Carolina Crossroads

Preliminary Bat Habitat Assessment

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Acronyms and Abbreviations

DBH	diameter at breast height
IPaC	Information, Planning, and Consultation
NLCD	National Land Cover Database
Project	Carolina Crossroads Project
SCDNR	South Carolina Department of Natural Resources
SCDOT	South Carolina Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1 Introduction

The Carolina Crossroads Project (Project) is the largest construction venture in South Carolina transportation history and includes the reconfiguration of 14 miles of the I-20/26/126 Corridor (SCDOT 2021) (Appendix A). The Project also includes 132 new lane miles, 43 new brides, and 7 reconstructed interchanges. Construction is divided into 5 Phases to accommodate incremental improvements throughout the duration of the Project.

A reconnaissance-level bat habitat suitability assessment was conducted by HDR biologists from June 26-29, 2023 to determine the presence/absence of roosting habitat in the Project footprint. Prior to field surveys, a desktop review of publicly available data was conducted to determine the potential suitable bat roosting habitat and for state and/or federally protected bat species to be present in the Project footprint, including the United States Geological Surveys's (USGS) National Land Cover Database (NLCD), the United States Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system and the South Carolina Department of Natural Resources (SCDNR) Natural Heritage Report for protected species in Richland and Lexington counties (Appendix B) (SCDNR 2023; USFWS 2023a; USGS 2023). Approximately 70.2 acres of potential suitable habitat, defined as forested habitat within riparian floodplains, exist within the project study area (Appendix C). The tricolored bat (*Perimyotis subflavus*) is the only bat protected bat species potentially occurring in the Project footprint and is currently proposed for federal listing as endangered.

The tricolored bat is a small, insectivorous bat that is distinguished by its tricolored fur and often appears yellow to nearly orange in color (USFWS 2023b). Historically, tricolored bats had a wide range throughout the eastern and central United States, as well as portions of Canada, Mexico, and Central America; however, they now face extinction throughout their range as white-nose syndrome has caused in a decline in over 90 percent of the total population. Tricolored bats are generally solitary or roost in small groups. During winter months, tricolored bats are often found in caves and abandoned mines, although they are known to roost in road-associated culverts in the southern states where caves are sparse. During spring, summer, and fall, tricolored bats are found in forested habitats where they primarily roost among the leaves of live or recently dead deciduous hardwood trees. Roosting may also occur in Spanish moss, pine trees, and artificial structures. Foraging typically occurs in riparian areas and individuals typically feed within a 5-mile radius of their roosting sites (NatureServe 2023).

2 Project Setting

The Project footprint is located in the Southeastern Plains Ecoregion (Ecoregion 65) which extends northwest from the Savannah River to the Pee Dee River (Griffith et al. 2002). The southeastern plains encompass portions of 24 counties and 9,106 square miles. Vegetation within the ecoregion consists primarily of longleaf pine (*Pinus palustris*), with smaller areas of oak-hickory-pine. Below the fall line, the ecoregion is dominated by sandy soils with scrub vegetation on moderately sloping lands; this area is known as the Sand Hills Sub-Ecoregion (Ecoregion 65c) and includes the location of the Project footprint. Elevations in the sand halls range from 250 to 450 feet above mean sea level and is comprised of rolling hills.

Habitat descriptions of each Project Phase based on the field surveys are provided in the following sections.

2.1 Phase 1

The area surrounding Phase 1 primarily consists of developed land for commercial and residential use, with the remaining undeveloped area containing a mix of deciduous, evergreen, and mixed forested area; early successional habitat with herbaceous vegetation, scrub-shrub habitat, and/or grasslands; and wetlands, streams, and open water bodies. Phase 1 is crossed by the Saluda River, unnamed tributaries to the Saluda River, and includes the I-26/126 interchange. Most culverts in Phase 1 were observed to contain flowing water, rough surfaces, bird nests, signs of human disturbance, and protection from high winds. Forested habitat surrounding the culverts and bridges generally contained trees with a diameter at breast height (DBH) greater than 5 inches, shag bark, and snags. No caves or abandoned mines are known in the vicinity of the Phase 1 footprint. Representative photos are included in Appendix D and Bat Habitat Assessment Forms with more detailed habitat descriptions are provided in Appendix E.

Phase 1 of the Carolina Crossroads project is currently under construction and all clearing activities have been completed. Construction started in 2021, prior to proposed listing of tri-color bats. Substantial construction completion is expected in October 2024. No additional analysis of the phase is anticipated.

2.2 Phase 2

Phase 2 consists primarily of urban areas with commercial buildings and suburban areas with residential dwelling. The remaining, undeveloped areas consists of either deciduous, evergreen, and/or mixed forest; early successional habitat with herbaceous vegetation, scrub-shrub habitat, and/or grasslands; and wetlands, streams, and open water bodies. The Phase 2 footprint is adjacent to the Broad River. Phase 2 contains 1 box culvert, 1 pipe culvert, and 2 bridges spanning I-20. Most culverts in Phase 2 were observed to contain flowing water, rough surfaces, bird nests, signs of human disturbance, and protection from high winds. Forested habitat surrounding the culverts and bridges generally contained trees greater than 5 inches DBH, shag bark, and snags. caves or abandoned mines are known in the vicinity of the Phase 2 footprint. Representative photos are included in Appendix D and Bat Habitat Assessment Forms with more detailed habitat descriptions are provided in Appendix E.

Phase 2 of the Carolina Crossroads project is currently under construction and all clearing activities have been completed. Construction started in 2022, prior to proposed listing of tri-color bats. Substantial construction completion is expected in February 2025. No additional analysis of the phase is anticipated.

2.3 Phase 3

Phase 3 consists primarily of urban areas with commercial buildings and suburban areas with residential dwelling. The remaining, undeveloped areas consists of either deciduous, evergreen, and/or mixed forest; early successional habitat with herbaceous vegetation, scrub-shrub habitat, and/or grasslands; and wetlands, streams, and open water. Phase 3 includes 23 culverts and 13 bridges. The Phase 3 footprint is crossed by the Saluda River, unnamed tributaries to the Saluda River, and includes the I-20/26 interchange. Most culverts in Phase 3 were observed to contain flowing water, rough surfaces, bird nests, signs of human disturbance, and protection from high winds. Forested habitat surrounding the culverts and bridges generally contained trees greater than 5 inches DBH, shag bark, and snags. No caves or abandoned mines are known in the vicinity of the Phase 3 footprint. Representative photos are included in Appendix D and Bat Habitat Assessment Forms with more detailed habitat descriptions are provided in Appendix E.

2.4 Phases 4 and 5

Phases 4 and 5 were surveyed collectively and are located at the northwest end of the Project. The footprint for Phases 4 and 5 contains 24 culverts and pipes, including the Harbison Road pedestrian culverts, and 4 bridges spanning I-26. Land use in and surrounding the Phase 4 and 5 footprint consists primarily of urban and commercial development, secondary roads, and residential communities. Undeveloped habitat in the vicinity of Phases 4 and 5 includes deciduous, evergreen, and mixed forest; early successional habitat including grasslands, herbaceous vegetation, and scrub-shrub habitat; wetlands; and surface waters including streams and ponds. Most culverts in Phases 4 and 5 were observed to contain flowing water, rough surfaces, bird nests, signs of human disturbance, and protection from high winds. Forested habitat surrounding the culverts and bridges generally contained trees greater than 5 inches DBH, shag bark, and snags. No caves or abandoned mines are known in the vicinity of the Phase 4 or 5 footprint. Representative photos are included in Appendix D and Bat Habitat Assessment Forms with more detailed habitat descriptions are provided in Appendix E.

3 Survey Methods

Bridges and pipes/culverts within Phases 1 through 5 of the project study area were inspected for roosting habitat and bat activity. Bat habitat survey forms were completed for each bridge and/or culvert and are included in Appendix E. Surveys were conducted during daylight hours and did not include dusk emergence or dawn re-entry surveys for determining the intensity of bat activity.

For each culvert or pipe inspected within the Project footprint, the length of each tunnel was walked (where accessible) and all rough surfaces, crevices, side tunnels, and other potential roosting sites were inspected. Field staff were outfitted with headlamps and handheld spotlight for traversing the tunnels and inspecting potential roosting sources. Culverts and/or pipes with a diameter of 4 feet or less were visually inspected from the opening on either side using the spotlight, and a mirror fixed to a telescoping pole was used to inspect as much of the culvert as possible. The culvert openings were measured, and photos were taken of the surrounding habitat at both openings.

Bridge decks spanning trafficked roads were inspected to the extent possible using spotlights. The abutment ramps on either side of the road were carefully walked so that potential roosting habitat and evidence of bats could be closely inspected. Bridge attributes (i.e., deck and beam materials, presence/absence of guardrails, etc.) were notes and photos were taken of the surrounding habitat.

4 Survey Results

Suitable bat roosting habitat was observed at various locations throughout the Project footprint and a single bat was observed roosting under bridge location 4366 in the Phase 3 footprint. Although field identification to the species level was not possible, it was determined that this individual bat was not a protected species and is likely a common species such as the big brown bat (*Eptesicus fuscus*). Bridge 4366 has a concrete deck, metal guard rails, steel beams, and a concrete back end wall. The bat was observed roosting on the deck near the back end wall. No noticeable roosting crevices were observed in this area as the concrete appeared relatively smooth. Additionally, no guano or evidence of other bats using this bridge for roosting habitat were observed. Bridge 4366 consists of travel lanes for I-26 and spans CSX railroad tracks. Bridge

4366 is located approximately 0.18 mile from the Saluda River, with other smaller surface waters suitable for bat foraging closer to the bridge. The bridge abatement areas are not equipped with artificial lighting and there was little evidence of human disturbance; however, the bridge would be classified as a “high disturbance” area based on the volume of vehicular traffic on I-26 and the adjacent, active railroad.

5 References

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