

**THE MAMMALS OF THE  
GREAT FALLS BYPASSED REACHES  
(Great Falls-Dearborn Development)  
IN SOUTH CAROLINA**



**Submitted to Duke Power Company**

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## EXECUTIVE SUMMARY

The purpose of this investigation is to document the mammalian fauna of the Great Falls Bypassed Reaches (Terrestrial Study Plan 06) as part of the Catawba River hydroelectric relicensing area in North and South Carolina. This investigation focused on rare, threatened, and endangered (RTE) species of mammals in the Great Falls Bypassed Reaches, which is associated with the Great Falls-Dearborn Development in South Carolina.

Federal and South Carolina management agencies currently list 10 species of mammals or local subspecies of widely distributed mammal species that might occur in the lower Catawba-Wateree Project area. Both federal and state management agencies list the mountain lion (*Puma concolor*), eastern small-footed myotis (*Myotis leibii*), southeastern myotis (*M. austroriparius*), and Rafinesque's big-eared bat (*Corynorhinus rafinesquii*). In addition, the RTE list in South Carolina currently includes the star-nosed mole (*Condylura cristata*), northern long-eared myotis (*Myotis septentrionalis*), hoary bat (*Lasiurus cinereus*), northern yellow bat (*Lasiurus intermedius*), eastern fox squirrel (*Sciurus niger*), and meadow vole (*Microtus pennsylvanicus*); however, the northern long-eared myotis and hoary bat will be removed from the South Carolina RTE list in the near future.

The mammalian fauna of the Great Falls-Dearborn Development is typical of that observed throughout the Piedmont physiographic province of the Carolinas. Thirty-eight species of mammals were documented in the Great Falls Bypassed Reaches area of South Carolina, including the southeastern myotis, a RTE species that is listed as Species of Concern by the US Fish and Wildlife Service and ranked S1 in South Carolina. Species richness was greatest in the upland forests adjacent to the river levee, it was somewhat diminished in the cedar-cane glade, and it was lowest in the rocky river bottom habitat, although this habitat appeared to be important for foraging bats and larger mammals.

Currently, there is discussion about increasing water flow along the Great Falls Long Bypassed Reach, with spate events designed to provide recreational opportunities for kayaking enthusiasts. The effects of spate events on the mammalian fauna of the Great Falls-Dearborn Development will depend on release volume, duration, and frequency. The direct and indirect consequences of deliberate but infrequent spate events likely will have no long-term negative effects on the mammals of the Great Falls-Dearborn Development. However, regular and frequent spate events might cause profound scouring in the Great Falls Long Bypassed Reach, so the development should be monitored carefully to determine the cumulative effects on that region.

## INTRODUCTION

The purpose of this investigation is to document the mammalian fauna of the Great Falls Bypassed Reaches (Terrestrial Study Plan 06) as part of the Catawba River hydroelectric relicensing area in North and South Carolina, focusing on rare, threatened, and endangered (RTE) species. The Catawba-Wateree Project area contains 11 hydroelectric developments that are undergoing the process of relicensing. As part of the relicensing process, surveys for RTE species are required to determine accurately the presence or absence of RTE species in each of the 11 hydroelectric developments and to determine the abundance of those RTE species found to occur in each development. This investigation focused on RTE mammals in the Great Falls Bypassed Reaches, which is associated with the Great Falls-Dearborn Development in north-central South Carolina.

The entire Catawba-Wateree Project area has received scant attention by mammalogists in the past, and little is known about the mammals of each development. Most early fieldwork has tended to focus in the Mountain physiographic province where mammalian diversity is greater than in the Piedmont and Coastal Plain, which contributed to the excitement as new taxa were discovered. Nineteenth Century and early 20<sup>th</sup> Century mammalogists tended to avoid the Coastal Plain because it was hot and buggy, and trapping success there was meager compared to that in the Mountains. The Piedmont then was viewed as a region to travel through, not a region to investigate. For these reasons, little mammalogical research was conducted in the Piedmont physiographic province in the past.

Federal (US Fish and Wildlife Service) and state (SC Department of Natural Resources) management agencies currently list 10 species of mammals or local subspecies of widely distributed mammal species that might occur in the lower Catawba-Wateree Project area. The mountain lion (*Puma concolor*) is considered to be Endangered by federal and state management agencies. The eastern small-footed myotis (*Myotis leibii*), southeastern myotis (*M. austroriparius*), and Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) are listed as Species of Concern by the US Fish and Wildlife Service, and each is ranked in South Carolina. The eastern fox squirrel (*Sciurus niger*) is considered to be Significantly Rare in South Carolina but is not listed federally. Five other species of mammals—the star-nosed mole (*Condylura cristata*), northern long-eared myotis (*Myotis septentrionalis*), hoary bat (*Lasiurus cinereus*), northern yellow bat (*Lasiurus intermedius*), and meadow vole (*Microtus pennsylvanicus*)—are not listed federally but they currently are ranked in South Carolina; however, the first two species of bats will be removed from the South Carolina RTE list in the near future (Mary Bunch, SC DNR, personal communication).

## MATERIALS AND METHODS

This investigation includes two sets of data: existing museum material and fieldwork conducted on site. Voucher material deposited in major North American museum collections was examined to compile a list of mammal species occurring in each county along the Catawba-Wateree River from the Bridgewater Development southward to the Wateree Development, including McDowell, Burke, Caldwell, Alexander, Catawba, Iredell, Lincoln, Mecklenburg, and Gaston counties in North Carolina, and York, Lancaster, Chester, Fairfield, and Kershaw counties in South Carolina. Additional literature records are included when appropriate, and extralimital locality records are mentioned where warranted.

Fieldwork was conducted in the Great Falls-Dearborn Development between Chester and Lancaster counties, South Carolina from May until October 2004 and from May until June 2005, including the USFWS-approved time-table for conducting Indiana bat surveys (15 May to 15 August). Specifically, the author focused fieldwork in the Great Falls Long Bypassed Reach area (eastern red mile 0.15-2.25) immediately downstream of the Diversion Dam just south of Fishing Creek Tailrace, and to a lesser extent the Great Falls Short Bypassed Reach area (western red mile 2.35-2.85), Mountain Island, and surrounding region (Map 1). Three primary habitats were identified—the rocky river-bottom bypass area *per se*; a cedar (*Juniperus*) – cane (*Arundinaria*) glade located immediately east of the Great Fall Long Bypassed Reach area but still in the remnant river levee; and the adjacent uplands that are dominated by pine (*Pinus*) and mixed hardwoods.

These three habitats were the major focus of study, and the amount of survey effort was proportionate to the size of each habitat in the Great Falls Long Bypassed Reach area (Table 1). Extensive ground truthing was used to canvas the three habitats in the Great Falls Long Bypassed Reach and the surrounding uplands, including Mountain Island and the Great Falls Short Bypassed Reach, for tracks, scat, bone fragments, and other sign of terrestrial mammals. Carnivore scat was collected and separated in the lab to determine prey items. In addition, photographs were taken of tracks, scat, and other spoor to provide documentation of occurrence in the study area, and specimens that were found dead on adjacent highways were recorded. Three scent stations were used in each habitat to attract carnivores, some of which were observed at the stations during nocturnal surveys; however, most of the scent station data consisted of tracks and occasionally scat.

In each habitat grids of 25 pitfall traps arranged in a 5X5 pattern, each separated by 10 meters, sampling an area of 0.25 hectares were established. Additionally, grids of 25 Sherman live-traps in a 5X5 pattern, also sampling an area of 0.25 hectares were established in each habitat. Captured small mammals were photographed and released on site when possible. To survey the bat fauna, the author used SONOBAT and mist netting, following USFWS-approved guidelines for Indiana bat surveys, in these same habitats from May until October 2004 and in June 2005. Captured bats were photographed and released on site. In addition, all hydroelectric buildings in the Great Falls-Dearborn Development were surveyed for the presence of bats and their spoor.

## ACCOUNTS OF SPECIES

The following list of mammal species includes the general distribution for each species found the north-central Piedmont of South Carolina, a more detailed description of the distribution and status of each species within the Great Falls Bypassed Reaches area of the Great Falls-Dearborn Development (Table 2), a comment about the federal and state listing and ranking for RTE species in South Carolina, and other comments thought to be appropriate. Each account includes a list of specimens from the 14 counties included in the Catawba-Wateree Project area that currently are housed in museum collections and examined by the author, and each account includes a list of additional records from the same geographic area in the literature. Common and scientific names are from Baker et al. (2003). Additional accounts for imperiled species hypothetically thought to occur in the region are included to document their absence in the Great Falls-Dearborn Development.

State ranking are from <http://www.dnr.state.sc.us/pls/heritage/> for South Carolina mammals, updated on 9 June 2003. In addition, the author has updated rankings for South Carolina mammals, and this list currently is in the process of being approved (Mary Bunch, SC DNR, personal communication). Standard listing categories (Endangered, Threatened, and Special Concern) and ranking categories (S1, S2, S3, S4) are defined as follows (LeGrand et al., 2004): 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. 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. On occasion, state listings in North Carolina are provided for some mammal species included herein (LeGrand et al., 2004).

### **Virginia opossum** *Didelphis virginiana*

The Virginia opossum is one of the most widely distributed mammals in eastern North America (McManus, 1974; Hall, 1981), and it is widespread and common throughout the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). 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 habitats as it traverses its relatively large home range; it is common in residential areas as well. Because of its abundance and widespread distribution, it is not considered to be imperiled by federal or state management agencies. The Virginia opossum is common to abundant throughout the entire Catawba-Wateree Project area. Tracks and scat were commonly seen in the Great Falls-Dearborn Development, in all three habitats and on multiple occasions, and individuals were observed at night at scent stations.

#### SPECIMEN EXAMINED:

NORTH CAROLINA.—Mecklenburg County: Charlotte (1 NCSU).

#### ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Caldwell County. Iredell County. McDowell County.  
SOUTH CAROLINA (Golley, 1966).—Chester County. Kershaw County.

### **Southeastern shrew** *Sorex longirostris*

The southeastern shrew is one of the most common and widespread small mammals in the southeastern United States (French, 1980; Hall, 1981). In the Carolinas, 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 Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2004; Webster et al., in press), and that it occupies a broader variety of habitats than previously understood. It is not listed by federal or state management agencies. The southeastern shrew occurs throughout the Catawba-Wateree watershed. It was not encountered at the Great Falls-Dearborn Development, but it is uncommon to common in there.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: 6 km NW Ellendale, SR 1303, 1400 ft (2 UNCW). Iredell County: 1 km N Buffalo City, 800 ft (9 UNCW). McDowell County: 3 km N Old Fort, FS 482, 1650 ft (3 UNCW).

**Southern short-tailed shrew**  
*Blarina carolinensis*

The southern short-tailed shrew is widespread in most terrestrial habitats throughout the southeastern United States, exclusive of the southern Appalachian Mountains (Genoways and Choate, 1998; McCay, 2001), so it is not considered to be imperiled by federal and state management agencies. The southern short-tailed shrew and the northern short-tailed shrew (*Blarina brevicauda*) are sibling species that compete intensely along a lengthy zone of parapatry, and they almost never coexist. In the Catawba-Wateree Project area, the southern short-tailed shrew is common to abundant in a variety of habitats from the Cowans Ford Development southward throughout the remainder of the project area (Webster et al., 1985; Trani Griep, 2005; Webster et al., in prep.). It is common to abundant in the Great Falls-Dearborn Development.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Catawba County: Clines Township (1 ASU). Gaston County: Gastonia (1 UNCW). Iredell County: 1 km N Buffalo City, 800 ft (2 UNCW). Mecklenburg County: Charlotte area (3 ASU, 2 NCSM, 4 UMMZ, 3 UNCW); Davidson (2 UMMZ).

**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). Its abundance appears to vary dramatically across the Carolinas. It is common to abundant in the Coastal Plain, uncommon to common in the Piedmont, rare at lower elevations in the Mountains, and absent from higher elevations in the Mountains (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2004). It occurs throughout the Catawba-Wateree Project area in appropriate habitat, following the same pattern—abundant around the Wateree Development, common around the Piedmont developments, and rare to uncommon around the Bridgewater Development. Federal and state management agencies do not consider it to be imperiled. It is rare to uncommon in the Great Falls-Dearborn Development because there is a scant amount of appropriate habitat, but it would be expected in poorly maintained powerline cuts leaving hydroelectric facilities in the surrounding area, roadside ditches, and abandoned croplands.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: 6 km NW Ellendale, SR 1303, 1400 ft (1 UNCW). Burke County: 5 km W Ramsey, 1400 ft (3 UNCW). Mecklenburg County: Pineville (1 GMNH).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Caldwell County. Mecklenburg County.

**Eastern mole**  
*Scalopus aquaticus*

The eastern mole is distributed throughout much of eastern and central North America (Yates and Schmidly, 1978; Hall, 1981), and it is widespread in the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2004). It is common to abundant at lower elevations throughout the region, uncommon in rocky habitats above 2000 ft in elevation, and rare at elevations above 4000 ft. It is not listed by federal and state management agencies. In the Catawba-Wateree Project area, it is rare to common—rare in rocky areas around reservoirs and bypass areas, but uncommon to common in maintained lawns and early, mid-, and late successional habitats—but present in each development from Bridgewater southward to Wateree. Its abundance also varies in the Great Falls-Dearborn Development. Tunnels were observed regularly along trails and roadbeds and in the surrounding forests, where this mole is uncommon to common, but they were seldom observed in the rocky habitat adjacent to the river, where it is rare.

SPECIMEN EXAMINED:

NORTH CAROLINA.—McDowell County: 2 mi W Marion (1 CM).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—McDowell County. Mecklenburg County.

SOUTH CAROLINA (Golley, 1966).—Kershaw County. York County.

**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 (Petersen and Yates, 1980; Hall, 1981; Lee et al., 1983; Webster et al., 1985; Webster, 1987; Beane, 1995). Throughout most of its range, including western North Carolina, this gregarious mole is locally abundant in suitable habitat. It therefore is not considered to be imperiled federally, and the mountain population is not considered to be imperiled in North Carolina. In South Carolina, however, it is rarely encountered in either the Mountain or Coastal Plain physiographic provinces, and it therefore is ranked S3S4. There is no voucher material from within the Catawba-Wateree Project area, although this species likely occurs on the Blue Ridge Escarpment above the Bridgewater Development. Discounting the dubious records from Mecklenburg County in North Carolina (Beane, 1995) and York and Kershaw counties in South Carolina (Golley, 1966), the star-nosed mole does not inhabit the Catawba-Wateree Project area, including the Great Falls-Dearborn Development.

**Eastern small-footed myotis**  
*Myotis leibii*

The eastern small-footed myotis is restricted to eastern North America, and its distribution extends southward along the Appalachian Mountains as far south as western North Carolina, northwestern South Carolina, and northern Georgia westward to the Ozark Mountains (Barbour and Davis, 1969; Hall, 1981; Lee et al., 1983; Webster et al., 1985; Choate et al., 1994; Best and Jennings, 1997; Menzel et al., 2003). It is rare to uncommon throughout its range, and federal and state management agencies consider it imperiled. It is listed federally as a Species of Concern (USFWS) or, alternatively, a Species at Risk (USGS). It is listed as Special Concern and ranked S2N/SUB (non-breeding and breeding status, respectively) in North Carolina (LeGrand et al., 2004) and as S1 in the 2003 and revised South Carolina rankings. In both states it typically is confined to the Mountain physiographic province, but one individual was collected in Davidson County, North Carolina (Webster et al., in press). Therefore, it is unlikely that the small-footed myotis occurs in the Catawba-Wateree Project area, save for an occasional migrating individual around the Bridgewater, Rhodhiss, and Oxford developments. The eastern small-footed myotis is included herein because all bats, due to their ability to fly, are more likely than terrestrial mammals to provide extralimital records; however, it does not occur in the Great Falls-Dearborn Development.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Caldwell County: no specific locality (1 UNCW). Davidson County: no specific locality (1 UNCW).

**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). In addition, there are scattered records from the Piedmont and Coastal Plain in the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003), which appear to represent migrating individuals rather than residents (Barbour and Davis, 1969; Webster et al., in press). The little brown myotis is not considered to be imperiled by federal and state management agencies because it is so widely distributed; however, it was ranked S3? in South Carolina in 2003. In the Carolinas, it is common to abundant in the Mountain physiographic province, where it occurs throughout the year, but it is uncommon in the Piedmont and rare in the Coastal Plain. It is nowhere common in the Catawba-Wateree Project area, being uncommon from the Bridgewater Development eastward to the Lookout Shoals Development and rare throughout the remainder of the project area. It was not recorded with SONOBAT and it was not observed in the powerhouses in the Great Falls-Dearborn Development, but it may occur there during migration.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Burke County: no specific locality (1 UNCW). McDowell County: near Little Switzerland, 4000 ft (1 USNM). Mecklenburg County: no specific locality (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA.—Catawba County (Lee et al., 1983). McDowell County (Webster et al., in press): Limekiln Cave; Pseudosaltpete Cave; Wind Cave.

**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). It is restricted to the Coastal Plain in North and South Carolina (Golley, 1966; Lee et al., 1983 Webster et al., 1985; Menzel et al., 2003). There is concern by federal and state management agencies that it is imperiled. At the federal level it is listed as Species of Concern, in North Carolina it is listed as Special Concern and ranked S3 (LeGrand et al., 2004), and in South Carolina it is ranked S1 in both the 2003 and revised rankings. In the Atlantic and Gulf Coastal Plain in the southeastern United States, it is common at best in cypress-gum swamps and abandoned buildings adjacent to permanent sources of water, over which it forages. It is rare to uncommon elsewhere within its range. It does not occur around the hydroelectric reservoirs along the Catawba River in North Carolina, although it likely occurs in the next major river basin to the east, the Pee Dee River (Kalcounis-Rüppel, pers. comm.). In South Carolina, it has been recorded from the E. I duPont factory in Kershaw County (Neuhauser and DiSalvo, 1972) and the author recorded it with SONOBAT in the Great Falls-Dearborn Development (Lancaster County) and over the Wateree River between Lugoff and Camden (Kershaw County). Therefore, it likely occurs in the Rocky Creek-Cedar Creek and Wateree developments as well.

SPECIMEN EXAMINED:

SOUTH CAROLINA.—Kershaw County: Camden (1 ChM).

ADDITIONAL LITERATURE RECORD:

SOUTH CAROLINA.—Kershaw County: Lynches River (Webster et al., 1985).

**Northern long-eared myotis**  
***Myotis septentrionalis***

The northern long-eared myotis is a denizen of forested habitats throughout much of north-central and northeastern North America (Barbour and Davis, 1969; Fitch and Shump, 1979; Hall, 1981; Caceres and Barclay, 2000). In the Carolinas, most records are from the southern Appalachian Mountains, where it is relatively common, but there are scattered records from the Piedmont and Coastal Plain of North Carolina as well (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003; Webster et al., in press). It is not considered to be imperiled federally, but it is listed as Special Concern and ranked S3 in North Carolina. It was ranked S4 in South Carolina in 2003, but it will be removed in the revised rankings. In the Catawba-Wateree Project area, the northern long-eared myotis is rare to uncommon from the Bridgewater Development eastward to the Lookout Shoals Development, but absent downstream from there. It does not occur in the Great Falls-Dearborn Development, but is included herein because it is more likely than the eastern small-footed myotis to generate extralimital records during migration.

LITERATURE RECORDS:

NORTH CAROLINA.—Burke County (LeGrand et al., 2004). McDowell County: Pseudosaltpeper Cave (Webster et al., in press).

**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 and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003). It is highly migratory (Cryan, 2003), arriving in the Carolinas in late summer and staying through mid-spring (Webster et al., in press). Its abundance, therefore, varies throughout the year. It is not considered to be imperiled federally or in South Carolina, but in North Carolina it is listed Significantly Rare and ranked SU, but only during the breeding season (LeGrand et al., 2004). The silver-haired bat is uncommon to common throughout the Catawba-Wateree Project area, including the Great Falls-Dearborn Development, except during most of the summer months, when it is absent. It was not captured in mist nets or recorded with SONOBAT on the dates surveyed, but it would be expected in the region during the months from October through April.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Burke County: 0.8 mi NW Morganton (1 NCSM). Caldwell County: no specific locality (5 UNCW). Catawba County: no specific locality (2 UNCW). Gaston County: no specific locality (1 UNCW). Iredell County: no specific locality (3 UNCW). Mecklenburg County: Charlotte (3 MCZ, 1 NCSU); no specific locality (13 UNCW).

SOUTH CAROLINA.—Lancaster County: no specific locality (1 ChM). York County: Rock Hill (1 ChM).

ADDITIONAL LITERATURE RECORDS:

SOUTH CAROLINA (Menzel et al., 2003).—Chester County. Kershaw County. Lancaster County. York County.

**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 and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003). It is common throughout much of its range and, therefore, is not considered to be imperiled by federal and state management agencies. The eastern pipistrelle occurs throughout the entire Catawba-Wateree Project area and is relatively common in the Great Falls-Dearborn Development based on SONOBAT recordings.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Catawba County: no specific locality (1 UNCW). Gaston County: no specific locality (1 UNCW). Iredell County: no specific locality (1 UNCW). McDowell County: Linville Cave (1 UMMZ); Linville Caverns (6 KU); Linville Caverns, 15 mi S Linville, Hwy 221 (6 CM, 2 MVZ); Linville Falls (2 UMMZ); Marion (1 UMMZ); North Fork, Catawba River, 20 mi E Marion (7 USNM); no specific locality (1 UNCW). Mecklenburg County: Charlotte (1 NCSM, 1 NCSU, 1 UMMZ); no specific locality (10 UNCW).

SOUTH CAROLINA.—Chester County: no specific locality (1 ChM).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA.—McDowell County (Webster et al., in press): Limekiln Cave, Pseudosalt peter Cave, Wind Cave.

SOUTH CAROLINA (Menzel et al., 2003, unless noted otherwise).—Chester County. Kershaw County (Golley, 1966; Neuhauser and DiSalvo, 1972). York County.

**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; Kurta and Baker, 1990). It is the most commonly encountered bat in eastern North America because it typically roosts in houses, and buildings, and other man-made structures. It has a statewide distribution in North and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003). Because of its widespread distribution and abundance, it is not considered to be imperiled by federal or state management agencies. It is common to abundant throughout the Catawba-Wateree Project area and common in the Great Falls-Dearborn Development, where it was recorded with SONOBAT. Approximately 50 big brown bats and 30 Barn Swallows were found mummified in the screens protecting the exhaust fans in the roof of the Rocky Creek Powerhouse in the Rocky Creek-Cedar Creek Development. This is the only powerhouse in the Catawba-Wateree Project in which bats were found.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: Taylorsville (4 ASU); no specific locality (2 UNCW). Burke County: no specific locality (19 UNCW). Caldwell County: no specific locality (1 ASU, 60 UNCW). Catawba County: no specific locality (53 UNCW). Gaston County: no specific locality (107 UNCW). Iredell County: no specific locality (90 UNCW). Lincoln County: no specific locality (22 UNCW). McDowell County: no specific locality (5 UNCW). Mecklenburg County: Charlotte (1 UMMZ); no specific locality (611 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Burke County. Catawba County. Gaston County.

SOUTH CAROLINA (Menzel et al., 2003).—Chester County. Fairfield County. Kershaw County. Lancaster County. York County.

**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; Shump and Shump, 1982a), and it likely is the most common and widespread bat in the Catawba-Wateree Project area. It is common to abundant throughout the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003), but roosts singly in trees so it is encountered much less frequently than the big brown bat, which is less abundant overall but roosts in large concentrations in man-made structures (Webster et al., in press). The eastern red bat is not considered to be imperiled by federal and state management agencies. Eastern red bats commonly were recorded using SONOBAT in the Great Falls-Dearborn Development, individuals were regularly observed flying over stagnant pools at Camp Creek in the Great Falls Long Bypassed Reach. It is common to

abundant throughout the entire Catawba-Wateree Project area, including the Great Falls-Dearborn Development.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: 10 mi NW Taylorsville (1 NCSM); no specific locality (1 UNCW). Burke County: no specific locality (3 UNCW). Caldwell County: no specific locality (3 UNCW). Catawba County: no specific locality (8 UNCW). Gaston County: 5 mi E Kings Mountain, 800 ft (1 USNM); no specific locality (16 UNCW). Iredell County: no specific locality (9 UNCW). McDowell County: no specific locality (1 UNCW). Mecklenburg County: Charlotte area (1 NCSU, 6 UMMZ); no specific locality (39 UNCW).

SOUTH CAROLINA.—Kershaw County: Camden (2 MVZ); Lugoff (1 ChM). York County: Catawba (1 FMNH).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Burke County. Catawba County. Gaston County.

SOUTH CAROLINA (Menzel et al., 2003).—Chester County. Fairfield County. Kershaw County. Lancaster County. York County.

**Seminole bat**  
*Lasiurus seminolus*

The Seminole bat is a denizen of pine (*Pinus*) 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). It generally is uncommon throughout Lower Piedmont and Coastal Plain in the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003), because its abundance wanes northward along the mid-Atlantic coast. Vagrants have been taken in Pennsylvania and New York., and there are records of autumnal migrants from 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 the Carolinas during the cooler months of the year (Webster et al., in press). Federal and state management agencies do not consider it to be imperiled. In the Catawba-Wateree Project area, it is seasonally absent to rare from the Bridgewater Development eastward to the Lookout Shoals Development, seasonally rare to uncommon from the Cowans Ford Development southward to the Rocky Creek-Cedar Creek Development, and seasonally common in the Wateree Development. There are no reliable sonar characteristics that allow it to be distinguished from the eastern red bat using ANABAT or SONOBAT, and the author cannot state with certainty that it was recorded with SONOBAT in the Great Falls-Dearborn Development area. However, records from other counties included in the study suggest that it occurs in the Great Falls-Dearborn Development.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Buncombe County: no specific locality (1 UNCW). Mecklenburg County: Camp Steere, near Charlotte (1 UMMZ).

SOUTH CAROLINA.—Pickens County: Clemson (1 GMNH).

ADDITIONAL LITERATURE RECORDS:

SOUTH CAROLINA (Menzel et al., 2003).—Fairfield County. Kershaw County. Lancaster County.

**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). It is not considered to be imperiled federally; however, it is listed as Significant Rare and ranked S3? and S1? during the non-breeding and breeding seasons, respectively, in North Carolina (LeGrand et al., 2004). It was ranked S? in the 2003 South Carolina rankings, but it will be removed in the revised rankings. Its abundance varies seasonally from absent to relatively abundant at any one site throughout the year because it is highly

migratory (Cryan, 2001, 2003). The hoary bat typically occurs throughout the Carolinas 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; Webster et al., in press). It is widely distributed throughout the Catawba-Wateree Project area, where it likely varies in abundance from absent in the summer months to rare or uncommon during migration. Its status in the Great Falls-Deerborn Development varies seasonally, from absent to uncommon, respectively. It was not captured in mist nets or recorded with SONOBAT on the dates surveyed, but it would be expected in the region during the months from September through April.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Gaston County: no specific locality (1 UNCW). Iredell County: no specific locality (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

SOUTH CAROLINA (Menzel et al., 2003).—Kershaw County. Lancaster County. York County.

**Northern yellow bat**  
*Lasiurus intermedius*

The northern yellow bat is a denizen of 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). Most records in the Carolinas are from the Lower Coastal Plain (Golley, 1966; Webster et al., 1985; Menzel et al., 2003), but one individual was collected in Mecklenburg County, North Carolina (Webster, 2002). Although the northern yellow bat is common to abundant in the Deep South, it is rare to uncommon in the Carolinas. It 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., 2004), S? in the 2003 South Carolina rankings, and S3S4 in the revised South Carolina rankings. Except for the extralimital record from Mecklenburg County, the northern yellow bat has not been reported in the Catawba-Wateree Project area.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Mecklenburg County: no specific locality (1 UNCW).

**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—it is absent at higher elevations in the southern Appalachian Mountains but common in the Coastal Plain of the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003). It is not considered to be imperiled by federal and state management agencies. The evening bat is distributed throughout the Catawba-Wateree Project area, but its abundance in the project area also varies inversely to elevation. It is rare in the Bridgewater Development, uncommon from the Rhodhiss Development eastward to the Lookout Shoals Development, and common from the Cowans Ford Development southward to the Wateree Development. It is common in the Great Falls-Deerborn Development where it was frequently recorded with SONOBAT.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Catawba County: no specific locality (4 UNCW). Iredell County: no specific locality (5 UNCW). Gaston County: no specific locality (15 UNCW). Lincoln County: no specific locality (1 UNCW). Mecklenburg County: Charlotte (2 UMMZ); no specific locality (72 UNCW).

SOUTH CAROLINA.—Fairfield County: Cedar Creek and Hwy 218 (1 ChM).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA.—Catawba County (Lee et al., 1983).

SOUTH CAROLINA (Menzel et al., 2003).—Chester County. Kershaw County. Lancaster County. York County.

**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 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). It is considered to be rare to uncommon throughout its range and is listed at the federal level as Species of Concern. In North Carolina it is listed as Threatened and ranked S2 (LeGrand et al., 2004), and in South Carolina it was ranked S2? in 2003 and S2S3 in the revised rankings. The Alexander County (NC) records are from 1915 and it is likely that an extant population no longer exists in that part of the state; however, it recently was found at South Mountains State Park in Burke County, North Carolina (Webster et al., in press). South Carolina records are confined to the extreme northwestern part of the state or the Coastal Plain (Menzel et al., 2003). A specimen from Lugoff in Kershaw County (SC) was collected in 1973, and two individuals were observed by the author at Mulberry Plantation, approximately 10 km S Camden in Kershaw County. The latter two specimens were using a horse stable as a daytime roost. Rafinesque's big-eared bat, therefore, likely does not occur in the Catawba-Wateree Project area, except downstream of the Wateree Development. The author did not record it with SONOBAT in the Great Falls-Dearborn Development and the habitat there seemed unsuitable; however, this secretive bat is considered a 'whispering bat' because its low-amplitude echolocation calls render it undetectable to echolocation-detecting devices such as ANABAT and SONOBAT.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: Taylorsville (1 NCSM); 10 mi NW Taylorsville (1 NCSM).

SOUTH CAROLINA.—Kershaw County: Lugoff (1 ChM).

ADDITIONAL LITERATURE RECORD:

NORTH CAROLINA.—Burke County: South Mountains State Park (Webster et al., in press).

**Brazilian free-tailed bat**  
*Tadarida brasiliensis*

The Brazilian free-tailed bat is distributed throughout the Deep South, 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; Hall, 1981; Wilkins, 1989). It occurs in the Coastal Plain and Piedmont of North Carolina and the Coastal Plain and Lower Piedmont of South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Menzel et al., 2003; Webster et al., in press). Federal and state management agencies do not consider the Brazilian free-tailed bat to be imperiled. In the Catawba-Wateree Project area, it most likely occurs from the Cowans Ford Development southward to the Wateree Development. It was recorded with SONOBAT in the Great Falls-Dearborn Development, where it is uncommon.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Gaston County: no specific locality (5 UNCW). Mecklenburg County: no specific locality (45 UNCW).

ADDITIONAL LITERATURE RECORD:

SOUTH CAROLINA.—Kershaw County (Neuhauser and DiSalvo, 1972): Camden; Elgin.

**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), and it is widespread in the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). It inhabits a wide variety of early and mid-successional habitats and natural or maintained broken habitats that provide both cover and adequate forage. It is not considered to be imperiled by federal or state management agencies. It occurs in all developments in the Catawba-Wateree Project area. In the Great Falls-Dearborn Development, it is uncommon in all three habitats in the Great Falls Long Bypass Reach, but it is common in powerline rights-of-way and habitats dominated by herbaceous vegetation for forage and adjacent brush piles, brambles, and thickets for cover.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Burke County: 3 km W Ramsey, 1200 ft (1 UNCW). Iredell County: Statesville (1 MCZ, 1 UNCW). Mecklenburg County: Charlotte (1 NCSU).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA.—Burke County (Lee et al., 1983).

SOUTH CAROLINA.—Kershaw County (Golley, 1966).

**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 17<sup>th</sup> and 18<sup>th</sup> 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 habitats that it is considered a nuisance (Jenkins and Busher, 1979); it is not considered to be imperiled by federal and state management agencies. It is found throughout the Carolinas (Golley, 1966; Webster et al., 1985; Trani Griep, 2005), and it is locally common to abundant from the Bridgewater Development downstream to the Wateree Development. It is abundant in the Great Falls-Dearborn Development—individuals were observed swimming at night in Camp Creek and beaver spoor (chewed and fallen trees, trails and tracks, etc) were found throughout the Great Falls Bypassed Reaches area (Fig. 1). The population appeared to increase in the Camp Creek area after the natural and controlled spate events of 2004, based on the amount of sign in the area.

**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 southern distribution includes the Piedmont and Mountain physiographic provinces in North Carolina and the Mountain physiographic province in South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. The eastern chipmunk occurs throughout much of the Catawba-Wateree Project area. It is common to abundant from the Bridgewater Development eastward to Lookout Shoals, uncommon to locally common from the Cowans Ford Development southward to the Lake Wylie Development, and rare in the Great Falls-Dearborn Development, where it was seldom observed or heard.

LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Alexander County. Caldwell County. Catawba County. Gaston County. Mecklenburg County.

**Eastern gray squirrel**  
*Sciurus carolinensis*

The eastern gray squirrel is a denizen of hardwood forests in eastern North America (Hall, 1981; Koprowski, 1994), and it is common to abundant in most forested habitats in the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. The eastern gray squirrel is common to abundant in all developments in the Catawba-Wateree Project area. It is rare to abundant in the Great Falls-Dearborn Development: rare along the rocky river bottom in the Bypass Reaches, uncommon to common in the cedar-cane glade, and common to abundant in the adjacent upland forests. It was observed and heard during every survey on the property, one partial cranium (UNCW 13581) was recovered from site, and chewed hickory (*Carya*) nuts and acorns (*Quercus*) were found throughout the development (Fig. 1).

SPECIMENS EXAMINED:

NORTH CAROLINA.—Burke County: Glen Alpine (1 UNCW); 3 mi S Morganton (1 UNCW); 5 mi S Morganton (1 UNCW). Iredell County: 4 km NNW Buffalo City (1 UNCW); Statesville (2 MCZ).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Alexander County. Caldwell County. Catawba County. Mecklenburg County.

SOUTH CAROLINA.—Lancaster County (Golley, 1966).



Figure 1. Chewed trees (left) and hickory nuts (right), evidence of American beaver and eastern gray squirrel, respectively, where commonly found throughout the Great Falls Bypassed Reaches.

**Eastern fox squirrel**  
*Sciurus niger*

The eastern fox squirrel is distributed throughout much of the eastern United States (Hall, 1981). In North and South Carolina numbers are declining, but it is locally common in remnant stands of long-leaf pine (*Pinus palustris*) in the Coastal Plain physiographic province but rare in mid-elevational hardwood forests in the Mountain province. It does not occur in the Piedmont of North Carolina or the northern Piedmont of South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). It does not occur in any developments in the Catawba-Wateree Project area, including the Great Falls-Dearborn Development. Nonetheless, it is included herein because it inhabits the Sandhill physiographic sub-province, and there are SC DNR records of fox squirrels from the sandhills of eastern Kershaw County (SC), a county included in this investigation, and local employees have reported it at Mulberry Plantation, approximately 10 km S Camden in Kershaw County. The eastern fox squirrel is ranked S4 in South Carolina in both the 2003 and revised lists.

**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). It has a statewide distribution in North and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. The southern flying squirrel occurs throughout all developments in the Catawba-Wateree Project area, including the Great Falls-Dearborn Development. The author found one nest containing three flying squirrels on Mountain Island (SC), and he regularly heard flying squirrels while conducting nocturnal surveys for bats.

SPECIMEN EXAMINED:

NORTH CAROLINA.—McDowell County: 2 km E Busick, Wood Mountain (1 UNCW).

ADDITIONAL LITERATURE RECORD:

SOUTH CAROLINA.—Lancaster County (Golley, 1966).

**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 the Carolinas, except at elevations above 2000 ft in the Mountain physiographic province (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. Although there are museum and literature records from only five counties in the Catawba-Wateree Project area, the eastern harvest mouse occurs throughout the entire project area. However, because it prefers early to mid-successional habitats, its distribution and abundance in the project area varies. It is locally common in poorly maintained powerline rights-of-way leaving the hydroelectric facilities but rare in adjacent forested habitats. In the Great Falls-Dearborn Development, it is rare in the Great Falls Long Bypassed Reach, but likely common in the powerline rights-of-way leaving the Powerhouses.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Burke County: 5 km W Ramsey, 1400 ft (1 UNCW). Iredell County: 1 km N Buffalo City, 800 ft (1 UNCW). McDowell County: 3 km N Old Fort, FS 482, 1650 ft (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Catawba County. Mecklenburg County.

**Oldfield mouse**  
*Peromyscus polionotus*

The oldfield mouse is distributed throughout the southeastern United States, and its northern boundary in the region approaches the vicinity of the Wateree Development (Golley, 1966; Webster et al., 1985; Hall, 1981, Trani Griep, 2005). In Florida and Alabama, insular populations are listed by federal and state management agencies, but the subspecies of oldfield mouse that inhabits South Carolina is not considered to be imperiled federally or by South Carolina. The oldfield mouse occurs in sandier and more open habitats than do most other small rodent species, and these soils are rarely found in the Catawba-Wateree Project area. Therefore, the oldfield mouse does not occur anywhere in the project area, except possibly in the Wateree Development. It does not inhabit the Great Falls-Dearborn Development.

LITERATURE RECORD:

SOUTH CAROLINA.—Kershaw County (Golley, 1966).

**White-footed mouse**  
*Peromyscus leucopus*

The white-footed mouse is widely distributed across much of North America (Hall, 1981; Lackey et al., 1985), and it is common to abundant in brush piles, hedgerows, thickets, and forests throughout the Carolinas (Golley, 1966; Webster et al., 1985; Trani Griep, 2005). It is not considered to be imperiled by federal or state management agencies. It occurs throughout the entire Catawba-Wateree Project area. The white-footed mouse is the most abundant small mammal in the Great Falls-Dearborn Development, and it is common to abundant in all three habitats surveyed. One nursing female, dragging three hairless pups, was observed in the Great Falls Long Bypassed Reach after they were displaced by an eastern kingsnake (*Lampropeltis getulus*).

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: 4 km NW Ellendale, 1400 ft (1 UNCW); 6 km NW Ellendale, SR 1303, 1400 ft (1 UNCW); 7 km NW Ellendale, 1800 ft (2 UNCW); 9 km NW Ellendale (2 UNCW). Burke County: Glen Alpine (1 UNCW); 4 km SW Pleasant Grove, 1600 ft (7 UNCW). Caldwell County: Blowing Rock (20 UNCW). Iredell County: 6 km NNE Houstonville (1 UNCW); 10 mi SW Statesville, Catawba River (1 USNM). Lincoln County: 8 mi N Lincolnton (6 CM). McDowell County: Lake Tahoma (5 GMNH). Mecklenburg County: 1 mi from Hwy 74/51 (2 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Burke County. Caldwell County. Catawba County. Lincoln County. Mecklenburg County.

SOUTH CAROLINA (Golley, 1966).—Fairfield County. Lancaster County. York County.

**Cotton mouse**  
*Peromyscus gossypinus*

The cotton mouse is distributed throughout the southeastern United States (Wolfe and Linzey, 1977; Hall, 1981), save for the Upper Piedmont and Mountain physiographic provinces in the Carolinas (Golley, 1966; Webster et al., 1985; Trani Griep, 2005). It is common to abundant in a wide variety of forested habitats, including relatively dry, mesic, riparian, and swampy environments. Federal and state management agencies do not consider it to be imperiled in South Carolina. There are few records of the cotton mouse in the Catawba-Wateree Project area, and those that do exist are from lower elevations at the southern and eastern perimeters of the project area. The cotton mouse does not inhabit the Catawba-Wateree Project area from the Bridgewater Development southward to the Rocky Creek-Cedar Creek Development, and it is uncommon in the Wateree Development. It does not occur in the Great Falls-Dearborn Development.

LITERATURE RECORDS:

SOUTH CAROLINA (Golley, 1966).—Kershaw County. Lancaster County.

**Golden mouse**  
*Ochrotomys nuttalli*

The golden mouse is another rodent that is endemic to the southeastern United States (Linzey and Packard, 1977; Hall, 1981), and it is found at all elevations throughout the Carolinas (Golley, 1996; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. The golden mouse certainly inhabits each of the development in the Catawba-Wateree Project area, including the Great Falls-Dearborn Development. However, it is semi-arboreal and prefers habitats that have well-developed three-dimensional structure, so it inhabits the adjacent uplands but not the cedar glade or rocky river bottom in the Great Fall Long Bypassed Reach.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: 6 km NW Ellendale, SR 1303, 1400 ft (2 UNCW). Burke County: 4 km SW Pleasant Grove, 1600 ft (1 UNCW). Catawba County: 1 mi N Catawba, Catawba River (1 USNM). Lincoln County: 8 mi N Lincolnton (1 CM); 1 mi W Triangle (3 UNCW). McDowell County: 2 mi W Marion (1 CM).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Iredell County.

SOUTH CAROLINA (Golley, 1966).—Kershaw County. Lancaster County. York County.

**Hispid cotton rat**  
*Sigmodon hispidus*

The hispid cotton rat is a ubiquitous denizen of early to mid-successional habitats in the southern United States and Mexico (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 not considered to be imperiled by federal and state management agencies. It is widespread throughout the Carolinas (Golley, 1966; Webster et al., 1985; Trani Griep, 2005) and it is one of the most common mammals in each development in the Catawba-Wateree Project area. It is uncommon to common in suitable habitat in the Great Falls-Dearborn Development, it was observed in the Great Falls Long Bypassed Reach, where its characteristic piles of chewed grasses were found on numerous occasions.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: 4 km NW Ellendale, 1400 ft (1 UNCW); 6 km NW Ellendale, SR 1303, 1400 ft (1 UNCW); 9 km NW Ellendale (1 UNCW). Iredell County: 1 km N Buffalo City, 800 ft (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Caldwell County. Mecklenburg County.

SOUTH CAROLINA (Golley, 1966).—Kershaw County. Lancaster County. York County.

**Meadow vole**  
*Microtus pennsylvanicus*

The meadow vole is locally abundant throughout most of Canada and the northern United States (Hall, 1981; Reich, 1981), and it is locally abundant in the Carolinas as well (Golley, 1966; Webster et al. 1985; Trani Griep, 2004). It prefers herbaceous habitats such as fallow fields, roadside ditches, meadows, bogs, and estuarine slat marshes. It is not considered to be imperiled federally or in North Carolina, where it is found throughout most of the Mountain and Piedmont physiographic provinces. It is ranked S? in South Carolina because it is restricted to the northwesternmost corner of the state and because a disjunct population on the coast in Charleston County is now likely extirpated. In the Catawba-Wateree Project area, the meadow vole is widely distributed from the Bridgewater Development, where it is locally common, downstream to the Mountain Inland Development, where it is locally uncommon. It does not occur between the Wylie and Wateree developments, including the Great Falls-Dearborn Development.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Caldwell County: Blowing Rock (2 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Caldwell County. Mecklenburg County.

**Woodland vole**  
*Microtus pinetorum*

The woodland vole is distributed throughout the eastern United States (Hall, 1981; Smolen, 1981), it is locally abundant in the Carolinas (Golley, 1966; Webster et al. 1985; Trani Griep, 2005), and it occupies a wide variety of habitats, despite its common name. It therefore is not considered to be imperiled by federal and state management agencies. It undoubtedly occurs throughout the entire Catawba-Wateree Project area, including the Great Falls-Dearbon Development, where it is uncommon to locally common.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Burke County: Morganton (1 UNCW). Catawba County: 1 mi N Catawba, Catawba River (1 USNM).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Alexander County. McDowell County. Mecklenburg County.

SOUTH CAROLINA (Golley, 1966).—Kershaw County. York County.

**Common muskrat**  
*Ondatra zibethicus*

The common muskrat is a denizen of aquatic habitats throughout most of North American north of Mexico (Willner et al., 1980; Hall, 19981). It is found throughout North Carolina and most of South Carolina, except the southern Coastal Plain (Golley, 1966; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. It is distributed throughout the entire Catawba-Wateree Project area; however, its abundance diminishes from north to south along the project area. It is abundant in the Bridgewater Development, common from the Rhodhiss Development downstream to the Mountain Island Development, and uncommon throughout the remainder of the project area, including the Great Falls-Dearbon Development. It was observed swimming in a tributary of Camp Creek, and spoor (scat and tracks) was observed in the Great Falls Long Bypassed Reach.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Gaston County: 5 mi E King Mountain, 760 ft (6 USNM).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Iredell County. Mecklenburg County.

SOUTH CAROLINA (Golley, 1966).—Chester County. York County.

**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, museums collections seldom include exotic species since they are non-native and therefore viewed as being unimportant in local community structure. It is much less common than its relative, the Norway rat (*Rattus norvegicus*), primarily because the Norway rat is a superior competitor. The black rat rarely is encountered in the Piedmont and Mountain physiographic provinces, but it is common in coastal cities where major shipping facilities provide a continued source of immigrants (Webster et al., 1985). It is rare to absent in the Catawba-Wateree Project area and not likely to be encountered in any development. I did not find evidence of its presence in the Great Falls-Dearbon Development. It is not considered to be imperiled by federal or state management agencies.

LITERATURE RECORD:

SOUTH CAROLINA (Golley, 1966).—York County.

**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 Gulf Coast. The Norway rat is widely distributed in the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. It is common to abundant around large cities and rural agricultural facilities, and it likely occurs throughout the Catawba-Wateree Project area, albeit rarely except when adjacent to metropolitan communities. It is rare in the Great Falls-Dearborn Development.

**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 the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). 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 Catawba-Wateree Project area. It is rare to locally abundant from the Bridgewater Development southward to the Wateree Development—rare in natural forested habitats, but locally abundant in early successional habitats and around haystacks, barns, and other man-made structures. It is rare in the Great Falls-Dearborn Development.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Catawba County: 1 mi N Catawba, Catawba River (1 USNM). Gaston County: Dallas (2 UNCW).

ADDITIONAL LITERATURE RECORDS:

SOUTH CAROLINA (Golley, 1966).—Kershaw County. York County.

**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 confined to wet meadows and bogs in the Piedmont and Mountain physiographic provinces in North Carolina and the Mountain province in South Carolina, where it is locally rare to uncommon (Golley, 1966; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. It likely occurs throughout much of the Catawba-Wateree Project area, but there is a dearth of museum and literature records. In suitable habitat, it is uncommon from the Bridgewater Development eastward to the Lookout Shoals Development and then rare around the Cowans Ford and Lake Wylie developments. It does not occur south of the Lake Wylie Development, including the Great Falls-Dearborn Development.

LITERATURE RECORD:

NORTH CAROLINA (Lee et al., 1983).—Mecklenburg County.

**Coyote**  
*Canis latrans*

The coyote has recently expanded its geographic distribution and now is distributed across most of North America (Bekoff, 1977; Hall, 1981), including the Carolinas (Lee et al., 1983; Webster, 198; DeBow et al., 1998; Trani Griep, 2005). Federal and state management agencies do not consider it to be imperiled. Despite the lack of museum and literature records, the coyote certainly inhabits all developments in the Catawba-Wateree Project area, including the Great Falls-Dearborn Development. Coyote tracks were

observed and scat was recovered during most ground-truthing surveys (Fig. 2); scat included fur and skeletal fragments of eastern cottontail (*Sylvilagus floridanus*), northern raccoon (*Procyon lotor*), and house cat (*Felis catus*).



Figure 2. Coyote scat was common in the Great Falls Bypassed Reaches area.

**Red fox**  
*Vulpes vulpes*

The red fox is found throughout most of Canada and the United States (Hall, 1981; Larivière and Pasitschniak-Arts, 1996) and it occurs throughout the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). It is common in open habitats, uncommon in broken forests, and rare in dense forests and not considered to be imperiled by federal or state management agencies. It likely inhabits every development in the Catawba-Wateree Project area, including the Great Falls-Dearborn Development, but is likely rare to uncommon there.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Iredell County: Statesville (1 NCSU).

**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 has a statewide distribution in North Carolina and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). Federal and state management agencies do not consider the gray fox to be imperiled because it is common throughout much of its range, including the Carolinas. It is common to abundant throughout the Catawba-Wateree Project area, where it inhabits all developments. It also is common in the Great Falls-Dearborn Development—gray foxes were attracted to scent stations on the property and dead foxes were observed on highways adjacent to the development.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Lincoln County: 15 km W Lincolnton, Hwy 27 (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA.—Mecklenburg County (Lee et al., 1983).

SOUTH CAROLINA (Golley, 1966).—Chester County. Kershaw County.

**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). It occurs throughout North and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005) and is not considered to be imperiled by federal or state management agencies. The raccoon is common to abundant in all developments in the Catawba-Wateree Project area, and it is abundant in all three habitats in the Great Falls-Dearbon Development. Raccoon tracks were plentiful along watercourses and in mud puddles, and they were the most common track observed at scent stations (Fig. 3); scat was found throughout the development. Raccoons were not often observed sleeping in tree snags in the development, but they were the most common animal found dead on highways surrounding the property.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Alexander County: 6 km Ellendale, SR 1303, 1400 ft (1 UNCW). Burke County: 5 km S Morganton (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Burke County. Caldwell County.

SOUTH CAROLINA (Golley, 1966).—Chester County. Kershaw County. York County.



Figure 3. Tracks of northern raccoon (left) and scat of the white-tailed deer (right), respectively, were commonly observed throughout the Great Falls Bypassed Reaches.

**Long-tailed weasel**  
*Mustela frenata*

The long-tailed weasel is found throughout most of North America and western South America (Hall, 1981; Sheffield and Thomas, 1997), and it is distributed throughout both North and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). Its abundance is difficult to determine because of its secretive nature, but in the Carolinas it is likely abundant in the Mountain physiographic province and common in the Piedmont and Coastal Plain. Federal and state management agencies do not consider it to be imperiled. There are few museum and literature records from the Carolinas, but the long-tailed weasel undoubtedly occurs in every development in the Catawba-Wateree Project area, including the Great Falls-Dearbon Development. The author observed one individual in the rocky river bottom in the Great Falls Long Bypassed Reach, foraging among large boulders along the edge of the river levee. I was only able to observe it for about four minutes as it darted under, around, and over rocks and along fallen logs.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Mecklenburg County: Charlotte (1 NCSU).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA.—Catawba County (Lee et al., 1983).

SOUTH CAROLINA (Golley, 1966).—Chester County. York County.

**American mink**

*Mustela vison*

The American mink is a denizen of wetland habitats throughout most of Canada and the United States (Hall, 1981; Larivière, 1999). It has a statewide distribution in North and South Carolina, but its abundance varies tremendously. This variation is explained not by physiographic province but perhaps by water quality, which reflects habitat degradation. Nonetheless, federal and state management agencies do not consider it to be imperiled. There are few records from the Catawba-Wateree Project area, but the American mink probably inhabits every development in the project area. I found no tangible evidence that it occurs in the Great Falls-Dearborn Development, but it likely occurs there as an uncommon resident.

SPECIMEN EXAMINED:

NORTH CAROLINA.—Mecklenburg County: Charlotte (1 NCSU).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA.—Burke County (Lee et al., 1983).

SOUTH CAROLINA (Golley, 1966).—Chester County. York County.

**Northern river otter**

*Lontra canadensis*

The northern river otter is common to abundant in aquatic habitats throughout most of North American north of Mexico (Hall, 1981; Larivière and Walton, 1998), and it occurs statewide in North Carolina and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). The northern river otter is not considered to be imperiled by federal and state management agencies. Since it prefers aquatic habitats, it unsurprisingly occurs in each development in the Catawba-Wateree Project area and is abundant in the Great Falls-Dearborn Development. Scat, tracks, and feeding stations were common along the rocky river bottom in the Great Falls Bypassed Reaches, but uncommon in the cedar-cane glade and rare in the adjacent uplands. The northern river otter was not attracted to scent stations, except in the rocky river bottom.

LITERATURE RECORD:

SOUTH CAROLINA.—Chester County (Golley, 1966).

**Striped skunk**

*Mephitis mephitis*

The striped skunk inhabits most of southern Canada, the United States, and northern Mexico (Hall, 1981; Wade-Smith and Verts, 1982), and it is distributed throughout North and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). In the Carolinas, it is common in the Mountain physiographic province, uncommon in the Piedmont, and rare in the Coastal Plain. It is not considered to be imperiled by federal and state management agencies. The striped skunk occurs throughout the Catawba-Wateree Project area, and its abundance in this area follows the same trend—it is common from the Bridgewater Development downstream to the Mountain Lake Development and uncommon from the Lake Wylie Development southward to the Wateree Development. It was not observed in the Great Falls-Dearborn Development, but its odor was detected on one occasion on Hwy 97 just south of Liberty Hill, South Carolina.

SPECIMENS EXAMINED:

NORTH CAROLINA.—Burke County: Morganton (1 UNCW). Caldwell County: 3 km W Oak Hill, Hwy 64, 1300 ft (1 UNCW). McDowell County: Dysartville (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

NORTH CAROLINA (Lee et al., 1983).—Burke County. Iredell County. Mecklenburg County.

**Bobcat**  
*Lynx rufus*

The bobcat is distributed widely across southern Canada, the United States, and most of Mexico (Hall, 1981; Larivière and Walton, 1997), and it has a statewide distribution in North Carolina and South Carolina (Golley, 1966; Lee et al., 1983; Webster et al. 1985; Trani Griep, 2005). Its abundance varies according to that of its prey base, but in general the bobcat is uncommon to common throughout its range. Federal and state management agencies do not consider it to be imperiled. Despite the lack of museum and literature records, the bobcat inhabits each development in the Catawba-Wateree Project area, including the Great Falls-Dearborn Development. A poor set of tracks was found around a scent station on one occasion, and local people mention its abundance in the surrounding area and on Bowden Island in Stumpy Pond.

LITERATURE RECORD:

NORTH CAROLINA.—Burke County (Lee et al., 1983).

**Mountain lion**  
*Puma concolor*

The mountain lion was once the most widely distributed mammal in the Western Hemisphere, ranging from northern Canada to southern South America (Hall, 1981), but its distribution has become much reduced as a result of relentless human persecution and loss of habitat (Lee, 1987; Choate et al., 1994). In the eastern United States, it only remains in southern Florida and northeastern Canada. Despite numerous reports to the contrary, it no longer inhabits the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). It continues to be listed as Endangered by federal and state management agencies.

**White-tailed deer**  
*Odocoileus virginianus*

The white-tailed deer is found throughout most North America and northern South America (Hall, 1981; Smith 1991). Its numbers declined significantly as a result of unregulated harvest in the early 20<sup>th</sup> century, but it has recovered since game laws became established and it is now widespread throughout the Carolinas (Golley, 1966; Lee et al., 1983; Webster et al., 1985; Trani Griep, 2005). It is not considered to be imperiled by federal or state management agencies. The white-tailed deer is uncommon to abundant in the Catawba-Wateree Project area. Numbers are greatest on either end of the project area, especially from the Great Falls-Dearborn Development southward to the Wateree Development, where it is abundant. The lower jaws of one individual was recovered (UNCW 11029).

SPECIMEN EXAMINED:

NORTH CAROLINA.—Alexander County: 8 km NW Ellendale, 1800 ft (1 UNCW).

ADDITIONAL LITERATURE RECORDS:

SOUTH CAROLINA (Golley, 1966).—Chester County. Fairfield County. Lancaster County.

## DISCUSSION

Thirty-eight species of mammals were documented in the Great Falls Bypassed Reaches area of South Carolina (Table 2). This list includes one species—the southeastern myotis—that is considered to be a Species of Concern by the US Fish and Wildlife Service and ranked S1 in South Carolina. Accounts for 12 additional species that do not occur in the Great Falls-Dearborn Development were included herein both to document their apparent absence in the Great Falls-Dearborn Development area and to document the absence of suitable habitat in the region. This group includes one federally listed species (mountain lion) and seven species that are listed in South Carolina (star-nosed mole, eastern small-footed myotis, northern long-eared myotis, northern yellow bat, Rafinesque's big-eared bat, eastern fox squirrel, and meadow vole).

The mammalian fauna of the Great Falls-Dearborn Development is typical of that observed throughout the Piedmont physiographic province of the Carolinas (Webster et al., 1985). Most of these species, 33 of 38 (86.8%) of the mammal species have widespread geographic distributions in the eastern United States and the entire Catawba-Wateree Project area, including such representative mammals as the Virginia opossum, eastern mole, eastern red bat, eastern cottontail, eastern gray squirrel, white-footed mouse, common gray fox, northern raccoon, and white-tailed deer. Four of the remaining five mammal species (southern short-tailed shrew, southeastern myotis, Seminole bat, Brazilian free-tailed bat) have austral affinities and one (eastern chipmunk) has boreal affinities. The mammalian fauna of the Great Falls-Dearborn Development, therefore, is not unusual given its geographic location in the Lower Piedmont of South Carolina.

Of the three habitat types surveyed in this investigation, species richness was greatest in the upland forests adjacent to the river levee (Table 2). Species richness diminished slightly in the cedar-cane glade. Species richness was lowest in the rocky river bottom habitat, although this habitat appeared to be important for foraging bats and larger mammals.

Currently, there is discussion about increasing water flow along the Great Falls Long Bypassed Reach, with spate events designed to provide recreational opportunities for kayaking enthusiasts. The effects of spate events on the mammalian fauna of the Great Falls-Dearborn Development will depend on release volume, duration, and frequency. In their existing state, the Great Falls Bypassed Reaches can be described as 'water starved' by the effects of the Great Falls Diversion Dam. Deliberate spate events would be similar in effect to natural flooding events, as happened in the summer of 2004 when several hurricanes slammed into the southern Appalachian Mountains and caused tremendous flooding downstream (Fig. 4).

Most mammals that occur in the Great Falls-Dearborn Development are distributed widely throughout the eastern United States, and most occupy a wide variety of habitat types across their geographic ranges. Likewise, local populations of these species are wide ranging in the Great Falls Long Bypassed Reach region. Therefore, there is no reason to suspect that deliberate spate events, despite the temporary loss of habitat and short-term inability to cross the Great Falls Long Bypassed Reach, will cause direct negative effects on most species of mammals.

Deliberate spate events might affect mammals indirectly, however, by rendering food and nesting resources temporarily unavailable or removing them entirely. The southeastern myotis, for example, forages over slow moving rivers and creeks in the southeastern United States, and individuals in the Great Falls Bypassed Reaches would have to forage at other nearby sites during spate events. Furthermore, populations of species characterized by low levels of mobility and occurring on opposite sides of the Great Falls Long Bypassed Reach, such as the eastern mole and woodland vole, would be isolated during these spate events. The effects of isolation on the population genetics of these species would be minimal unless the isolation became permanent.



Figure 4. View of the Great Falls Diversion Dam under normal circumstances (left) and after torrential rains in the southern Appalachians (right).

In conclusion, the direct and indirect consequences of deliberate but infrequent spate events likely will have no long-term negative effects on the mammals of the Great Falls-Dearborn Development. However, regular and frequent spate events might cause profound scouring in the Great Falls Long Bypassed Reach, so the development should be monitored carefully to determine the cumulative effects on that region.

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Table 1. Summary statistics of effort expended during various survey techniques in the Great Falls Bypassed Reaches survey (scientific names in text).

Habitat	Survey technique	Trap nights or net nights	Man hours	Species captured and observed
Rocky river bottom	Sherman live traps	450	8	White-footed mouse
	Pitfall traps			
	Scent stations	6	2	Virginia opossum Coyote Northern raccoon Northern river otter
	Mist nets	8	10	
	SONOBAT		10	Southeastern myotis Big brown bat Eastern red bat Evening bat Brazilian free-tailed bat
Cedar-cane glade	Ground truthing		32	Eastern cottontail Eastern chipmunk American beaver White-footed mouse Hispid cotton rat Common muskrat Coyote Northern raccoon Long-tailed weasel Northern river otter White-tailed deer
	Sherman live traps	450	8	
	Pitfall traps	750	8	
	Scent stations	6	2	Virginia opossum Coyote Common gray fox Northern raccoon
	Mist nests	8	10	Eastern red bat
	SONOBAT		10	Eastern pipistrelle Big brown bat Eastern red bat Evening bat

Table 1 (cont.)

Habitat	Survey technique	Trap nights or net nights	Man hours	Species captured and observed
	Ground truthing		24	Eastern mole Eastern cottontail Eastern gray squirrel American beaver Common muskrat Coyote Northern raccoon White-tailed deer
Upland forests	Sherman live traps	450	8	White-footed mouse
	Pitfall traps	750	8	S. short-tailed shrew
	Scent stations	8	3	Virginia opossum Eastern gray squirrel Coyote Common gray fox Northern raccoon Bobcat
	Mist nets	14	22	Eastern red bat
	SONOBAT		14	Eastern pipistrelle Eastern red bat Evening bat
	Ground truthing		32	Virginia opossum Eastern mole Eastern cottontail Eastern chipmunk Eastern gray squirrel Southern flying squirrel American beaver Common muskrat Coyote Common gray fox Northern raccoon White-tailed deer

Table 2. The federal listing, South Carolina ranking, and status of mammal species suspected of occurring in three habitat types in the Great Falls Bypassed Reaches area of the Great Falls-Deerborn Development in north-central South Carolina. Italics indicate species that may rarely occur during migration, but not at other times of the year. Definitions of state ranking (from LeGrand et al., 2004) are provided in the Accounts of Species (page 5).

Species	Federal listing	State ranking	Rocky river bottom	Cedar-cane glade	Adjacent uplands
Virginia opossum <i>Didelphis virginiana</i>			Common	Common	Abundant
Southeastern shrew <i>Sorex longirostris</i>				Uncommon	Common
Southern short-tailed shrew <i>Blarina carolinensis</i>			Rare	Common	Abundant
Least shrew <i>Cryptotis parva</i>				Rare	Rare
Eastern mole <i>Scalopus aquaticus</i>			Rare	Uncommon	Common
Star-nosed mole <i>Condylura cristata</i>		S3S4			
Eastern small-footed myotis <i>Myotis leibii</i>	Species of Concern	S1			
Little brown myotis <i>Myotis lucifugus</i>			<i>Uncommon</i>	<i>Uncommon</i>	<i>Uncommon</i>
Southeastern myotis <i>Myotis austroriparius</i>	Species of Concern	S1	Uncommon	Rare	Rare
Northern long-eared myotis <i>Myotis septentrionalis</i>		S4 <sup>1</sup>			
Silver-haired bat <i>Lasionycteris noctivagans</i>			<i>Uncommon</i>	<i>Uncommon</i>	<i>Uncommon</i>
Eastern pipistrelle <i>Pipistrellus subflavus</i>			Uncommon	Common	Common
Big brown bat <i>Eptesicus fuscus</i>			Common	Common	Common
Eastern red bat <i>Lasiurus borealis</i>			Abundant	Common	Common
Seminole bat <i>Lasiurus seminolus</i>			Uncommon	Rare	Rare
Hoary bat <i>Lasiurus cinereus</i>		S? <sup>1</sup>	<i>Rare</i>	<i>Rare</i>	<i>Rare</i>
Northern yellow bat <i>Lasiurus intermedius</i>		S? <sup>2</sup>			

Table 2 (cont.)

Species	Federal listing	State ranking	Rocky river bottom	Cedar-cane glade	Adjacent uplands
Evening bat <i>Nycticeius humeralis</i>			Common	Common	Common
Rafinesque's big-eared bat <i>Corynorhinus rafinesquii</i>	Species of Concern	S2? <sup>3</sup>			
Brazilian free-tailed bat <i>Tadarida brasiliensis</i>			Uncommon	Rare	Rare
Eastern cottontail <i>Sylvilagus floridanus</i>			Uncommon	Uncommon	Uncommon
Eastern chipmunk <i>Tamias striatus</i>			Rare	Rare	Rare
Eastern gray squirrel <i>Sciurus carolinensis</i>			Rare	Uncommon	Common
Eastern fox squirrel <i>Sciurus niger</i>		S4			
Southern flying squirrel <i>Glaucomys volans</i>				Rare	Common
American beaver <i>Castor canadensis</i>			Abundant	Uncommon	Rare
Eastern harvest mouse <i>Reithrotomomys humulis</i>				Rare	Rare
Oldfield mouse <i>Peromyscus polionotus</i>					
White-footed mouse <i>Peromyscus leucopus</i>			Uncommon	Common	Abundant
Cotton mouse <i>Peromyscus gossypinus</i>					
Golden mouse <i>Ochrotomys nuttalli</i>				Rare	Uncommon
Hispid cotton rat <i>Sigmodon hispidus</i>			Common	Uncommon	Uncommon
Meadow vole <i>Microtus pennsylvanicus</i>		S?			
Woodland vole <i>Microtus pinetorum</i>				Rare	Uncommon
Common muskrat <i>Ondatra zibethicus</i>			Uncommon	Rare	Rare
Black rat <i>Rattus rattus</i>					

Table 2 (cont.)

Species	Federal listing	State ranking	Rocky river bottom	Cedar-cane glade	Adjacent uplands
Norway rat <i>Rattus norvegicus</i>			Rare	Rare	Rare
House mouse <i>Mus musculus</i>			Rare	Rare	Rare
Meadow jumping mouse <i>Zapus hudsonius</i>					
Coyote <i>Canis latrans</i>			Uncommon	Uncommon	Uncommon
Red fox <i>Vulpes vulpes</i>			Rare	Rare	Rare
Common gray fox <i>Urocyon cinereoargenteus</i>			Uncommon	Common	Common
Northern raccoon <i>Procyon lotor</i>			Abundant	Abundant	Abundant
Long-tailed weasel <i>Mustela frenata</i>			Rare	Uncommon	Uncommon
American mink <i>Mustela vison</i>			Uncommon	Uncommon	Rare
Northern river otter <i>Lontra canadensis</i>			Common	Uncommon	Rare
Striped skunk <i>Mephitis mephitis</i>			Rare	Uncommon	Uncommon
Bobcat <i>Lynx rufus</i>			Uncommon	Uncommon	Uncommon
Mountain lion <i>Puma concolor</i>	Endangered	S1			
White-tailed deer <i>Odocoileus virginianus</i>			Rare	Uncommon	Common

<sup>1</sup> will be removed from the South Carolina RTE list in the near future (Mary Bunch, SC DNR, pers. comm.)

<sup>2</sup> will be ranked S3S4 in the near future (Mary Bunch, SC DNR, pers. comm.)

<sup>3</sup> will be ranked S2S3 in the near future (Mary Bunch, SC DNR, pers. comm.)

