – *Richland County*: Columbia (1 MCZ); CONG (observation and scat); 5 km N CONG (1 UNCW).

HOBE: Alabama – *Clay County*: Talladega Mountains (Howell 1921). *Coosa County*: Mount Weogufka (Howell 1921). *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: CHAT, no evidence. *Dawson County*: no specific locality (Golley 1962). *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, Bowmans Island, Richland Creek (tracks). *Paulding County*: no specific locality (Golley 1962).

KEMO: Georgia – *Cherokee County*: no specific locality (Golley 1962). *Cobb County*: KEMO, no evidence. *Paulding County*: no specific locality (Golley 1962).

OCMU: Georgia – *Bibb County*: OCMU, Lamar Unit (tracks). *Jones County* or *Jasper County*: Piedmont NWR (5 USNM). *Talbot County*: 3 mi E Junction City (3 KU); no specific locality (2 MVZ).

FOFR: Georgia – *Glynn County*: Anguilla (1 GMNH); FOFR, no evidence; Saint Simons Island (Reitz and Honerkamp 1983).

CUIS: Georgia – *Camden County*: CUIS (tracks and scat; at least 3 CIM; Wilson and Durden 2003); no specific locality (1 UF). *Charlton County*: Okefenokee Swamp, Grand Prairie (1 CUMV); Okefenokee Swamp, Suwanee Canal (1 USNM).

TIMU: Florida – *Duval County*: New Berlin (Bangs 1898); FOCA (observation and scat); Huguenot State Park, 5 mi W Mayport (1 UF); 4 mi N Jacksonville (1 GMNH); TIMU, Cedar Point (scat); TIMU, Thomas Creek (tracks and scat); TIMU, Theodore Roosevelt Area (tracks). *Nassau County*: 8 mi NW Callahan (1 ChM).

FOCA: Florida – *Duval County*: New Berlin (Bangs 1898); FOCA (observation and scat); Huguenot State Park, 5 mi W Mayport (1 UF); 4 mi N Jacksonville (1 GMNH); TIMU, Cedar Point (scat); TIMU, Thomas Creek (tracks and scat); TIMU, Theodore Roosevelt Area (tracks). *Nassau County*: 8 mi NW Callahan (1 ChM).

CASA: Florida – *Saint Johns County*: CASA, no evidence; FOMA (observation).

FOMA: Florida – *Saint Johns County*: FOMA (observation).

Domestic/feral horse (*Equus caballus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island (observation, tracks, and scat; Engels 1942; Parnell et al. 1992).

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, Portsmouth Island, no evidence; CALO, Shackleford Banks (photographs, observation, tracks, and scat; Engels 1952; Webster, 1987a); CALO, South Core Banks, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG (tracks and scat).

HOBE: Alabama – *Tallapoosa County*: HOBE (tracks).

CHAT: Georgia – *Cobb County*: CHAT, no evidence; KEMO (tracks and scat). *Forsyth County*: CHAT, Bowmans Island, dam access (tracks and scat). *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO (tracks and scat).

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS (2 CIM, 1 GMNH, 2 UNCW).

TIMU: Florida – *Duval County*: TIMU, Cedar Point (tracks and scat).

FOCA: Florida – *Duval County*: FOCA, no evidence; TIMU, Cedar Point (tracks and scat).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Feral pig (*Sus scrofa*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (Lawson 1718); FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (Lawson 1718); FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (Lawson 1718); CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG (2 UNCW); Congaree Swamp (Mayer and Brisbin 1991).

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (5 UNCW); OCMU, Lamar Unit (tracks).

FOFR: Georgia – *Glynn County*: FOFR, no evidence; Jekyll Island (Neuhauser and Baker 1974); Saint Simons Island (Neuhauser and Baker 1974; Mayer and Brisbin 1991).

CUIS: Georgia – *Camden County*: CUIS (5 UNCW; Neuhauser and Baker 1974; Mayer and Brisbin 1991); Little Cumberland Island (Neuhauser and Baker 1974).

TIMU: Florida – *Duval County*: TIMU, Cedar Point (tracks); TIMU, marsh island NPS45 (McClurg 2004); TIMU, Sohn Tract (1 UNCW).

FOCA: Florida – *Duval County*: TIMU, Cedar Point (tracks); TIMU, marsh island NPS45 (McClurg 2004); TIMU, Sohn Tract (1 UNCW).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Goat (*Capra hircus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: Buford Dam Road (observation); CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

European mouflon sheep (*Ovis aries*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FORA: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, no evidence.

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE, no evidence.

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS, no evidence.

TIMU: Florida – *Duval County*: TIMU, no evidence.

FOCA: Florida – *Duval County*: FOCA, no evidence.

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

Domestic cattle (*Bos taurus*)

CAHA: North Carolina – *Dare County*: CAHA, no evidence. *Hyde County*: CAHA, Ocracoke Island, no evidence.

WRBR: North Carolina – *Dare County*: WRBR, no evidence.

FOR A: North Carolina – *Dare County*: FORA, no evidence.

CALO: North Carolina – *Carteret County*: CALO, Shackleford Banks (1 UNCW).

MOCR: North Carolina – *Pender County*: MOCR, no evidence.

FOSU: South Carolina – *Charleston County*: FOSU, no evidence.

FOMO: South Carolina – *Charleston County*: FOMO, no evidence.

CHPI: South Carolina – *Charleston County*: CHPI, no evidence.

CONG: South Carolina – *Richland County*: CONG, no evidence.

HOBE: Alabama – *Tallapoosa County*: HOBE (1 UNCW).

CHAT: Georgia – *Cobb County*: CHAT, no evidence. *Forsyth County*: CHAT, no evidence. *Fulton County*: CHAT, no evidence. *Gwinnett County*: CHAT, no evidence.

KEMO: Georgia – *Cobb County*: KEMO, no evidence.

OCMU: Georgia – *Bibb County*: OCMU, no evidence.

FOFR: Georgia – *Glynn County*: FOFR, no evidence.

CUIS: Georgia – *Camden County*: CUIS (Shoop and Ruckdeschel 2001; Wilson and Durden 2003).

TIMU: Florida – *Duval County*: TIMU, Sohn Tract (1 UNCW).

FOCA: Florida – *Duval County*: FOCA, no evidence; TIMU, Sohn Tract (1 UNCW).

CASA: Florida – *Saint Johns County*: CASA, no evidence.

FOMA: Florida – *Saint Johns County*: FOMA, no evidence.

White-tailed deer (*Odocoileus virginianus*)

CAHA: North Carolina – *Dare County*: Avon (1 UNCW); CAHA, Bodie Island (Boone 1988; Webster 1988; Parnell et al. 1992; tracks); CAHA, Buxton (3 MCZ, 1 NCSU, 1 UNCW); CAHA, Cape Hatteras (Webster 1988; Parnell et al. 1992); Nags Head Woods (Webster 1988); WRBR (observation, tracks, and scat; Boone 1988; Parnell et al. 1992); no specific locality (1 USNM). *Hyde County*: Lake Mattamuskeet NWR (5 USNM); Swan Quarter NWR (2 USNM); no specific locality (2 NCSU, 3 USNM).

WRBR: North Carolina – *Dare County*: Avon (1 UNCW); CAHA, Bodie Island (Boone 1988; Webster 1988; Parnell et al. 1992; tracks); CAHA, Buxton (3 MCZ, 1 NCSU, 1 UNCW); CAHA, Cape Hatteras (Webster 1988; Parnell et al. 1992); Nags Head Woods (Webster 1988); WRBR (observation, tracks, and scat; Boone 1988; Parnell et al. 1992); no specific locality (1 USNM).

FORA: North Carolina – *Dare County*: Avon (1 UNCW); CAHA, Bodie Island (Boone 1988; Webster 1988; Parnell et al. 1992; tracks); CAHA, Buxton (3 MCZ, 1 NCSU, 1 UNCW); CAHA, Cape Hatteras (Webster 1988; Parnell et al. 1992); FORA, no evidence; Nags Head Woods (Webster 1988); WRBR (observation, tracks, and scat; Boone 1988; Parnell et al. 1992); no specific locality (1 USNM).

CALO: North Carolina – *Carteret County*: CALO, no evidence. *Hyde County*: Lake Mattamuskeet NWR (5 USNM); Swan Quarter NWR (2 USNM); no specific locality (2 NCSU, 3 USNM).

MOCR: North Carolina – *Pender County*: 4 mi N Atkinson (16 UNCW); Burgaw (1 UNCW); 2 mi SE Burgaw, I-40 (1 UNCW); near Burgaw (1 UMMZ); 5 mi SW Camp Davis (1 UMMZ); 6 mi SW Camp Davis (1 UMMZ); Hwy 11 and Hwy 210 (1 UNCW); MOCR (1 UNCW); 6 mi E Burgaw (4 UNCW); Scotts Hill (2 UNCW); Surf City (1 UNCW); no specific locality (1 UNCW).

FOSU: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (Lawson 1718); CHPI (1 UNCW); FOSU, no evidence; no specific locality (Sanders 1978). *County unknown*: Santee (1 USNM).

FOMO: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (Lawson 1718); CHPI (1 UNCW); FOMO, no evidence; no specific locality (Sanders 1978). *County unknown*: Santee (1 USNM).

CHPI: South Carolina – *Charleston County*: [Cape Romain NWR] Bulls Island (Lawson 1718); CHPI (1 UNCW); no specific locality (Sanders 1978). *County unknown*: Santee (1 USNM).

CONG: South Carolina – *Richland County*: CONG (5 UNCW).

HOBE: Alabama – *Tallapoosa County*: HOBE (1 UNCW).

CHAT: Georgia – *Cobb County*: CHAT, no evidence; KEMO (1 UNCW). *Forsyth County*: CHAT, no evidence; no specific locality (Golley 1962). *Fulton County*: CHAT, Island Ford (tracks); CHAT, Jones Bridge (tracks and scat); CHAT, McGinnis Ferry (tracks and scat); CHAT, Palisades East (observation and scat). *Gwinnett County*: CHAT, Abbotts Bridge (tracks and scat); CHAT, Bowmans Island, Richland Creek (1 UNCW); CHAT, Cochran Shoals, rec area (tracks); CHAT, Cochran Shoals, Powers Island (tracks); CHAT, Cochran Shoals, Sope Creek (tracks); CHAT, Level Creek (1 UNCW); CHAT, Medlock Bridge (tracks); CHAT, Orrs Ferry (1 UNCW); CHAT, Settles Bridge (tracks and scat); CHAT, Suwanee (1 UNCW).

KEMO: Georgia – *Cobb County*: CHAT, no evidence; KEMO (1 UNCW). *Fulton County*: CHAT, Island Ford (tracks); CHAT, Jones Bridge (tracks and scat); CHAT, McGinnis Ferry (tracks and scat); CHAT, Palisades East (observation and scat).

OCMU: Georgia – *Bibb County*: OCMU, Main Unit (observation); OCMU, Lamar Unit (tracks and scat); no specific locality (Golley 1962).

FOFR: Georgia – *Glynn County*: FOFR, Bloody Marsh Site (tracks); FOFR, Frederica Site (tracks and scat); Saint Simons Island (1 UNCW); no specific locality (Golley 1962; Neuhauser and Baker 1974, and references cited therein).

CUIS: Georgia – *Camden County*: Cabin Bluff (1 GMNH); CUIS (at least 1 CIM, 7 MCZ, 9 UNCW, 15 USNM; Shoop and Ruckdeschel 1990; Wilson and Durden 2003); Saint Marys

(Bangs 1898); no specific locality (Golley 1962; Neuhauser and Baker 1974, and references cited therein).

TIMU: Florida – *Duval County*: FOCA (observation); Jacksonville (10 UF); TIMU, marsh islands NPS8, NPS18, and NPS19 (McClure 2004); TIMU, Thomas Creek (1 UNCW).

FOCA: Florida – *Duval County*: FOCA (observation); Jacksonville (10 UF); TIMU, marsh islands NPS8, NPS18, and NPS19 (McClure 2004); TIMU, Thomas Creek (1 UNCW).

CASA: Florida – *Saint Johns County*: CASA, no evidence; FOMA, Rattlesnake Island (1 UNCW).

FOMA: Florida – *Saint Johns County*: Anastasia Island (observation); FOMA, Main Unit, no evidence; FOMA, Rattlesnake Island (1 UNCW).

Appendix B. Status of Mammals in SECN Parks

Table B-1. Status of mammals in 19 SECN parks (acronyms by National Park Service). Species documented (PRESENT) in each park are indicated by YES, those EXPECTED BUT NOT FOUND are indicated by EXP, those that potentially occur in each park but are UNDOCUMENTED (unconfirmed or encroaching) are indicated by UNK, those that are EXTIRPATED (historic) are indicated by NO, and those that DO NOT OCCUR IN THE REGION of each park (false report or no evidence) are shown in gray. The presence of the nine-banded armadillo, coyote, and red fox is considered to be the result of natural range expansion.

	Park																			
Common Name <i>Scientific Name</i>	CAHA	WRBR	FORA	CALO	MOCR	FOSU	FOMO	CHPI	CONG	HOBE	CHAT	KEMO	OCMU	FOFR	CUIS	TIMU	FOCA	CASA	FOMA	
Virginia opossum <i>Didelphis virginiana</i>	YES	YES	YES		YES		EXP	YES	YES	EXP	YES	YES	YES	YES	YES ¹	YES	YES	UNK	YES	
Southeastern shrew <i>Sorex longirostris</i>					YES				YES	YES	YES	YES	EXP			YES	EXP			
Least Shrew <i>Cryptotis parva</i>	YES	EXP	EXP	YES	YES			EXP	YES	YES	YES	YES	EXP			YES	EXP			
Northern short-tailed shrew <i>Blarina brevicauda</i>					YES					YES	YES	YES								
Southern short-tailed shrew <i>Blarina carolinensis</i>	YES	EXP	EXP					EXP	YES		YES		YES	UNK	YES	EXP	EXP		EXP	
Eastern mole <i>Scalopus aquaticus</i>	YES	YES	YES	YES	YES			YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	UNK	YES	
Star-nosed mole <i>Condylura cristata</i>					EXP				EXP											
Little brown myotis ² <i>Myotis lucifugus</i>																				
Southeastern myotis ² <i>Myotis austroriparius</i>					YES															
Silver-haired bat ² <i>Lasionycteris noctivagans</i>	YES	EXP	EXP	YES	EXP															
Eastern pipistrelle ² <i>Pipistrellus subflavus</i>					YES															
Big brown bat ¹ <i>Eptesicus fuscus</i>																				
Eastern red bat ² <i>Lasiurus borealis</i>	YES	YES	YES	YES	YES															
Seminole bat ² <i>Lasiurus seminolus</i>				YES	EXP															
Hoary bat ² <i>Lasiurus cinereus</i>				EXP	EXP															

	Park																																
Common Name <i>Scientific Name</i>	CAHA	WRBR	FORA	CALO	MOCR	FOSU	FOMO	CHPI	CONG	HOBE	CHAT	KEMO	OCMU	FOFR	CUIS	TIMU	FOCA	CASA	FOMA														
Northern yellow bat ² <i>Lasiurus intermedius</i>																																	
Evening bat ² <i>Nycticeius humeralis</i>	EXP	EXP	EXP	EXP	YES																												
Rafinesque's big-eared bat ² <i>Corynorhinus rafinesquii</i>					EXP																												
Brazilian free-tailed bat ² <i>Tadarida brasiliensis</i>	YES																																
Nine-banded armadillo <i>Dasypus novemcinctus</i>																								YES				YES	YES	YES	YES		YES
Eastern cottontail <i>Sylvilagus floridanus</i>	YES	YES	YES	YES	EXP																YES	YES	YES	YES	YES	YES	YES	YES		EXP	YES	UNK	
Swamp rabbit <i>Sylvilagus aquaticus</i>										EXP	YES	EXP	UNK																				
Marsh rabbit <i>Sylvilagus palustris</i>	YES		YES	YES	EXP	EXP		EXP	EXP				UNK	YES	YES	YES	YES	YES	NO	YES													
Woodchuck <i>Marmota monax</i>										YES	UNK	EXP																					
Eastern chipmunk <i>Tamias striatus</i>										YES	YES	YES	YES																				
Eastern gray squirrel <i>Sciurus carolinensis</i>	YES	YES	YES		YES		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES														
Eastern fox squirrel <i>Sciurus niger</i>									YES		UNK				NO ³	UNK																	
Southern flying squirrel <i>Glaucomys volans</i>					EXP			EXP	YES	EXP	EXP	EXP	EXP			EXP	EXP																
Southeastern pocket gopher <i>Geomys pinetis</i>															NO ⁴	UNK																	
American beaver <i>Castor canadensis</i>					YES				YES	YES	YES	YES	YES		NO																		
Marsh rice rat <i>Oryzomys palustris</i>	YES	UNK	EXP	YES	EXP	YES	UNK	EXP	YES	YES	YES		EXP	YES	YES	EXP	YES		YES														
Eastern harvest mouse <i>Reithrodontomys humulis</i>		EXP			YES			EXP	YES	EXP	YES	YES	EXP			EXP	UNK																

	Park																		
Common Name Scientific Name	CAHA	WRBR	FORA	CALO	MOCR	FOSU	FOMO	CHPI	CONG	HOBE	CHAT	KEMO	OCMU	FOFR	CUIS	TIMU	FOCA	CASA	FOMA
Oldfield mouse <i>Peromyscus polionotus</i>											UNK								YES
White-footed mouse <i>Peromyscus leucopus</i>	YES	YES	EXP		YES					YES	YES	EXP							
Cotton mouse <i>Peromyscus gossypinus</i>					YES		EXP	EXP	YES	YES	UNK		YES	EXP	YES	YES	EXP		YES
Florida mouse <i>Podomys floridanus</i>																			UNK
Golden mouse <i>Ochrotomys nuttalli</i>					YES				EXP	YES	YES	EXP	EXP			YES	YES		
Hispid cotton rat <i>Sigmodon hispidus</i>	NO ⁴	EXP	EXP		YES		YES	YES	YES	YES	YES	YES	YES	EXP	YES	YES	YES		YES
Eastern woodrat <i>Neotoma floridana</i>									YES				YES	YES		YES	UNK		
Meadow vole <i>Microtus pennsylvanicus</i>	YES		EXP								EXP	EXP							
Woodland vole <i>Microtus pinetorum</i>					EXP			EXP	EXP	YES	YES	EXP	YES						
Round-tailed muskrat <i>Neofiber alleni</i>																			
Common muskrat <i>Ondatra zibethicus</i>	YES		YES	YES	EXP				EXP	EXP	YES	UNK	YES						
Black rat ¹ <i>Rattus rattus</i>	YES	UNK	UNK		EXP	YES	EXP	EXP	EXP		UNK			EXP	EXP			EXP	YES
Norway rat ¹ <i>Rattus norvegicus</i>	YES	EXP	EXP	YES	EXP	EXP	EXP	EXP	EXP	EXP	UNK	YES	EXP	EXP					
House mouse ¹ <i>Mus musculus</i>	YES	YES	EXP	YES	EXP	EXP	YES	YES	EXP	EXP	EXP	EXP	EXP	EXP		EXP	UNK	EXP	YES
Meadow jumping mouse <i>Zapus hudsonius</i>											YES	EXP							
Nutria ¹ <i>Myocastor coypus</i>	YES		YES	YES	UNK								YES			UNK			
Coyote <i>Canis latrans</i>	UNK	UNK	UNK	UNK	YES			UNK	YES	YES	YES	YES	YES		YES	YES	UNK		YES
Feral/domestic dog ¹ <i>Canis familiaris</i>	YES	YES	YES	YES	YES		YES	YES	YES	UNK	YES	YES	YES	YES		YES	YES	YES	YES

	Park																		
Common Name Scientific Name	CAHA	WRBR	FORA	CALO	MOCR	FOSU	FOMO	CHPI	CONG	HOBE	CHAT	KEMO	OCMU	FOFR	CUIS	TIMU	FOCA	CASA	FOMA
Domestic cattle ³ <i>Bos taurus</i>	NO	NO		NO						NO					NO	NO			
European fallow deer ³ <i>Dama dama</i>														NO					
White-tailed deer <i>Odocoileus virginianus</i>	YES	YES		YES	YES		NO ⁴	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES		YES

1 Introduced (native or exotic) and thriving (free-ranging or accompanied by humans)

2 North Carolina parks only

3 Introduced, but did not become established or later was removed

4 Insular population recently extirpated

5 Extirpated on a landscape scale

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior



Natural Resource Program Center
1201 Oakridge Drive, Suite 150
Fort Collins, CO 80525

www.nature.nps.gov

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