

WILDLIFE CROSSING STUDY

Cape Fear River Basin



White Oak Creek at N.C. 540 (2026)

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1. Background & Objectives

Background

Wildlife-Vehicle Crashes (WVC) are a documented and growing roadway safety problem in the United States. *The Effectiveness of short sections of wildlife fencing and crossing structures along highways in reducing wildlife-vehicle collisions and providing safe crossing opportunities for large mammals*, published in the Biological Conservation, found that fenced road sections that were at least 3.1 miles in length reduced large mammal vehicle collisions by more than 80% .¹ Capitalizing on this potential requires a systematic planning approach: identifying high-risk structures and corridors, assessing existing structures for retrofit or upgrade potential, and coordinating investments with planned road projects and maintenance cycles. This planning-level process is the foundation of the Capital Area Metropolitan Planning Organization (CAMPO) Cape Fear River Basin Wildlife Crossing Study.

CAMPO's study draws on a growing body of practice at the state and regional level. *The North Carolina Department of Transportation (NCDOT) and North Carolina Wildlife Resources Commission (NCWRC) Wildlife Passage Guidance* established the technical and design framework for integrating wildlife passage into North Carolina roadway planning, design, and construction, providing the state-level standards that

this study's findings are intended to inform.² *The Wildlands Network and National Parks Conservation Association study of I-40 through the Pigeon River Gorge* identified areas of WVC and potential mitigation options proposed by Wildlands and National Parks Conservation Association (NPCA), supporting CAMPO's focus on using existing NCDOT infrastructure as primary candidates for treatment.³

Durham County's Wildlife Habitat Connectivity Analysis provided context regarding the importance of maintaining the connectivity of natural habitats.⁴ At the peer MPO level, the *French Broad River MPO Wildlife Crossing Study* and the *Triangle West Transportation Planning Organization (TWTPPO) (formally Durham-Chapel Hill-Carrboro MPO) Wildlife Crossing Study* both developed methodologies for WVC hot spot identification, structure-based prioritization, and stakeholder coordination within an MPO planning context.^{5 6} The TPO study prompted Chatham County to request that CAMPO undertake a comparable analysis for the portion of the county within the CAMPO planning boundary. CAMPO's methodology was adapted from these precedents and further refined to reflect stakeholder input and the geographic character of the study area. This study also establishes a replicable framework that CAMPO can extend to other river basins within the planning area in future fiscal years if desired by its

members. In Federal Fiscal Year 2026, CAMPO initiated this study as an in-house effort under its Unified Planning Work Program (UPWP), covering the portions of the Cape Fear River Basin within the CAMPO planning boundary. The study area includes portions of Chatham, Harnett, and Wake Counties; portions of the Towns of Angier, Apex, Cary, Coats, Fuquay-Varina, Holly Springs, Lillington, and Morrisville; roadway networks maintained by NCDOT Divisions 5, 6, and 8; and the B. Everett Jordan Dam and Lake, which is owned and maintained by the U.S. Army Corps of Engineers (USACE) Wilmington District.

Goal

The goal of this study is to reduce human fatalities and serious injuries resulting from wildlife-vehicle crashes through infrastructure design. Where data-driven contributing factors exist – i.e. crash history, road geometry, adjacent land uses, and Southeast Conservation Blueprint High Priority Areas – roadway treatment can meaningfully reduce the likelihood of collisions. This study pursues that outcome by identifying where the risk is greatest and where the transportation system presents realistic opportunities for mitigation.

Objective

The objective of this study is to identify locations where wildlife-vehicle conflict is likely and where future infrastructure

projects or retrofitting existing structures may present opportunities for mitigation. This is achieved through a three-step process. First, the study evaluates the transportation network in relation to recorded WVC data to determine where crashes are concentrated. This study refers to this evaluation as the “hot spot analysis,” and the concentrations are referred to as “hot spots”. Second, it assesses NCDOT maintained structures – existing bridges, culverts, and pipes – within hot spots that are within Southeast Conservation Blueprint High Priority Areas. This analysis provides strong justification that wildlife crossing treatment at these identified structures may both reduce the likelihood of wildlife-vehicle conflicts and improve interconnectivity between wildlife conservation corridors. Hot spots located within CAMPO’s High Injury Network (HIN) but outside of Southeast Conservation Blueprint High Priority Areas and not associated with existing NCDOT structures are also noted and assessed in this study. Third, following the identification of structures and HIN hot spots, the study conducted site assessments to verify on-the-ground conditions at each location, which will provide NCDOT further justification for the installation of wildlife crossing treatment during project development, when appropriate.

2. Study Area, Stakeholders, and Roles

Study Area

The study area encompasses the portions of the Cape Fear River Basin that fall within the CAMPO planning boundary, covering portions of Chatham, Harnett, and Wake Counties. The Cape Fear River Basin was selected as the geographic boundary for this study because it is a well-defined environmental feature that can be utilized for data analysis and consistently applied to future studies covering other basins within the region. The study area includes portions of the Towns of Angier, Apex, Cary, Coats Fuquay-Varina, Springs, Lillington, and Morrisville. It is bisected by several major transportation corridors including US-1 and NC-540 and contains large tracts of protected and managed land, including B. Everett Jordan Lake, the Shearon Harris Reservoir, and Raven Rock State Park. Two large regional rivers, the Haw and Deep Rivers, converge into the Cape Fear River at the study area's western boundary.

The landscape of the study area transitions from the rapidly suburbanizing western and southern portions of Wake County to more rural and agricultural land uses in southern Wake, northern Harnett and eastern Chatham Counties. This gradient creates conditions where transportation infrastructure intersects

frequently with long-established wildlife movement corridors, particularly along streams, rivers, and forested areas.

Stakeholders and Roles

Effective implementation of wildlife crossing improvements requires coordination across a range of agencies with distinct roles in planning, designing, funding, constructing and maintaining transportation infrastructure and with expertise in wildlife-related issues. The following describes the role of each partner in the context of this study.

The North Carolina Department of Transportation (NCDOT) is responsible for planning, constructing, and maintaining the state highway system within the study area. Three NCDOT Divisions share responsibility for the state-maintained roadway network within the study area, each assigned to specific counties. Division 5 is responsible for Wake County roads, Division 6 is responsible for Harnett County roads, and Division 8 is responsible for Chatham County roads. NCDOT structures – including bridges, culverts, and pipes maintained by these three divisions – are the primary candidates for wildlife crossing treatment identified in this study. NCDOT's *Wildlife Passage Guidance* provides the technical framework for how such improvements are designed and evaluated at the project level. The NC Wildlife Resources Com-

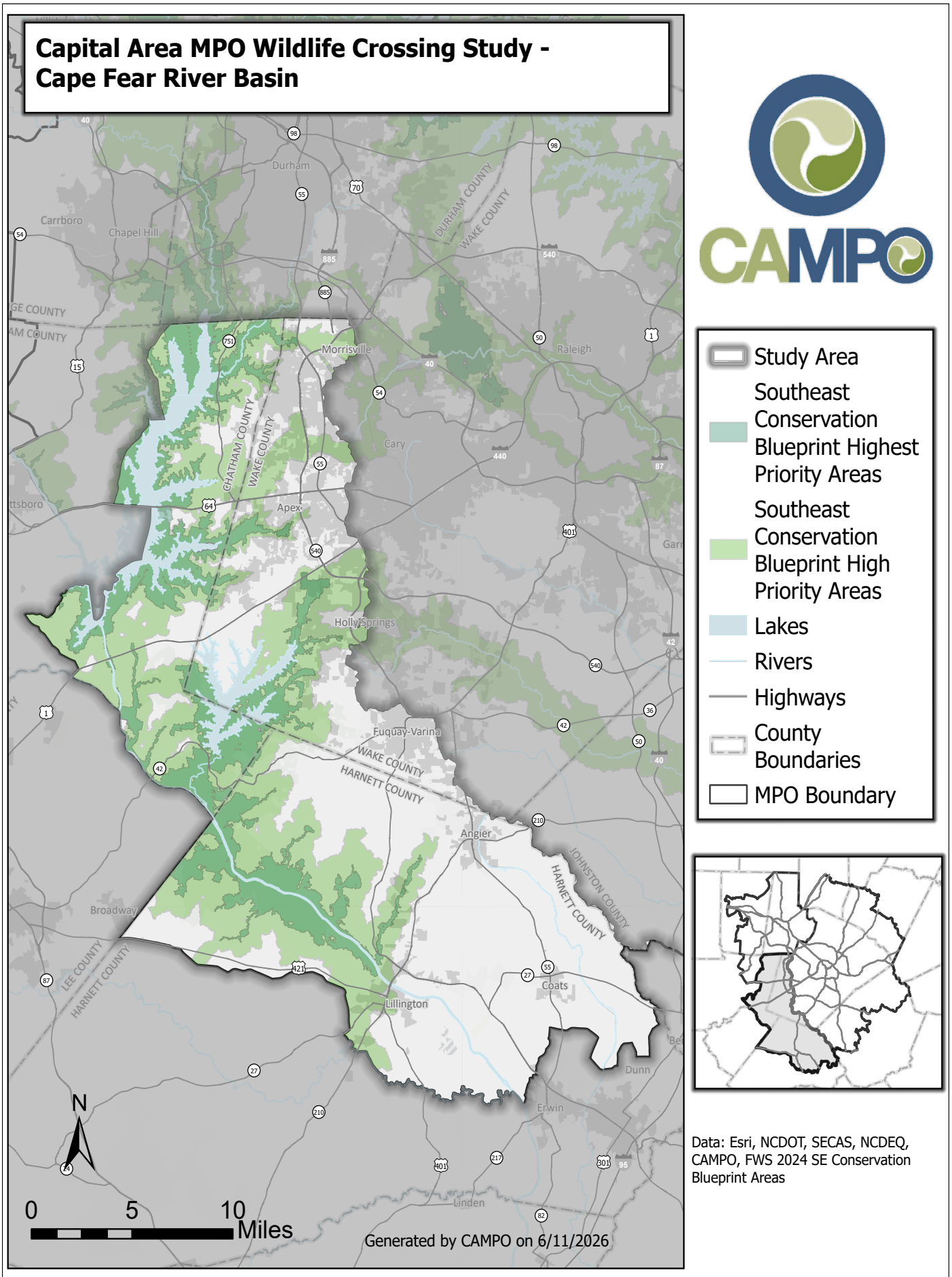


Figure 1: Study Area Map

mission (NCWRC) is the state agency responsible for the management and conservation of fish and wildlife resources in North Carolina.

In the context of wildlife crossing transportation planning, the NCWRC reviews NCDOT projects and advocates for the installation of wildlife passage treatments where appropriate. The NCWRC is a critical partner for translating this study's recommendations into NCDOT project development. The U.S. Army Corps of Engineers (USACE) Wilmington District owns and operates the B. Everett Jordan Dam and Lake, which encompasses approximately 46,768 acres primarily in Chatham County, but extends into Wake, Durham, and Orange Counties. This represents one of the largest contiguous landowners in the study area and is an important component of the regional landscape matrix for wildlife movement. Any transportation improvements on or adjacent to Corps-managed lands may require coordination with and approval from the USACE. Additionally, the Corps has regulatory authority over activities affecting waters of the United States, meaning that many wildlife crossing projects involving stream crossings may require Corps permitting. The USACE was engaged as a stakeholder in this study to ensure that candidate sites near Corps lands and waters are identified early and that the consultation process can be initiated in a timely manner during future proj-

ect development.

The Towns of Angier, Apex, Cary, Coats, Fuquay-Varina, Holly Springs, Lillington, and Morrisville each maintain a portion of the local road network within their jurisdictions that complement the state system. While this study focuses primarily on NCDOT-maintained structures, local roads may also intersect Southeast Conservation Blueprint High Priority Areas and WVC hot spots. Municipalities program local transportation improvements through Capital Improvement Plans (CIPs) and Comprehensive Transportation Plans (CTPs). Recommendations from this study that are associated with locally maintained infrastructure may be incorporated into these planning documents at the discretion of each municipality. Municipal representatives were engaged as stakeholders throughout the study and are positioned to serve as local champions for advancing wildlife crossing treatments through local planning processes and in coordination with CAMPO and NCDOT.

The three counties within the study area, Chatham, Harnett, and Wake Counties, each administer land use regulations that shape development patterns and their effect on Southeast Conservation Blueprint High Priority Areas. County planners are also positioned to incorporate findings from this study into local Comprehensive Plans which support the conservation of Southeast

Conservation Blueprint High Priority Areas and reduce the likelihood of WVCs.

The N.C. Conservation Network, Wildlands Network, and Triangle Connectivity Collaborative bring expertise in habitat connectivity, species identification and ecology, and regional conservation planning. Their involvement in this study ensures that recommendations are grounded in the broader context of regional Southeast Conservation Blueprint High Priority Areas and are consistent with long-range conservation strategies for the region.

3. Community & Stakeholder Engagement

Community Engagement

Community engagement was considered to potentially focus on raising awareness and educating the community in the study area on: 1) how wildlife-vehicle crashes have contributed to an increase in fatalities and serious injury crashes within the CAMPO region; and 2) the goals and objectives of this study. However, following stakeholder discussions, it was determined that community feedback was not necessary for this study due to the technical nature of identifying locations for site assessments and findings.

Community engagement and outreach exercises will be considered through

stakeholder discussions during any future studies if:

- There are wildlife crossing studies in other areas of the CAMPO region, such as the Neuse and Tar-Pamlico River Basins; or,
- CAMPO incorporates public-facing wildlife crossing awareness and education into future safety communication campaigns as part of the Blueprint for Safety Program.

Stakeholder Engagement

Stakeholder engagement was conducted throughout the study to ensure that the analysis methodology, site assessment process, and findings reflect the collective expertise of the agencies and organizations with the greatest stake in the study's outcomes. Stakeholders included representatives from the Towns of Angier, Apex, Cary, Coats, Fuquay-Varina, Holly Springs, Lillington, and Morrisville; NCDOT Divisions 5, 6, and 8; the U.S. Army Corps of Engineers; the N.C. Wildlife Resources Commission; the non-profit N.C. Conservation Network; non-profit Wildlands Network; Chatham, Harnett, and Wake Counties; and the Triangle Connectivity Collaborative.

A formal kick-off meeting was held on October 3, 2025. This meeting established shared goals, confirmed the study area and data inputs, and introduced the methodological framework for identifying priority locations for

wildlife crossing treatment. Stakeholder feedback from the kick-off meeting informed the development of the analysis methodology, which was documented in a technical memorandum and distributed to the stakeholder group in December 2025. Following stakeholder review and comment, the memo was revised and finalized in January 2026. Site assessments of identified structures were conducted in February and March 2026. Stakeholders were invited to accompany CAMPO staff during field visits, providing an opportunity for those with wildlife crossing development knowledge to contribute directly to the assessment process. A draft report was completed and distributed to the stakeholder group in May 2026 for review and comment. Following the comment period, a final stakeholder meeting in May 2026 was held to discuss feedback and confirm findings before the report was finalized.

4. Analysis Methodology

Overview

The methodology for this study was developed with stakeholders at the October 2025 kick-off meeting and documented in a technical memorandum distributed to and approved by the stakeholder group in January 2026. The analysis proceeds in three steps: 1) a crash-based hot spot analysis to identify where wildlife-vehicle collisions are concentrated; 2) a structure scree-

ing to identify NCDOT-maintained infrastructure within those hot spots in addition to being within Southeast Conservation Blueprint High Priority Areas, which suggests structures may be appropriate for wildlife crossing treatment; and 3) a supplemental review of hot spot locations outside Southeast Conservation Blueprint High Priority Areas that fall within ⁷ CAMPO's High Injury Network (HIN). This approach is designed to direct planning resources toward locations where the evidence for both safety risk and crossing opportunity is strongest, while ensuring that high-crash corridors without obvious structural opportunities are not overlooked.

It is important to note the scope of this study's findings. The analysis identifies locations that may be appropriate for wildlife crossing treatment and provides analytical justification for that determination. It does not recommend specific treatments. Advancing any identified site to project design would require additional analysis, such as engineering design work and ecological studies, to determine the species most likely to use a crossing and the appropriate treatment type. This study is intended to provide the foundation and justification for that future work.

Step 1: Wildlife-Vehicle Crash Hot Spot Analysis

The analysis began with 10 years of

NCDOT wildlife-vehicle crash data spanning 2015 through 2024. This crash data was collected via police reports, which generally indicate that the animals involved are large and, upon collision, inflict considerable property damage or physical harm, eliciting the need for the police report. Using these records, CAMPO performed a kernel density analysis to identify geographic clusters of WVCs within the study area. Kernel density estimation produces a continuous surface representing the concentration of crash events, allowing for the identification of locations where crashes are not isolated incidents but rather reflect a pattern of recurring conflict between vehicles and wildlife.

Analysis locations representing the 95th percentile of crash density were designated as primary hot spots, meaning the hot spots include higher concentrations of crashes than 95% of hot spots within the study area. This threshold was selected to focus the analysis on the highest-risk locations throughout the study area. These hot spot polygons form the spatial foundation for all subsequent analysis steps.

Step 2: Structure Screening Within Southeast Conservation Blueprint High Priority Areas

Wildlife crossing treatments are most cost-effective when paired with existing State Transportation Improvement Program (STIP) projects. To account for this, the analysis utilized NCDOT's inventory of structures - including bridges, culverts, and pipes - for identification of crossing treatment opportunities. These structures

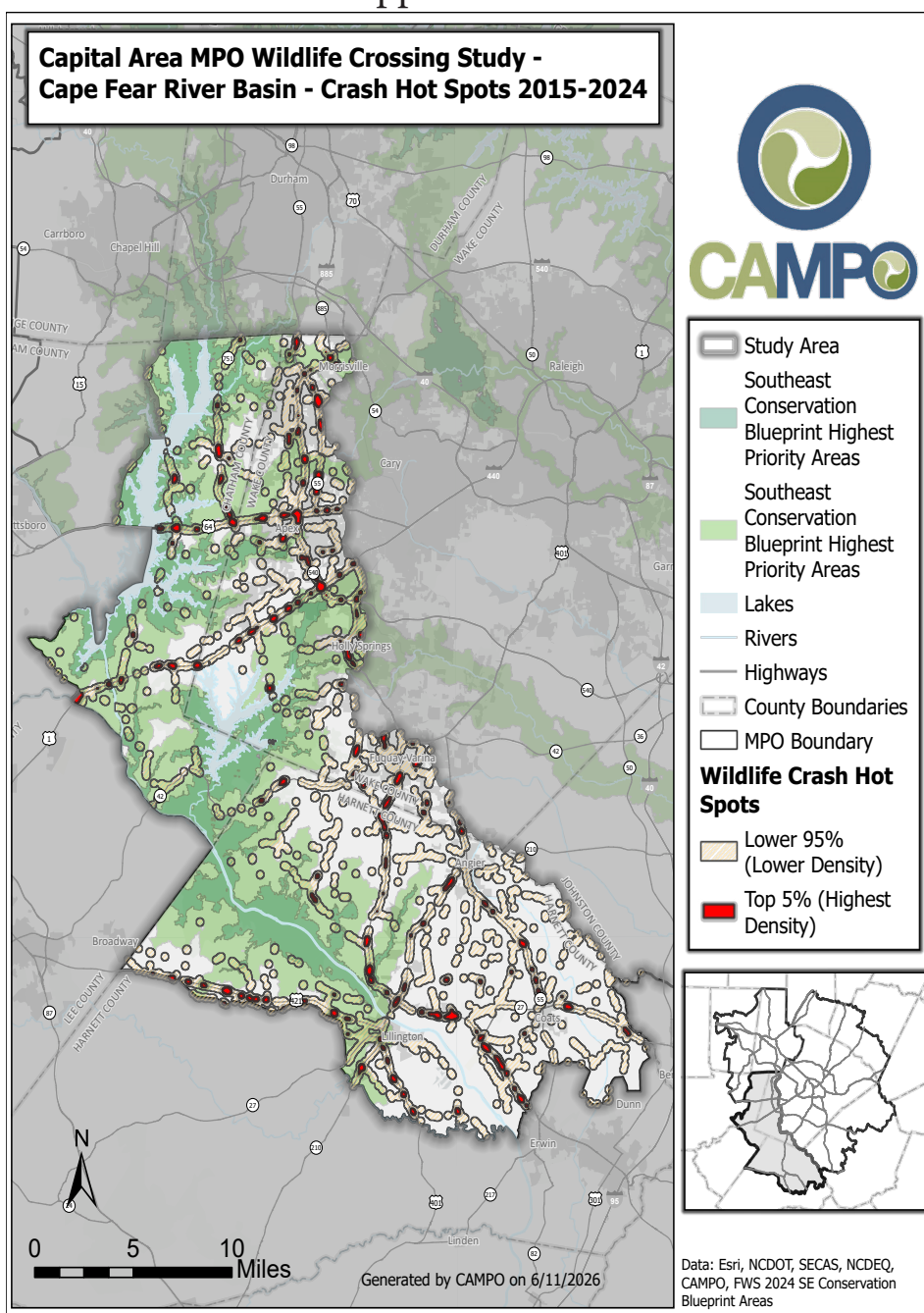


Figure 2: WVC Hot Spots

are maintained by NCDOT and, where improvements are warranted, can be advanced through NCDOT's project development and maintenance programming processes.

The NCDOT structure dataset was overlaid with two spatial layers: Southeast Conservation Blueprint High Priority Areas developed by the ⁹ U.S. Fish and Wildlife Service (USFWS) *Southeast Blueprint 2025*, and the 95th-percentile crash hot spot polygons produced in step 1. Structures meeting both criteria –located within a priority conservation corridor and within a crash hot spot – were identified for fur-

ther site assessment. This dual-criteria screening ensures that identified structures are supported by both a demonstrated crash risk and an existing priority conservation corridor, providing the strongest available justification for treatment consideration. This screening initially yielded 16 structures meeting both criteria. Following the distribution of the analysis to the stakeholder group, representatives from NCDOT Division 5, the Town of Apex, and the NCWRC noted that all 16 identified structures were overpasses on highways within the study area. NCDOT and the NCWRC indicated that such structures are not typically considered candidates

for wildlife crossing treatment, as treatment efforts focus on natural crossings – that is, bridges and culverts spanning rivers and streams – where wildlife movement is more likely to occur and where physical conditions are conducive to crossing treatment.

In response to this feedback, CAMPO identified stream crossings that are parallel to the Southeast Conservation Blueprint High Priority Areas, located along the same roadway as each originally identified structure, and within proximity of that structure. The rationale is that wildlife crossing improvements at these nearby stream crossings

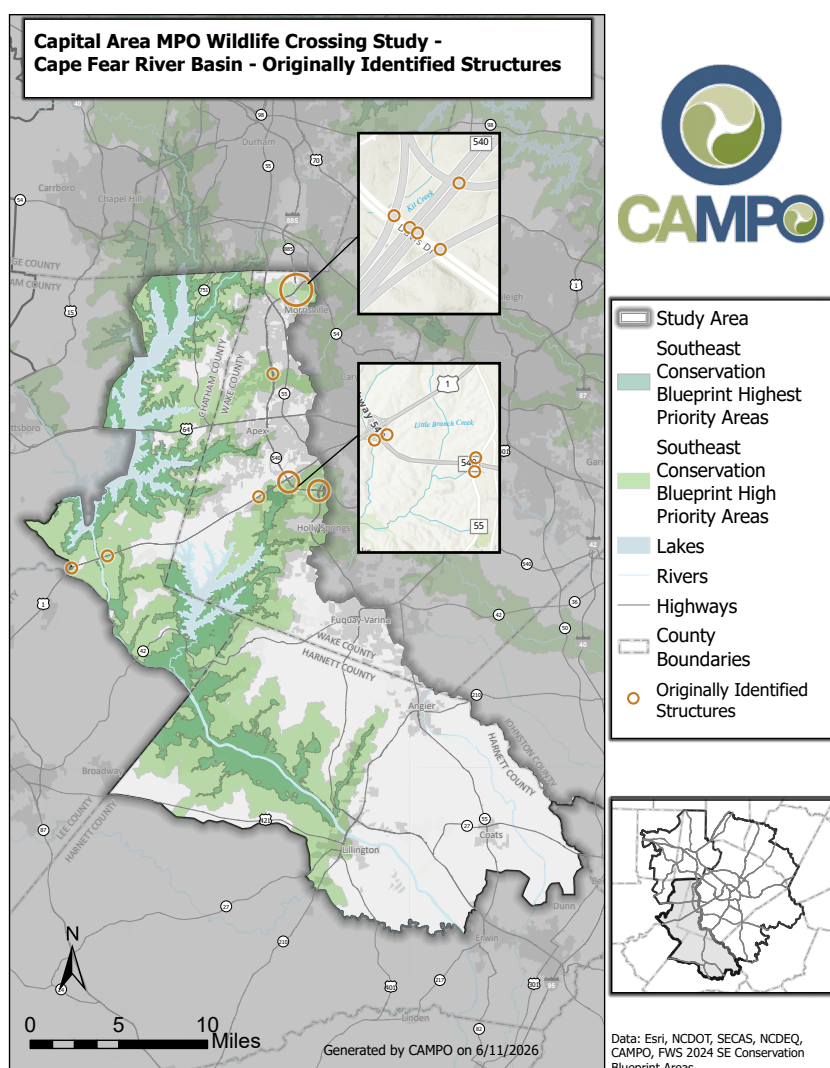


Figure 3: Originally Identified Structures

could serve a funneling function, guiding wildlife from the identified overpass locations to adjacent natural crossing points and reducing the likelihood of vehicle conflicts at those locations. This revised set of six structures was presented to and accepted by the stakeholder group and forms the basis for the formal site assessments conducted in this study. One originally identified structure – the bridge crossing at Friendship Road and US-1 – did not have an associated nearby stream crossing meeting the substitution criteria and was removed from the site assessment list. This removal is documented in this report for transparency.

Step 3: High Injury Network Hot Spot Review

The crash hot spot analysis identified a number of high-density WVC locations that do not intersect the Southeast Conservation Blueprint High Priority Areas and do not have nearby NCDOT structures suitable for retrofit. These locations nevertheless experience a signif-

icant volume of wildlife-related crashes and warrant consideration. To ensure these segments were not overlooked, CAMPO identified all hot spots that also fall within the ⁷ CAMPO Blueprint for Safety High Injury Network (HIN). The HIN designates roadway segments with disproportionately high rates of serious injury and fatal crashes across all crash types, or segments that meet design criteria that are known to increase the likelihood of fatal or serious injury

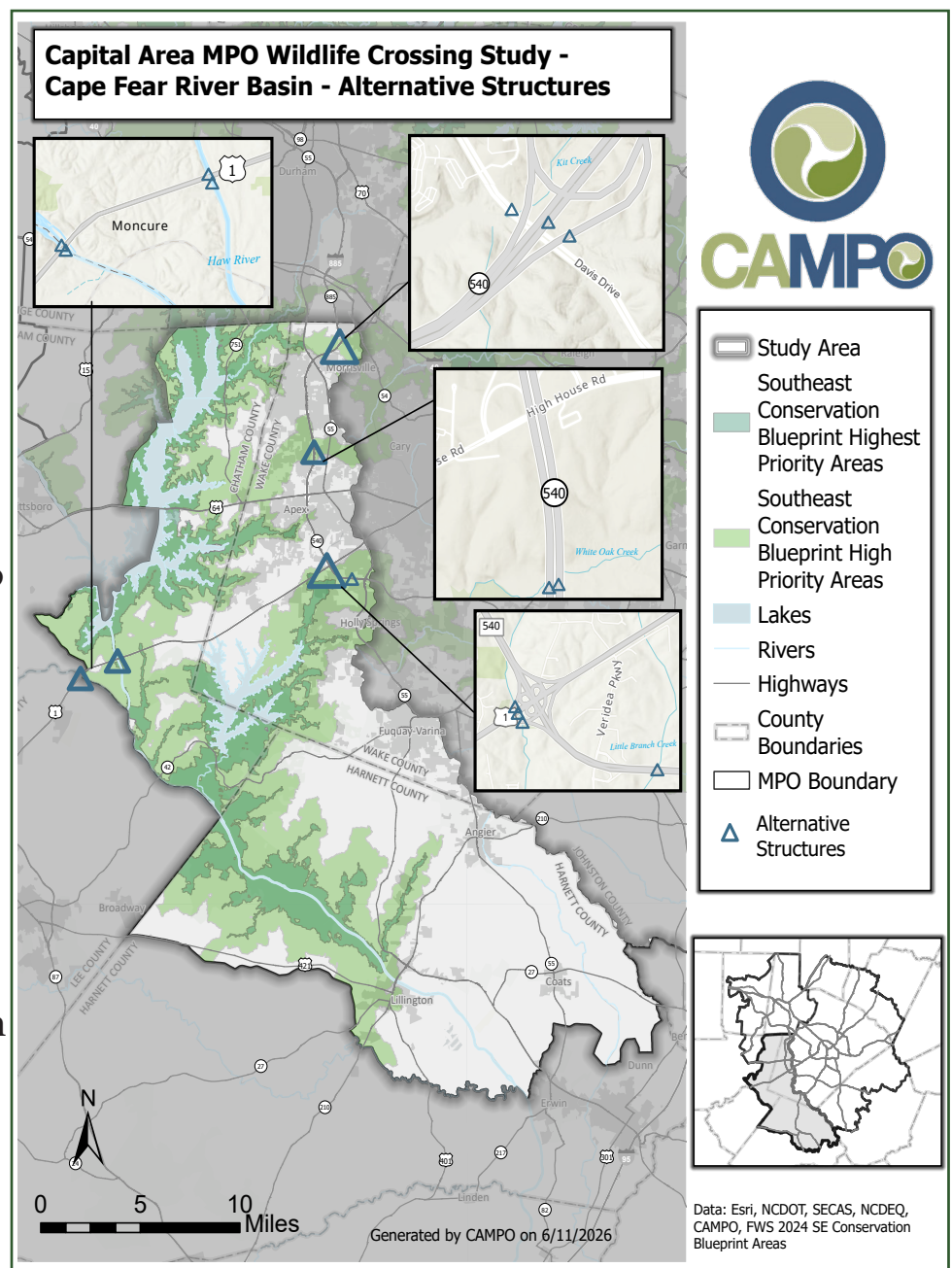


Figure 4: Alternate Structures

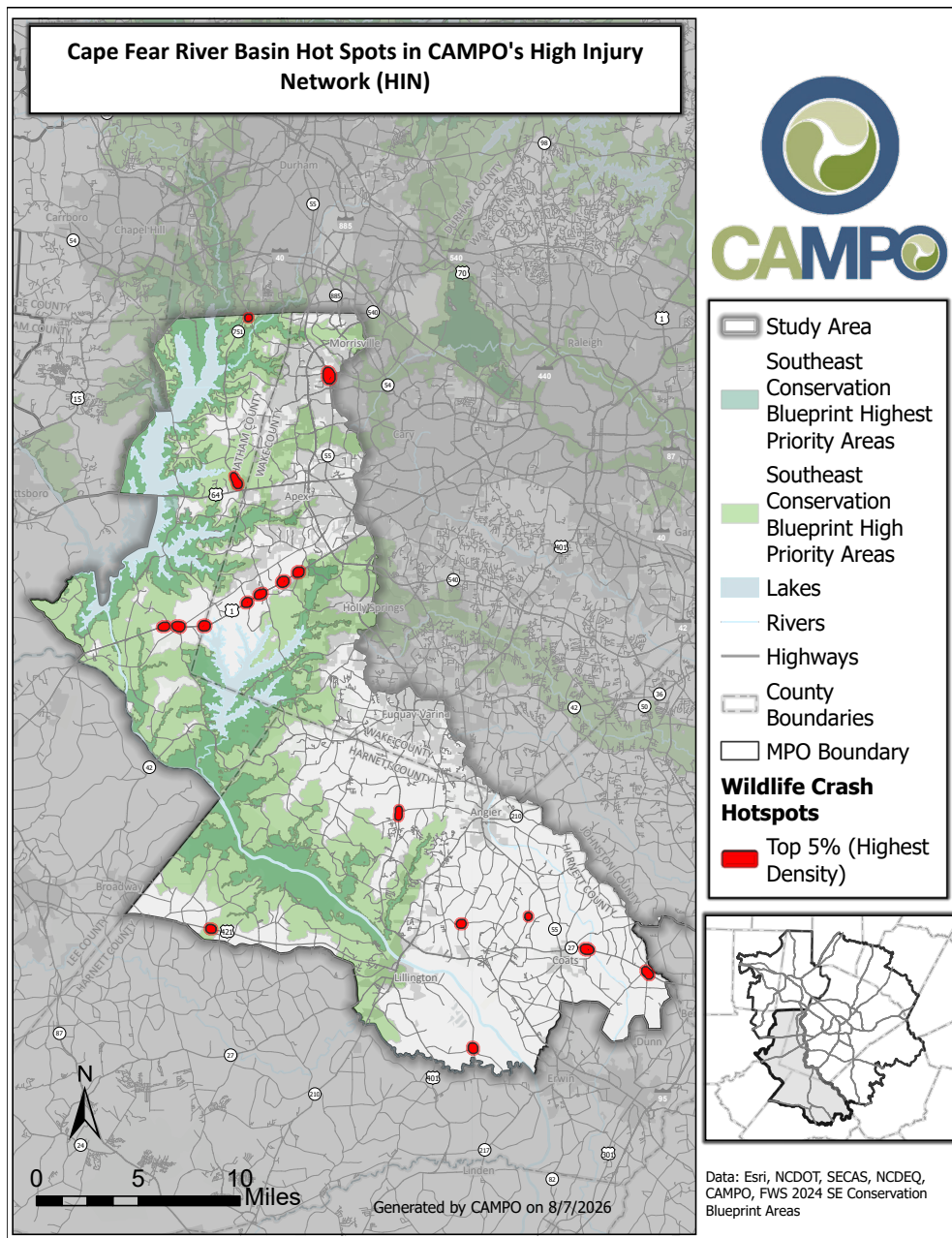


Figure 5: Hot Spots within HIN

crashes; the overlap between HIN segments and WVC hot spots identifies corridors where wildlife-vehicle conflict is contributing to an already elevated safety concern.

These HIN hot spot locations were carried forward for hot spot segment assessments. Because they lack nearby structures suitable for retrofit, they are evaluated as candidates for a combination of non-structural treatments such

as signage, fencing, or other low-cost countermeasures rather than dedicated crossing infrastructure.

They may also yield useful information about broader corridor characteristics and wildlife movement patterns not fully captured in existing datasets. For county-by-county hot spots within the HIN, please refer to [Appendices 1-3](#).

Data Sources

The following datasets were used as inputs to the GIS analysis. All data were current as of the analysis period unless otherwise noted.

Dataset	Source	Use in Analysis	Coverage Period / Notes
Wildlife-Vehicle Crash Data	NCDOT	Kernel density / hot spot identification	2015–2024
Southeast Conservation Blueprint High Priority Areas	USFWS Southeast Blueprint 2025	Structure screening overlay	Current at time of analysis
NCDOT Structures Inventory (bridges, culverts, pipes)	NCDOT	Identification of candidate crossing structures	Current at time of analysis
Blueprint for Safety High Injury Network (HIN)	CAMPO	Identification of high-crash WVC hot spots outside conservation corridors and are not associated with structures	Current at time of analysis

Table 1: Data Sources

Site and Hot Spot Assessments

Site assessments were conducted following stakeholder approval of the revised structure list and the HIN hot spot segments. Formal site assessments were performed at each identified structure, collecting inventory data on existing physical conditions relevant to crossing suitability. The hot spot segment assessments were conducted along each HIN hot spot segment to document road and landscape characteristics.

The findings of these assessments are presented in the Site Assessment section of this report and provide the on-the-ground evidence base to support future treatment consideration by NCDOT, the NCWRC, and partner municipalities.

5. Site Assessments

CAMPO staff conducted formal site assessments of six locations identified through the screening process described in Step 3. Assessments of five locations were completed in February 2026, with the last location being assessed in March 2026. Each location is an NCDOT-maintained roadway that crosses a stream or river. Locations may have one or several structures associated with them. For each structure, staff documented physical crossing conditions relevant to wildlife passage suitability, including structure type

and size, bank and channel substrate, barrier conditions, evidence of wildlife use, traffic volumes, structure age, and structural condition. The assessment form used for each site is provided in [Appendix 4](#).

Structure age and condition inform the likelihood for approaching maintenance, rehabilitation, or replacement cycles, which represent near-term windows to incorporate passage improvements at lower marginal cost; structures in good condition with no programmed STIP work may still warrant proactive engagement but face a longer timeline to implementation.

Wildlife crossing treatments range in scale and cost depending on site conditions, species context, and the type of infrastructure involved. The *NCDOT Wildlife Passage Guidance* identifies several treatment categories applicable to stream crossings and roadway corridors. Structural treatments include modifications to existing bridges and culverts — such as the installation of level bench paths or dry passage shelves within culvert openings — as well as replacement structures designed with increased width, height, or natural substrate to support terrestrial movement. Deflection fencing along the Right-of-Way guides wildlife away from at-grade crossing locations and toward designated passage points and is most effective when installed in conjunction with a suitable crossing structure. Lighting

within long or dark culverts can improve passage conditions for species deterred by visual barriers. Lighting along highways at either end of culverts can improve both wildlife and motorist ability to see each other before conflict occurs. At sites where no nearby structure is suitable for retrofit — such as the HIN hot spots identified in this study — combinations of signage, fencing, and low-cost countermeasures represent the primary available treatment category. The appropriate treatment or combination of treatments at any site identified in this study would be determined through subsequent engineering and ecological analysis conducted in coordination with NCDOT and NCWRC.

Findings from structure assessments provide additional justification for advancement of individual sites toward further study, project development, or incorporation into maintenance and replacement programs. The study does not recommend specific treatments; that determination requires additional engineering and ecological analysis.

White Oak Creek



Figure 6: N.C. 540 over White Oak Creek

The N.C. 540 bridge over White Oak Creek is located between Roberts Road and Green Level West Road in Cary. The crossing spans a broad, wetland portion of White Oak Creek and serves as an existing passage point for the White Oak Creek Greenway, which passes through the bridge underpass. Surrounding lands are owned by the Town of Cary and the NC Turnpike Authority.



Figure 7: White Oak Creek Crossing Map

There were a total of nine (9) crashes recorded within the hot spot associated with this bridge.

Assessment conditions indicate a large, open bridge with no identified barriers to passage. The structure spans a wide, meandering wetland; dry bank continuity through the crossing could not be confirmed given the wetland character of both the bank and stream channel. Geese were observed using the crossing at the time of assessment, and no road-kill was present. The crossing width and absence of barriers suggest clear functional passage. Whether dry terrestrial passage is consistently available for species that require it remains uncertain and would benefit from follow-up

monitoring. Built in 2012 and currently in good condition, the structure is not approaching a maintenance or replacement threshold in the near term, though its condition warrants monitoring as part of NCDOT's standard inspection cycle.

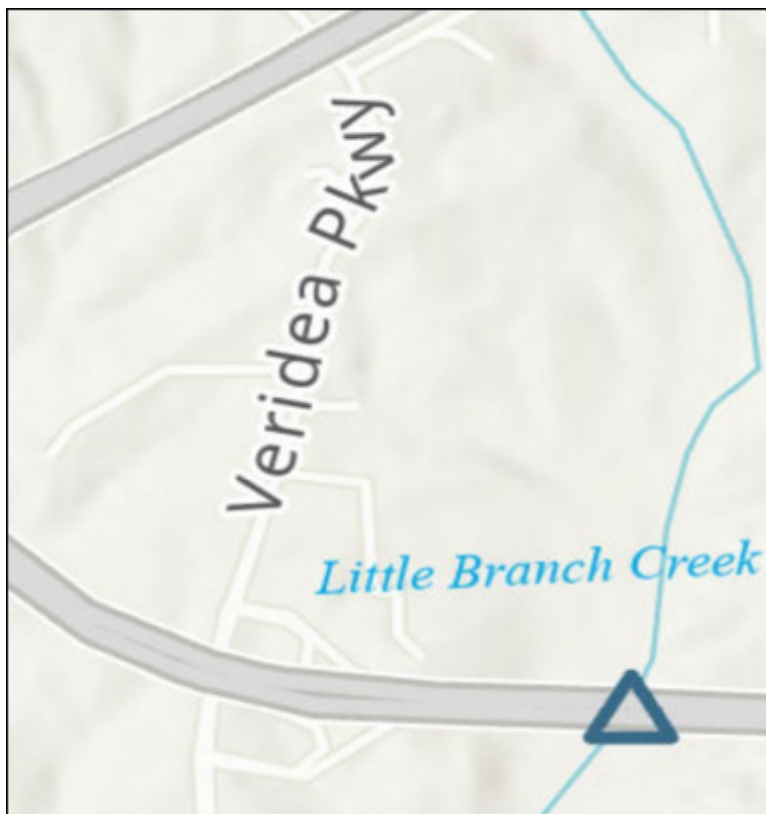
Date of Assessment	February 12, 2026
Road	NC 540 (northbound)
Location	Between Roberts Road and Green Level West Road, Town of Cary, Wake County
NCDOT Division(s)	Division 5
Body of Water	White Oak Creek
NCDOT Structure Code	911298 (SB/NB)
STIP Project	None
Structure Type	Bridge
Crossing Size	Large (>60 ft wide, 8 ft vertical clearance)
Number of Openings	N/A (bridge)
AADT (2024)	33,000
Total Crashes Recorded	Nine (9)
Year Built	2012
Structure Condition	Good
Structure Bank Substrate	Riprap and wetlands
Stream Channel Substrate	Wetlands
Barriers Present	None identified
Continuous Dry Bank	Unknown — wetland conditions preclude determination
Evidence of Road Kill On-Site	No
Evidence of Wildlife Use	Yes — geese observed
Existing/Planned Greenway	Yes — White Oak Creek Greenway (existing)
Adjacent Conservation Areas	Public-owned, but not explicitly listed for conservation

Table 2: White Oak Creek Data

Little Branch Creek



Figure 8: Little Branch Creek Culvert



likely dries out seasonally. Deer tracks and beaver activity were documented, confirming wildlife presence in the corridor. Structure age and condition are not available in the NCDOT database, and no STIP project is currently programmed, meaning a near-term construction window is not anticipated. Absent a programmed project, advancing improvements at this site would require a stand-alone project submission or coordination with NCDOT's maintenance division.

Figure 9: Little Branch Creek Map

The NC 540 culvert over Little Branch Creek is located between NC 55 and Veridea Parkway, near the toll facility at 3445 Apex Road in Holly Springs, Wake County. The crossing consists of two-barrel culverts carrying NC 540 over Little Branch Creek in a corridor transitioning from suburban development toward the highway right-of-way. There were a total of five (5) crashes recorded within the hot spot associated with this location.

Assessment conditions indicate a medium culvert with several barriers limiting passage effectiveness. Standing water, debris, and rip-rap were observed, and no continuous dry bank was present through the structure. A dry path was present but tied into only one bank. The culvert is dammed on one side and

Date of Assessment	February 12, 2026
Road	N.C. 540 (northbound)
Location	Between NC 55 and Veridea Parkway, near 3445 Apex Road, Wake County
NCDOT Division(s)	Division 5
Body of Water	Little Branch Creek
NCDOT Structure Code	Structure ID not assigned
STIP Project	None
Structure Type	Culvert
Crossing Size	Medium (<60 ft, >4 ft wide)
Number of Openings	Two (2)
AADT (2024)	17,500
Total Crashes Recorded	Five (5)
Year Built	Unknown - likely with N.C. 540 construction
Structure Condition	Inspection report not available
Structure Bank Substrate	Riprap and natural
Stream Channel Substrate	Sand
Barriers Present	Riprap; debris; standing water
Continuous Dry Bank	No
Visible Through Structure	Yes
Dry Path Tied into Bank	One side only
Evidence of Road Kill On-Site	No
Evidence of Wildlife Use	Yes — deer tracks and beaver activity observed
Existing/Planned Greenway	No
Adjacent Conservation Areas	None

Table 3: Little Branch Creek Data

Big Branch Creek



Figure 10: Big Branch Creek Culvert

The US 1 culvert over Big Branch Creek is located at the southwest corner of the US 1/NC 540 interchange in Wake County. The crossing consists of two-barrel culverts in a heavily engineered interchange environment, with adjacent culverts along the same side of the interchange sharing similar conditions. There were a total of nine (9) crashes recorded within the hot spot associated with this location.

Assessment conditions indicate a medium culvert with significant barriers

to passage. Standing water was present, no continuous dry bank was found, the structure was minimally visible through to the other side, and no dry path was tied into either bank. Rip-rap covers both the bank and stream channel. Wildlife use of the crossing could not be confirmed, though beaver activity was observed nearby. The structure is located within the NCDOT Non-NBIS dataset, specifically listed as BP-092-4483 and BP-092-4525. NCDOT Division 5 has provided structure codes of E4483 and E4525. There is no STIP project currently programmed for this location. The interchange context and uniformly poor passage conditions across multiple culverts suggest

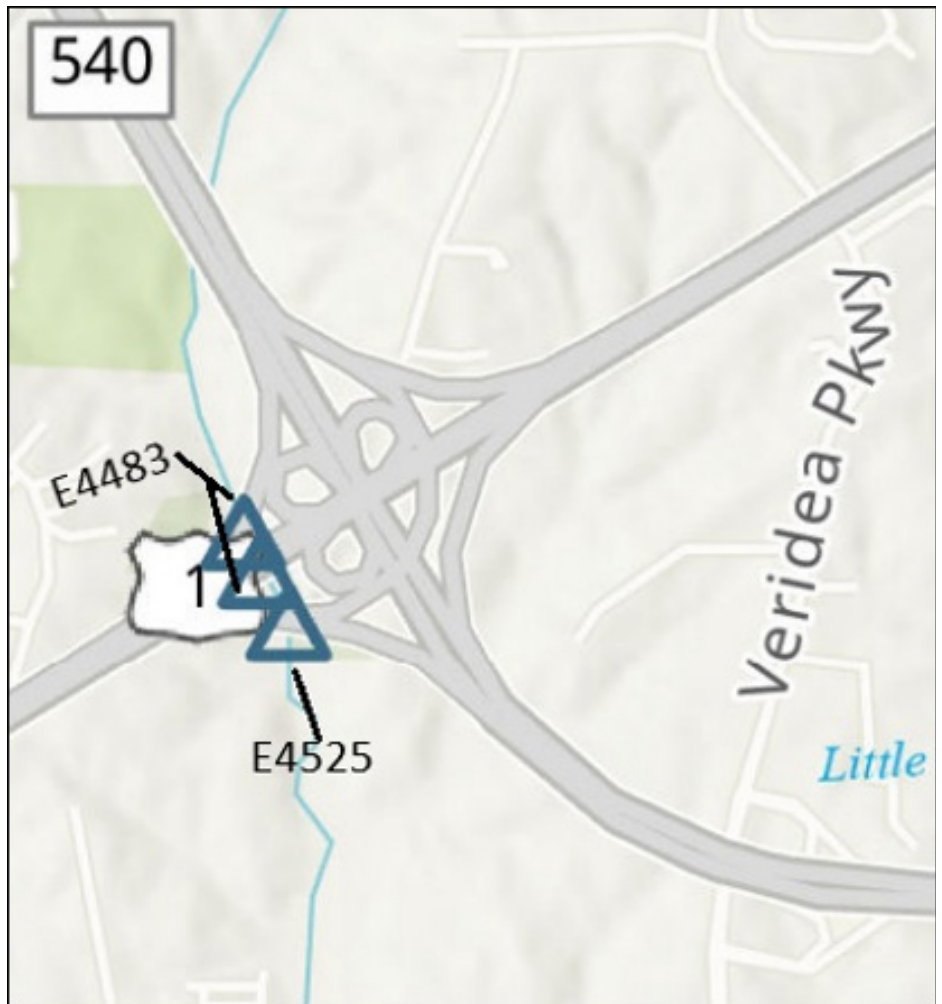


Figure 11: Big Branch Crossing Map

this site and its neighboring structures may warrant a corridor-level treatment strategy rather than improvement to a single opening. Without a programmed project, coordination with NCDOT Division 5 would be the likely path to advancing any treatment consideration.

Date of Assessment	February 12, 2026
Road	US 1 (northbound)
Location	First ramp at US 1/NC 540 interchange, Wake County
NCDOT Division(s)	Division 5
Body of Water	Big Branch Creek
NCDOT Structure Code	E4483, E4525
STIP Project	None
Structure Type	Culvert
Crossing Size	Medium (<60 ft, >4 ft wide)
Number of Openings	Two (2)
AADT (2024)	43,500
Total Crashes Recorded	Nine (9)
Year Built	Unknown
Structure Condition	Inspection report not available
Structure Bank Substrate	Riprap
Stream Channel Substrate	Riprap
Barriers Present	Standing water
Continuous Dry Bank	No
Visible Through Structure	No
Dry Path Tied into Bank	No
Evidence of Road Kill On-Site	No
Evidence of Wildlife Use	Unknown — beaver activity present; crossing use not confirmed
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 4: Big Branch Creek Data

Deep River



Figure 11: U.S. 1 over the Deep River

The US 1 bridge over the Deep River is located in the Moncure area of Chatham County. The Deep River marks the western boundary of the study area, where the landscape is more rural and within an ecologically significant river corridor. The surrounding area is designated for conservation in the Chatham County

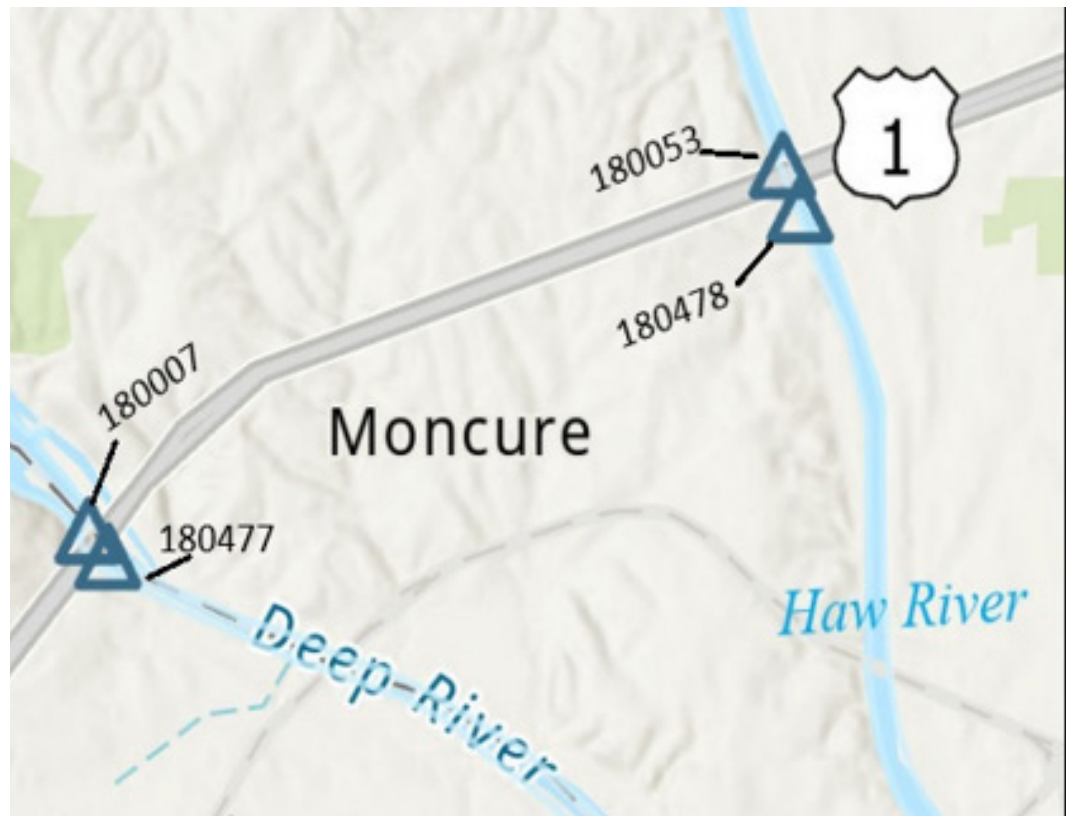


Figure 12: Deep River and Haw River Crossing Map

Future Land Use Plan. NCDOT has a planned natural surface trail — the Deep River Trail — along the river’s eastern bank. There were a total of 16 crashes recorded within the hot spot associated with this bridge.

Assessment conditions indicate a large bridge with a wide, lightly vegetated path beneath the structure suggesting active passage use. Riprap was the only barrier identified, and no dry bank was confirmed on the assessed side. No roadkill was present. The unobstructed underpass and observed passage conditions make this location one of the stronger candidates among the assessed structures. Both the southbound (180007) and northbound (180477) structures were built in 1997–1998 and

are currently rated in good condition, indicating no near-term replacement is anticipated. Without a programmed STIP project, a standalone submission or coordination with NCDOT Division 8 would be needed to advance treatment. Conditions on the eastern bank, where the Deep River Trail is planned, were not assessed from this approach and require further investigation.

Date of Assessment	February 12, 2026
Road	US 1 (northbound)
Location	Western bank of Deep River, Moncure area, Chatham County
NCDOT Division(s)	Division 8
Body of Water	Deep River
NCDOT Structure Code	180007 (SB), 180477 (NB)
STIP Project	None
Structure Type	Bridge
Crossing Size	Large (>60 ft wide, 8 ft vertical clearance)
Number of Openings	N/A (bridge)
AADT (2024)	32,500
Total Crashes Recorded	16
Year Built	1998 (SB), 1997 (NB)
Structure Condition	Good
Structure Bank Substrate	Rock
Stream Channel Substrate	N/A
Barriers Present	Riprap
Continuous Dry Bank	No
Evidence of Road Kill On-Site	No
Evidence of Wildlife Use	Yes — wide, lightly vegetated path beneath bridge indicates passage use
Existing/Planned Greenway	Planned — Deep River Trail (NCDOT natural surface, eastern bank)
Adjacent Conservation Areas	Not designated for conservation, but identified for conservation in the Chatham County Future Land Use Plan

Table 5: Deep River Data

Haw River



Figure 13: U.S. 1 over the Haw River

The US 1 bridge over the Haw River is located near the western boundary of both the CAMPO planning area and the Cape Fear River Basin study area. The surrounding area is designated for conservation in the Chatham County Future Land Use Plan, reflecting the ecological significance of the Haw River corridor. There were a total of five (5) crashes recorded within the hot spot associated with this bridge.

Assessment conditions on the eastern bank indicate a large bridge with riprap covering the bank and no clear terrestrial passage. No wildlife use was confirmed, though a raccoon roadkill was observed at the time of assessment — direct evidence of WVC risk at this location. Both structures (180053, 180478) were built in 1997–1998 and are currently rated in fair condition. Without a programmed STIP project, a standalone submission or coordination with NCDOT Division 8 would be needed to advance treatment. Conditions on the western bank were not assessed and require further investigation before passage suitability can be fully characterized.

Date of Assessment	February 12, 2026
Road	US 1 (northbound)
Location	Eastern bank of the Haw River, Chatham County
NCDOT Division(s)	Division 8
Body of Water	Haw River
NCDOT Structure Code	180053 (SB), 180478 (NB)
STIP Project	None
Structure Type	Bridge
Crossing Size	Large (>60 ft wide, 8 ft vertical clearance)
Number of Openings	N/A (bridge)
AADT (2024)	35,000
Total Crashes Recorded	Five (5)
Year Built	1998 (SB), 1997 (NB)
Structure Condition	Fair
Structure Bank Substrate	Rock
Stream Channel Substrate	N/A
Barriers Present	Riprap
Continuous Dry Bank	No
Evidence of Road Kill On-Site	Yes — raccoon observed at time of assessment
Evidence of Wildlife Use	Unknown
Existing/Planned Greenway	None
Adjacent Conservation Areas	Not designated for conservation; identified for conservation in the Chatham County Future Land Use Plan

Table 6: Haw River Data



Figure 14: N.C. 540 Northbound Ramp



Figure 15: N.C. 540 Culvert

The Kit Creek site encompasses three culvert structures in proximity to each other at the NC540 crossing of Davis Drive: the Davis Drive culvert over Kit Creek (911062), the NC 540 culvert (911063), and the NC 540 northbound ramp culvert to I-885 (911064). All three structures are located in Wake County, within or immediately adjacent to the Research Triangle Park, the dominant land use context for this site. A fourth structure on Davis Drive south of NC 540 was observed during the field visit due to its connection with Holt Pond's streambank, but detailed data was not recorded as part of this assessment outside of visual assessments, including photographs. There were a total of seven (7) crashes recorded within the hot spot associated with these bridges.

The defining physical condition at this site is the influence of Holts Pond, whose water level is sufficient to submerge all three culvert openings by a minimum of approximately three feet. This condition persists upstream and connects to the unrecorded structure on Davis Drive south of NC 540, effectively creating a continuous inundated corridor through the assessment area.

Under these conditions, the standard assessment framework for terrestrial passage — dry bank continuity, substrate visibility, passage width — is not applicable. All three structures are currently accessible only to aquatic and semi-aquatic species. Beaver activity was documented throughout the site,

terrestrial passage — dry bank continuity, substrate visibility, passage width — is not applicable. All three structures are currently accessible only to aquatic and semi-aquatic species. Beaver activity was documented throughout the site,



Figure 16: Davis Drive Culvert

consistent with the ponded conditions. The three structures were built in 2007 and are rated in good to fair condition.

No STIP project is currently programmed. The primary question for advancing this site is not structural — the crossings themselves are functional conduits — but hydrological: whether Holts Pond water levels can be managed or are expected to fluctuate seasonally in ways that would restore intermittent terrestrial passage.

That determination requires coordination with the pond's managing entity and is beyond the scope of this study. NCDOT Division 5 and NCWRC should be engaged to evaluate whether hydrological conditions are likely to change, whether the unrecorded south Davis Drive structure warrants inclusion in future analysis, and whether any near-term maintenance activity on the three recorded structures could

incorporate passage improvements contingent on pond level management.



Figure 17: Davis Drive Culvert (Not Formally Assessed)



Figure 18: Kit Creek Crossings Map

Date of Assessment	March 18, 2026
Road	Davis Drive / NC 540 / NC 540 NB ramp to I-885
Location	Davis Drive north of NC 540, Wake County
NCDOT Division(s)	Division 5
Body of Water	Kit Creek
NCDOT Structure Codes	911062 (Davis Drive culvert); 911063 (NC 540 culvert); 911064 (NC 540 NB ramp culvert)
STIP Project	None
Structure Type	Culvert (three structures assessed as one site)
Crossing Size	Not determinable — Holts Pond water level submerges all openings
Number of Openings	Two per structure (six total across three structures)
AADT (2024)	16,500 (Davis Drive)
Total Crashes Recorded	Seven (7)
Year Built	2007
Structure Condition	Good / Fair (all three structures)
Structure Bank Substrate	Primarily riprap and sediment deposit
Stream Channel Substrate	Likely sand — not observable; minimum 3 ft water depth across all culverts due to Holts Pond backwater
Barriers Present	Standing water — all culverts submerged at a minimum of 3 ft; terrestrial passage not feasible under current conditions
Continuous Dry Bank	No — precluded by Holts Pond water levels
Visible Through Structure	Yes
Dry Path Tied into Bank	No
Evidence of Road Kill On-Site	No
Evidence of Wildlife Use	Yes — beaver activity throughout
Existing/Planned Greenway	No
Other Bike/Ped Facilities	Pedestrian facilities on the west side of Davis Drive
Adjacent Conservation Areas	None — adjacent property entirely within Research Triangle Park (RTP)
Additional Notes	A fourth structure exists on Davis Drive south of NC 540, but was not recorded as part of this assessment

Table 7: Kit Creek Data

6. Hot Spot Segments

CAMPO staff conducted drive-through assessments of eleven hot spot segments identified through the HIN overlap analysis described in Step 3. Assessments were conducted on January 30, 2026. Each segment is a roadway corridor where WVC crash density meets the 95th-percentile threshold and the segment also falls within CAMPO's High Injury Network, indicating that wild-life-vehicle conflict is occurring in corridors already characterized by elevated safety risk. Unlike the six structure sites assessed in the preceding section, these segments do not have nearby NCDOT structures suitable for wildlife crossing retrofit. For each segment, staff documented general corridor conditions, including traffic volumes, speed characteristics, terrain, visibility, lighting, existing signage, and adjacent land uses. Because these locations lack suitable crossing structures, they are evaluated as candidates for non-structural treatments — signage, deflection fencing, or other low-cost countermeasures — rather than dedicated crossing infrastructure.

The appropriate combination of treatments at any segment would be determined through subsequent engineering

analysis in coordination with NCDOT and NCWRC. The one exception is the Carpenter Fire Station Road / U.S. 55 segment, which has an active STIP project (U-6227) and represents a near-term opportunity to incorporate wildlife countermeasures into an already-advancing effort.

Chalybeate Springs / U.S. 401



Figure 19: 401 southbound in Chalybeate Springs

The Chalybeate Springs Road and U.S. 401 intersection is located in Chalybeate Springs, an unincorporated community in Harnett County between the Towns of Holly Springs, Angier, and Lillington. The conditions on the date of assessment indicate that there are heavy truck volumes. The speed limit through the corridor is 45 Miles per Hour (MPH).

The landscape surrounding the roadway is relatively flat terrain, but there is low

visibility, due to the horizontal curvature of the roadway. To add, there is no street lighting or animal crossing signage nearby to warn drivers about potential conflicts with wild-life. There were a total of seven (7) crashes recorded within the hot spot.

Date of Assessment	January 30, 2026
Location	Chalybeate Springs Rd, east of U.S. 401
NCDOT Division(s)	Division 6
STIP Project	None
AADT (2024)	3,400
Total Crashes Recorded	Seven (7)
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 8: Chalybeate Springs / U.S. 401 Data

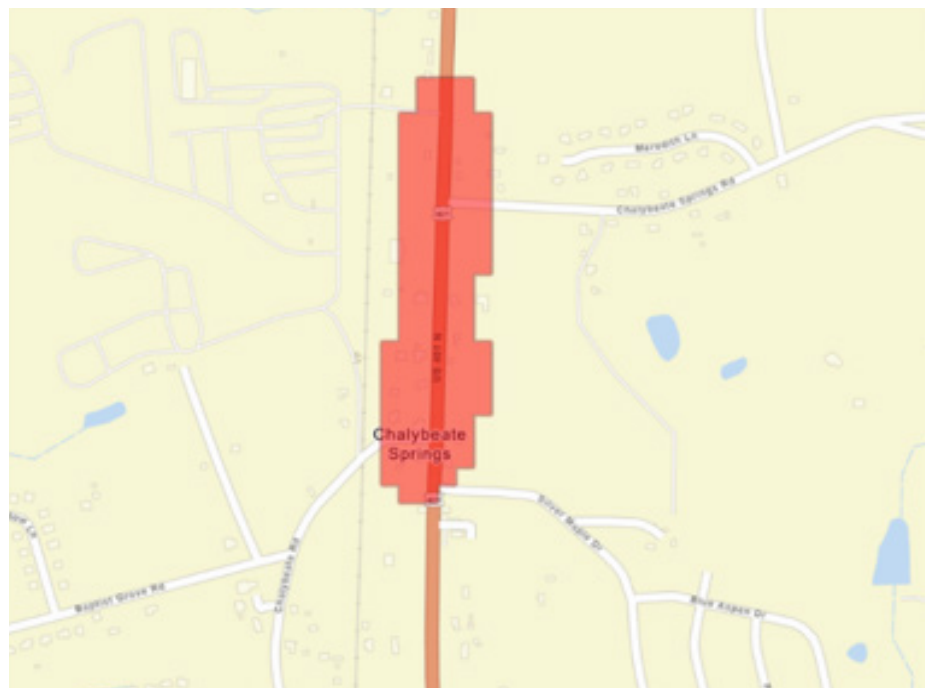


Figure 20: Chalybeate Springs / U.S. 401 Hot Spot

Titan Roberts / Ross Rd.

The Titan Roberts and Ross Road intersection is located in Harnett County between the Towns of Lillington and Erwin, and along the Cape Fear River. The conditions on the date of assessment indicate that there are low traffic volumes. The speed limit is 55 MPH. The landscape surrounding the roadway is relatively flat and relatively forested terrain. There was also no street lighting or animal crossing signage nearby. There were a total of six (6) crashes recorded within the hot spot.



Figure 21: Ross Rd Southbound at Titan Rd Intersection

Date of Assessment	January 30, 2026
Location	Titan Roberts Rd, east of Ross Rd
NCDOT Division(s)	Division 6
STIP Project	None
AADT (2024)	1,800
Total Crashes Recorded	Six (6)
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 9: Titan Roberts / Ross Rd. Data

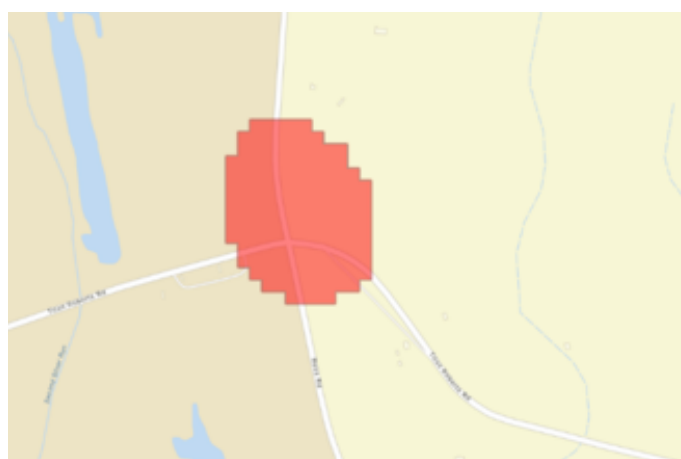


Figure 22: Titan Roberts / Ross Rd Hot Spot Map

N.C. 27 E. / Fairground Rd.

The N.C. 27 East and Fairground Road intersection is located in Harnett County, between the Towns of Benson and Coats. The conditions on the date of assessment indicate that there are moderate traffic volumes with a speed limit of 55 MPH and existing safety investment of a four-way stop with Rapid Flashing Beacons (RFBs). The landscape surrounding the roadway is relatively flat and relatively forested terrain. Also, there is fairly clear visibility, however, there is no street lighting or animal crossing signage nearby. There were a total of nine (9) crashes recorded within the hot spot.

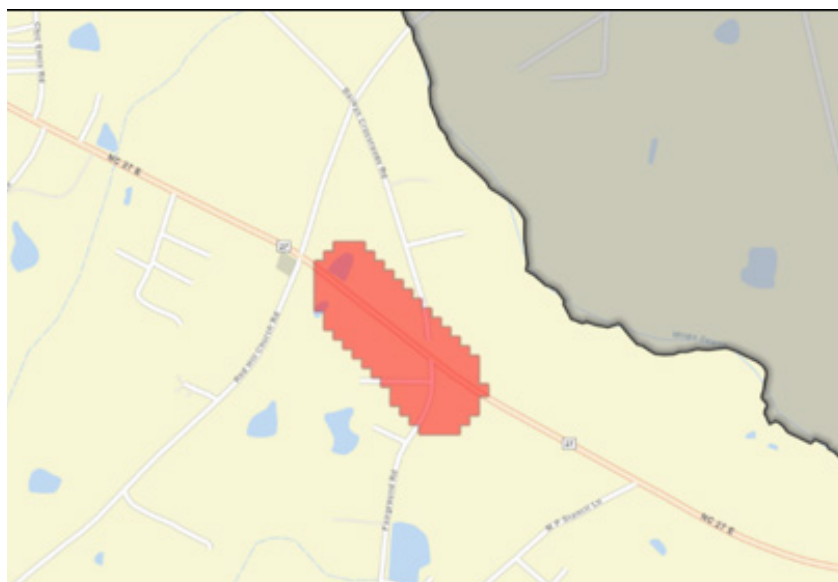


Figure 23: N.C. 27 E. / Fairground Rd. Hot Spot Map



Figure 24: N.C. 27 East at Fairground Rd.

Date of Assessment	January 30, 2026
Location	N.C. 27, east of Fairground Rd.
NCDOT Division(s)	Division 6
STIP Project	None
AADT (2024)	6,400
Total Crashes Recorded	Nine (9)
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 10: N.C. 27 E. / Fairground Rd. Data

N.C. 27 W. / Delma Grimes Rd.



Date of Assessment	January 30, 2026
Location	Delma Grimes Rd., south of N.C. 27
NCDOT Division(s)	Division 6
STIP Project	None
AADT (2024)	350
Total Crashes Recorded	10
Treatment Present	None
Evidence of Road Kills	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 11: N.C. 27 W. / Delma Grimes Rd. Data

Figure 25: N.C. 27 eastbound toward Delma Grimes Rd.

The N.C. 27 West and Delma Grimes Road intersection is located in the Town of Coats, Harnett County. The conditions on the date of assessment indicate that there are moderate traffic volumes. The speed limit is 55 MPH. The landscape surrounding the roadway is wide-open and flat terrain with sparse trees, and clear visibility. However, there was no street lighting or animal crossing signage nearby. There were a total of 10 crashes recorded within the hot spot.

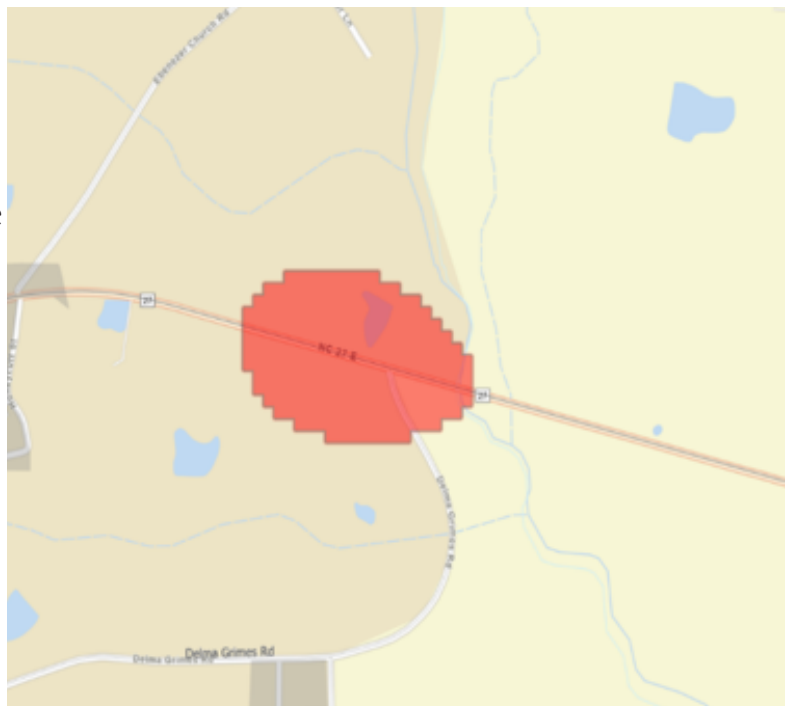


Figure 26: N.C. 27 W. / Delma Grimes Rd. Hot Spot Map

Old Stage Rd.



Figure 27: Old Stage Rd. northbound

The HIN hot spot on Old Stage Road is located in the Town of Coats. The conditions on the date of assessment indicate that there are low traffic volumes and the speed limit of the road is 55 MPH. The surrounding landscape is moderately hilly terrain and there is low visibility caused by the horizontal curvature of the roadway. There is also no street lighting or animal crossing signage nearby. There were a total of four (4) crashes recorded within the hot spot.

Date of Assessment	January 30, 2026
Location	Old Stage Rd. N, south of N.C. 55
NCDOT Division(s)	Division 6
STIP Project	None
AADT (2024)	1,700
Total Crashes Recorded	Four (4)
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 12: Old Stage Rd. Data

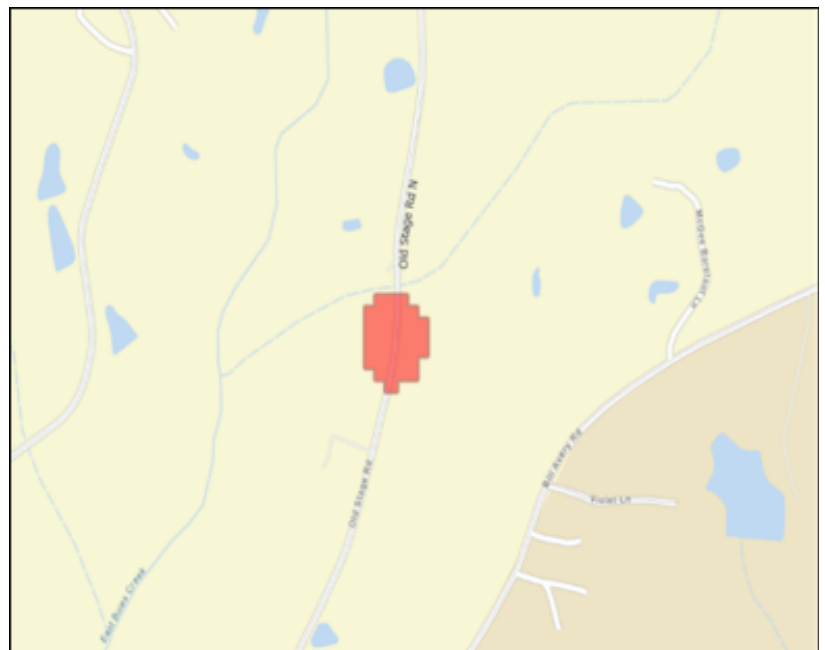


Figure 28: Old Stage Rd. Hot Spot Map

Sheriff Johnson Rd.



Figure 29: Sheriff Johnson Rd. westbound at Old Buies Creek

Date of Assessment	January 30, 2026
Location	Sheriff Johnson Rd., west of Old Buies Creek Rd
NCDOT Division(s)	Division 6
STIP Project	None
AADT (2024)	2,100
Total Crashes Recorded	Five (5)
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 13: Sheriff Johnson Rd. Data

The HIN hot spot on Sheriff Johnson Road is located in Harnett County near the Buies Creek community. The conditions on the date of assessment indicate that there are low traffic volumes and the speed limit of the corridor is 55 MPH. Existing safety treatment of a four-way stop with Rapid Flashing Beacons (RFB) has been at the nearest intersection. The surrounding landscape is a relatively open and flat terrain, with sparse trees and clear visibility. There is also no lighting or animal crossing signage nearby. There were a total of five (5) crashes recorded within the hot spot.

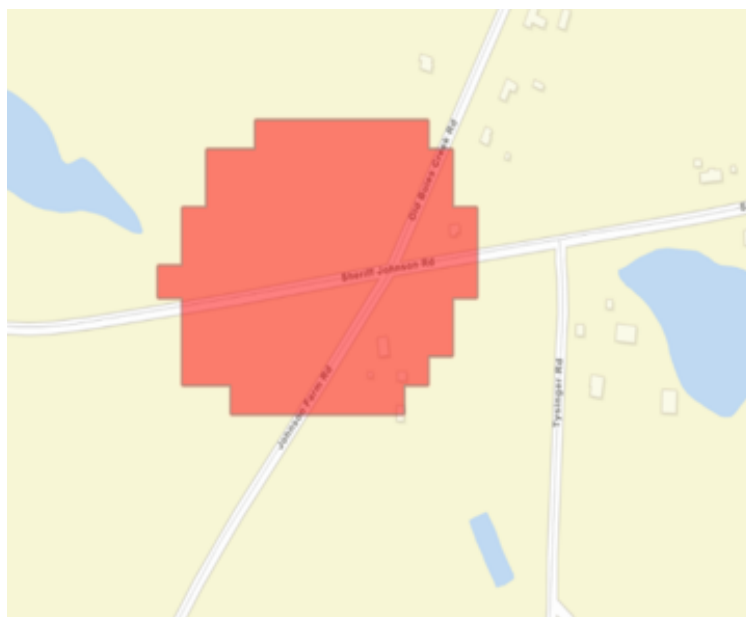


Figure 30: Sheriff Johnson Rd. Hot Spot Map

U.S. Hwy 421 / Sloan Rd.



Figure 31: U.S. Hwy 421 looking west-bound

The U.S. Highway 421 and Sloan Road intersection is located in Harnett County, roughly 12 miles from the Town of Lillington. The conditions on the date of assessment indicate that there is high traffic and moderate truck volumes, with a speed limit of 55 MPH along the corridor. The surrounding landscape is heavily forested with steep grades in the terrain and there is fairly clear visibility. There is no lighting or animal crossing signage nearby. There were a total of five (5) crashes recorded within the hot spot.

Date of Assessment	January 30, 2026
Location	U.S. 421, east of Sloan Rd.
NCDOT Division(s)	Division 6
STIP Project	None
AADT (2024)	8,500
Total Crashes Recorded	Five (5)
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	None

Table 14: U.S. Hwy 421 / Sloan Rd. Data

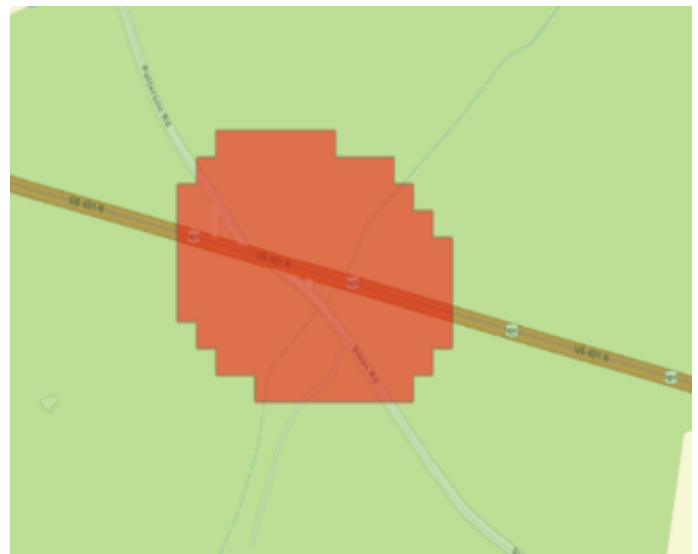


Figure 32: U.S. Hwy 421 / Sloan Rd. Hot Spot Map

U.S. 1 N. (Multiple hot spots)



Figure 33: U.S. 1 northbound

There are seven HIN hot spots along U.S. 1 between Old U.S. 1 and Friendship Road near the unincorporated community of New Hill in Wake County. The conditions along the corridor, on the date of assessment, indicate that there are high traffic volumes and the speed limit of the corridor is 70 MPH. The surrounding landscape is heavily forested with moderately steep grades in the terrain, however, there is relatively clear visibility. Also, there is no lighting or animal crossing signage along this section of the corridor. There were a total of 57 crashes recorded within these series of hot spots.

Date of Assessment	January 30, 2026
Location	U.S. 1 between Old U.S. 1, Exit 84, and New Hill Holleman Rd., Exit 89
NCDOT Division(s)	Division 8
STIP Project	None
AADT (2024)	37,500
Total Crashes Recorded	57
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	Shearon Harris Reservoir

Table 15: U.S. 1 Data

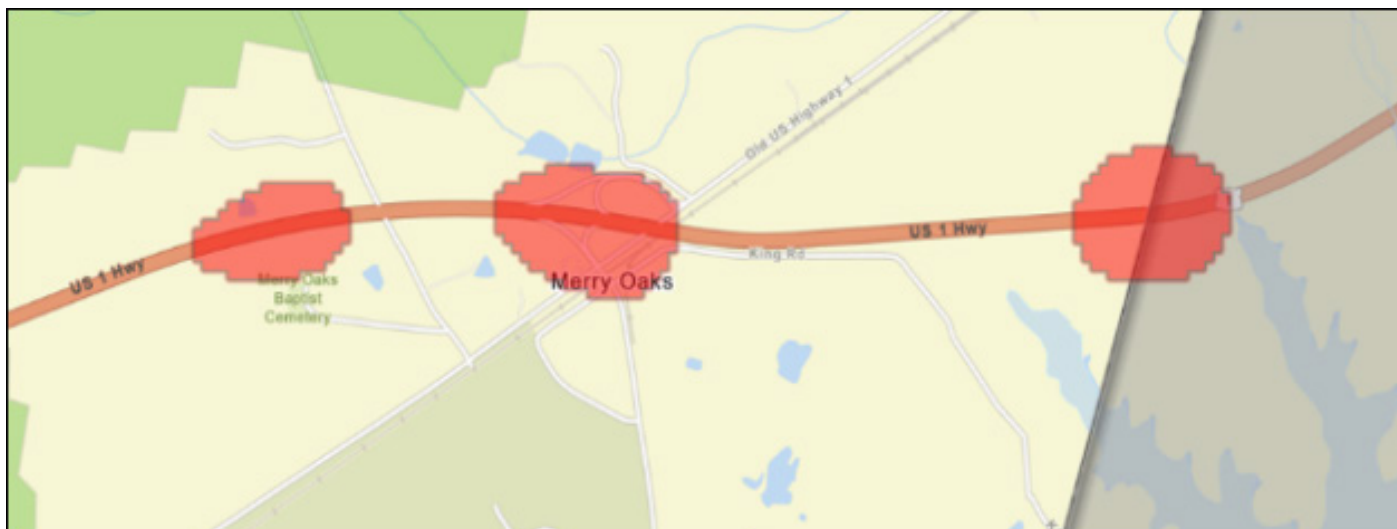


Figure 34: U.S. 1 (Chatham County)

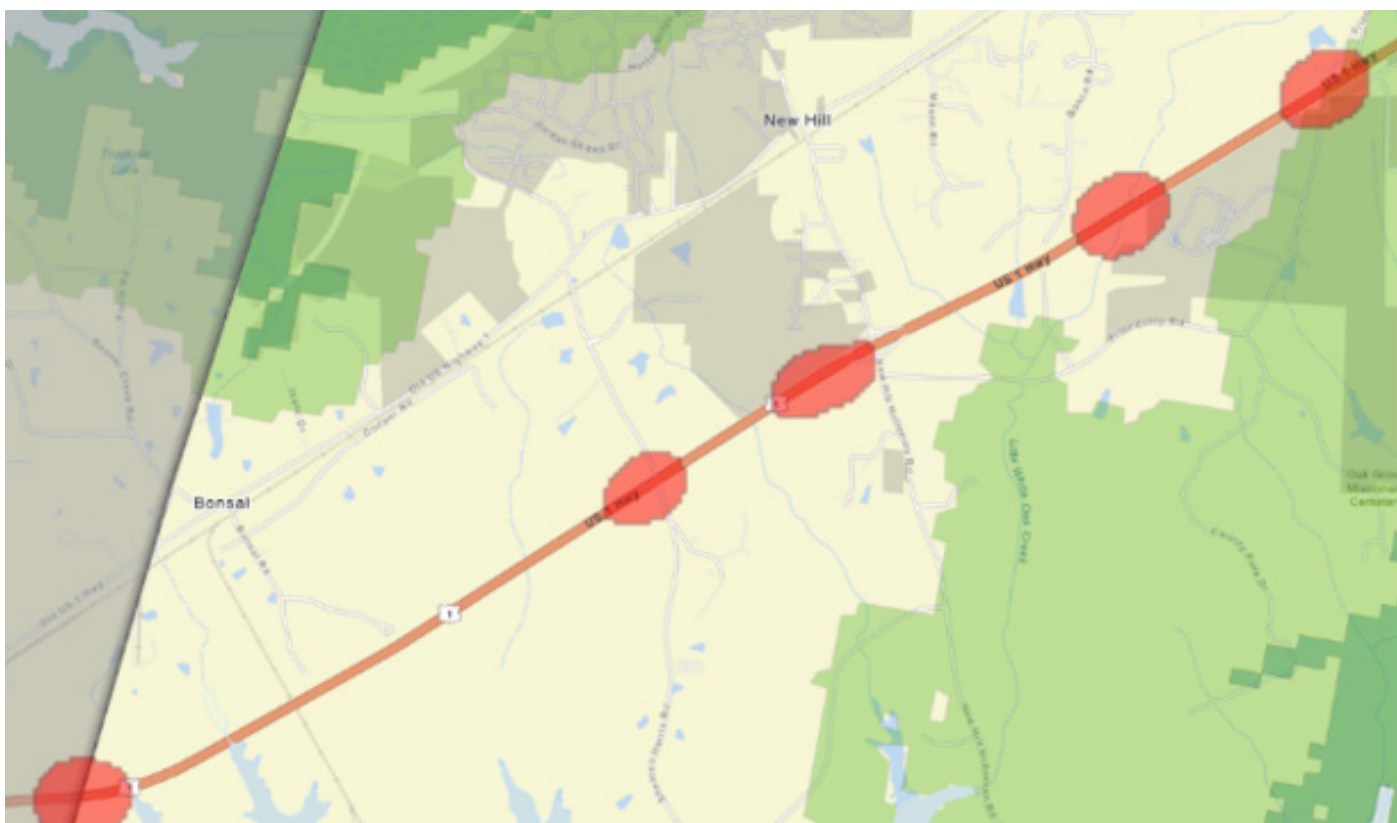


Figure 35: U.S. 1 (Wake County)

U.S. 751

The HIN hot spot on U.S. 751 is located in the Town of Apex. The conditions on the date of assessment indicate that there are high traffic volumes and the speed limit is 35 MPH. The surrounding landscape is relatively flat terrain and there is low visibility due to the horizontal curvature of the roadway. There is active construction of an industrial development occurring at this location. There is also no lighting or animal crossing signage nearby. There were a total of 10 crashes recorded within the hot spot.



Figure 36: U.S. 751 southbound toward U.S. 64

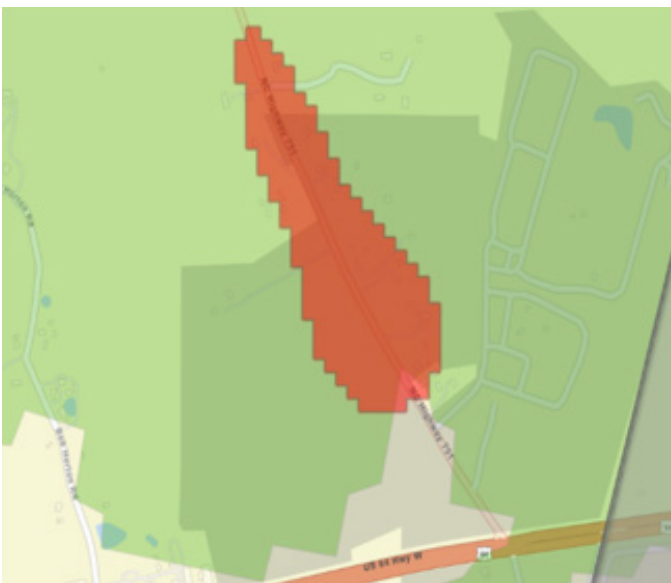


Figure 37: U.S. 751 Hot Spot Map

Date of Assessment	January 30, 2026
Location	N.C. 751 north of US 64
NCDOT Division(s)	Division 8
STIP Project	None
AADT (2024)	11,500
Total Crashes Recorded	10
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	Proposed
Adjacent Conservation Areas	Jordan Lake Watershed

Table 16: U.S. 751 Data

O'Kelly Chapel / U.S. 751



Figure 38: O'Kelly Chapel facing its intersection with U.S. 751

The O'Kelly Chapel Road and U.S. 751 intersection within Chatham County. The conditions on the date of assessment indicate that there are high traffic volumes and the speed limit is 45 MPH. The surrounding landscape is relatively forested and flat terrain, with clear visibility from all directions leading to the intersection's stoplight. However, there is some moderate horizontal curvature in the roadway, which may limit visibility at the stoplight. There is no street lighting or animal crossing signage. There were a total of two (2) crashes recorded within the hot spot.

Date of Assessment	January 30, 2026
Location	N.C. 751, south of O'Kelly Chapel Rd
NCDOT Division(s)	Division 8
STIP Project	None
AADT (2024)	15,500
Total Crashes Recorded	two (2)
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	None
Adjacent Conservation Areas	Jordan Lake Watershed

Table 17: O'Kelly Chapel / U.S. 751 Data



Figure 39: O'Kelly Chapel / U.S. 751 Hot Spot Map

Carpenter Fire Station Rd. / U.S. 55



Figure 40: Carpenter Fire Station Rd. at U.S. Hwy 55

The Carpenter Fire Station Road and U.S. 55 intersection is located in the Town of Cary. The conditions on the date of assessment indicate that there are high traffic volumes. The speed limit on Carpenter Fire Station Road is 45 MPH and the speed limit of U.S. 55 is 55 MPH. The surrounding landscape is relatively flat and fairly forested. There is also clear visibility, and the intersection is fairly lit by a small number of streetlights. Additionally, the area is surrounded by recently completed development with mid-density apartment complexes and multiple retail buildings. There is no animal crossing signage nearby. There were a total of 18 crashes recorded within the hot spot.

Date of Assessment	January 30, 2026
Location	Carpenter Fire Station Rd., west of N.C. 55
NCDOT Division(s)	Division 5
STIP Project	U-6227
AADT (2024)	11,000
Total Crashes Recorded	18
Treatment Present	None
Evidence of Road Kill On-Site	None
Existing/Planned Greenway	Proposed
Adjacent Conservation Areas	None

Table 18: Carpenter Fire Station Rd. / U.S. 55 Data

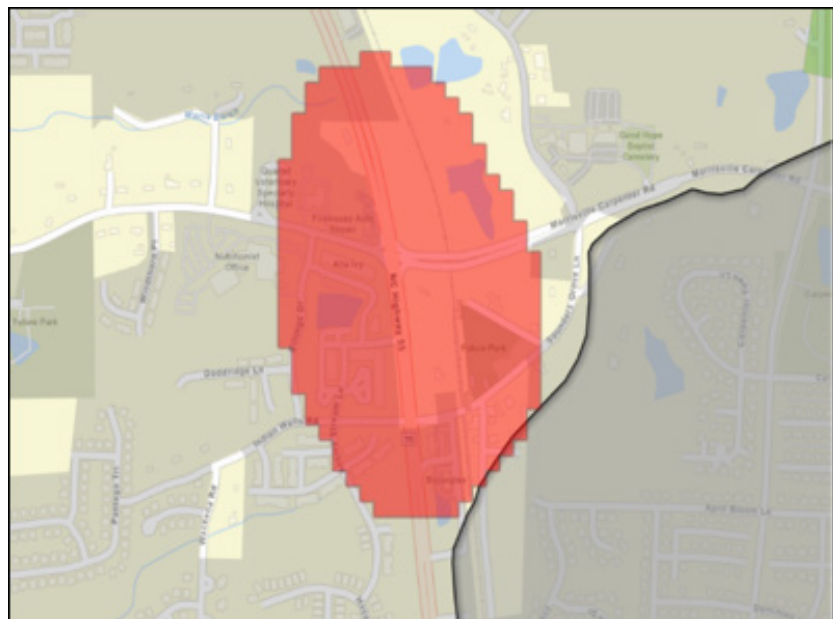


Figure 41: Carpenter Fire Station Rd. / U.S. 1 Hot Spot Map

7. Study Limitations

This study is a planning-level analysis. Its findings identify locations where wildlife crossing treatment may be appropriate and provide justification grounded in crash data, corridor designation, and field-observed conditions. They are not a substitute for the site-specific technical work required to advance any location to construction. When appropriate, potential treatments for consideration include a combination of fencing, lighting, signage, culvert, bridge, or pipe retrofit, etc.

The study does not include ecological surveys, wildlife population assessments, or species-specific movement analyses. Site assessments documented physical conditions observable during a single field visit but did not involve camera monitoring, track stations, or other systematic methods for characterizing which species use or attempt to use each crossing. Determining the appropriate treatment type and design parameters at any site advanced for construction would require ecological studies, including species identification and seasonal movement analysis.

The study does not include engineering design, structural feasibility analysis, or cost estimation for any identified site. Retrofit feasibility depends on site-specific structural conditions that require engineering analysis beyond the scope of this study.

Right-of-way constraints, 8 Section 404 permitting requirements for stream crossings, and coordination requirements for sites near Corps-managed lands add further variables that cannot be resolved at this planning stage.

The structure screening was limited to infrastructure in the NCDOT structures inventory; locally maintained crossings within WVC hot spots were not systematically evaluated. WVC crash data, which forms the basis of the hot spot analysis, is collected through police reports and is known to substantially underrepresent actual collision frequency, particularly for smaller species and crashes below the threshold of reportable property damage. Hot spot boundaries should be understood as indicators of elevated risk concentration, not definitive limits of conflict. Drive-through assessments of HIN hot spot segments document general roadway and landscape conditions only; more detailed field investigation would be required before specific countermeasures could be located or designed.

8. Conclusion

The CAMPO Cape Fear River Basin Wildlife Crossing Study identifies six NCDOT structures and eleven High Injury Network hot spot segments as priority locations for wildlife crossing treatment consideration. It is the first study of its kind conducted in-house by CAMPO and establishes a replicable

methodology that can be extended to other river basins within the planning area in future fiscal years, if desired.

The study does not recommend specific treatments. Its purpose is to assemble and document the evidence necessary for NCDOT and NCWRC to evaluate treatment feasibility at each identified location as projects and maintenance opportunities arise. That evidence — nine years of crash data, *USFWS Southeast Blueprint 2025 Priority Conservation Corridor* designations, field-documented physical conditions, traffic volumes, structure age, and condition — is now on record for each site. Based on structural condition ratings and programmed STIP activity, the following locations represent the most actionable near-term opportunities for treatment consideration:

Identified Structures:

- Haw River / U.S. 1 — Both structures (180053, 180478) are rated in fair condition and were built in 1997–1998, placing them within a plausible near-term maintenance or rehabilitation window. Roadkill was observed at the time of assessment, confirming active WVC risk.

Hot Spots Within the High Injury Network:

- Carpenter Fire Station Road / US 55, Town of Cary — The only assessed HIN hot spot with an active STIP project (U-6227). This represents a near-term opportunity to

incorporate wildlife-related countermeasures into an already-advancing project.

The remaining identified structures and HIN hot spots do not have programmed projects at this time and represent longer-term opportunities. This study's findings may be used as the basis for ongoing coordination between CAMPO, NCDOT Divisions 5, 6, and 8 and with NCWRC to advance sites through NCDOT's project development and prioritization processes as appropriate windows arise. A summary table of identified structures and structure conditions can be found in Table 19.

Site Name	Road	County & Division	Total Crash	Structure Type	Crossing Size	AADT (2024)	Year Built	Condition	Evidence of Wildlife Use	Evidence of Roadkill	Barriers Present	Adjacent Conservation / Greenway
White Oak Creek	N.C. 540	Wake (Div. 5)	9	Bridge	Large (>60 ft wide, 8 ft clearance)	33,000	2012	Good	Yes — geese observed	No	None identified	Public-owned land; White Oak Creek Greenway (existing)
Little Branch Creek	N.C. 540	Wake (Div. 5)	7	Culvert (2 openings)	Medium (<60 ft, >4 ft wide)	17,500	Unknown	Inspection not available	Yes — deer tracks; beaver activity	No	Riprap; debris; standing water	None
Big Branch Creek	U.S. 1	Wake (Div. 5)	9	Culvert (2 openings)	Medium (<60 ft, >4 ft wide)	43,500	Unknown	Inspection not available	Unknown — beaver activity nearby	No	Standing water	None
Deep River	U.S. 1	Chatham/ Lee (Div. 8)	15	Bridge	Large (>60 ft wide, 8 ft clearance)	32,500	1997–1998	Good	Yes — wide vegetated path beneath bridge	No	Riprap	Chatham Co. Future Land Use Plan (conservation); Deep River Trail (planned)
Haw River	U.S. 1	Chatham (Div. 8)	5	Bridge	Large (>60 ft wide, 8 ft clearance)	35,000	1997–1998	Fair	Unknown	Yes — raccoon observed	Riprap	Chatham Co. Future Land Use Plan (conservation)
Kit Creek	Davis Drive / N.C. 540 / N.C. 540 NB ramp	Wake (Div. 5)	7	Culvert (3 structures, 6 openings total)	Not determinable — all openings submerged	16,500 (Davis Drive)	2007	Good / Fair	Yes — beaver activity throughout	No	Standing water — all culverts submerged min. 3 ft; terrestrial passage not feasible	None — adjacent to Research Triangle Park

Table 19: Site Assessment Summary Table

The HIN hot spots identified in this study are also directly relevant to CAMPO's Blueprint for Safety program. The Blueprint for Safety's High Injury Network identifies roadway segments with disproportionately high rates of serious injury and fatal crashes, and its associated countermeasure library includes treatments to reduce wildlife-vehicle crashes. The hot spots identified in this study — locations where WVC density overlaps with the HIN — indicate where those wildlife-related countermeasures should be considered within the HIN as part of Blueprint for Safety implementation. This study's findings can also be carried forward into the 2060 Metropolitan Transportation Plan update, where identified structures and hot spots can be incorporated into the project universe for long-range consideration. A summary table of HIN hot spot conditions can be found in Table 20.

In addition to consideration for treatment for identified structures and hot spots within the HIN, future consideration for treatment should also be assessed for roadways within the Southeast Conservation Blueprint Highest Priority Areas that have Annual Average Daily Traffic of over 2,000, with roadway segments over 10,000 being the highest priority. This ensures that conservation connectivity is consistently being captured when planning for or designing infrastructure. See [Appendix 5](#) for specific roadway segments.

The goal articulated at the outset of this study — eliminating human fatalities and serious injuries resulting from wildlife-vehicle crashes through infrastructure design — will not be achieved through any single project. It requires a sustained planning effort, consistent engagement with transportation partners, and a willingness to identify opportunities early so that wildlife passage can be incorporated into the transportation system when the cost and timing are right. Encouragingly, it is the NCWRC's experience that appropriately designed and installed wildlife passage structures and fencing significantly reduce WVCs in North Carolina. This study is a step in that direction.

Location	County & NCDOT Division	Total Crash	AADT (2024)	Roadway / Landscape Conditions	Lighting / Signage	Evidence of Road-kill	STIP Project
Chalybeate Springs Rd, east of US 401	Harnett (Div. 6)	7	3,400	Heavy truck volumes; high speeds; flat terrain; low visibility (horizontal curve)	None	None observed	None
Titan Roberts Rd, east of Ross Rd	Harnett (Div. 6)	6	1,800	Low traffic; high speeds; flat, forested terrain	None	None observed	None
NC 27, east of Fairground Rd	Harnett (Div. 6)	9	6,400	Moderate traffic; low speeds (4-way stop w/ RFBs); flat, forested; clear visibility	None	None observed	None
Delma Grimes Rd, south of NC 27	Harnett (Div. 6)	10	350	Moderate traffic; high speeds; flat, open, sparse trees; clear visibility	None	None observed	None
Old Stage Rd N, south of NC 55	Harnett (Div. 6)	4	1,700	Low traffic; moderate speeds; moderately hilly; low visibility (horizontal curve)	None	None observed	None
Sheriff Johnson Rd, west of Old Buies Creek Rd	Harnett (Div. 6)	5	2,100	Low traffic; low speeds (4-way stop w/ RFBs); flat, open, sparse trees; clear visibility	None	None observed	None
US 421, east of Sloan Rd	Harnett (Div. 6)	5	8,500	High traffic; moderate truck volumes; high speeds; heavily forested; steep grades; clear visibility	None	None observed	None
US 1 between Old US 1 (Exit 84) and New Hill Holleman Rd (Exit 89)	Wake (Div. 5)	57	37,500	High traffic; high speeds; heavily forested; moderately steep grades; clear visibility; adjacent to Shearon Harris Reservoir	None	None observed	None
NC 751 north of US 64	Wake (Div. 5)	10	11,500	High traffic; high speeds; flat terrain; low visibility (horizontal curve); active industrial construction	None	None observed	None
NC 751, south of O'Kelly Chapel Rd	Chatham (Div. 8)	2	15,500	High traffic; high speeds; forested, flat terrain; clear visibility; some horizontal curvature near signal	None	None observed	None
Carpenter Fire Station Rd, west of NC 55	Wake (Div. 5)	18	11,000	High traffic; high speeds; flat, forested; clear visibility; lit by streetlights; surrounded by recent mid-density development	Present (street-lights)	None observed	U-6227 (active)

Table 20: HIN Hot Spot Summary Table

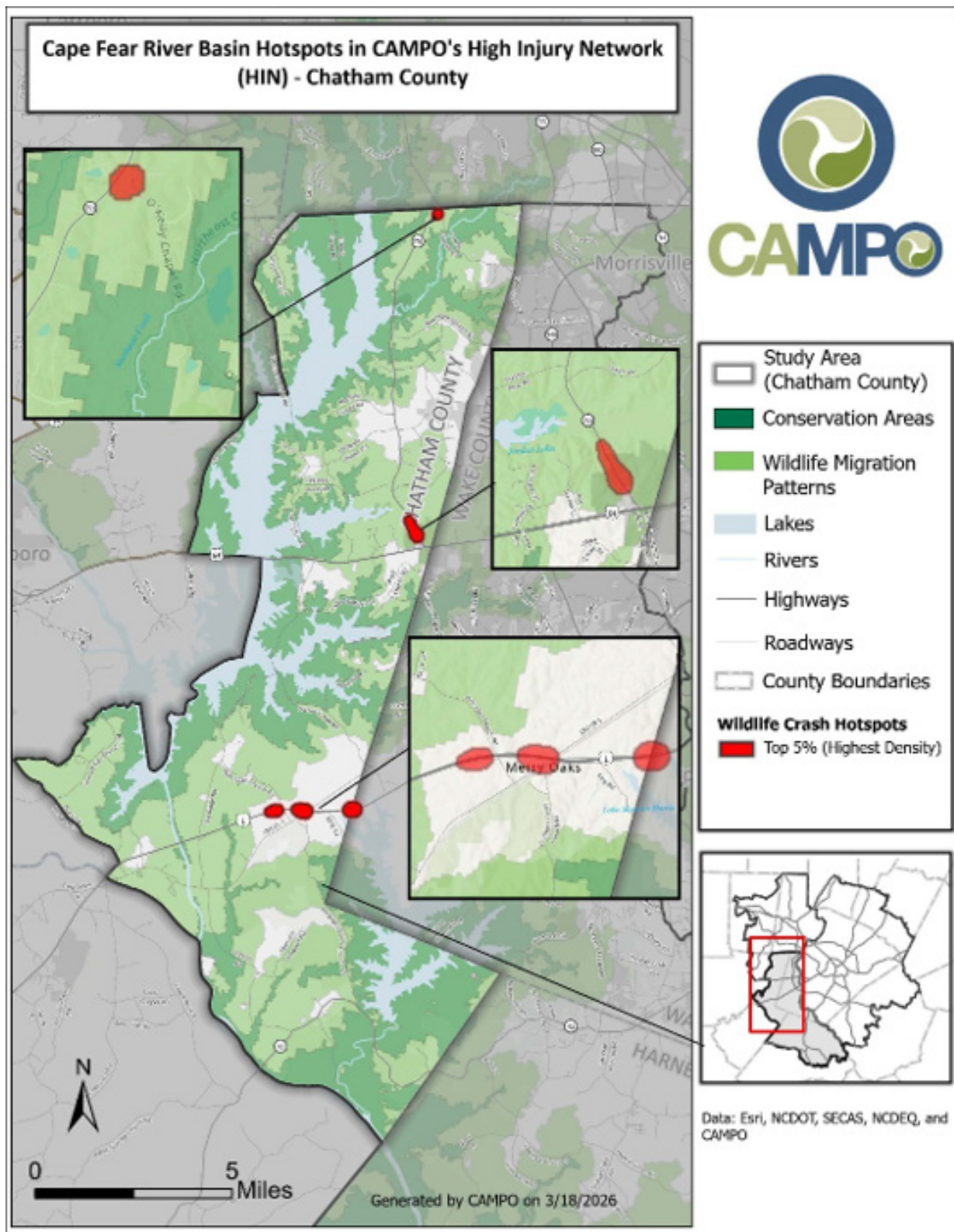
9. References

- ¹ Marcel P. Huijser, Elizabeth R. Fairbank, Whisper Camel-Means, Jonathan Graham, Vicki Watson, Pat Basting, Dale Becker, Effectiveness of short sections of wildlife fencing and crossing structures along highways in reducing wildlife–vehicle collisions and providing safe crossing opportunities for large mammals, *Biological Conservation*, Volume 197, 2016, Pages 61-68
- ² Wildlife passage guidance. (n.d.). https://connect.ncdot.gov/resources/Environmental/EPU/Policy/Documents/NCWRC-NCDOT_Wildlife_Passage_Guidance.pdf
- ³ Network, W. (2022, October 4). Improving wildlife connectivity and human safety along I-40 in the Pigeon River Gorge. Wildlands Network - Biodiversity Conservation + Wildlife Crossings. <https://www.wildlandsnetwork.org/newsroom/pigeon-river-gorge-report>
- ⁴ Wildlife habitat corridors and landscape connectivity in Durham County. Durham County | Landscape Connectivity. (n.d.). <https://dconc.gov/Engineering-and-Environmental-Services/Open-Space-and-Real-Estate/Science-Driven-Conservation/Landscape-Connectivity>
- ⁵ Adams, S. (2023, September 22). Potential Wildlife Crossings for the French Broad River MPO & Land of Sky RPO Planning Areas. https://frenchbroadriver-mpo.org/wp-content/uploads/2023/10/2023_09_22_FINAL_MPO-RPO_Report_on_Potential_Wildlife_Crossings.pdf
- ⁶ Triangle West TPO Wildlife Crossing Planning Study. (2024, November 19). <https://www.twtpo.org/programs-and-initiatives/ongoing-programs-and-projects/special-studies/wildlife-crossing-planning>
- ⁷ Capital Area Metropolitan Planning Organization (CAMPO) Blueprint for Safety: CAMPO (2025) <https://www.campo-nc.us/programs-studies/blueprint-for-safety>
- ⁸ United States, Environmental Protection Agency. Permit Program under CWA Section 404. U.S. Environmental Protection Agency, <https://www.epa.gov/cwa-404/permit-program-under-cwa-section-404>. Accessed 15 July 2026

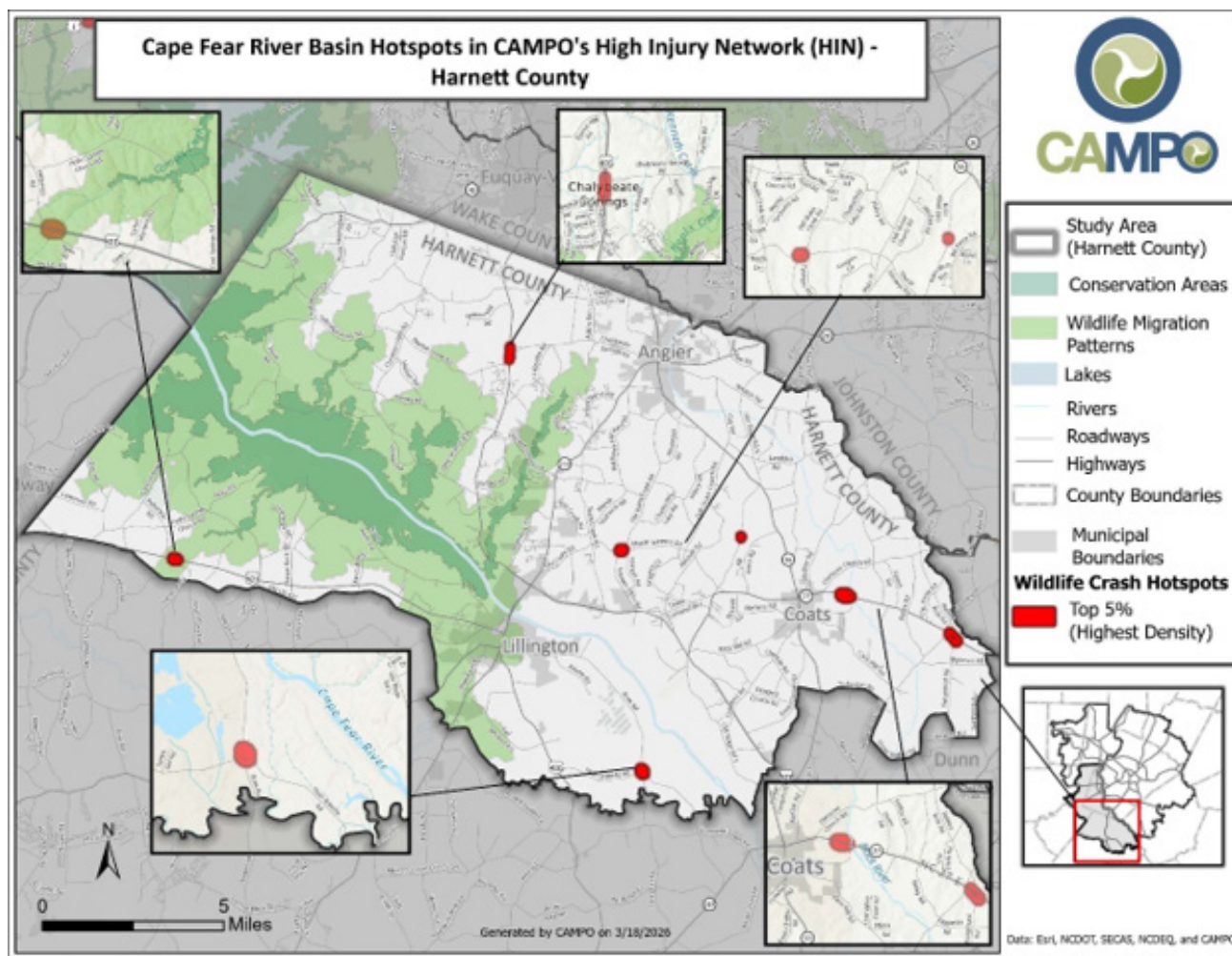
⁹ U.S. Fish and Wildlife Service & Southeast Conservation Adaptation Strategy. (2025). Southeast Conservation Blueprint 2025 (Version 2025) [Spatial Image and Feature Service]. U.S. Fish and Wildlife Service Open Data. <https://gis-fws.open-data.arcgis.com/>

10. Appendices

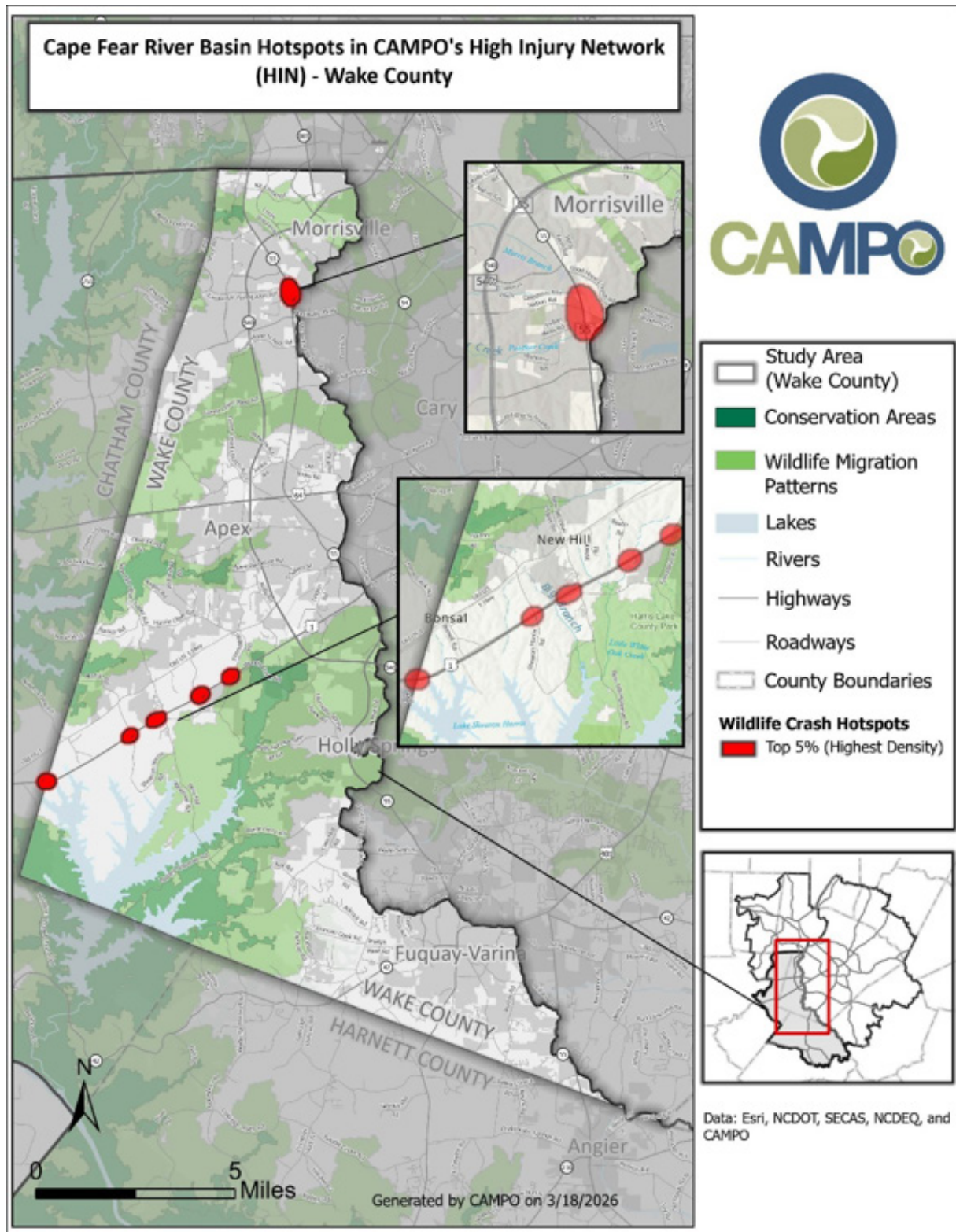
Appendix 1: Hot Spots within HIN – Chatham County



Appendix 2: Hot Spots within HIN – Harnett County



Appendix 3: Hot Spots within HIN – Wake County



Appendix 4: Site Assessment Form

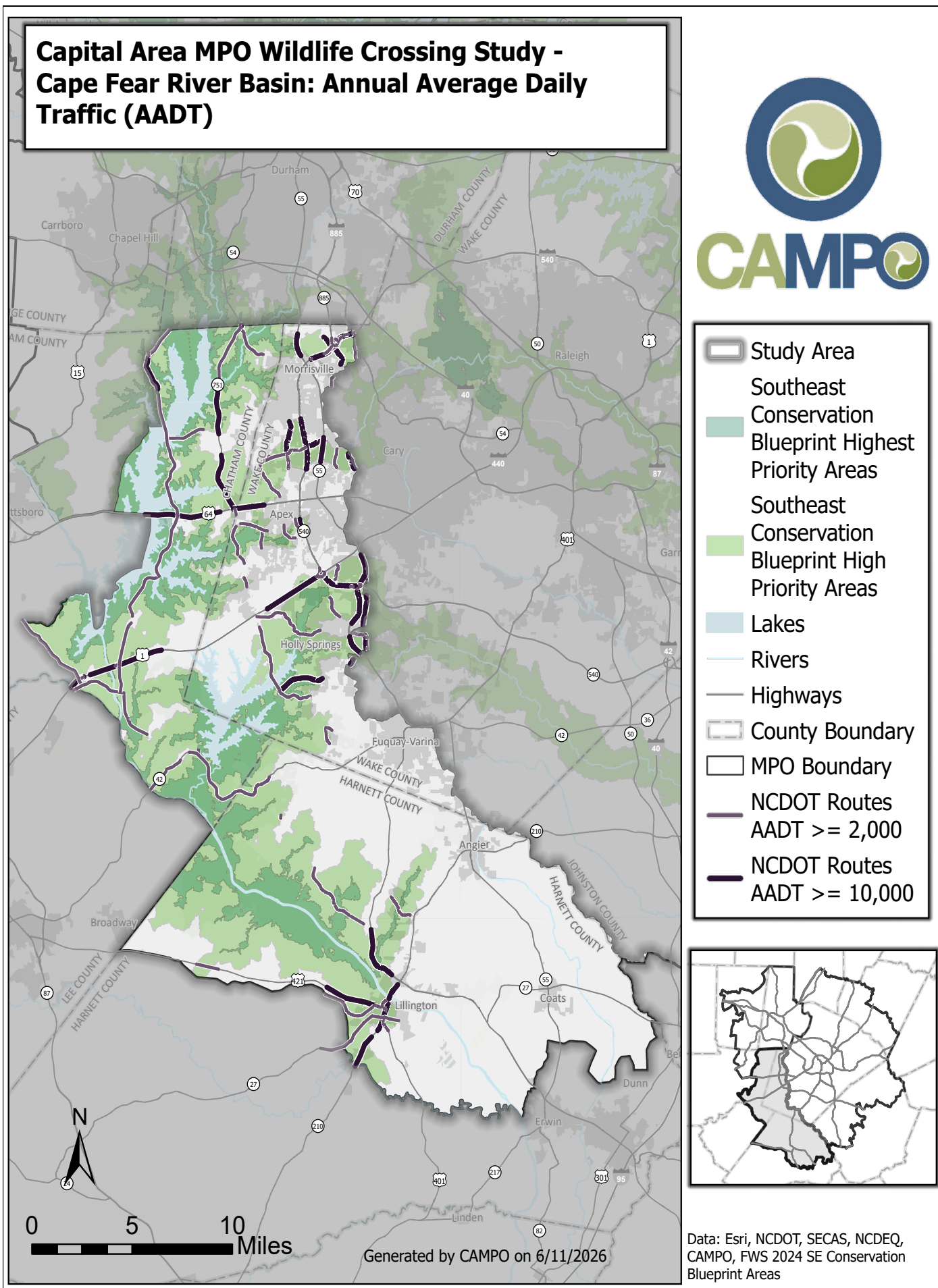
<u>CAMPO Wildlife Crossing Site Assessment Form</u>	
Name of Reviewer: _____ _____	
Date of Site Assessment: _____ _____	
Site Name: _____ _____	
	Assessment Description
1.	What is the existing cross structure code found in the NCDOT Structure Locations GIS database?
2.	What is the body of water (creek, lake, etc.) that intersects the structure?
3.	Provide useful directions for finding the crossing.
4.	Please take a photo of the structure that depicts the general aspect of the crossing, and others as you feel are necessary to help communicate the challenge. Please provide a detailed description of the photo for reference.

5.	What type of crossing is this? Bridge: a deck supported by abutments (or stream banks); Culvert: a structure buried under some amount of fill; Pipe: a cylinder culvert, typically metal; Other: railroads, fords, or other crossing types. Bridge / Culvert / Pipe / Other (circle one)
6.	What is the width of the underpass? Large: over 60ft wide with 8 ft vertical clearance; medium: less than 60 ft but more than 4 feet wide; small: less than 4 ft / 48 inches diameter. Large / Medium / Small (circle one)
7.	How many openings (culverts, pipes, etc.) are under the structure/bridge?
8.	Provide a description of the structure bank and stream channel. Structure Bank: Rock / Gravel / Sand / NA (circle one) Other: _____ Stream Channel: Rock / Gravel / Sand/ NA (circle one) Other: _____
9.	Barriers associated with the crossing. Indicate all that apply: Riprap / debris, sediment, rock / deformation / free fall / fence / dry, standing water, other, or none

10.	Is there a continuous dry stream bank through at least one side of the structure? Yes / No / Unknown (circle one)
11.	If a culvert/pipe, can you see through to the other side of the structure? Yes / No / Unknown / NA (circle one)
12.	If a culvert, is dry path tied into the bank at each end? Yes / No / Only one side / Unknown / NA (circle one)
13.	Is there evidence of road kills at the date of the assessment? Yes / No / Unknown (circle one)
14.	Is there evidence of wildlife using the crossing at the date of the assessment? If yes, please elaborate. Yes / No / Unknown (circle one)

15.	Provide comments about any aspect of the overall crossing that warrants additional information.
16.	Is there an existing greenway or planned greenway trail? Existing greenway / planned greenway / No (circle one)
17.	Are there any other bike/ped facilities present at this location (excluding greenway trail)? Bike facilities / pedestrian facilities
18.	Are there any conservation areas located adjacent to the structure?

Appendix 5: Annual Average Daily Traffic (AADT) within Priority Areas





Culvert at Davis Drive (2026)