



# CHAPTER 4

## ENVIRONMENTAL CONSEQUENCES

## 4. ENVIRONMENTAL CONSEQUENCES

### 4.1 SOCIAL AND ECONOMIC IMPACTS

#### 4.1.1 Population and Demographics

While the North Carolina Office of State Budget and Management projects that the Lenoir County population will decrease slowly over the next two decades, this could change if the GTP and/or Lenoir County are able to attract major new business development to the area. When it was first developed, the GTP was expected to stimulate economic development and population growth in Lenoir County due to an increase in local employment opportunities. Projections made in 2000 estimated that the population of Lenoir County would increase substantially by 2012. However, GTP's slower growth and restructuring of the manufacturing sector have also contributed to stagnant population levels in Kinston and Lenoir counties.

The Kinston Bypass project would alter property access for properties that abut, or are adjacent, to the DSAs. It would not provide new access to previously isolated areas; however, as discussed in the LUSA (NCDOT 2018g), additional residential and/or commercial development could occur near the DSAs given the proximity to other major highways, the availability of land suitable for development, and the availability of water and sewer.

The LUSA is available on the project website. According to interviews with Wayland Humphrey, Lenoir County GIS/Planning Coordinator, and Adam Short, City of Kinston Planning Director, on November 15, 2017, at the time of analysis, no new residential or commercial development projects are proposed as a result of the DSAs. Although there may be additional residential growth near the applicant's preferred alternative (when identified), it is anticipated to represent a shift in the location of the existing population, not a new population that could be attributed to the project. Due to the stagnant population in the area, the No-Build Alternative is not anticipated to affect population growth either within or outside the project study area.

##### Land Use Scenario Assessment (LUSA)

The LUSA for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

#### 4.1.2 Relocation of Homes and Businesses

Relocation impacts to property owners and tenants are identified in the R-2553 Relocation Report (NCDOT 2017f). Alternatives 1UE and 1SB would have the largest number of business relocations, with 188 and 115 business relocations, respectively. The remaining DSAs have a range of business impacts from 24 to 35 business relocations, with the majority of these business relocations being common to all DSAs. Types of businesses include convenience stores, restaurants, retail, and various services. Residential relocations would include single family residences and manufactured homes. Table 4-1 provides the residential and business relocation

##### Relocation Report

The Relocation Report for the Kinston Bypass can be found on the project website.

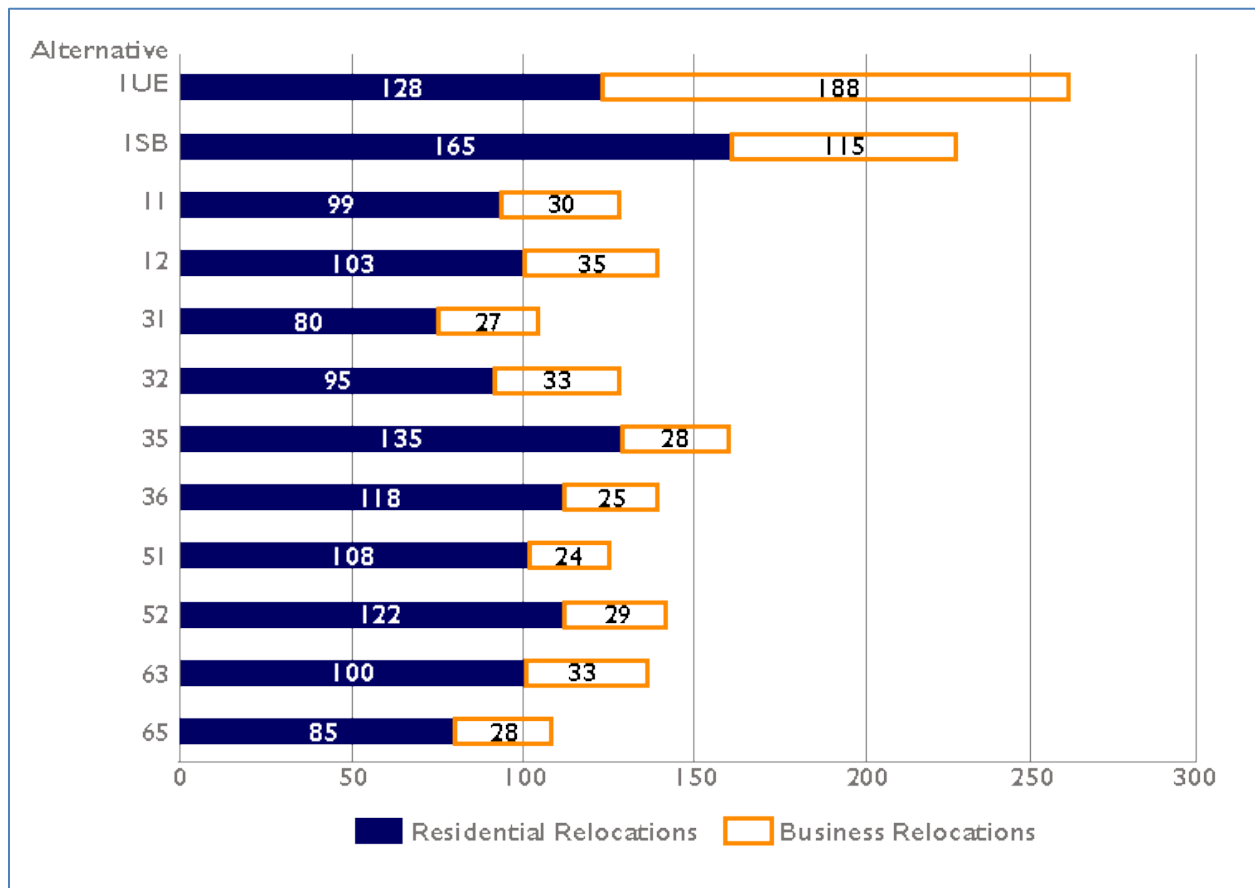
<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>



information for each DSA. The racial, ethnic, and economic composition of these relocations is further discussed in section 4.1.5. The R-2553 Relocation Report can be found on the project website.

Depending on the DSA, right-of-way acquisition would be required from between 285 parcels (Alternative 31) and 569 parcels (Alternative 1UE). In addition, the DSAs would require between 80 (Alternative 31) and 165 (Alternative 1SB) residential relocations. The relocation report noted that there appeared to be an adequate supply of available replacement sites. Relocations for the proposed action would be conducted in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) (Uniform Relocation Act) and the North Carolina Relocation Assistance Act (North Carolina General Statutes 133-5 through 133-18). Relocation benefits under the Uniform Relocation Act will be available to anyone displaced from the project (NCDOT 2017f).

**Table 4-1: Summary of residential and business relocation impacts**



Source: NCDOT 2017f.

### 4.1.3 Economics and Employment

The purpose of the EIA was to assess the project's potential future economic impact on future roadway users and the local economy. The EIA is available on the project website. The EIA analyzed the No-Build Alternative, Alternative 1UE, Alternative 1SB, and Alternative 51. These four DSAs were assessed in the EIA because it was determined that the differentiation of economic impacts from Alternatives 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 would be minimal, as they would be located along paths with similar land use, population, and business density. Therefore, Alternative 51 was chosen as a representative alternative to be assessed in the EIA.

#### Economic Impact Assessment

The EIA for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

The EIA estimated the economic benefits to roadway users from the projected improvements to their future travel within the study area. The EIA also analyzed the economic impacts to Lenoir County and the City of Kinston from the economic activity that would be directly affected by the project (NCDOT 2018f). Many of the build alternatives' potential economic benefits cannot be quantified. The current traffic modeling does not provide information to determine the future improvements in travel time reliability. Another important consideration is that there is currently insufficient data to estimate the comparably higher economic costs for Alternative 1UE (both from business interruption during construction and business displacement/relocation).

In cases where the project's impacts are less direct (e.g., profitability benefits from larger market and labor catchment areas), it is difficult to determine the specific contribution that can be attributed to project-related effects. Similarly, the project's potential future economic development benefits would also be dependent on other contributing factors (e.g., city planning, capital availability).

The economic impacts and benefits for the DSAs are summarized as follows:

- **Alternative 1UE.** Alternative 1UE would continue to focus future retail development along the existing US 70 corridor. However, the new controlled access highway would reduce access to businesses not located at the future interchange locations. Some existing businesses may be displaced or face encroachment as a result of Alternative 1UE's expanded right-of-way access and new frontage roads.

Based on its sales shift, average daily traffic growth, vehicle hours traveled, vehicle miles traveled (VMT), and safety benefits, Alternative 1UE is projected to result in total net benefits of \$20.6 million in 2040. Between 2025 and 2044, the net present value of Alternative 1UE's cumulative net benefits is estimated to total \$66.2 million.

- **Alternative 1SB.** Alternative 1SB would divert more than 50 percent of the pass-through traffic to the bypass, which would be located approximately three quarters of a mile south of the existing US 70 in Kinston. Any travelers interested in stopping would be expected to divert before the bypass and travel along the existing US 70 route. In addition, it is likely that new infill commercial development may be attracted to the interchanges as a secondary focus for future retail development. Alternative 1SB is projected to result in a net positive impact on Lenoir County.

Based on its sales shift, average daily traffic growth, vehicle hours traveled, VMT, and safety benefits, Alternative 1SB is projected to result in total net benefits of \$21.5 million in 2040. Between 2025 and 2044, the net present value of Alternative 1SB's cumulative net benefits is estimated to total \$177.2 million.

- **Alternative 51.** Alternative 51 would divert more than 50 percent of the pass-through traffic to the bypass, which would be located approximately 4 or 5 miles south of the existing US 70 in Kinston. However, any travelers interested in stopping would be expected to divert before the bypass and travel along the existing US 70 route. The lack of any nearby existing (or likely future) residential or commercial development and supporting utilities would also limit the local market support for any new businesses located at its interchanges. Alternative 51 would provide the least overall net economic benefit for Lenoir County since there would be no notable connectivity between its interchanges and US 70 existing retail clusters.

Based on its sales shift, average daily traffic growth, vehicle hours traveled, VMT, and safety benefits, Alternative 51 is projected to result in total net benefits of \$8.0 million in 2040. Between 2025 and 2044, the net present value of Alternative 51's cumulative estimated net benefit loss is \$14.7 million.

Furthermore, the EIA conservatively assumes that under the 2040 no-build baseline conditions, future retail business growth would not be negatively impacted despite its projected worsening future travel conditions.

#### 4.1.3.1 Highway Users

It is difficult to precisely and fully determine each project alternative's total net benefits. However, as Table 4-2 shows, the project would be expected to result in time savings and safety benefits for future roadway users. There would also be more limited user benefits resulting from the project's increased service capacity with only comparatively minor travel cost increases for future roadway users of Alternatives 1SB and 51 due to the slightly greater distance of their route. Although not quantified, these two alternatives would result in the highest reliability benefits since the existing US 70 roadway would remain as an alternate secondary route during any future highway delays or closures (e.g., due to congestion or accidents).

**Table 4-2: Summary of economic impacts to highway users by DSA (2016 \$; \$ millions)**

Impacts	Alternative 1UE	Alternative 1SB	Alternative 51
Travel Time Savings (2040)	\$17.5	\$13.1	\$8.0
Travel Cost (2040)	\$0	(\$1.2)	(\$3.2)
Safety Benefit (2040)	\$20.5	\$15.2	\$11.4
User Capacity Benefit (2040)	\$1.7	\$1.2	\$4.2
Reliability	Improved	Best – provides alternate route during delays	Best – provides alternate route during delays
Total User Benefits (2040)	\$39.7	\$28.3	\$20.4

Source: NCDOT 2018f.

### 4.1.3.2 Local Economy

Table 4-3 summarizes the project's expected impacts on the region's businesses and economy. The DSAs would result in a variety of economic benefits for the Lenoir County economy. The proposed action's primary purpose is to improve regional mobility, connectivity, and capacity for US 70 between La Grange and Dover in a manner that meets the intent of the North Carolina STC policy (NCDOT 2015c). Mitigation measures to businesses would be explored after selection of the applicant's preferred alternative.

While the project's benefits to the region's businesses and economic development cannot be quantified, the project may be expected nonetheless to improve most of its businesses' competitiveness, profitability, and development potential. These impacts would include potential for increased revenues from improved market access and/or cost savings from reduced transportation costs and expanded labor/supplier catchment area.

**Table 4-3: Summary of economic impacts to regional businesses by DSA (2016 \$; \$ millions)**

Impacts	Alternative 1UE	Alternative 1SB	Alternative 51
Business profitability	Improved financial performance and competitiveness <ul style="list-style-type: none"> <li>Increased market area</li> <li>Lower delivery costs</li> <li>Expanded labor and supplier catchment area</li> </ul>		
Market growth	No local market growth assumed under all DSAs Limited retail sales/business growth from increased future pass-through traffic		
Business development	Non-retail growth supported by improved US 70 travel conditions and enhanced businesses' competitiveness.		
	Retail growth focused on future US 70 interchanges.	Retail growth focused on future US 70 interchanges with infill development and US 70 growth also possible.	Minimal net retail growth. Very limited interchange and infill development due to poor amenities and negligible nearby market. US 70 growth also possible.

Source: NCDOT 2018f.

The No-Build Alternative's potential adverse conditions and impact on the region's businesses and economy similarly cannot be determined and quantified. It was also conservatively assumed that there would be no adverse impacts on the region's businesses and economy despite an expected deterioration in future travel conditions if the project is not built. Nonetheless, it might reasonably be expected that future non-retail growth could be potentially be constrained by worsened US 70 travel conditions. Similarly, future retail growth could also be limited by degraded US 70 traffic conditions and would remain limited along US 70. It was conservatively projected that in 2040 up to \$277.4 million in future retail and service sales growth would occur under the No-Build Alternative. This increase is expected to be primarily the result of future non-local highway users' spending growth since the area's stagnant population and absence of

increased highway traffic growth by local residents are expected to ensure that local residents' retail and service sales would remain unchanged.

### 4.1.3.3 Business Impacts

Table 4-4 summarizes the project's expected impacts on the region's existing businesses and potential future retail sales shift impacts. Sales shift impacts represent the projected net changes to the retail and service business sectors that otherwise may be "lost" or transferred to other businesses outside the market area under the DSAs compared to the No-Build Alternative.

**Table 4-4: Summary of US 70 business impacts by DSA (2016 \$; \$ millions)**

Impacts	Alternative 1UE	Alternative 1SB	Alternative 5I
US 70 land use and access	US 70 businesses access restricted by interchanges. Potential encroachment and site access changes.	No access changes for existing US 70 businesses. Improved US 70 travel conditions.	
Construction (short-term)	Comparable increased local spending and employment during project construction. Not included as an economic benefit for impact analysis.		
	Major disruption to US 70 use and businesses.	Minor disruption to US 70 use and businesses.	
Retail sales growth (2040)	\$258.4m	\$270.7m	\$265.5m
Sales shift <sup>a</sup> from No Build (2040)	Growth change (2040): <ul style="list-style-type: none"><li>■ Sales: -\$19.1m</li><li>■ Jobs: -128</li><li>■ Output: -\$8.0m</li></ul>	Growth change (2040): <ul style="list-style-type: none"><li>■ Sales: -\$6.7m</li><li>■ Jobs: -45</li><li>■ Output: -\$2.8m</li></ul>	Growth change (2040): <ul style="list-style-type: none"><li>■ Sales: -\$11.9m</li><li>■ Jobs: -80</li><li>■ Output: -\$5.0m</li></ul>
Other existing businesses	Up to 270 ac farmland impacted and <\$0.1m net revenue loss.	Up to 464 ac farmland impacted and \$0.15m net revenue loss.	Up to 743 ac farmland impacted and \$0.24m net revenue loss.

Source: NCDOT 2018f.

m = million

As shown in Table 4-4, the EIA estimated that the project's potential future retail sales shifts could range from a \$6.7 million decrease in the region's future highway related retail sales growth (Alternative 1SB) up to a \$19.1 million decrease (Alternative 1UE). These future retail sales shift impacts are relatively minor as they would range from approximately 2.4 percent to 6.9 percent of the future highway related retail sales growth projected under the No-Build Alternative. Furthermore, successful marketing, planning, and other development efforts could result in other new business growth and/or retention that could readily offset the projected potential sales shift impacts. In addition, the DSAs may encourage business growth and/or retention as a result of increased non-local highway users, improved business productivity, and/or improved traffic conditions on the existing US 70 roadway (under Alternatives 1SB and

51). In contrast to Alternative 1UE, Alternatives 1SB and 51 would have only limited access and property impacts on the existing US 70 businesses and have greater potential and likelihood of new business development and/or relocations at its interchanges. Due to its relative proximity to the existing US 70 roadway, Alternative 1SB has the best potential for encouraging future infill development along its arterial connections to the existing US 70 roadway and businesses.

#### 4.1.3.4 Business Relocations

The impacted businesses are identified by the R-2553 Relocation Report (NCDOT 2017f). The Relocation Report can be found on the project website. Impacts to any displaced businesses (which may be distinct from the landowners who will be financially compensated) would consist of their lost future net earnings potential (i.e., revenues minus business costs). However, except for the one-time relocation cost, the displaced businesses would probably not incur any long-term net earnings losses if other comparable relocation sites were available nearby. Given the availability of underused and developable land sites in Lenoir County (as defined in the LUSA), it would be reasonable to expect that future business relocations should be possible to reduce the future displacement impacts. The LUSA can be found on the project website.

Table 4-5 shows the estimated average annual sales and employment associated with the businesses that would be relocated under each DSA. The impacted businesses were also separated into two groups – highway market dependent and other businesses. The highway market dependent group consisted of lodging, food and beverage, entertainment, and retail businesses. This includes businesses such as lodging, fuel stations, fast food restaurants, and convenience stores that obtain a major proportion of their sales from non-local highway users, and therefore proximity and easy access from the highway are important for their success. The remaining businesses were aggregated as other businesses. While these other businesses may rely on the highway for their customers, employees, and suppliers to access their facility, their sales are not predominantly obtained from in-transit highway users making unplanned stops and/or purchase decisions.

The values shown in Table 4-5 provide a highly conservative estimate of the businesses that would require relocation to alternate sites with highway access since it does not differentiate those businesses that provide goods and service for non-local customers travelling through Kinston. If there is an insufficient supply of suitable highway-accessible sites then some displaced highway market dependent businesses may leave the area, which can increase the future “sales leakage” out of the local economy. This would represent a negative economic impact for both the permanently displaced businesses and potentially for the local economy (if the sales leakage cannot be served and captured by other local businesses). The economic impact could also be more long-term if the site availability constraints persist and are not corrected through planning, rezoning, or other means.

##### Relocation Report

The Relocation Report for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

##### Land Use Scenario Assessment (LUSA)

The LUSA for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

**Table 4-5: Business relocation impacts by DSA (2016 \$; \$ millions)**

	Alternative 1UE	Alternative 1SB	Alternative 51
<b>Total Business Relocations</b>	<b>137</b>	<b>66</b>	<b>26</b>
Highway Market Dependent	69	31	12
Other Businesses	68	35	14
<b>Total Sales (\$ millions/year)</b>	<b>\$150</b>	<b>\$49</b>	<b>\$16</b>
Highway Market Dependent	\$82	\$25	\$11
Other Businesses	\$68	\$24	\$5
<b>Total Jobs</b>	<b>1,158</b>	<b>349</b>	<b>178</b>
Highway Market Dependent	652	188	127
Other Businesses	506	161	51

Source: NCDOT 2017f; AECOM 2018a.

Note: Business relocations listed in Table 4-5 differ from those shown in Table 4-1 and in the relocation report, as the EIA only considered operational businesses, whereas the relocation report considered commercial or business properties, regardless of whether there was an operational business.

Non-highway market dependent businesses will have a greater selection of alternative relocation sites and generally will be far less liable to long-term adverse sales or business impacts from the relocation. The economic impacts for specific business from relocation may also differ depending on the condition of their current property. Businesses and/or landowners of outmoded buildings may benefit from an opportunity to revitalize their businesses.

As a result, while it is difficult to project individual business decisions, it is the overall net economic outcomes that are most relevant to the EIA. No net loss to the local economy would occur if an existing business's lost sales and jobs are subsequently recaptured by other existing businesses or new ventures.

#### 4.1.3.5 Short-term Impacts

The EIA also found that project-related construction would have short-term economic benefits in local employment and spending. However, these benefits are not included in the EIA as an additional benefit of the DSAs compared to the No-Build Alternative. This was primarily a conservative assumption so as not to overly favor future roadway development based on the project's ability to secure construction spending that would result in only temporary economic gains for Lenoir County. In addition, due to the similarity of the alternatives' construction cost estimates, potential cost savings is not considered an important consideration for weighting the EIA results. As a result, the alternatives' construction costs are not included in the EIA estimates of the alternatives' economic benefits.



#### 4.1.4 Communities and Neighborhoods

Potential neighborhood impacts include access and mobility, residential property relocations and acquisitions, visual quality, and noise effects. These impacts are the direct impacts to communities and neighborhoods as a result of the proposed action. Impacts to community cohesion and stability are most likely to result with Alternative 1UE, given the highest number of community facilities and community gathering spots that would be impacted along the corridor. A moderate level of impacts is expected for Alternative 1SB that results from disruption between neighborhoods and commercial areas, employment facilities, and dislocation of community gathering places due to a moderately high number of relocations. A lower level of impact is expected from Alternatives 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 based on areas of community cohesion noted at the small group meetings and by local planners. An analysis of community cohesion and potential impacts to community cohesion within the project study area is included in the CIA (NCDOT 2018d). The CIA is available on the project website. An analysis of visual quality and noise effects can be found in sections 4.5 and 4.10, respectively.

Impacts to residential areas and GNIS communities by DSA are summarized in Table 4-6 and in the following paragraphs.

- **Cedar Dell Lane** (census tract 110.01, block group 2): A neighborhood along Cedar Dell Lane, just off of Kennedy Home Road, is located southwest of the C.F. Harvey Parkway interchange. The neighborhood contains single family housing, the Baptist Children's Organization's Kennedy Memorial Home, the Lenoir County Learning Academy, and tennis courts. Alternatives 1UE and 1SB would not directly impact the neighborhood but would reduce access from the neighborhood to US 70 as well as destinations north of US 70. Access to the neighborhood would not be impacted by any additional DSAs, but Alternatives 31 and 32 would pass just south of the neighborhood.

##### Direct Impacts

Direct impacts are caused by the action and occur at the same time and place. (40 CFR 1508.8)

##### Access

Access is the ability to reach private property from a transportation network. Access effects were assessed by determining where the DSAs would result in changes to the existing pattern of vehicular or pedestrian/bicycle traffic, how they would restrict access at locations where access currently exists, or where new or enhanced access would be provided.

##### Mobility

Mobility is the ability to move around a transportation network. Mobility effects were assessed through the change in transportation options, as well as changes in the efficiency of travel. These impacts are indicated by the expansion, addition, reduction, or removal of travel lanes, transit, or pedestrian facilities.

##### Residential Property Relocations and Acquisitions

Residential relocations are the complete taking of property. Residential properties within the proposed right-of-way or affected by the proposed right-of-way (i.e., inaccessible, close proximity to improvements) were identified as relocations.

##### Community Impact Assessment (CIA)

The CIA for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>



**Table 4-6: Residential areas and GNIS community impacts by DSA**

Neighborhood	Alternative											
	1UE	1SB	11	12	31	32	35	36	51	52	63	65
Cedar Dell Lane	X	X	--	--	--	--	--	--	--	--	--	--
Jackson's Crossroads	--	--	--	X	X	X	--	--	--	--	X	X
Howard Place Drive Neighborhood	--	--	--	--	--	--	X	X	--	--	--	--
Albrittons	--	--	--	--	--	--	--	--	X	X	--	--
Woodington	--	--	--	--	--	--	X	X	--	--	--	--
Sandy Bottom	--	--	--	--	--	--	X	X	--	--	--	--
Bucklesberry	--	--	--	--	--	--	X	X	--	--	--	--
Loftin's Crossroads			X	X	X	X	--	--	X	X	X	X
Murray Circle	X	X	--	--	--	--	--	--	--	--	--	--
Town of Dover	--	--	--	--	--	--	--	--	--	--	--	--
Little Baltimore	X	X	X	X	X	X	X	X	X	X	X	X
Wyse Forks	X	X	--	X	--	X	X	--	--	X	X	--

Source: NCDOT 2018d.

Note: X = residential impacts -- = no residential impacts

- **Bucklesberry** (census tract 110.01, block group 2): Alternatives 35 and 36 intersect Kennedy Home Road within the neighborhood of Bucklesberry. Only one home is expected to be impacted, but the proposed roadway would split the housing along Louie Pollock Road and the housing to the east along Kennedy Home Road. While one home would be directly impacted, the dominant issue in the neighborhood is access and mobility. The neighborhood contains residential housing and a church.
- **Jackson's Crossroads** (census tract 113, block group 3): Neighborhoods in the vicinity of the NC 55 and NC 11 intersection include a manufactured home park on Williams Loop and a neighborhood of single family and manufactured homes east of NC 11 off Sherry Drive. No DSAs would result in direct impacts to the neighborhoods; however, Alternatives 11, 12, 21, 32, 63, and 65 would result in minor changes in access to the neighborhood as current access from NC 11 would be closed.
- **Howard Place Drive Neighborhood** (census tract 113, block group 1): The Howard Place Drive neighborhood is located off of NC 11 and includes 34 manufactured homes. Alternatives 35 and 36 would have a half cloverleaf interchange at NC 11 that would directly impact the entire community, requiring acquisition and relocation of all 34 homes.
- **Albrittons** (census tract 113, block group 3): Development is dense along a triangle comprised of NC 55, Jesse T. Bryan Road, and Green Haynes Road. The neighborhood includes or is in close proximity to multiple churches and businesses. Alternatives 51 and 52 intersect Jesse T. Bryan Road, which would cause direct impacts to approximately 20 houses along NC 55. Access would also be changed for homes that are not directly impacted, given the control of access of the proposed action.
- **Sandy Bottom** (census tract 113, block group 1): The Sandy Bottom community is located along NC 55 near the intersections of Croom-Bland Road and Green Haynes Road and consists of scattered single family housing, churches, and a fire station. For Alternatives 35 and 36, there would be direct impacts to approximately seven houses along NC 55 and Croom-Bland Road. The alternatives would also be in the vicinity of the Sandy Bottom Fire Station, making access an important issue in this area. Two churches are located along the portion of NC 55 that would be realigned leading up to the proposed interchange, but neither church would be directly impacted.
- **Woodington** (census tract 114, block group 3): Woodington is a rural community composed of scattered residential housing, a church, and a middle school along US 258. Alternatives 35 and 36 intersect John Green Smith Road and US 258. Two homes along John Green Smith Road would be directly impacted and approximately twelve homes along US 258 would be directly impacted. In both locations, the alternatives would directly impact homes. An interchange serving these alternatives at US 258 would maintain overall access between the northern and southern side of the alternative; however, access along smaller roads would be affected by the closing of local roads, including Joe Nunn Road and Patterson Road. This could impact the overall connectivity of housing to the north of the alternatives and the middle school to the south of the alternatives.
- **Loftin's Crossroads**: The crossroads community near the intersection of Elijah Loftin Road and NC 58 would be impacted by Alternatives 11, 12, 31, 32, 51, 52, 63, and 65. It appears that only one home would be directly impacted by the alternatives. Access would not be

impacted due to the interchange at the proposed alignment and NC 58. The neighborhood includes, or is located in the vicinity of, a church and multiple businesses.

- **Crossroads Community at Cobb Road and Silo Road** (census tract 114, block groups 2 and 3): The neighborhood along the intersection of Cobb Road and Silo Road is located south of all alternatives. Access from the neighborhood to more northern destinations would be maintained due to the planned grade separations at Cobb Road for all DSAs.
- **Murray Circle** (census tract 114, block group 2): Access along Murray Circle would be slightly changed for Alternatives 1UE and 1SB. Residents would have to access or cross US 70 using the proposed interchanges at NC 58 or Wyse Fork Road. However, no direct impacts would occur.
- **Town of Dover** (census tract 9603, block groups 3 and 4): The housing and development within the Town of Dover would not be impacted by any of the DSAs. All DSAs would maintain the current access the town has to US 70.
- **Little Baltimore** (census tract 111, block group 3): Little Baltimore contains a church and several small businesses and restaurants. All DSAs would directly impact the community. The proposed interchange and service roads at the intersection of Willie Measley Road/Jim Sutton Road and US 70 would include business and residential relocations. Access to Washington Street and Sugg Road would be available by the proposed service roads. As noted in section 3.3.3.2, STIP project number R-5813 proposes to construct this intersection to an interchange.
- **Wyse Forks** (census tract 9203, block group 1): Wyse Forks contains a fire station, EMS station, church, and a convenience store. Alternatives 1UE and 1SB would directly impact the fire station and the convenience store. Alternatives 12, 32, 35, 52, and 63 would have change of access impacts to US 70 and a new interchange would be constructed near Wyse Fork Road and US 70.

In addition to the above communities, 11 minority and/or low-income communities were identified where potential impacts may occur. The potential impacts on these communities are discussed in section 4.1.5.

#### 4.1.5 Environmental Justice

Title VI of the Civil Rights Act of 1964 protects individuals from discrimination on the grounds of race, age, color, religion, disability, sex, and national origin. Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” provides that each federal agency shall make achieving EJ part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations. Executive Order 12898 requires that EJ principles be incorporated into all transportation studies, programs, policies and activities. The three EJ principles are to (1) ensure the full and fair participation of potentially affected communities in the transportation decision-making process; (2) avoid, minimize or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority or low income populations; and (3) fully evaluate the benefits and burdens of transportation programs, policies, and activities, upon low-income and minority populations.

Potential impacts to minority and low-income populations are summarized in the following paragraphs. EJ residential areas were determined using available demographic Census data, identified EJ thresholds, field observations—including observations of the presence of poor housing conditions—and input from local officials and public meetings.

- **Norbert Hill Road:** The Norbert Hill Road residential area, located on Norbert Hill Road between US 70 and Gregg Drive, contains low-income populations that would be affected by all the DSAs. The DSAs may displace some of these residences that are closest to US 70 and those that remain would experience a change in access, as they would be connected to US 70 via a service road.
- **Foss Farm Road:** The Foss Farm Road residential area, located on US 70 between Barwick Station Road and Albert Sugg Road, contains concentrations of minority and low-income populations that would be displaced by DSAs 1UE, 1SB, 11, 12, 35, 36, 51, and 52. Access to this residential area would be affected by Alternatives 31, 32, 63, and 65 (from Willie Measley/Little Baltimore interchange), as these alternatives would provide a service road to this community.
- **Crooms Drive:** The Crooms Drive residential area, located on Crooms Drive off of NC 55, contains low-income populations that would be impacted by Alternatives 51 and 52. Some of the residences would be displaced by the proposed interchange with NC 55 and those that remained would experience a change of access to NC 55.
- **Jesse T. Bryan Road:** The Jesse T. Bryan Road residential area, located off of Jesse T. Bryan Road and Barwick Road, contains low-income populations. Alternatives 51 and 52 would change how the residences access the local road network.
- **Carrie Hill Drive and Howard Place Drive:** The Carrie Hill Drive and Howard Place Drive residential area, located off of NC 11, contains low-income populations. Alternatives 35 and 36 would displace this residential area that contains approximately 35 homes.
- **Lonesome Pine Drive:** The Lonesome Pine Drive residential area, located on Lonesome Pine Drive between Joe Nunn Road and Randy Road, contains low-income populations. Alternatives 63 and 65 are expected to displace several of these homes.
- **Albert Baker Road:** The Albert Baker Road residential area, located on Albert Baker Road off of NC 58, contains concentrations of minority and low-income populations. Alternatives 35 and 36 propose an interchange with NC 58 in a location that would displace this residential area.
- **Fordham Lane:** The Fordham Lane residential area, located on Fordham Lane off of US 258, contains a minority and low-income population that would be displaced by Alternative 1SB due to the proposed interchange with US 258.
- **Johnson Road/NC 58:** The Johnson Road/NC 58 residential area contains a minority population that would be displaced by Alternative 1SB due to the proposed interchange with NC 58.
- **British Road and Caswell Station Road:** A minority residential area is located between British Road and Caswell Station Road on the north side of US 70. Alternatives 1UE and 1SB would upgrade existing US 70 and require the construction of service roads, which would directly impact several homes along existing US 70 in this area due to the need for

additional right-of-way. Homes that would not be directly impacted would experience change in access to the US 70 corridor.

- **US 70/Tilghman Road:** A cluster of housing that contains potential minority and low-income populations is located on the southern side of US 70 just west of its junction with Tilghman Road. Alternatives 1UE, 1SB, 12, 32, 35, 52, and 63 would involve widening existing US 70 in this location, which would include adding service roads. These alternatives are expected to displace most of these residences and those that remain would experience a change in access, as they would be connected to US 70 via a service road.

Full and fair access to meaningful involvement by low-income and minority populations in project planning and development is an important aspect of EJ. As described in the CIA and in section 5.2.4, efforts have been taken to date to reach out and seek input from the EJ populations near the project. This information will continue to be used in the design and evaluation of alternatives, to avoid negative impacts to valued sites, and to support the development of safe, practical, and attractive design of the applicant's preferred alternative that are responsive to the concerns of EJ populations. Efforts will be made to continue to identify issues and concerns for potential impacts to EJ residential areas and to avoid, minimize, and mitigate for potential disproportionately high and adverse impacts.

Benefits of the project, including improved safety and mobility, would be enjoyed by both regional travelers and local residents, including minority and low-income residents. While adverse community impacts including right-of-way acquisition, relocations, and construction delays and detours could result from this project, specific impacts to minority and low-income populations will be evaluated as part of the FEIS to determine whether the impacts are disproportionate and adverse.

#### 4.1.6 Community Facilities and Resources

The CIA identified the following impacts to community facilities and resources (Table 4-7). Figure 4-1 through Figure 4-12 display the possible effects to community resources.

Small family plot cemeteries identified during field visits could also be impacted by the proposed action. Alternatives 11, 31, 51, and 65 would impact one unnamed cemetery and Alternatives 35 and 36 would impact two cemeteries.

Parking spaces at Lenoir Community College adjacent to US 70 as well as the driveway access to US 70 would be impacted by Alternatives 1UE and 1SB. Southwood Elementary School and Woodington Middle School would not be directly impacted by any of the DSAs; however, the schools are located just outside of proposed interchanges with NC 58 and US 258, so indirect impacts could occur, such as changes in traffic patterns and access.

**Table 4-7: Community facility impacts by DSA**

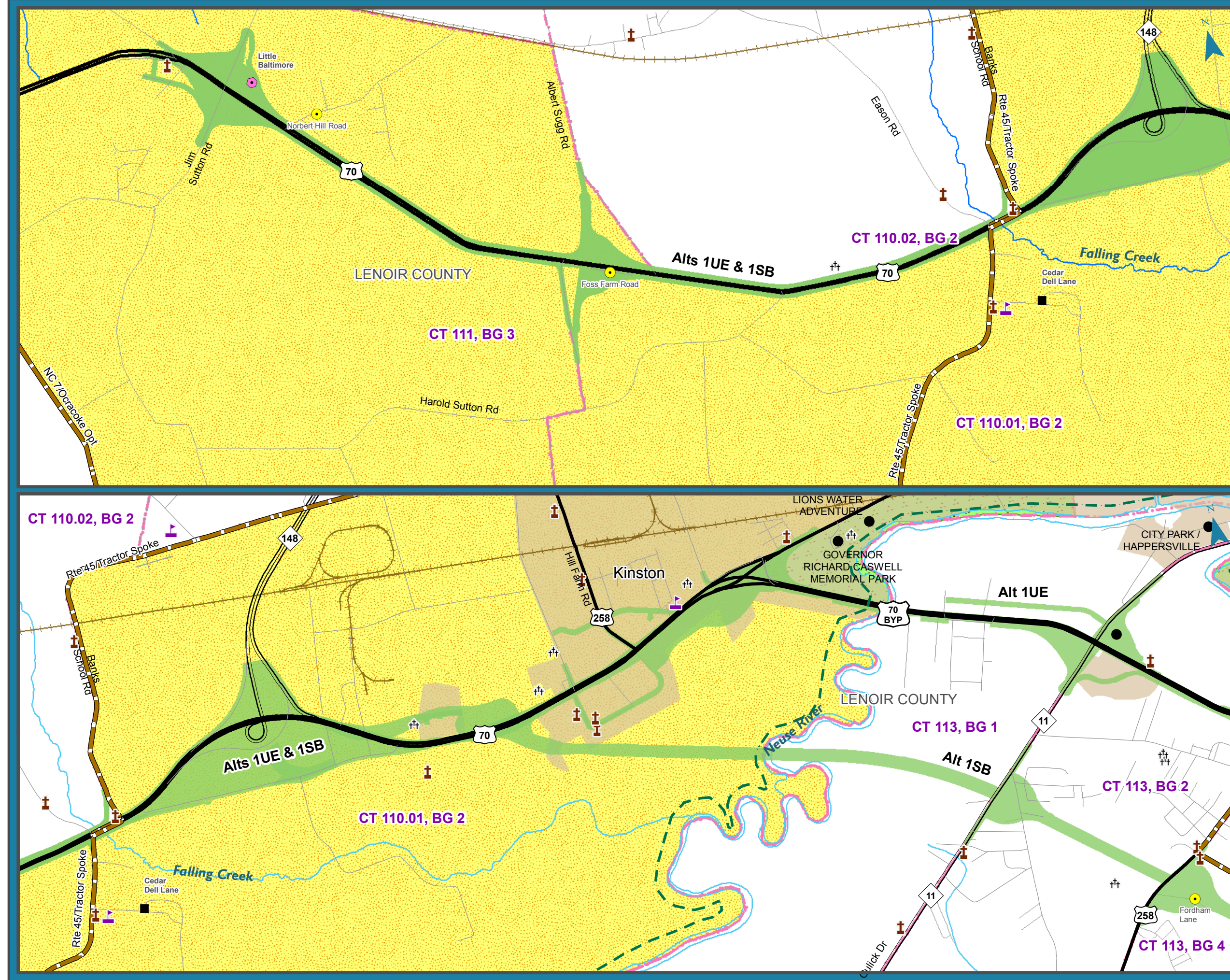
Feature	Alternative											
	1UE	1SB	11	12	31	32	35	36	51	52	63	65
<b>Cemeteries</b>												
Pinelawn Memorial Park Cemetery	X	X	--	--	--	--	--	--	--	--	--	--
Westview Cemetery	X	--	--	--	--	--	--	--	--	--	--	--
<b>Civic Buildings</b>												
Woodmen of the World Lodge	X	X	--	--	--	--	--	--	--	--	--	--
Lenoir County Shrine Club	X	X	--	--	--	--	--	--	--	--	--	--
<b>Government Facilities</b>												
US Post Office	X	--	--	--	--	--	--	--	--	--	--	--
Kinston/Lenoir County Visitors Center	X	--	--	--	--	--	--	--	--	--	--	--
Lenoir County Fairgrounds	--	X	--	--	--	--	--	--	--	--	--	--
<b>Schools</b>												
Woodington Middle School	--	--	--	--	--	--	X	X	--	--	--	--
Southwood Elementary School & Southwood Gym	--	--	X	X	X	X			X	X	X	X
Lenoir Community College	X	X	--	--	--	--	--	--	--	--	--	--
<b>Churches</b>												
Church of God, La Grange	X	X	X	X	X	X	X	X	X	X	X	X
Chosen Vessel Ministries	X	X	X	X	X	X	X	X	X	X	X	X
Greater Vision Baptist Church	X	--	--	--	--	--	--	--	--	--	--	--
Identity Ministries Church	X	--	--	--	--	--	--	--	--	--	--	--
Destiny Ministries	X	--	--	--	--	--	--	--	--	--	--	--

Feature	Alternative											
	1UE	1SB	11	12	31	32	35	36	51	52	63	65
Trinity United Methodist	X	--	X	X	--	--	--	--	--	--	--	--
Kennedy Home Church	--	--	--	--	--	X	--	--	--	--	--	--
Grace Baptist Church	--	X	--	--	--	--	--	--	--	--	--	--
Tabernacle Free Will Baptist Church	X	--	--	--	--	--	--	--	--	--	--	--
New Testament Baptist Church	X	--	--	--	--	--	--	--	--	--	--	--
Armenia Christian Church	X	X	--	--	--	--	--	--	--	--	--	--
Victorious Living Chapel	X	X	X	X	X	X	X	X	X	X	X	X

Note: X = community facility impacts -- = no community facility impacts




Figure 4-1:  
Community feature and  
environmental justice population  
impacts-Alternatives 1UE and 1SB-A



**Legend**

- Alts 1UE and 1SB ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- EJ Communities
- Residential Areas
- USGS GNIS Community
- Parks
- Hospital
- Police or EMS
- Fire Station
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail
- Block Group
- Block Group Above Both Low-Income and Minority Threshold
- Block Group Above the Low-Income Threshold

0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

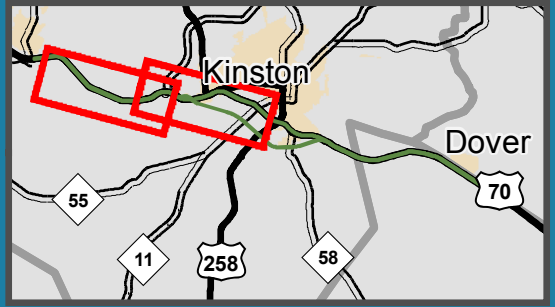
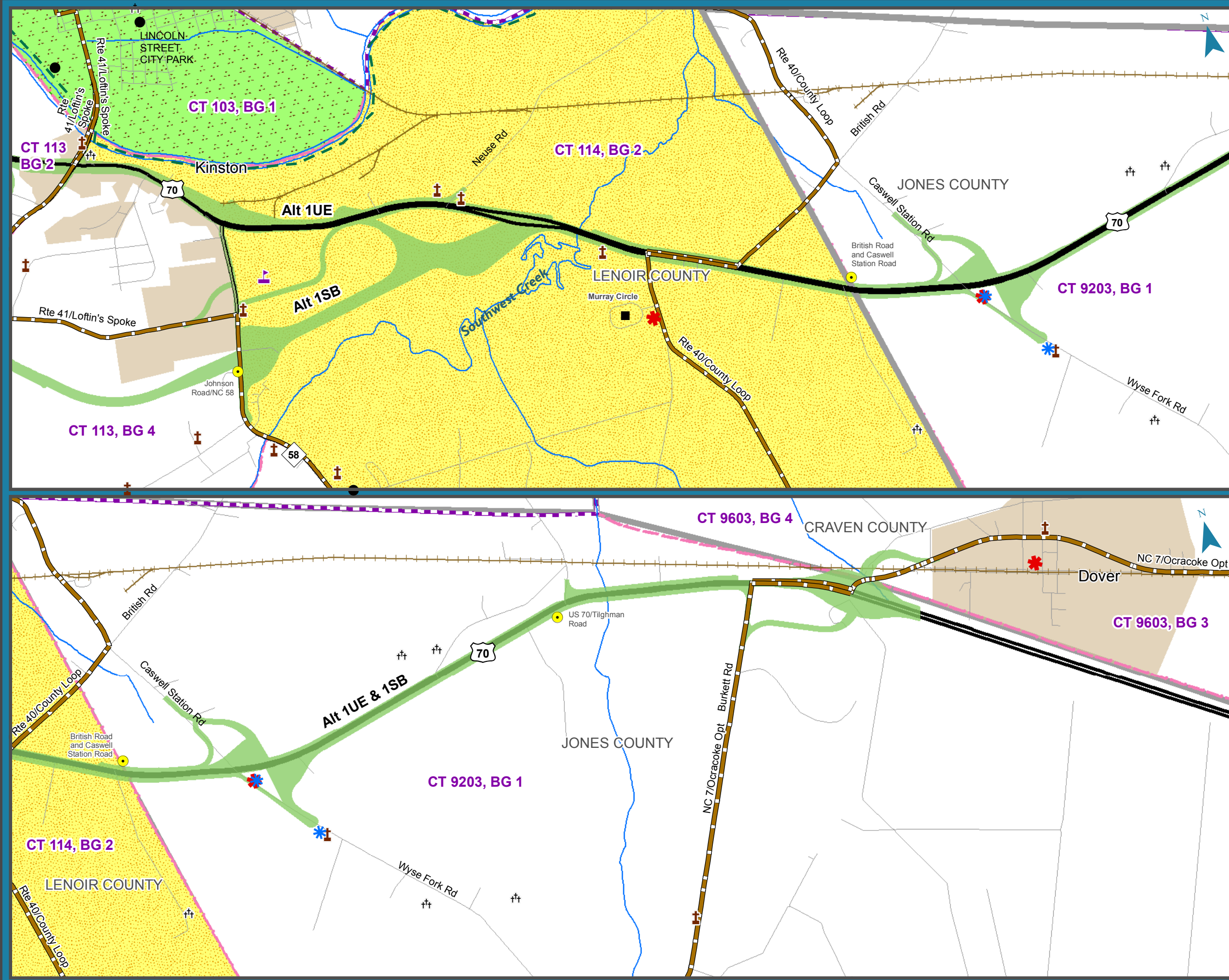





Figure 4-2:  
Community feature and  
environmental justice population  
impacts-Alternatives 1UE and 1SB-B



**Legend**

- Alts 1UE and 1SB ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- EJ Communities
- Residential Areas
- USGS GNIS Community
- Parks
- Hospital
- Police or EMS
- Fire Station
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail
- Demographic Study Area
- Block Group
- Block Group Above Both Low-Income and Minority Threshold
- Block Group Above the Low-Income Threshold

0 0.25 0.5 Miles

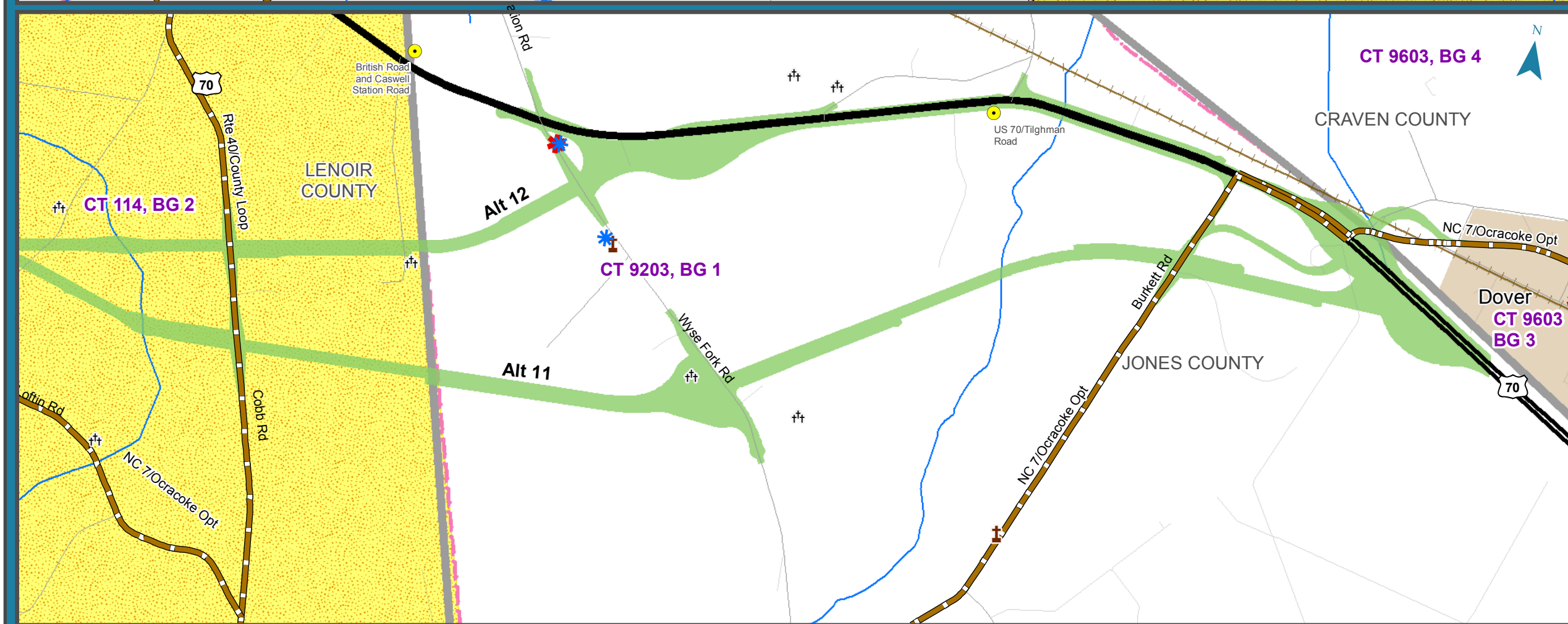
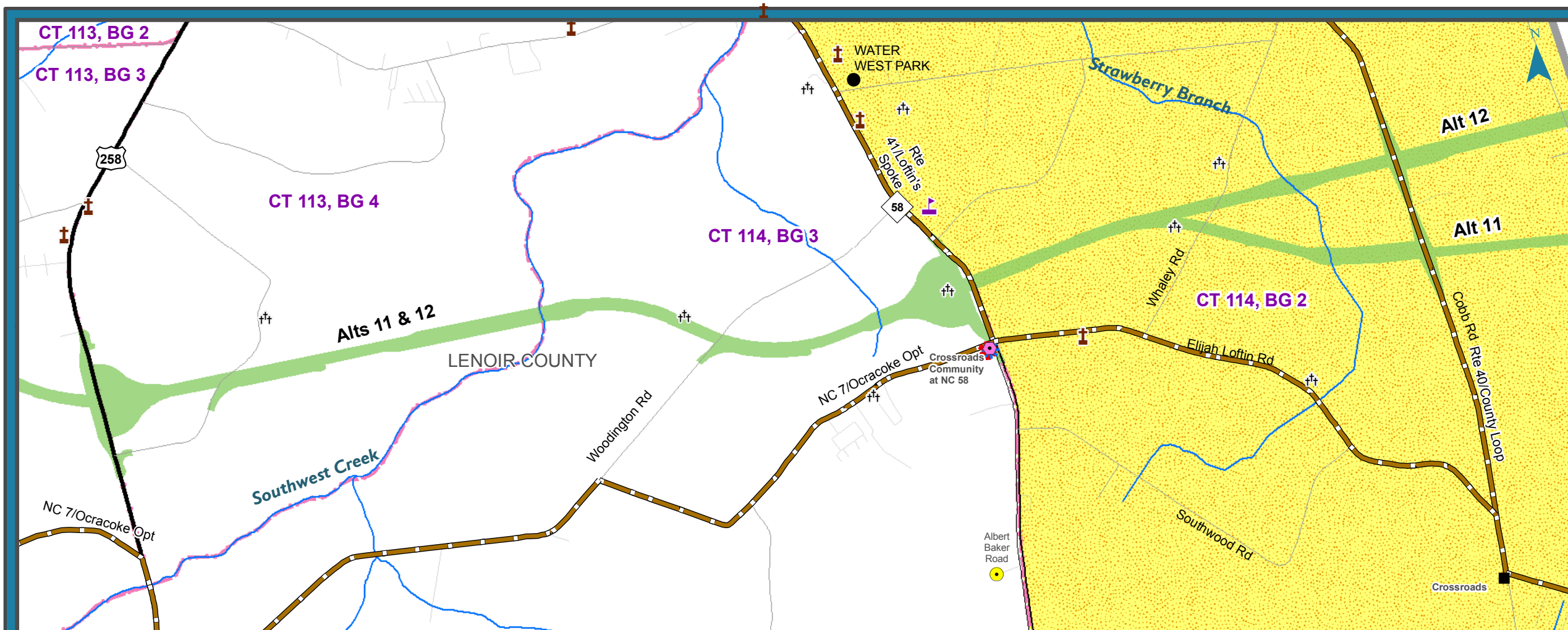
  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS



















**Figure 4-4:**  
Community feature and  
environmental justice population  
impacts - Alternatives 11 and 12 - B

**Legend**

- Alts. 11 and 12 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- EJ Communities
- Residential Areas
- USGS GNIS Community
- Parks
- Hospital
- Police or EMS
- Fire Station
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail
- Block Group
- Block Group Above the Low-Income Threshold



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS

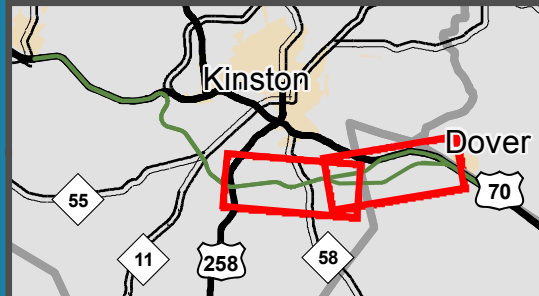




Figure 4-5:  
Community feature and  
environmental justice population  
impacts - Alternatives 31 and 32 - A

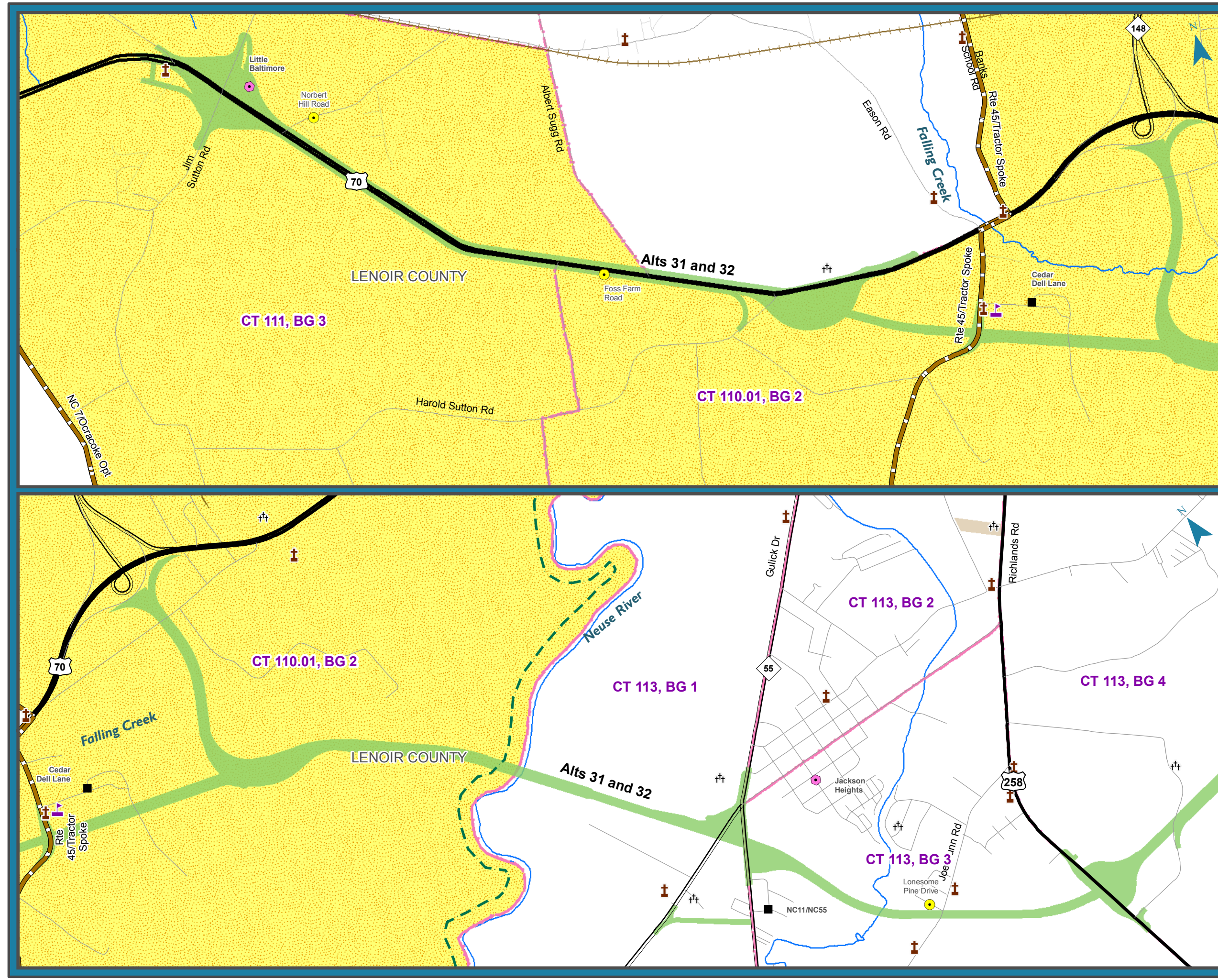
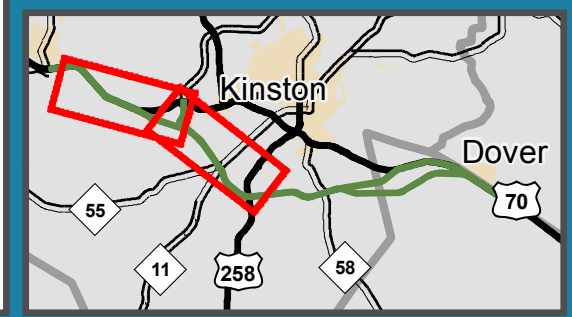
**Legend**

- Alt. 31 and 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- EJ Communities
- Residential Areas
- USGS GNIS Community
- Parks
- Hospital
- Police or EMS
- Fire Station
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail
- Block Group
- Block Group Above the Low-Income Threshold

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS





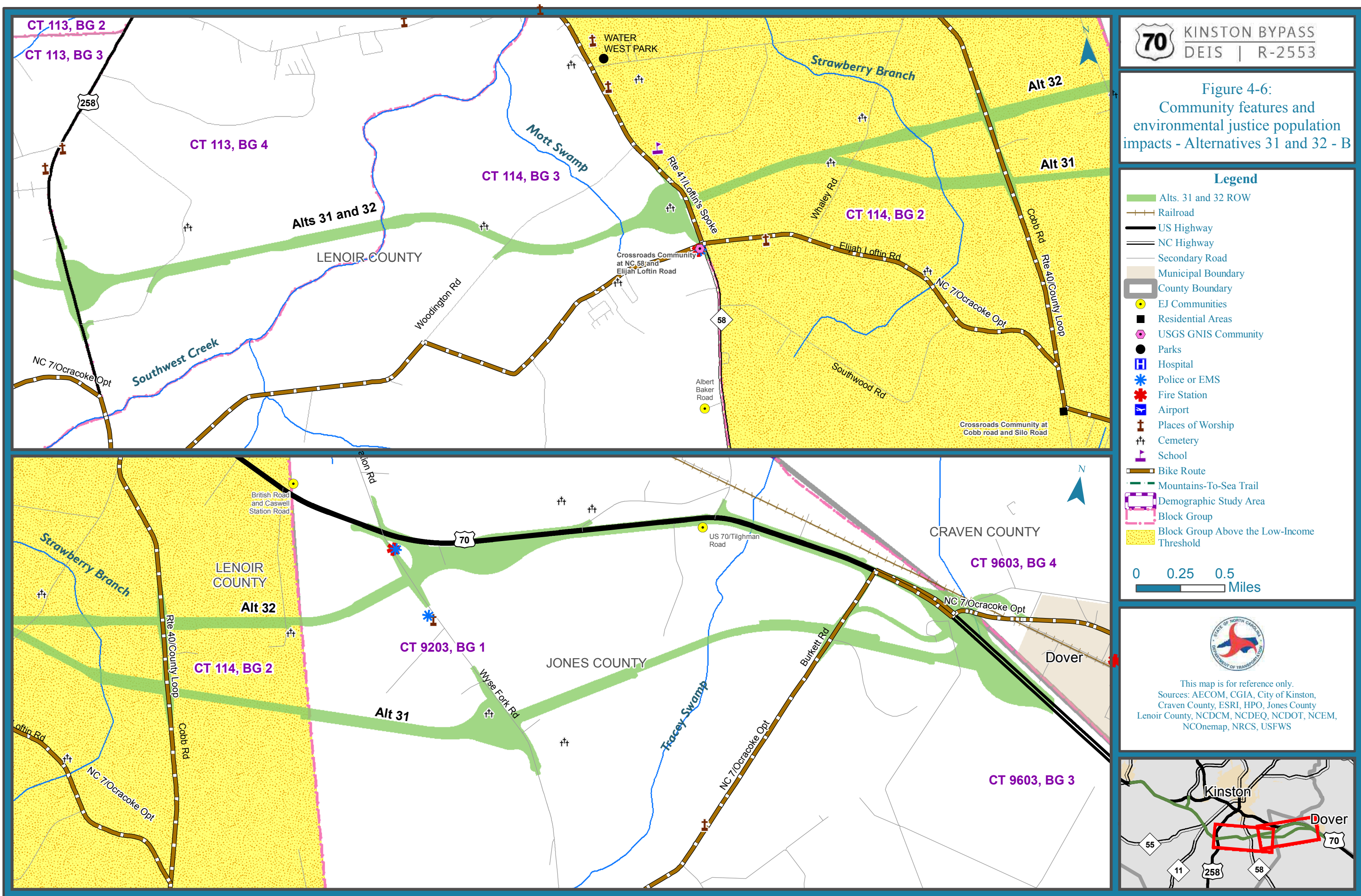





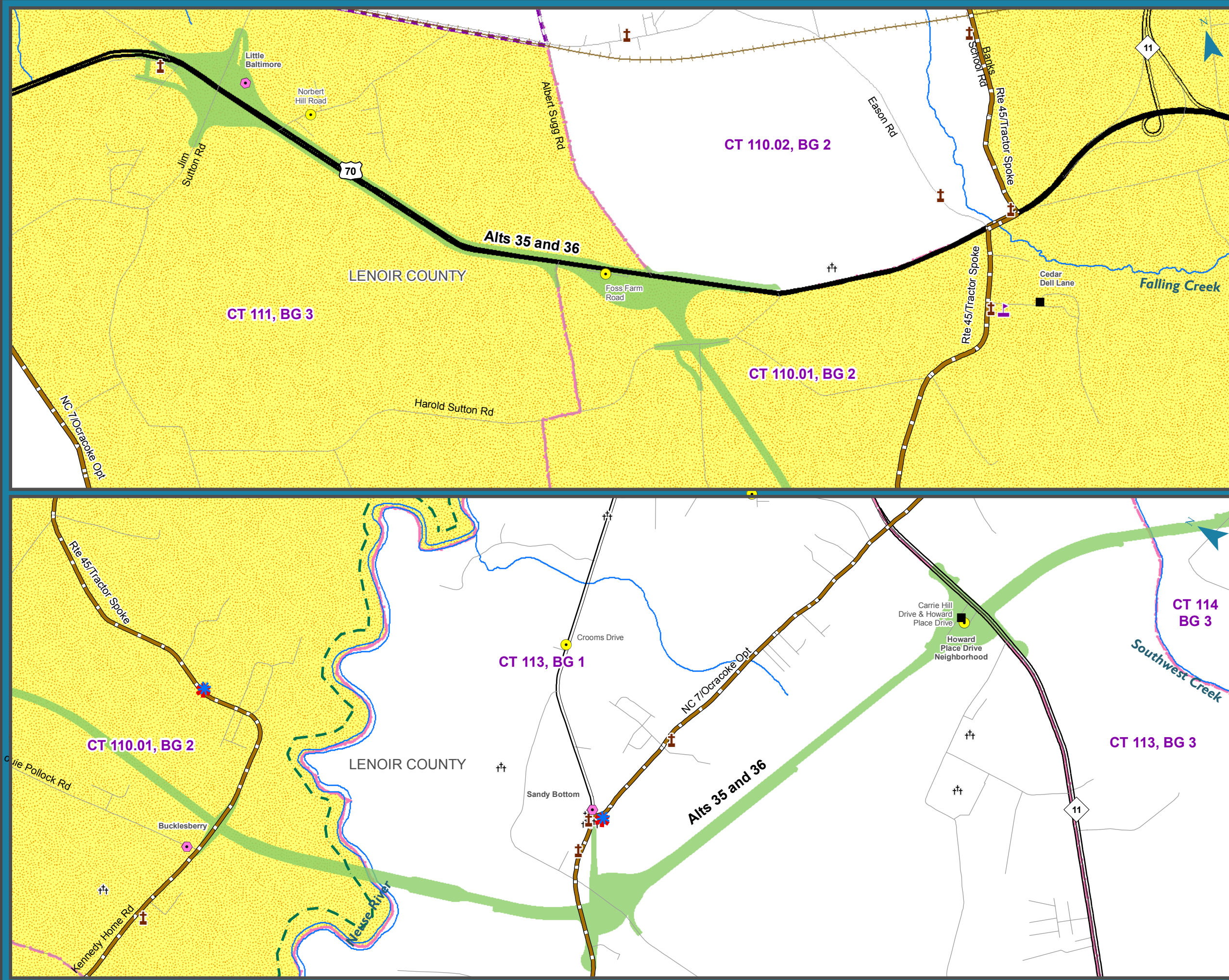
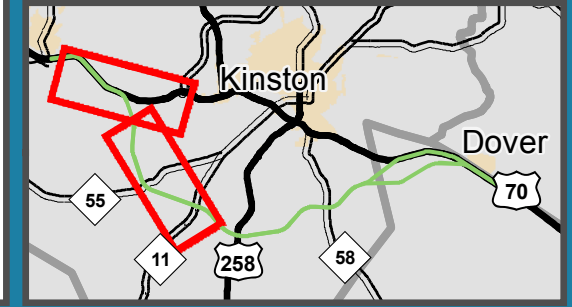
Figure 4-7:  
Community feature and  
environmental justice population  
impacts - Alternatives 35 and 36 - A

**Legend**

- Alts. 35 and 36 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- EJ Communities
- Residential Areas
- USGS GNIS Community
- Parks
- Hospital
- Police or EMS
- Fire Station
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail
- Demographic Study Area
- Block Group
- Block Group Above the Low-Income Threshold

0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS











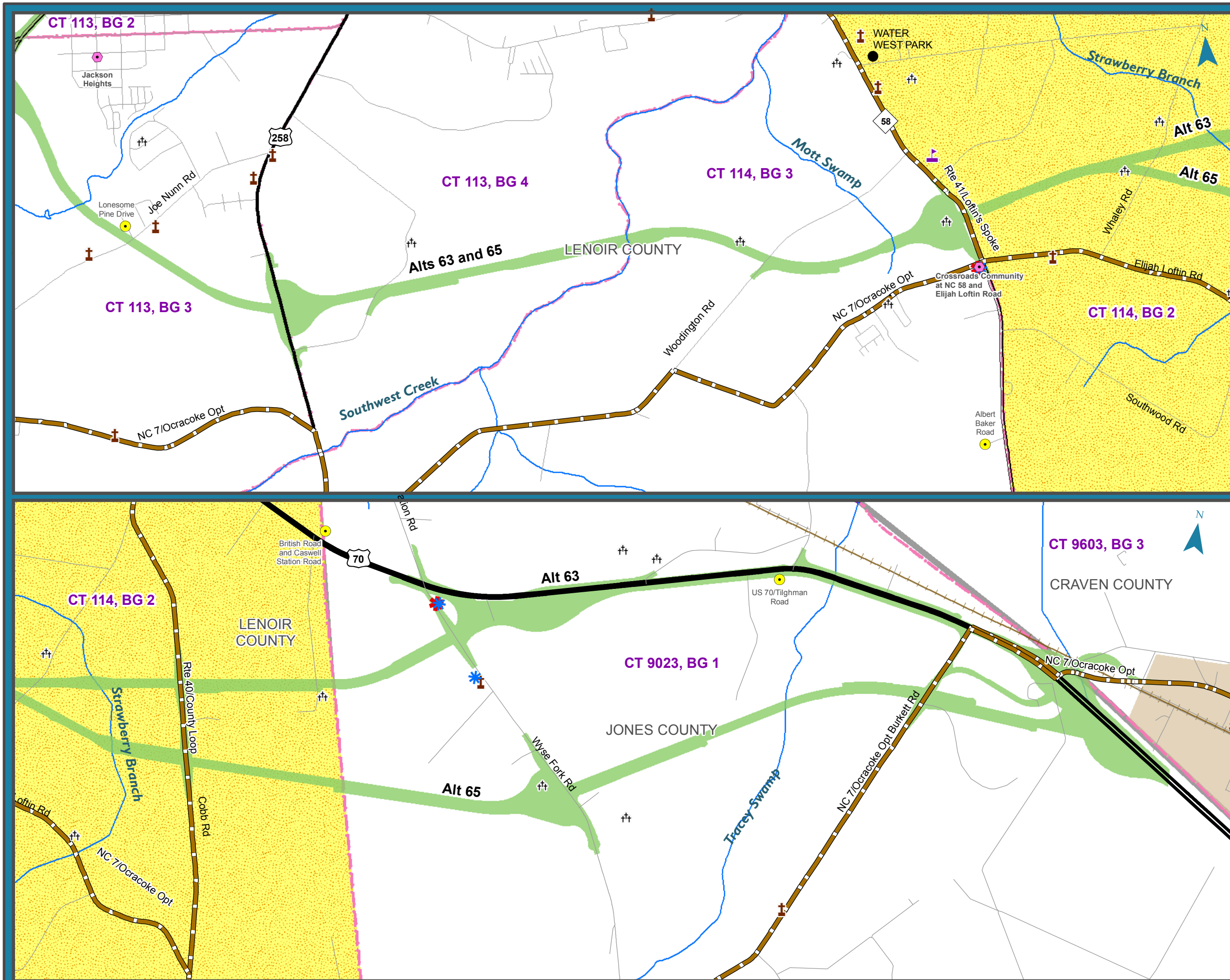














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Figure 4-12:  
Community feature and  
environmental justice population  
impacts - Alternatives 63 and 65 - B

**Legend**

- Alts. 63 and 65 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- EJ Communities
- Residential Areas
- USGS GNIS Community
- Parks
- Hospital
- Police or EMS
- Fire Station
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail
- Demographic Study Area
- Block Group
- Block Group Above the Low-Income Threshold

0 0.25 0.5  
Miles

This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS



## 4.2 RECREATION AREAS

Kinston Rotary Dog Park would be directly impacted by a proposed interchange at NC 11/55 and upgraded US 70 under Alternative 1UE. The Governor Richard Caswell Memorial Park is also located near Alternative 1UE and changes in access (temporary or permanent) are possible. The Woodmen of the World Lodge would also be directly impacted by Alternatives 1UE and 1SB.

Wyse Fork Battlefield would be crossed by Alternatives 1UE, 1SB, 12, 32, 35, 52, and 63. None of the DSAs would impact the sites associated with the First Battle of Kinston.

Given that the Kinston Bypass project will be a full-control of access freeway, there would be no bicycle or pedestrian accommodation on the actual roadway. However, the proposed action would impact existing bicycle and pedestrian facilities. Table 4-8 provides a summary of the level of impact to each crossing of a bicycle route by the DSAs. A small portion of existing US 70 from Whaley Road to British Road is designated as a bicycle route. If Alternative 1UE is selected, the bicycle route would need to be re-routed off US 70 since bicycles are not permitted on freeways.

It is recommended that the NCDOT coordinate with the NCDOT Bicycle and Pedestrian Division to evaluate the inclusion of bicycle/pedestrian facilities where the project crosses existing bicycle routes, as well as the necessary level of bicycle/pedestrian access accommodation during construction.

**Table 4-8: Potential impacts to bicycle routes**

Alternative	Tractor Spoke	County Loop	Connector Spoke	Loftin's Spoke	Ocracoke Option
1UE	A	A	N	T	N
1SB	A	A	N	T	N
11	A	T	N	T	A
12	A	T	N	T	A
31	T	T	N	T	N
32	T	T	N	T	N
35	T	T	A	N	T
36	T	T	A	N	T
51	T	T	N	T	N
52	T	T	N	T	N
63	T	T	N	T	N
65	T	T	N	T	N

Note: No Proposed Changes = N; Temporary Construction Impacts = T; Access Removed = A

### 4.3 COMPATIBILITY WITH LAND USE AND TRANSPORTATION

The compatibility of the project with local land use and transportation planning is assessed in this section. Consistency with land use plans is a factor when considering the scope and intensity of each DSA's impacts.

The proposed action is largely compatible with local public policy since it would meet the goals identified in the *Kinston Land Use Plan* (City of Kinston 2015) and the Lenoir County *Future Land Use Plan* (Lenoir County 2001). Kinston and Lenoir County are generally supportive of growth within the municipal limits of Kinston and supportive of the preservation of rural residential developments and agricultural lands outside of the municipal limits. The *Kinston Land Use Plan* identifies continued investment in transportation infrastructure as a policy to achieve the goals outlined in the plan. The Lenoir County *Future Land Use Plan* identifies transportation and corridor protection as both short-term and long-term strategies in order to reach plan goals, which include safe and efficient transportation, farming and rural landscape, economic development and job creation, and quality residential communities.

The Kinston Bypass project would not impact existing pedestrian facilities or planned future pedestrian projects outlined in the city's *Comprehensive Pedestrian Plan* (City of Kinston 2012).

Jones and Craven counties are supportive of growth, but also exhibit caution to protect the county's agricultural and natural resources and rural lifestyle while addressing the transportation needs of the county. The *Jones County Future Land Use Plan* indicates a desire for largely agricultural uses surrounding the eastern terminus of the proposed action (Jones County 2013).

Overall, the proposed action is compatible with the Jones County CTP (NCDOT 2016a) and is included as a four-lane, median-divided freeway on new location in the Kinston CTP (NCDOT 2011b).

## 4.4 CULTURAL RESOURCES

### 4.4.1 Historic Architectural Resources

Adverse effects are defined in 36 CFR 800 (Section 106) as occurring when an undertaking may alter, directly or indirectly, any of the characteristics of a historic architectural resource that qualify the historic architectural resource for inclusion in the NRHP in a manner that would diminish its integrity. Adverse effects can include destruction or alteration of the resource, isolation of the resource from its surrounding environment, and introduction of visual, audible, or atmospheric elements that are out of character with the architectural resource (36 CFR 800.5). As determined by the USACE, NCDOT, and the North Carolina HPO at an effects meeting on November 28, 2017, the Kinston Bypass project could have adverse effects on historic architectural resources as summarized in Table 4-9 (NCDOT 2017c, 2017d, 2018e). Figure 4-13 through Figure 4-24 depict possible effects to historic architectural resources. Avoidance, modification, and mitigation suggestions are included in the January 30, 2018 Concurrence Form for Assessment of Effects between NCDOT and North Carolina HPO found in Appendix E, section E-3, dated November 28, 2017. Once the applicant's preferred alternative is selected, measures to address and resolve adverse effects will be taken (36 CFR 800.6).

#### Section 106 Process

Historic properties or districts may qualify for protection under Section 106 of the National Historic Preservation Act of 1966. In order to receive protection, properties must be listed on the US Department of Interior's National Register of Historic Places or be deemed eligible for listing on the National Register. Local historic sites that are not eligible for listing may, in some cases, still be considered when locating new highways.

**Table 4-9: Kinston Bypass historic architectural resource adverse effects by DSA**

HPO Site #	Resource Name	Alternative											
		1UE	1SB	11	12	31	32	35	36	51	52	63	65
JN-0306	Wyse Fork Battlefield	X	X	--	X	--	X	X	--	--	X	X	--
LR-1203	Kelly's Millpond Site	--	--	--	--	--	--	--	--	--	--	--	--
LR-1197	Cobb-King-Humphrey House	X	X	--	--	--	--	--	--	--	--	--	--
LR-1550	Kelly's Pond Fire Lookout Tower	--	--	--	--	--	--	--	--	--	--	--	--
LR-1185	Wooten-Whaley House (John Council Wooten House)	--	--	O	O	O	O	O	O	O	O	O	O
LR-1186	Robert Bond Vause House	--	--	--	O	--	O	--	O	--	O	O	--
LR-0008	Dempsey Wood House	--	--	--	--	--	--	O	O	--	--	--	--
LR-1040	Croom Meeting House	--	--	--	--	--	--	X	X	--	--	--	--
LR-0927	James A. & Laura McDaniel House ("Maxwood")	--	--	--	--	X	X	--	--	--	--	O	O
LR-1189	Kennedy Memorial Home Historic District	--	--	O	O	X	X	--	--	--	--	X	X
LR-0001	Cedar Dell (Kennedy Memorial Home)	--	--	O	O	X	X	--	--	--	--	X	X
LR-0703	Dr. James M. Parrott House ("The Grove")	--	O	X	X	X	X	--	--	--	--	X	X
LR-0700	Henry Loftin Herring Farm	O	O	--	--	--	--	--	--	--	--	--	--
LR-0005	Jesse Jackson House	--	--	X	X	X	X	--	--	--	--	X	X

HPO Site #	Resource Name	Alternative											
		1UE	1SB	11	12	31	32	35	36	51	52	63	65
LR-1195	Elijah Loftin Farm (Mossy Oaks)	--	--	X	X	X	X	--	--	X	X	X	X

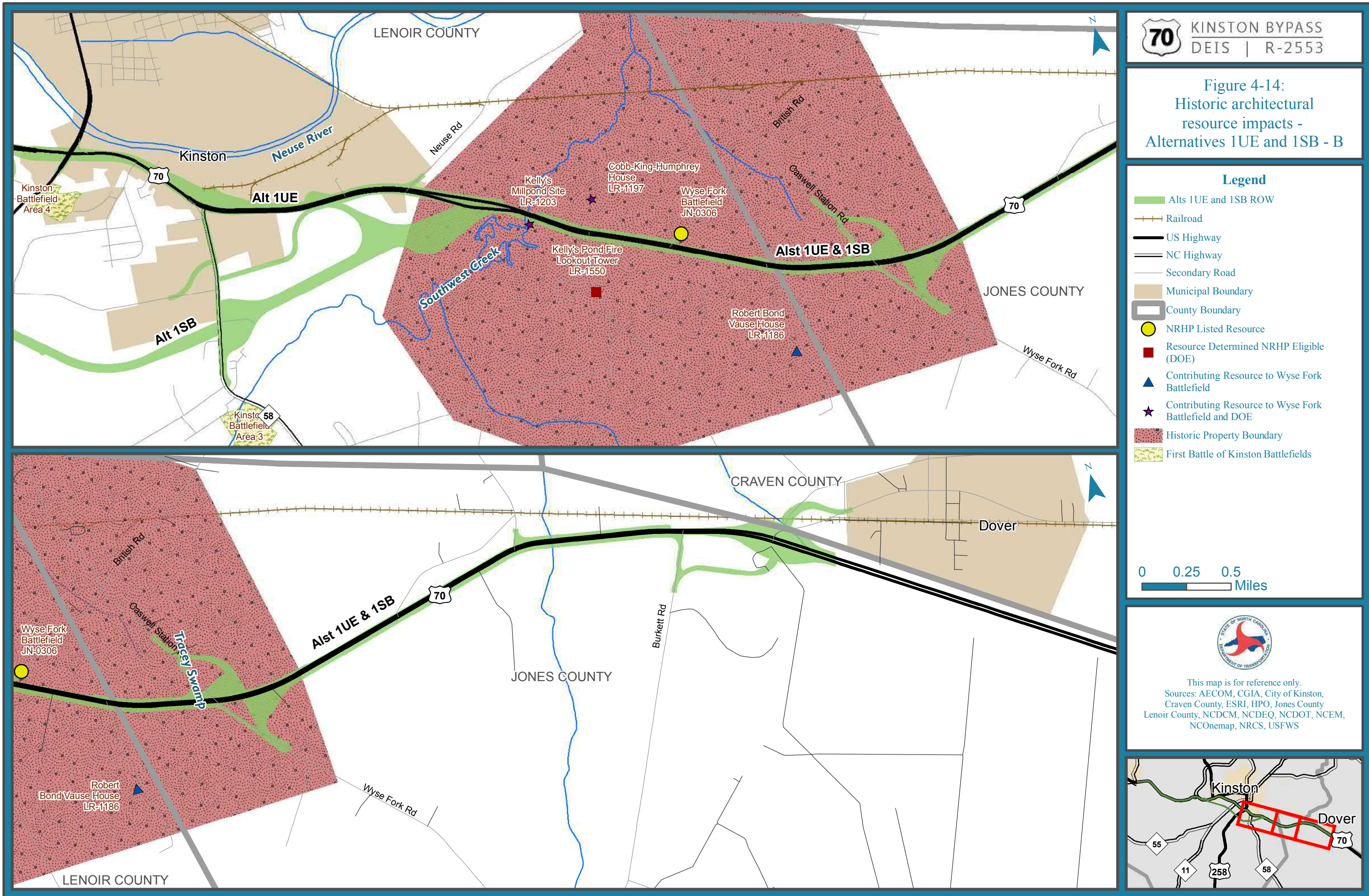
Source: NCDOT 2018e.

Note: X= Adverse Effects; O= No Adverse Effects; -- = No Effect





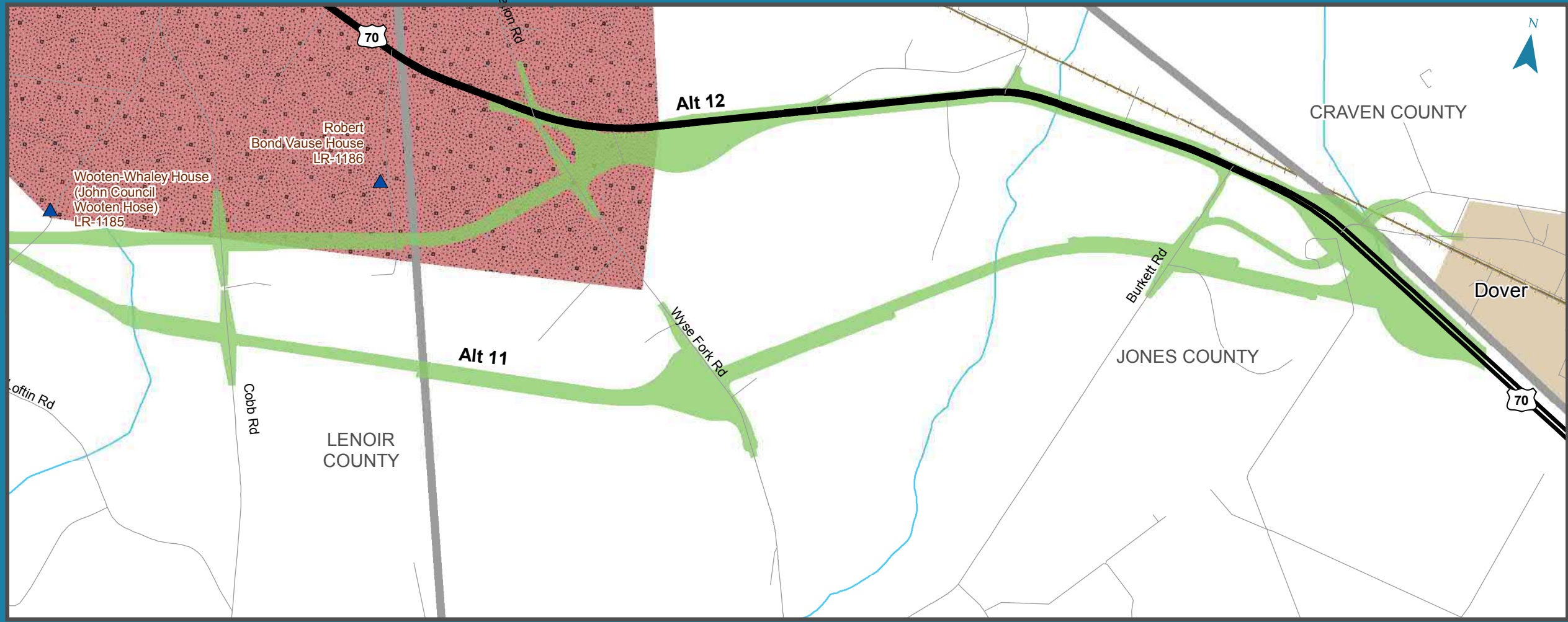
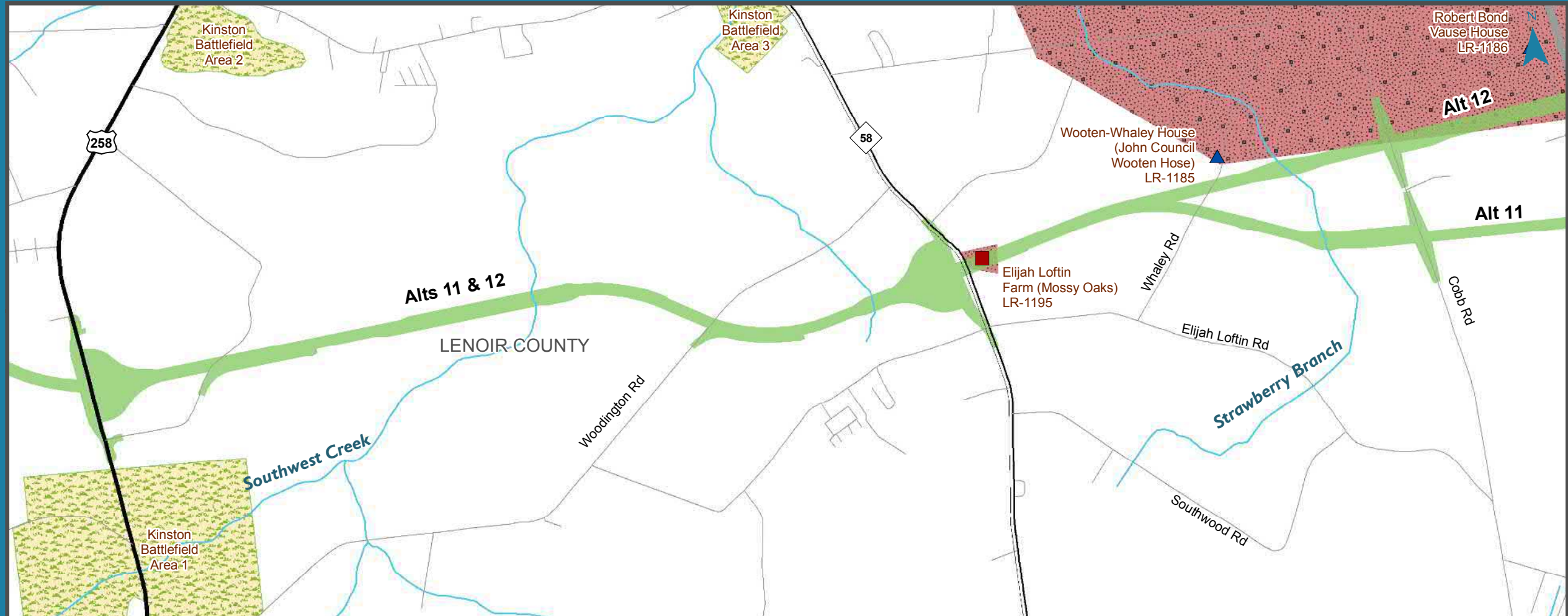












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Figure 4-16:  
Historic architectural  
resource impacts -  
Alternatives 11 and 12 - B

Legend

- Alts. 11 and 12 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NRHP Listed Resource
- Resource Determined NRHP Eligible (DOE)
- Contributing Resource to Wyse Fork Battlefield
- Contributing Resource to Wyse Fork Battlefield and DOE
- Historic Property Boundary
- First Battle of Kinston Battlefields

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS

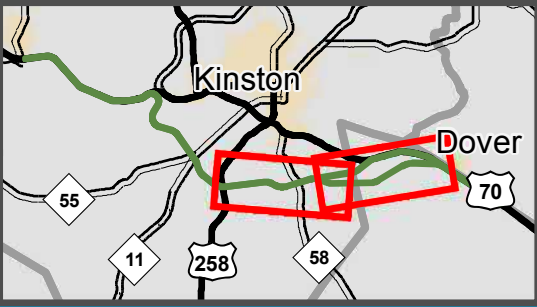











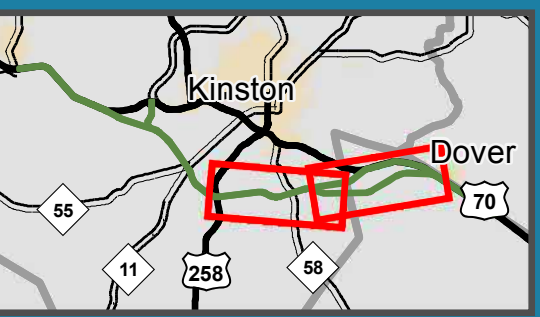
Figure 4-18:  
Historic architectural  
resource impacts -  
Alternatives 31 and 32 - B

**Legend**

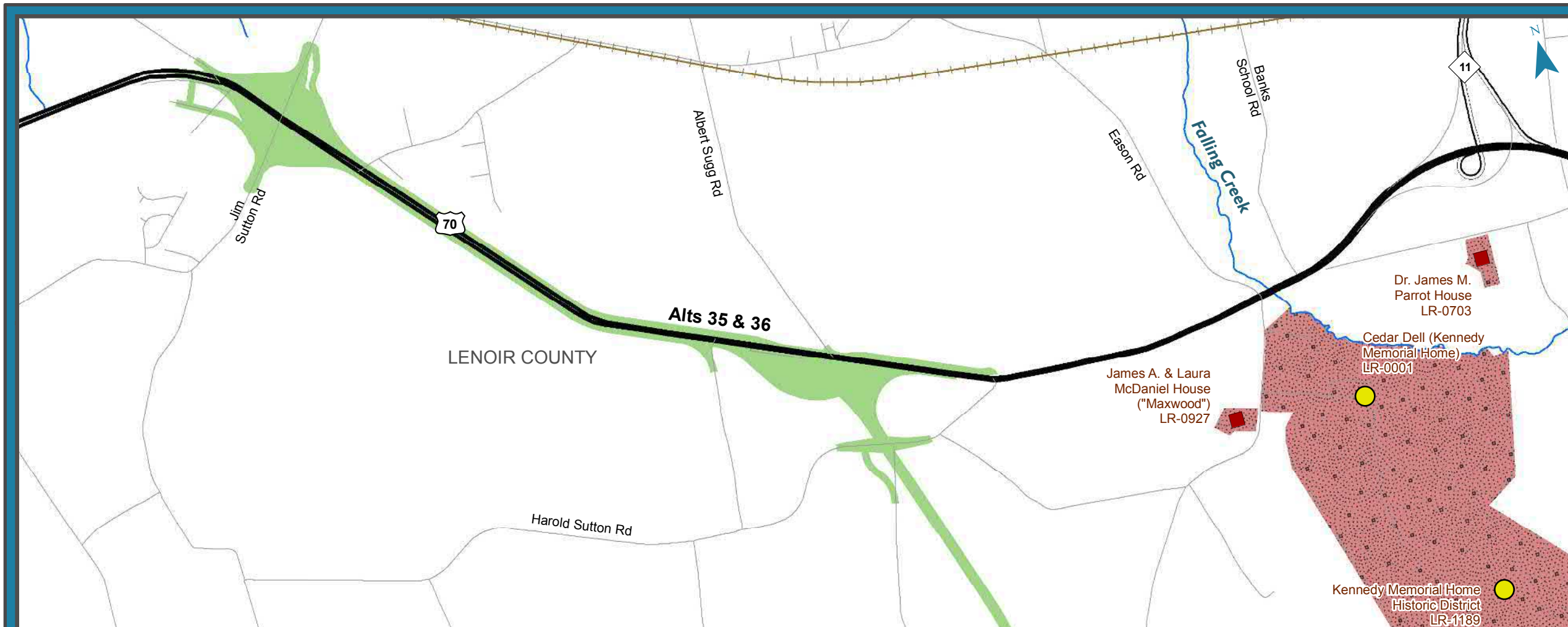
- Alts. 31 and 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NRHP Listed Resource
- Resource Determined NRHP Eligible (DOE)
- Contributing Resource to Wyse Fork Battlefield
- Contributing Resource to Wyse Fork Battlefield and DOE
- Historic Property Boundary
- First Battle of Kinston Battlefield


0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS










**KINSTON BYPASS**  
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**Figure 4-19:**  
Historic architectural  
resource impacts -  
Alternatives 35 and 36 - A

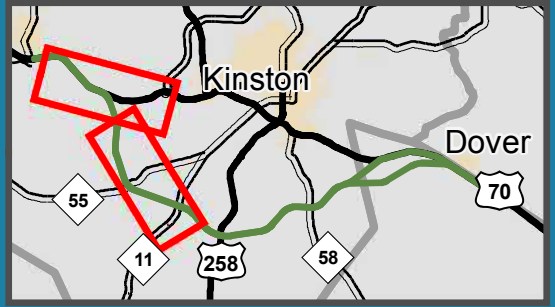
**Legend**

- Alts. 35 and 36 ROW
- Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NRHP Listed Resource
- Resource Determined NRHP Eligible (DOE)
- Contributing Resource to Wyse Fork Battlefield
- Contributing Resource to Wyse Fork Battlefield and DOE
- Historic Property Boundary
- First Battle of Kinston Battlefields

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





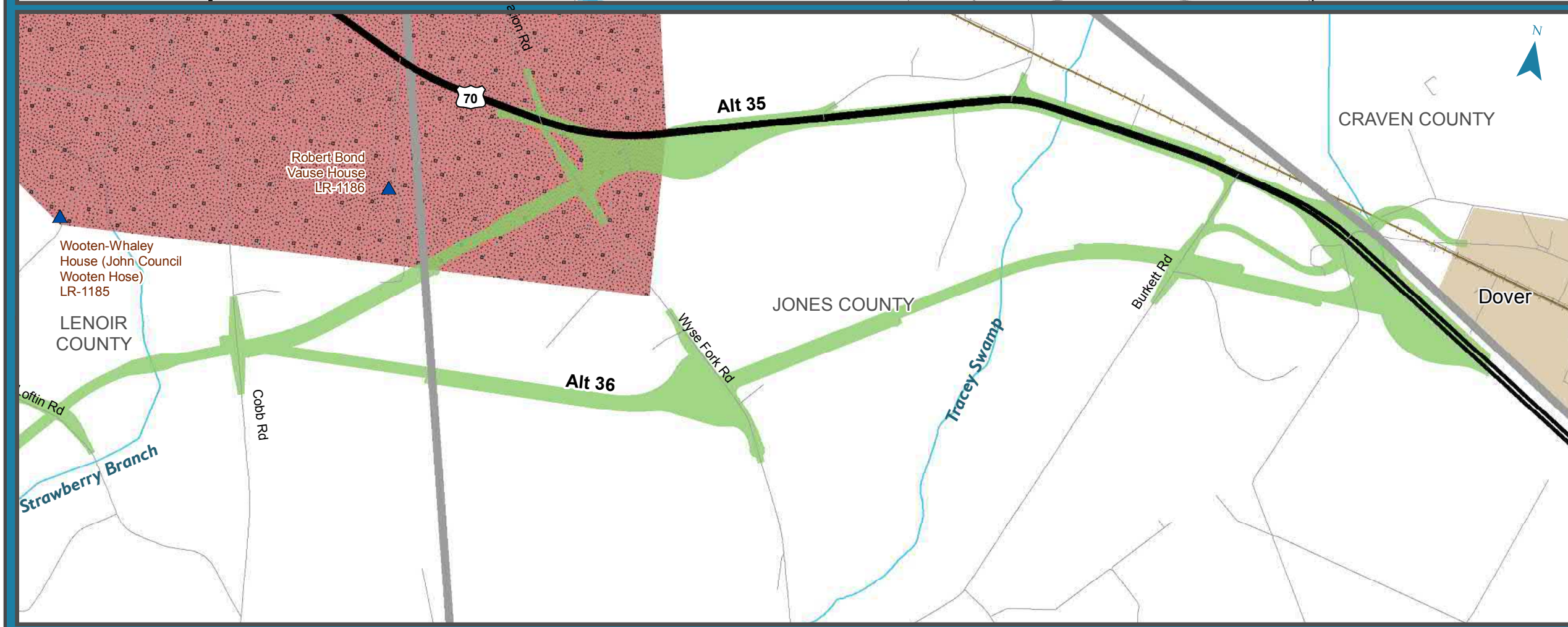
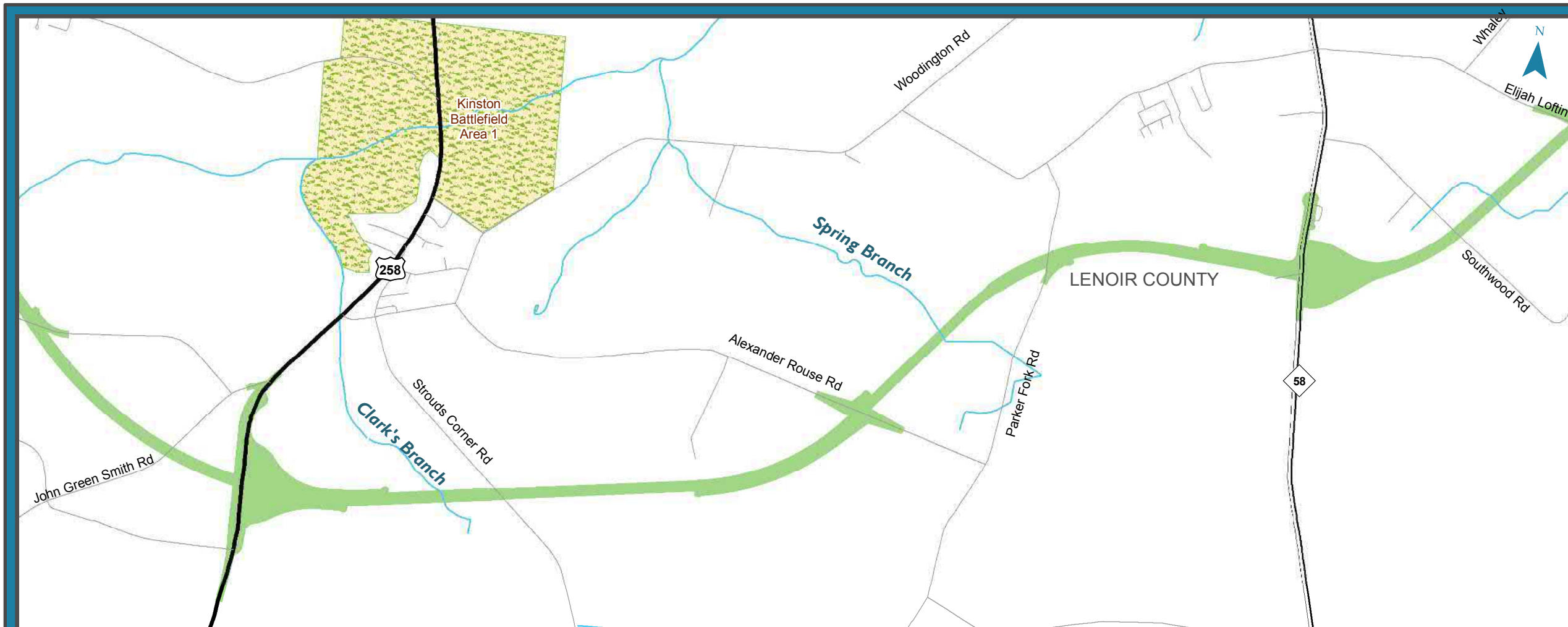


Figure 4-20:

Historic architectural

resource impacts -

Alternatives 35 and 36 - B

Legend

Alts. 35 and 36 ROW

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

NRHP Listed Resource

Resource Determined NRHP Eligible (DOE)

Contributing Resource to Wyse Fork Battlefield

Contributing Resource to Wyse Fork Battlefield and DOE

Historic Property Boundary

First Battle of Kinston Battlefields

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

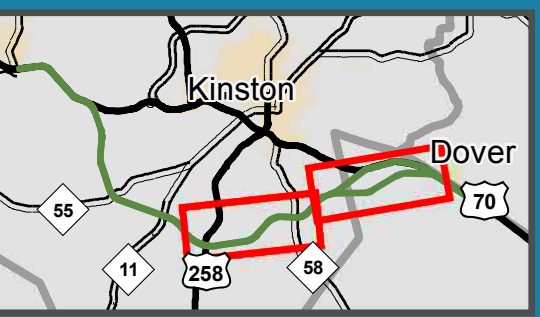
This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NConemap, NRCS, USFWS





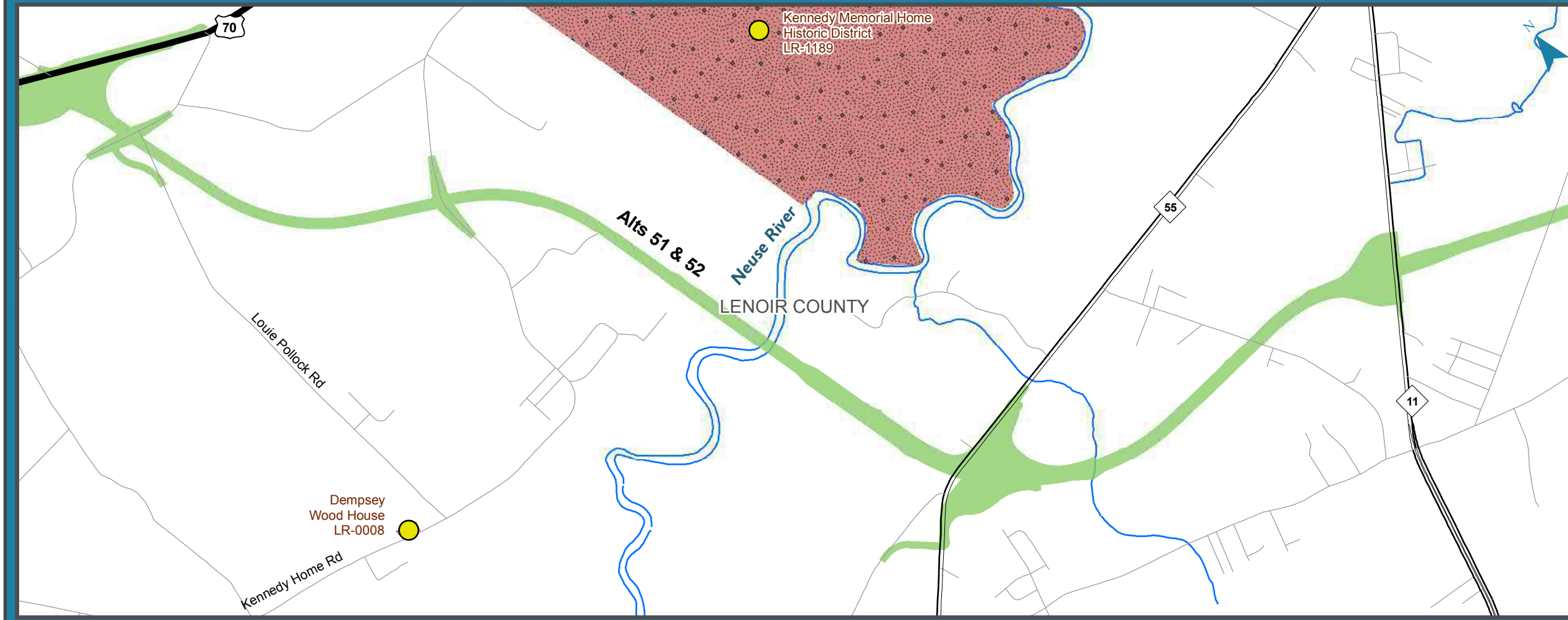
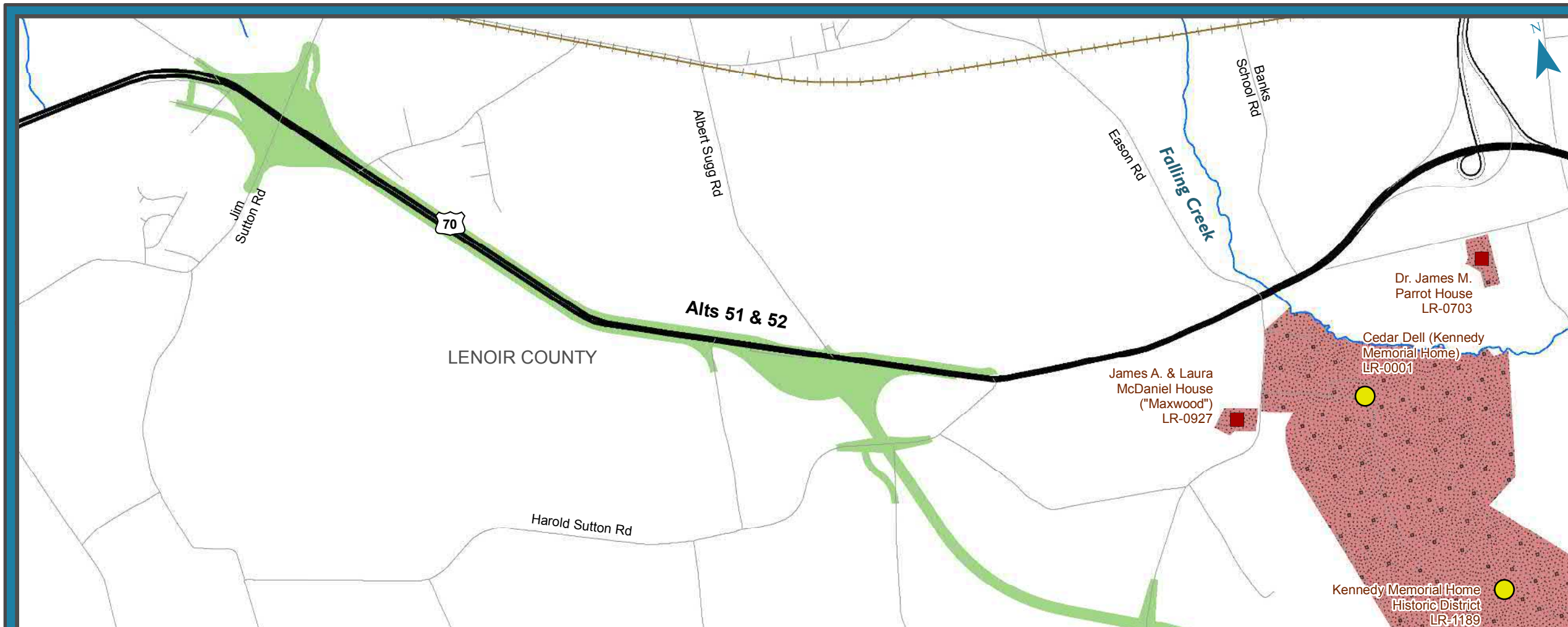


Figure 4-21:  
Historic architectural  
resource impacts -  
Alternatives 51 and 52 - A

**Legend**

- Alts. 51 and 52 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NRHP Listed Resource
- Resource Determined NRHP Eligible (DOE)
- Contributing Resource to Wyse Fork Battlefield
- Contributing Resource to Wyse Fork Battlefield and DOE
- Historic Property Boundary
- First Battle of Kinston Battlefields

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS

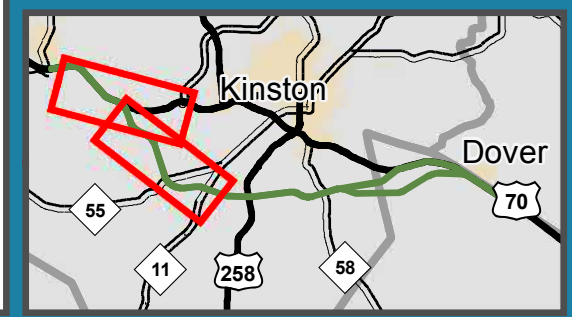







Figure 4-22:  
Historic architectural  
resource impacts -  
Alternatives 51 and 52 - B

- Legend**
- Alts. 51 and 52 ROW
  - Railroad
  - US Highway
  - NC Highway
  - Secondary Road
  - Municipal Boundary
  - County Boundary
  - NRHP Listed Resource
  - Resource Determined NRHP Eligible (DOE)
  - Contributing Resource to Wyse Fork Battlefield
  - Contributing Resource to Wyse Fork Battlefield and DOE
  - Historic Property Boundary
  - First Battle of Kinston Battlefields



  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

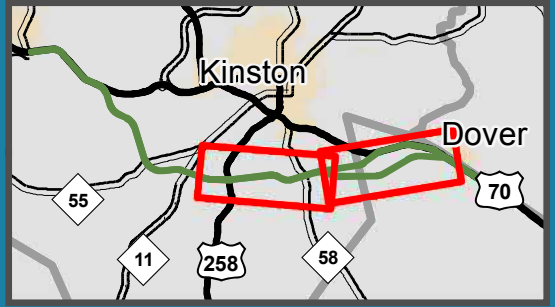








Figure 4-24:  
Historic architectural  
resource impacts -  
Alternatives 63 and 65 - B

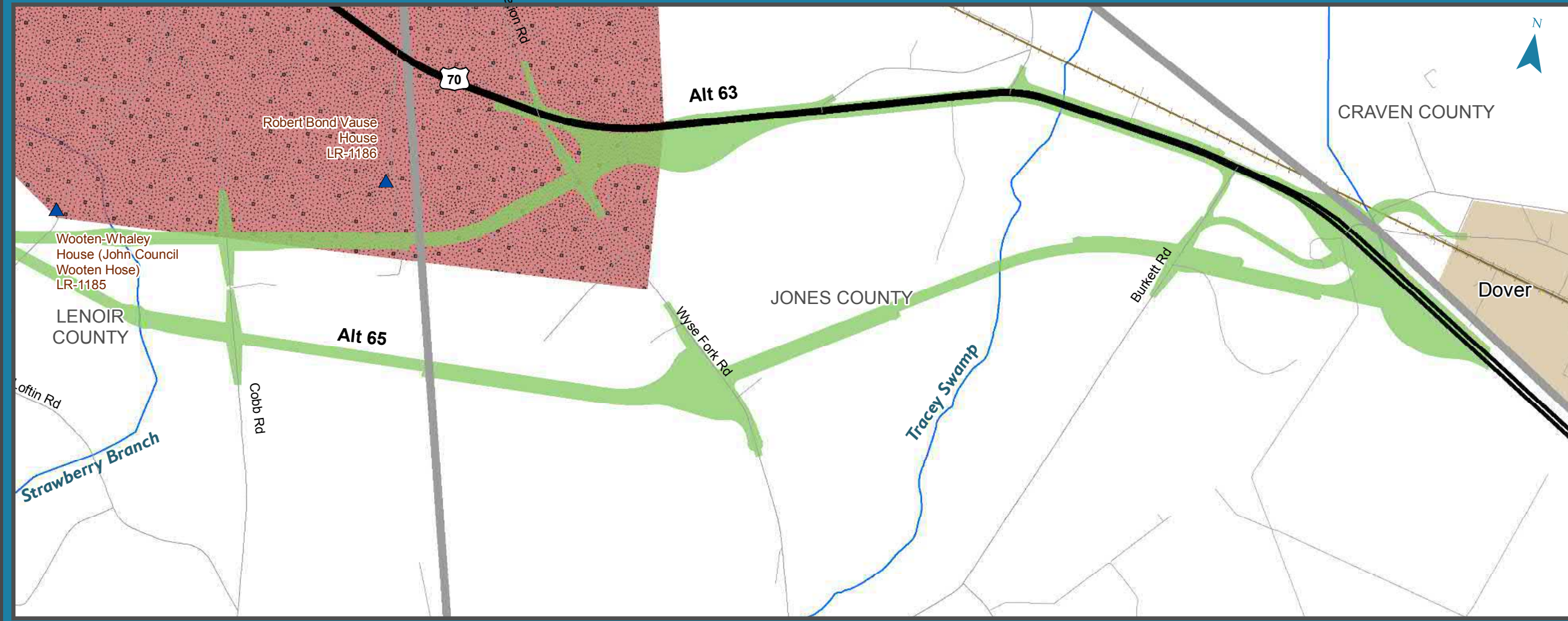
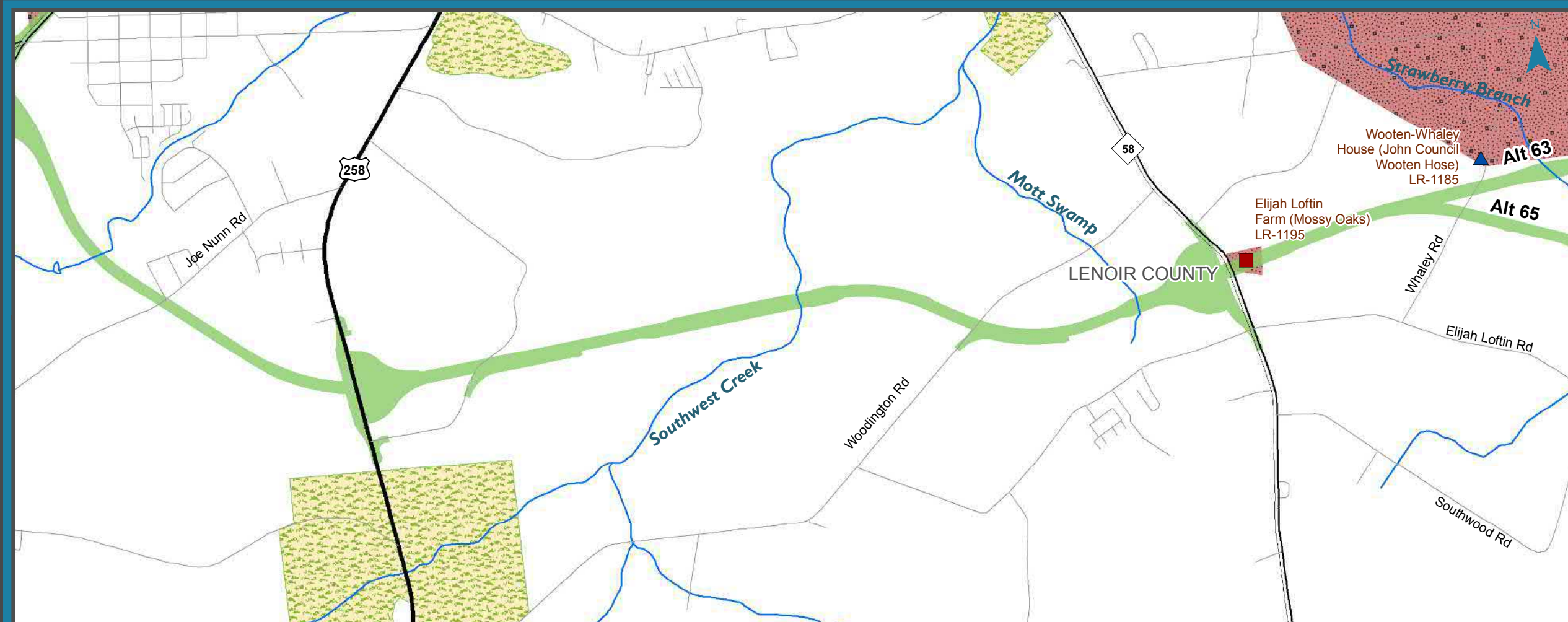
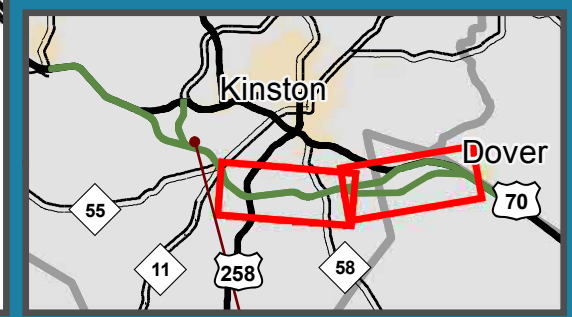
**Legend**

- Alts. 63 and 65 ROW
- Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NRHP Listed Resource
- Resource Determined NRHP Eligible (DOE)
- Contributing Resource to Wyse Fork Battlefield
- Contributing Resource to Wyse Fork Battlefield and DOE
- Historic Property Boundary
- First Battle of Kinston Battlefields

0 0.25 0.5  
Miles



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NCONemap, NRCS, USFWS



#### 4.4.2 Archaeological Resources

Based on the October 2017 update of the archaeological predictive model results, the following summarizes potential impacts to high- and low-probability areas (Table 4-10). Of the 12 DSAs under consideration, Alternatives 1UE, 1SB, 12, 32, and 63 have the most potential to encounter and affect archaeological resources. Conversely, Alternatives 35, 36, 51, and 65 have the least potential to affect archaeological resources (NCDOT 2017g). The five sites associated with the First Battle of Kinston are not anticipated to be impacted by any of the DSAs.

Archaeological field work will be conducted once the applicant's preferred alternative is selected.

**Table 4-10: Archaeological probability for Kinston Bypass DSAs**

Alternative	High Probability (acres)	High Probability (%)	Low Probability (acres)	Low Probability (%)	Total (acres)
1SB	1,132	64.5	624	35.5	1,756
12	771	55.4	622	44.6	1,393
32	736	54.7	610	45.3	1,346
1UE	842	53.2	742	46.8	1,584
63	703	50.5	688	49.5	1,391
52	687	49.9	691	50.1	1,378
11	654	47.7	716	52.3	1,369
31	606	46.2	707	53.8	1,313
65	558	41.4	791	58.6	1,349
51	513	39.9	773	60.1	1,286
35	635	39.9	957	60.1	1,593
36	563	37.7	929	62.3	1,491

Source: NCDOT 2017g

Note: Sorted (descending) by high probability percentage.

#### 4.5 VISUAL QUALITY AND AESTHETICS

Visual impacts to the rural and agricultural landscape are likely to result along the corridors that predominantly traverse agricultural land.

The design of the project's mainline, interchanges, and crossings of roadways, railways, and waterways dictates the project be constructed above grade. Portions of Alternative 1SB would be elevated over the floodplain, and other DSAs would include areas where the mainline crosses over secondary roads or railroads. Due to the region's flat terrain, elevated portions of the roadway would be highly visible to those living within the view sheds. In wooded areas or locations with a built environment, the view sheds are already obstructed by buildings, trees, and



other structures, and thus the proposed action would not have as much of an adverse impact to the view shed. Agricultural zones and low density residential areas with low levels of development and relatively clear view shed would have a higher degree of visual impacts. These types of areas are more associated with Alternatives 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 as opposed to Alternatives 1UE and 1SB. The highway will be landscaped to improve the aesthetic quality of the view shed.

In general, visual quality would be enhanced or improved for those using the highway and degraded for those viewing the highway from surrounding communities. The proposed action would provide motorists opportunities for scenic views across agricultural fields, the Neuse River, and forested areas, which would be a positive effect. In the urban settings, visual impacts are still possible, but the project context is more in line with urban land uses and would likely be in context to the surrounding areas.

Additional lighting near the transportation nodes where there are interchanges could be noticeable in rural areas where it is currently absent. Context sensitive designs will be used in areas along the applicant's preferred alternative where visual/aesthetic impacts are likely.

## **4.6 NATURAL RESOURCES**

### **4.6.1 Geology, Topography, Soils**

No major changes to geology or topography are anticipated as a result of any of the DSAs or the No-Build Alternative. Bridge structures and grade separations may require some fill or excavation to topography in the vicinity of the larger stream and wetland systems. Otherwise, it is anticipated that existing elevations would be maintained along the remainder of the routes.

Soil properties along the applicant's preferred alternative could affect the final engineering design of the proposed action. The most common soil limitations within the project study area include poor drainage, high water table, susceptibility to flooding, and loose, sandy soils. Soil borings will be taken after selection of the applicant's preferred alternative to inform the design. There are no soils impacts associated with the No-Build Alternative.

Best management practices and sediment and erosion control plans will be implemented to minimize soil compaction and erosion outside of the construction area as required and to the extent practicable.

### **4.6.2 Surface Water and Water Quality**

Stormwater runoff from roadways carries materials that can degrade water quality and aquatic habitat integrity, such as silt, heavy metals, petroleum products, nitrogen, and phosphorous. The effects on water quality vary based on the size of the waterways crossed, the number of such crossings, and the season of construction. Streams with low flow are more severely impacted since they have less volume to dilute the runoff.

Soil erosion and sedimentation may cause short-term impacts to water quality within the project area and, if uncontrolled, could potentially destroy aquatic algae, eliminate benthic (bottom dwelling) macroinvertebrate habitat, eradicate fish-spawning habitat, and remove food sources for many stream species. Potential impacts will be considered for the communities where construction activities would occur as well as downstream communities. Long-term impacts on

water quality are possible due to the particulates, heavy metals, organic matter, pesticides, herbicides, nutrients, and bacteria that can be found in highway runoff.

The following are potential impacts to water resources that could occur in any of the DSAs:

- Increased sediment loading and siltation as a consequence of watershed vegetation removal, erosion, and/or construction
- Decreased light penetration/water clarity from increased sedimentation
- Changes in water temperature due to vegetation removal
- Changes in the amount of available organic matter due to vegetation removal
- Increased concentration of toxic compounds from highway runoff, construction activities and equipment, and spills from construction equipment
- Alteration of water levels and flows as a result of interruptions and/or additions to surface water and groundwater flow from construction

In accordance with the North Carolina Sedimentation Pollution Control Act of 1973 (GS Chapter 113A, Art. 4), as amended, and NCAC Title 15A, Chapter 4 (Sedimentation Control), an erosion and sedimentation control plan must be prepared for land-disturbing activities that cover one or more acres to protect against runoff from a 10-year storm.

An erosion and sedimentation control plan will be developed for the applicant's preferred alternative prior to construction. The plan will be prepared in accordance with the NCDENR publication *Erosion and Sediment Control Planning and Design Manual* (NCDENR 2006) and the NCDOT's *Best Management Practices for Protection of Surface Waters* (NCDOT 1997).

The *Standard Specifications for Roads and Structures* requires proper handling and use of construction materials and loose, sandy, or organic soils (NCDOT 2012c). The contractor will be responsible for taking every reasonable precaution throughout the construction of the project to prevent the pollution of any body of water. The contractor also will be responsible for preventing soil erosion and stream siltation.

There are no streams with Primary Nursery Area, Outstanding Resource Waters, or High Quality Waters designations within the NRTR study area. The DSAs would not impact any designated Shellfish Growing Area waters.

Impacts to each stream channel are discussed further in section 4.7.2. Portions of the Neuse River and Falling Creek contain AFSA. The Neuse River also contains IPNA. Portions of the Neuse River, Bear Creek, and Squirrel Creek are part of a water supply watershed and designated as WS-IV, meaning they occur in a highly developed water supply watershed (NCDEQ 2017a). None of the DSAs would result in any impacts to AFSA and IPNA. As discussed in the NRTR, Alternatives 35 and 36 would each result in impacts to streams within a WS-IV watershed. The No-Build Alternative is not anticipated to impact water quality.



### 4.6.3 Biotic Resources

#### 4.6.3.1 Terrestrial Communities

Terrestrial communities in the NRTR study area would be impacted by project construction as a result of clearing of vegetation, grading, and paving. Impacts to terrestrial communities are shown in Table 4-11. The No-Build Alternative would not impact terrestrial communities.

**Table 4-1 I: Impacts to terrestrial communities**

Alternative	Maintained/ Disturbed	Agriculture	Pine Plantation	Forested Upland	Palustrine Wetland	Open Water	Total
Alt 1 UE (acres)	706.2	317.9	73.0	21.5	98.3	3.5	1220
Alt 1SB (acres)	516.6	507.9	148.5	25.3	97.4	13.7	1309
Alt 11 (acres)	264.2	672.2	246.7	28.0	98.2	3.9	1313
Alt 12 (acres)	346.3	689.6	193.0	19.9	86.6	2.3	1338
Alt 31 (acres)	242.3	664.6	242.6	27.9	97.0	3.9	1278
Alt 32 (acres)	324.3	682.3	188.7	19.7	85.4	2.3	1303
Alt 35 (acres)	312.7	714.1	265.3	29.7	117.3	4.0	1443
Alt 36 (acres)	230.1	699.9	305.1	38.0	130.7	5.6	1409
Alt 51 (acres)	214.9	637.3	266.1	34.2	115.1	5.6	1273
Alt 52 (acres)	297.6	655.6	212.4	26.0	103.5	4.0	1299
Alt 63 (acres)	315.5	667.8	211.3	19.4	114.8	4.3	1333
Alt 65 (acres)	232.8	648.9	265.1	27.6	126.3	5.9	1307

Note: Impacts were calculated using right-of-way limits of the functional designs.

#### **4.6.3.2 Wildlife**

Terrestrial communities found along the DSAs serve as shelter, nesting, and foraging habitat for numerous species of wildlife. Any of the DSAs would result in direct impact to both natural and altered terrestrial communities through clearing of vegetation, grading, and paving. The forested upland and palustrine wetland community types provide relatively undisturbed forest and aquatic habitat for wildlife.

#### **4.6.3.3 Invasive Species**

Trucks and heavy equipment associated with project construction may introduce or transport seeds from terrestrial, non-native vegetation, resulting in colonization of existing or newly created vacant spaces with exotic vegetation. Impacts could occur during cut-and-fill and temporary or permanent clearing within the limits of the proposed construction. The No-Build Alternative would not result in any invasive species impacts.

Species that appear on the NCDOT Invasive Exotic Plant List for North Carolina (NCDOT 2012b) will be identified and their presence noted, where applicable, during field investigations once the applicant's preferred alternative is selected.

#### **4.6.4 Aquatic Resources**

Aquatic communities found along the DSAs include habitats ranging from small, intermittent brownwater tributaries, to large perennial slow-moving bottomland hardwood systems. These communities support various fish, reptile, and amphibian species, as well as mollusks and crustaceans. Any of the DSAs would result in direct impact to the aquatic communities they cross through clearing of vegetation, grading, and paving. Due to the fact that extensive field investigations did not take place during the development of the NRTR, data on aquatic species are limited to field visits conducted during verification of model data, other brief field activities, and landowner accounts. A list of aquatic species that could be expected to be present is provided in Appendix F. Aquatic wildlife that were directly observed or determined to be present through evidence during field visits or landowner accounts are indicated with an asterisk (\*) in Appendix F.

#### **4.6.5 Protected and Conservation Lands**

##### **4.6.5.1 Hazard Mitigation Grant Program Properties**

NCDOT began coordination with FHWA, FEMA Region IV, and NCDEM in December 2013 to develop a plan to address potential impacts to HMGP properties from the proposed action. Potential impacts were disclosed and HMGP compliance strategies were discussed. The coordination resulted in a three-phased approach that will be used to maintain contact with and provide project updates to FEMA and NCDEM throughout the project development and decision-making phase. Phase I of this approach has been completed, and consisted of a coordination meeting that reviewed the project alternatives screening process. Phase II will occur after the selection of the applicant's preferred alternative and Phase III will occur during the 30 percent hydraulic review phase of the design process (NCDOT 2014).



Only Alternatives 1UE and 1SB would impact HMGP properties. Alternative 1UE would impact all or a portion of 21 properties, totaling 21.7 acres. Alternative 1SB would impact all or a portion of 54 properties, totaling 20.9 acres. Impacts to the properties would not occur at proposed bridge locations. The No-Build Alternative would not impact HMGP properties.

Impacts to HMGP properties will be avoided and minimized to the extent practicable during final project design. NCDOT's coordination with FHWA, FEMA, and NCDDEM will ensure that any impacts will be mitigated to the fullest extent practicable.

#### 4.6.5.2 North Carolina Natural Heritage Program Managed Areas

Only four of the DSAs would have permanent impacts to NCNHP managed areas. Permanent impacts to NCNHP managed areas are shown in Table 4-12. Figure 4-25 through Figure 4-36 show the potential impacts to NCNHP resources. The No-Build Alternative would not impact NCNHP managed areas.

**Table 4-12: Impacts to NCNHP managed areas**

Alternative	Caswell Research Farm	NC Coastal Land Trust Preserve	NCDMS Easement	CSS Neuse & Governor Caswell Memorial	Total
Alt 1 UE (acres)	3.5	2.3	--	0.2	6
Alt 1SB (acres)	--	2.3	--	--	2.3
Alt 11 (acres)	--	--	--	--	--
Alt 12 (acres)	--	--	--	--	--
Alt 31 (acres)	--	--	6.1	--	6.1
Alt 32 (acres)	--	--	6.1	--	6.1
Alt 35 (acres)	--	--	--	--	--
Alt 36 (acres)	--	--	--	--	--
Alt 51 (acres)	--	--	--	--	--
Alt 52 (acres)	--	--	--	--	--
Alt 63 (acres)	--	--	--	--	--
Alt 65 (acres)	--	--	--	--	--

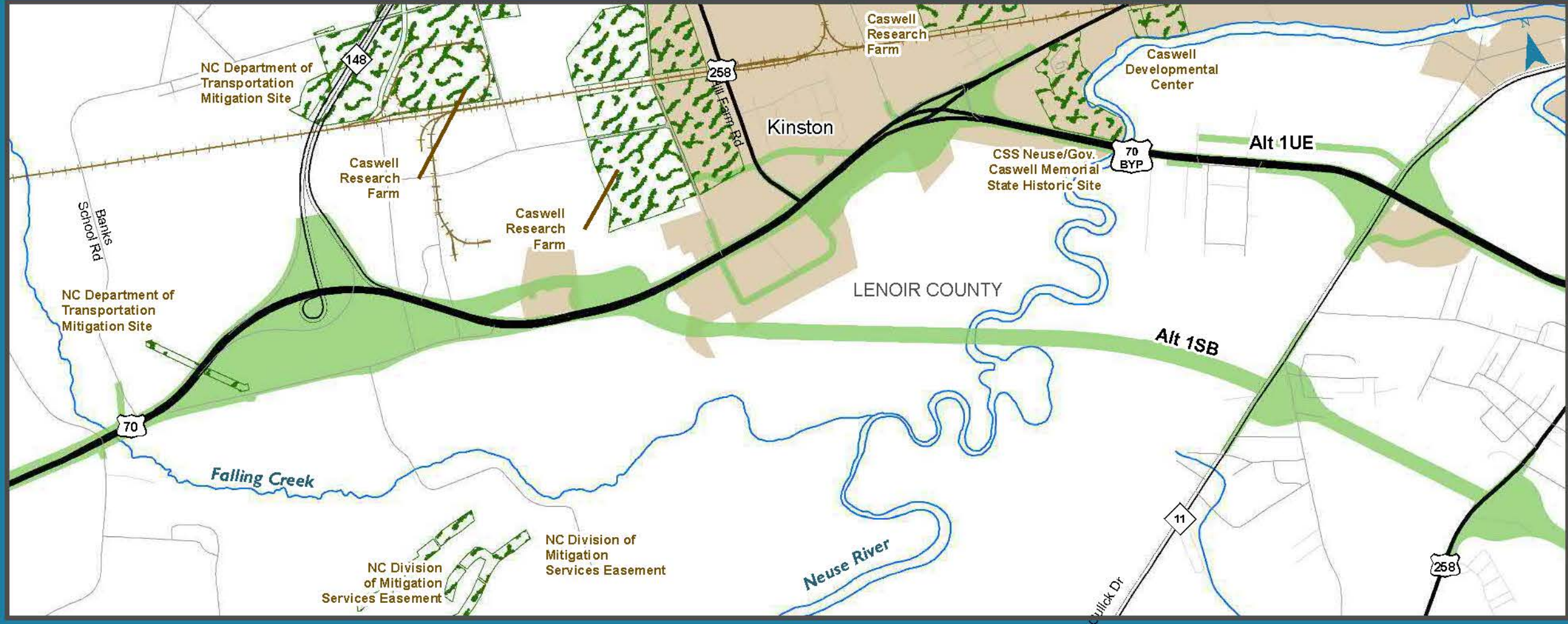
Note: Impacts were calculated using right-of-way limits of the functional designs.



Figure 4-25:  
NCNHP and mitigation  
resource impacts -  
Alternatives 1UE and 1SB - A

**Legend**

- Alts 1UE and 1SB ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas



0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





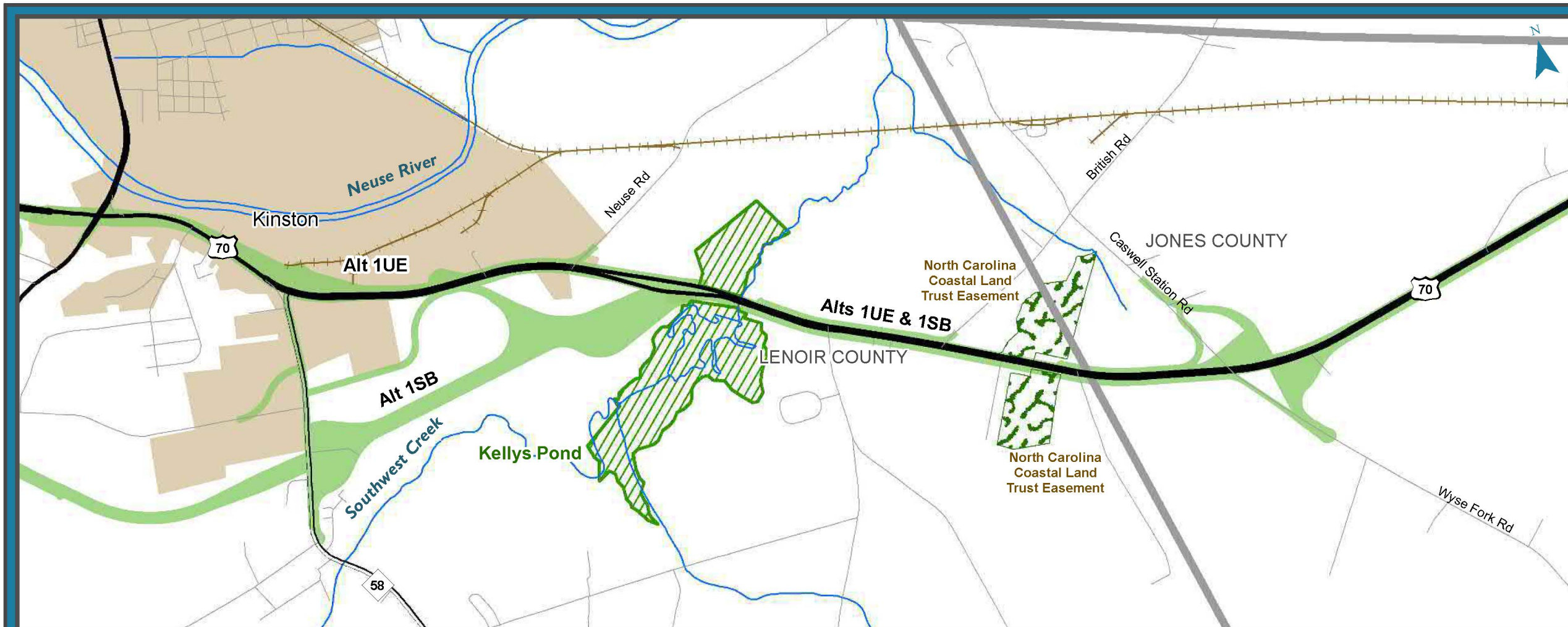
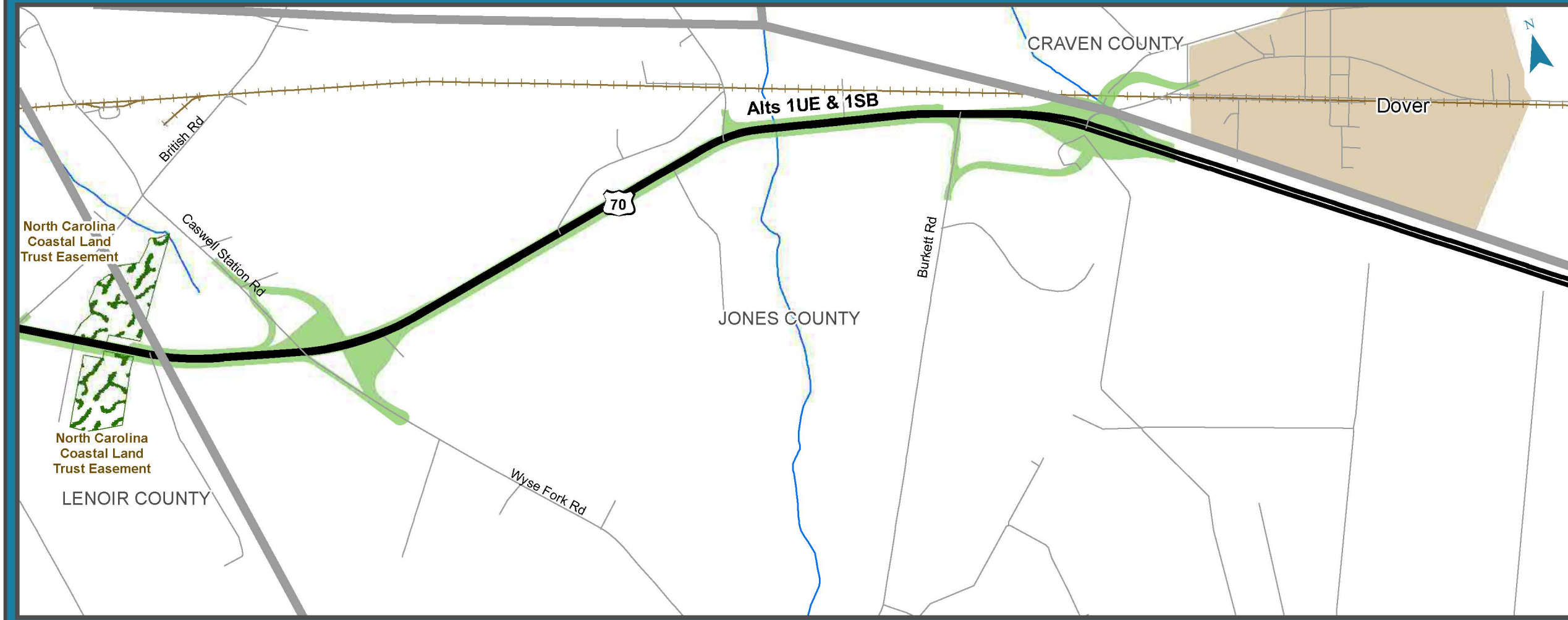
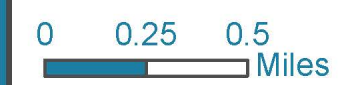



Figure 4-26:  
NCNHP and mitigation  
resource impacts -  
Alternatives 1UE and 1SB - B

**Legend**

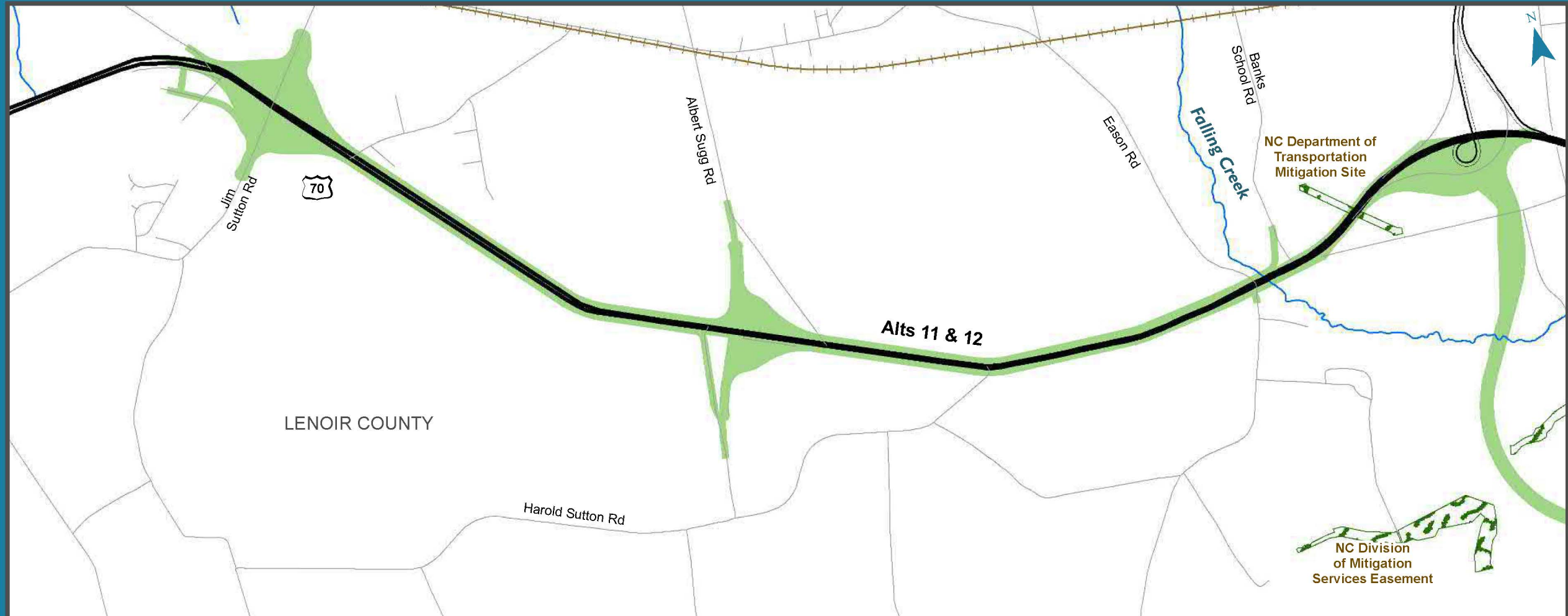
- Upgrade Existing Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- State Road
- Local Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas



  
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NCONemap, NRCS, USFWS







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Figure 4-27:  
NCNHP and mitigation  
resource impacts -  
Alternatives 11 and 12 - A

**Legend**

- Alts. 11 and 12 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas



0 0.25 0.5  
Miles



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NCONemap, NRCS, USFWS





Figure 4-28:  
NCNHP and mitigation  
resource impacts -  
Alternatives 11 and 12 - B

**Legend**

- Alts. 11 and 12 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas

0 0.25 0.5  
Miles



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Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCEM, NCEM, NRCS, USFWS

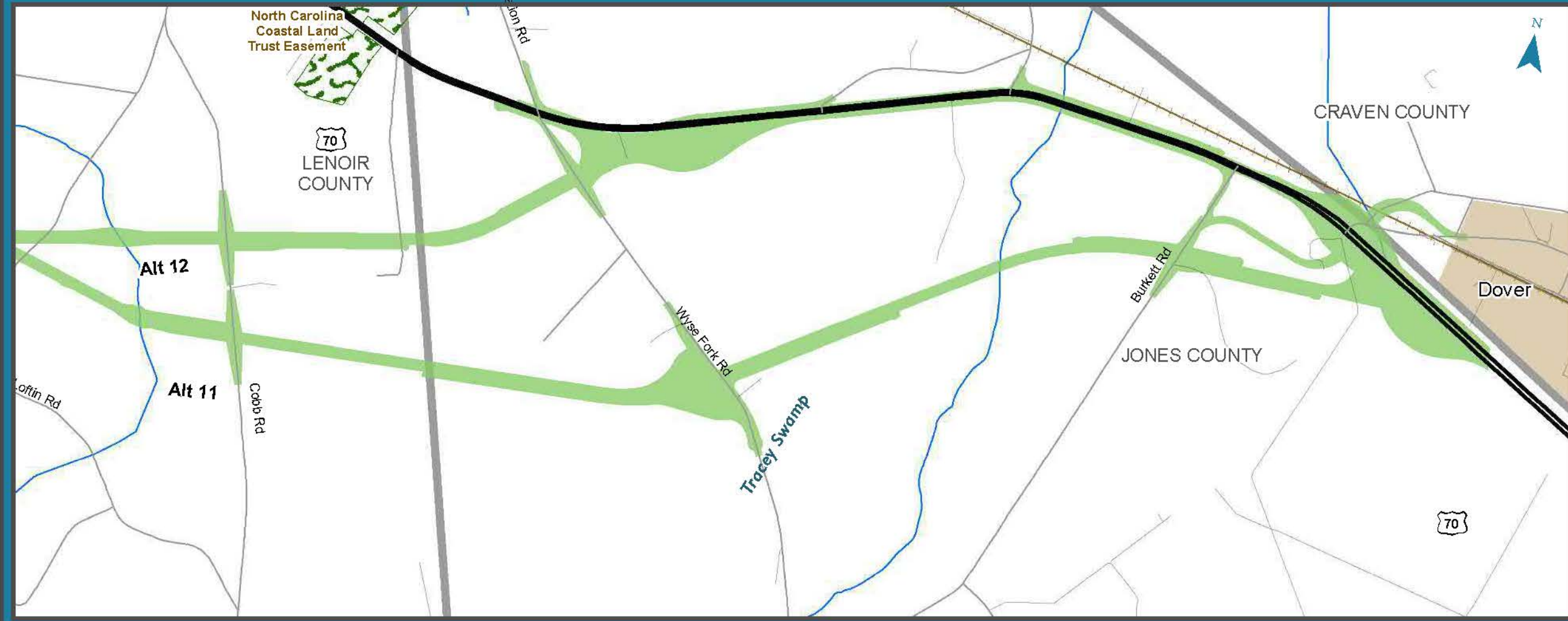
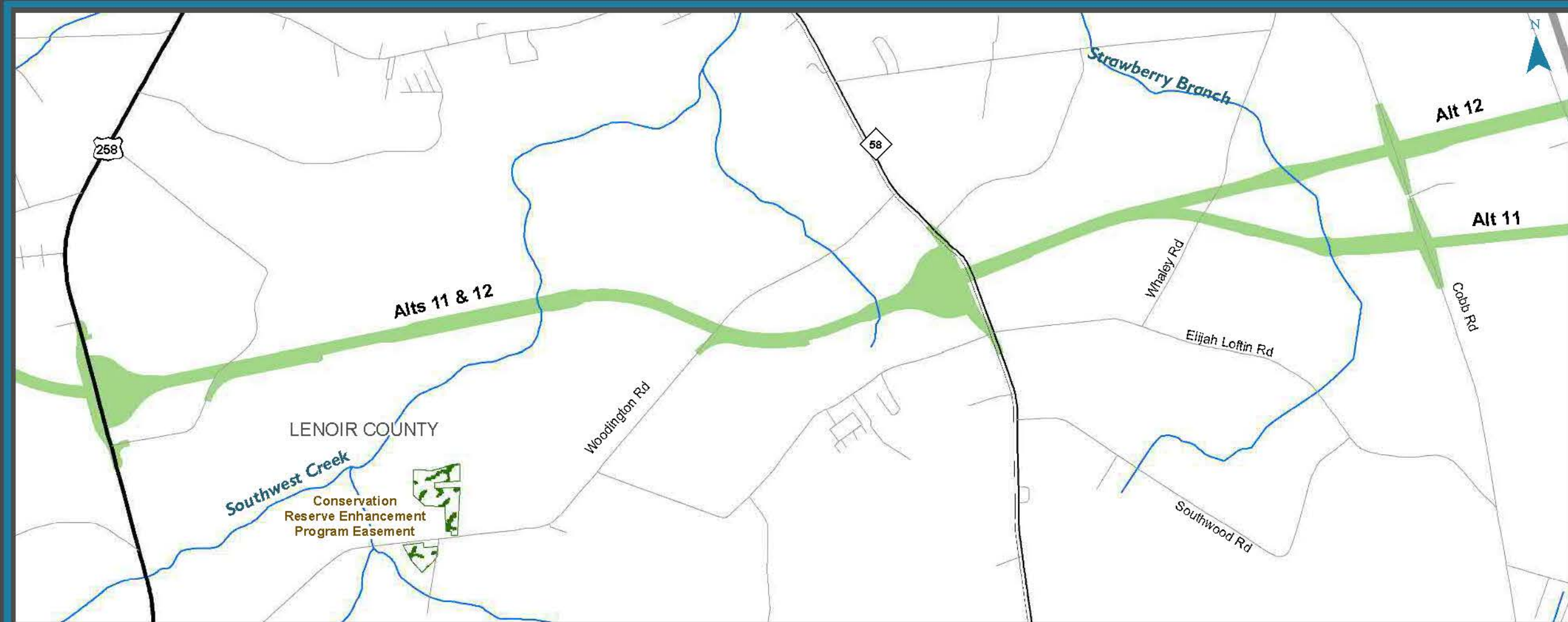
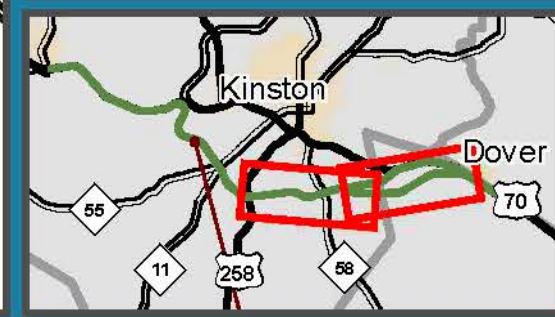
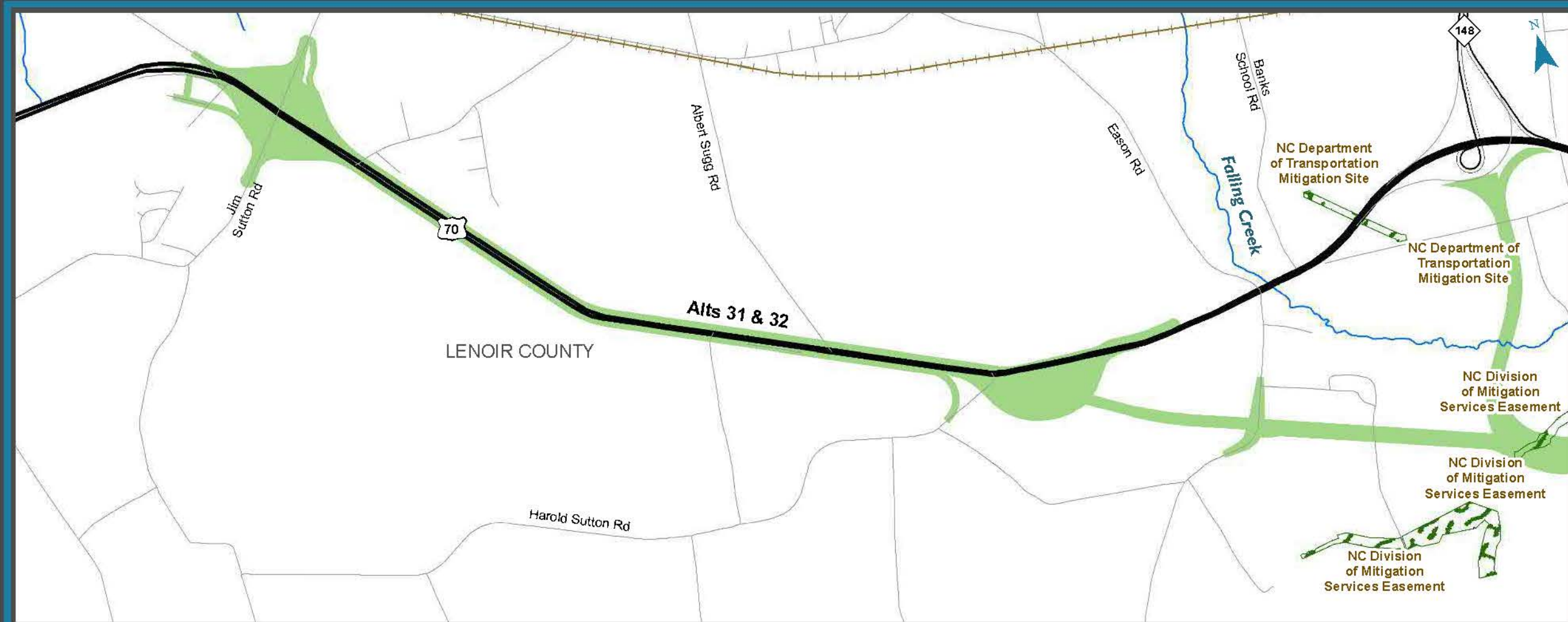




Figure 4-29:  
NCNHP and mitigation  
resource impacts -  
Alternatives 31 and 32 - A



- Legend**
- Alt. 31 and 32 ROW
  - Railroad
  - US Highway
  - NC Highway
  - Secondary Road
  - Municipal Boundary
  - County Boundary
  - NHP Natural Areas
  - NHP Managed Areas

0 0.25 0.5  
Miles



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Lenoir County, NCDOT, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

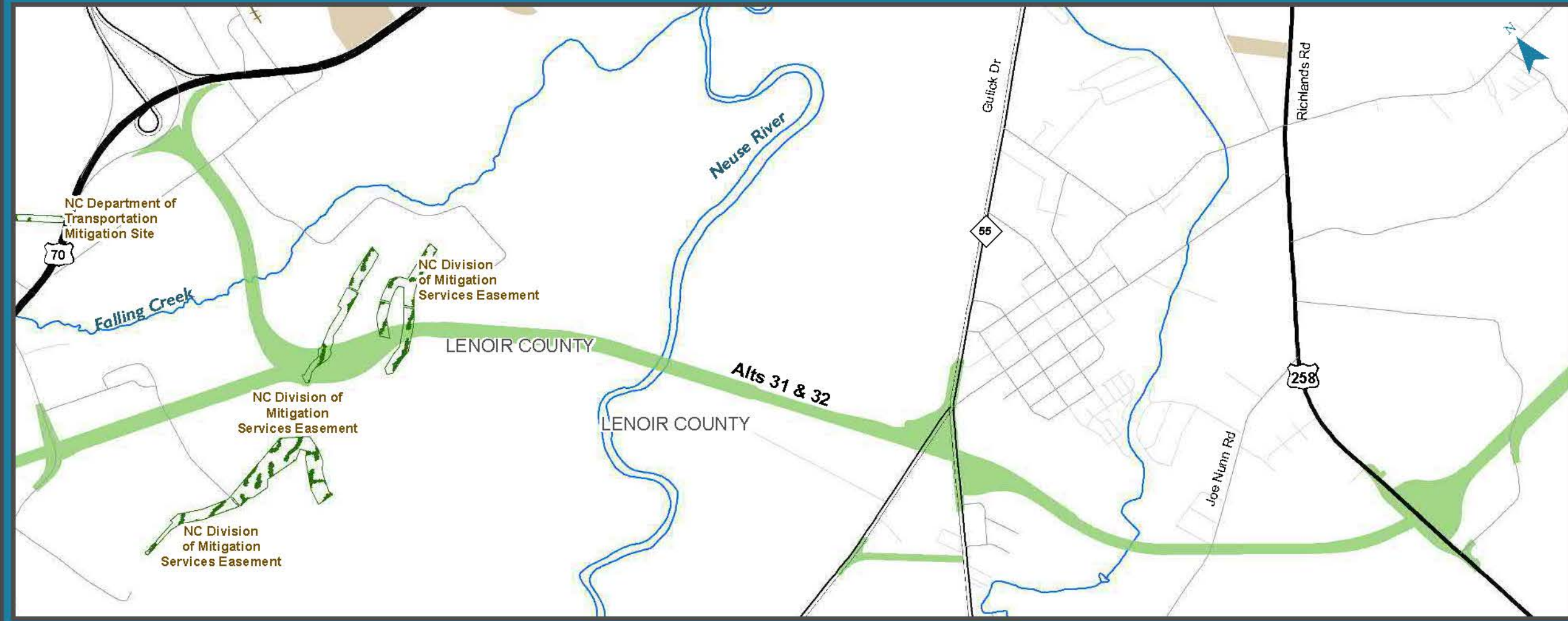
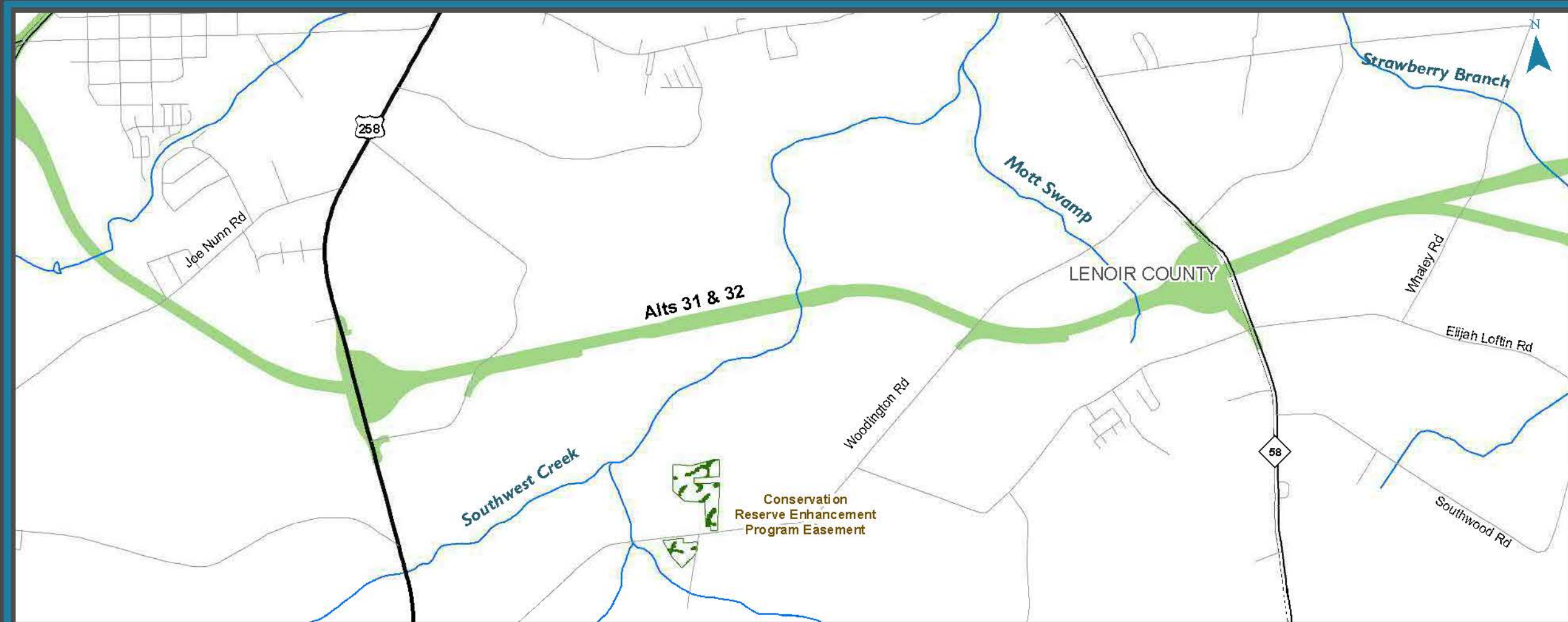




Figure 4-30:  
NCNHP and mitigation  
resource impacts -  
Alternatives 31 and 32 - B



**Legend**

- Alts. 31 and 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Local Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas



0 0.25 0.5  
Miles



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Lenoir County, NCDOT, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

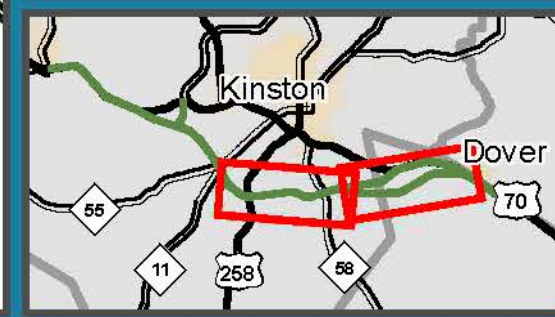




Figure 4-31:  
NCNHP and mitigation  
resource impacts -  
Alternatives 35 and 36 - A

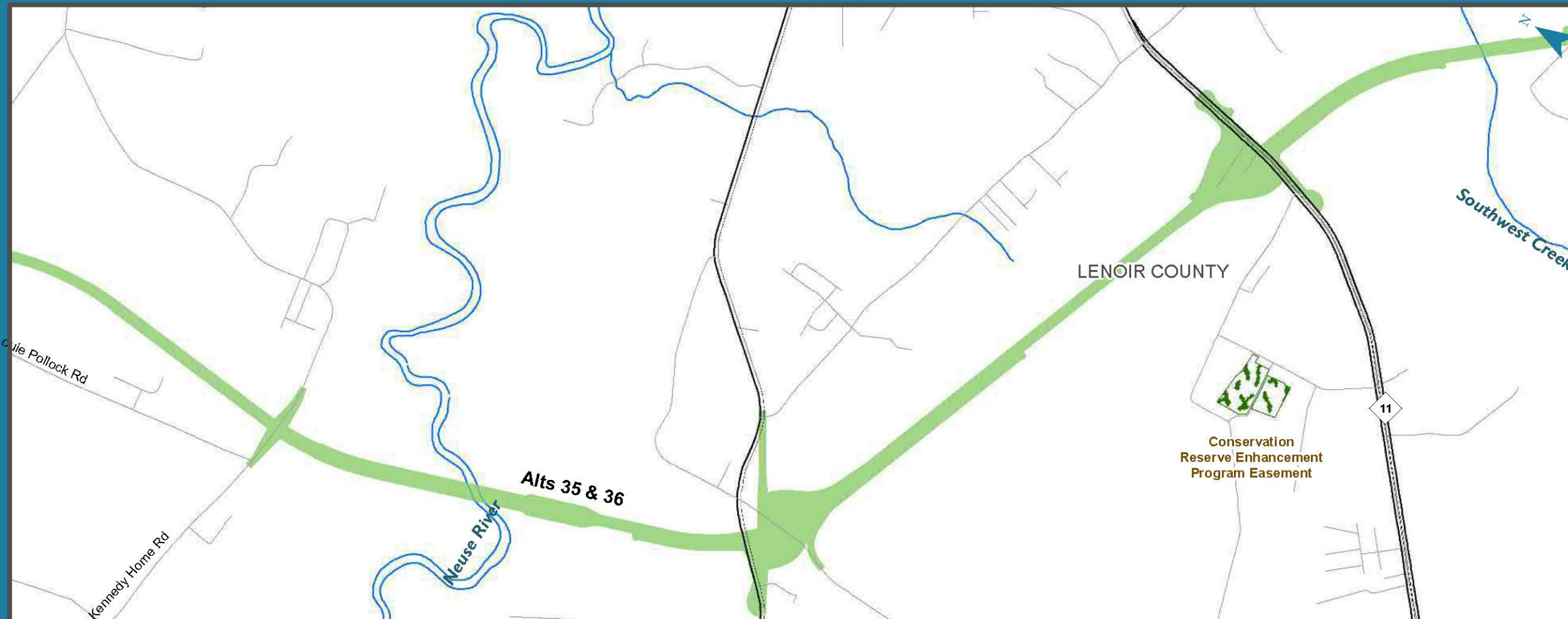
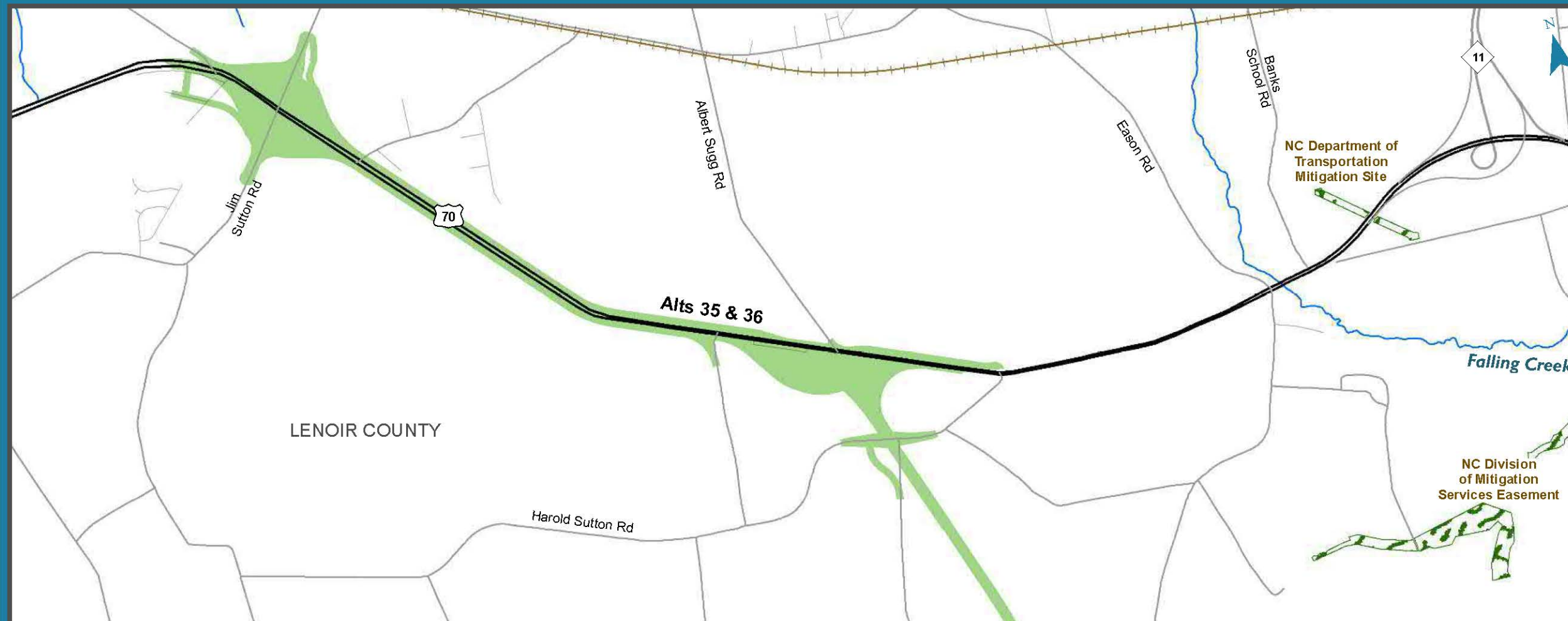
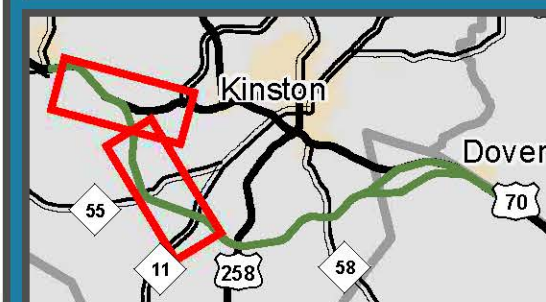
**Legend**

- Alts. 35 and 36 ROW
- Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- State Road
- Local Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas

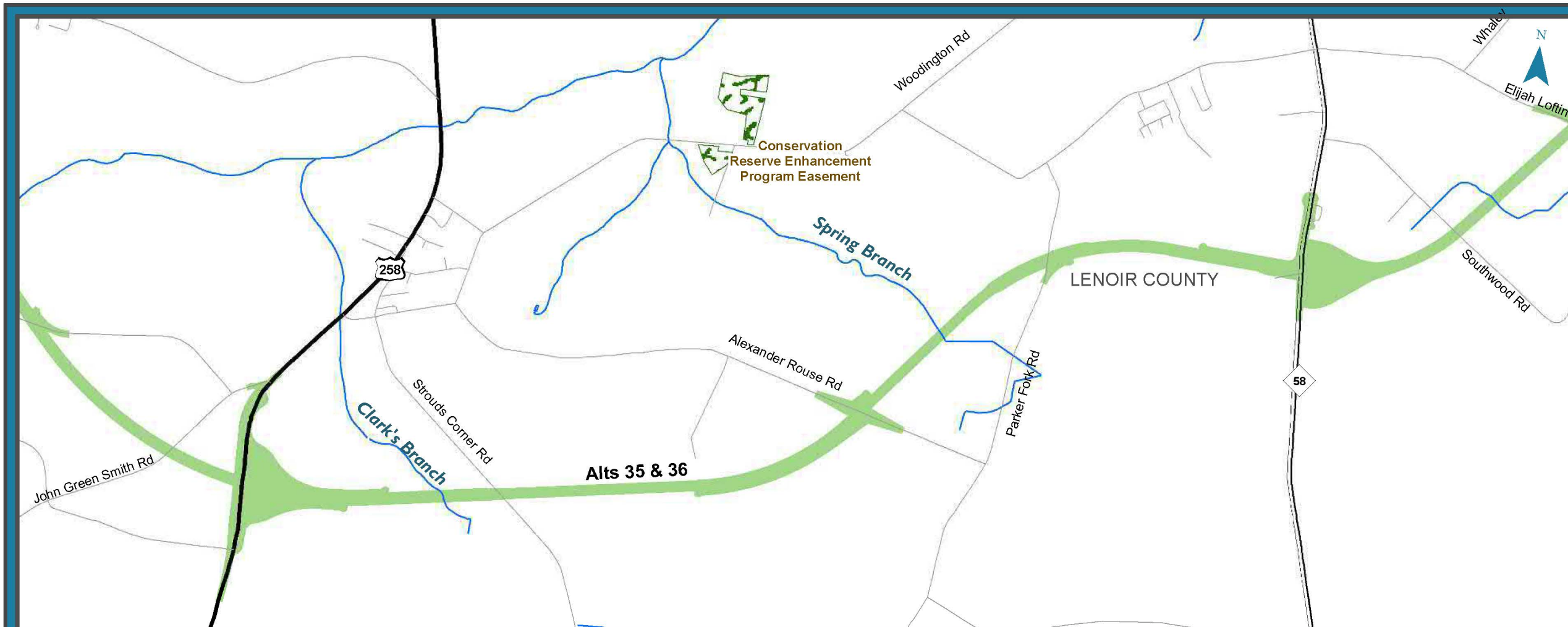
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NConemap, NRCS, USFWS









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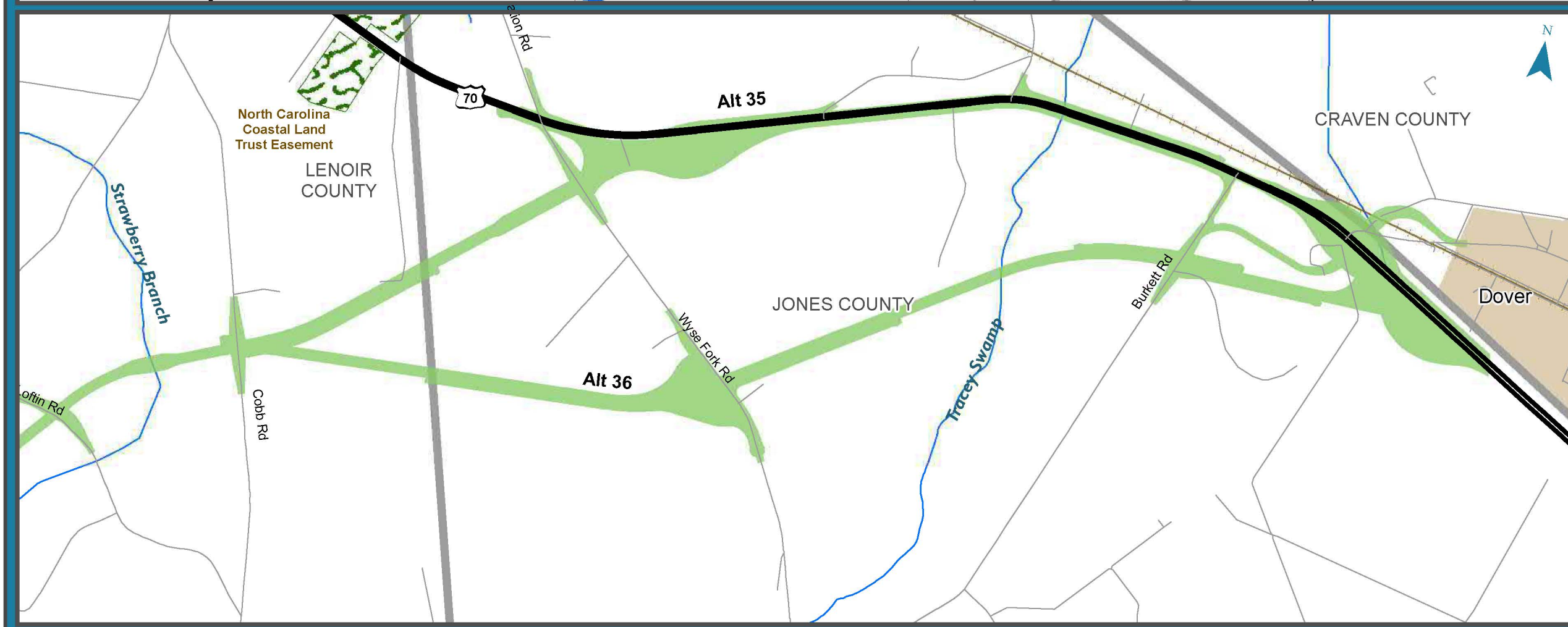
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Figure 4-32:  
NCNHP and mitigation  
resource impacts -  
Alternatives 35 and 36 - B

**Legend**

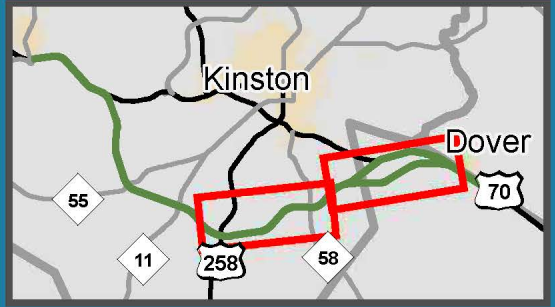
- Alts. 35 and 36 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas

0 0.25 0.5 Miles



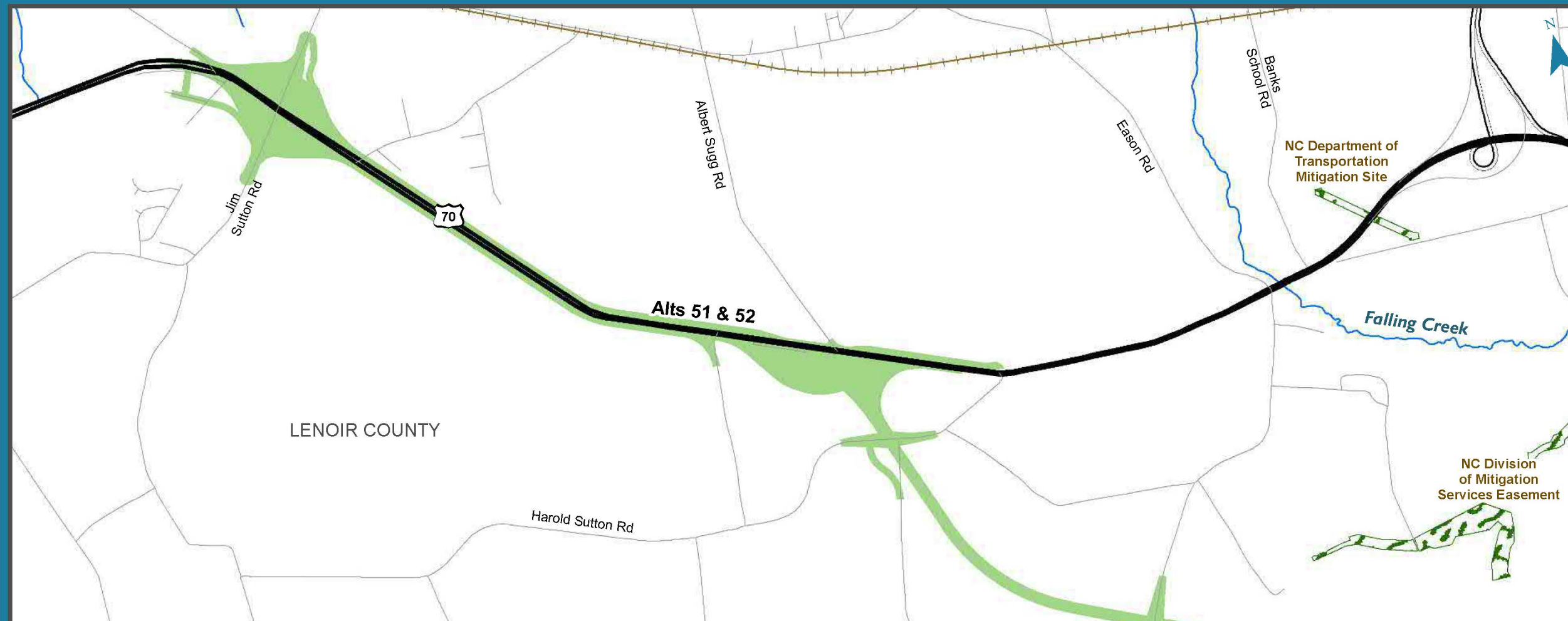


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 NConemap, NRCS, USFWS



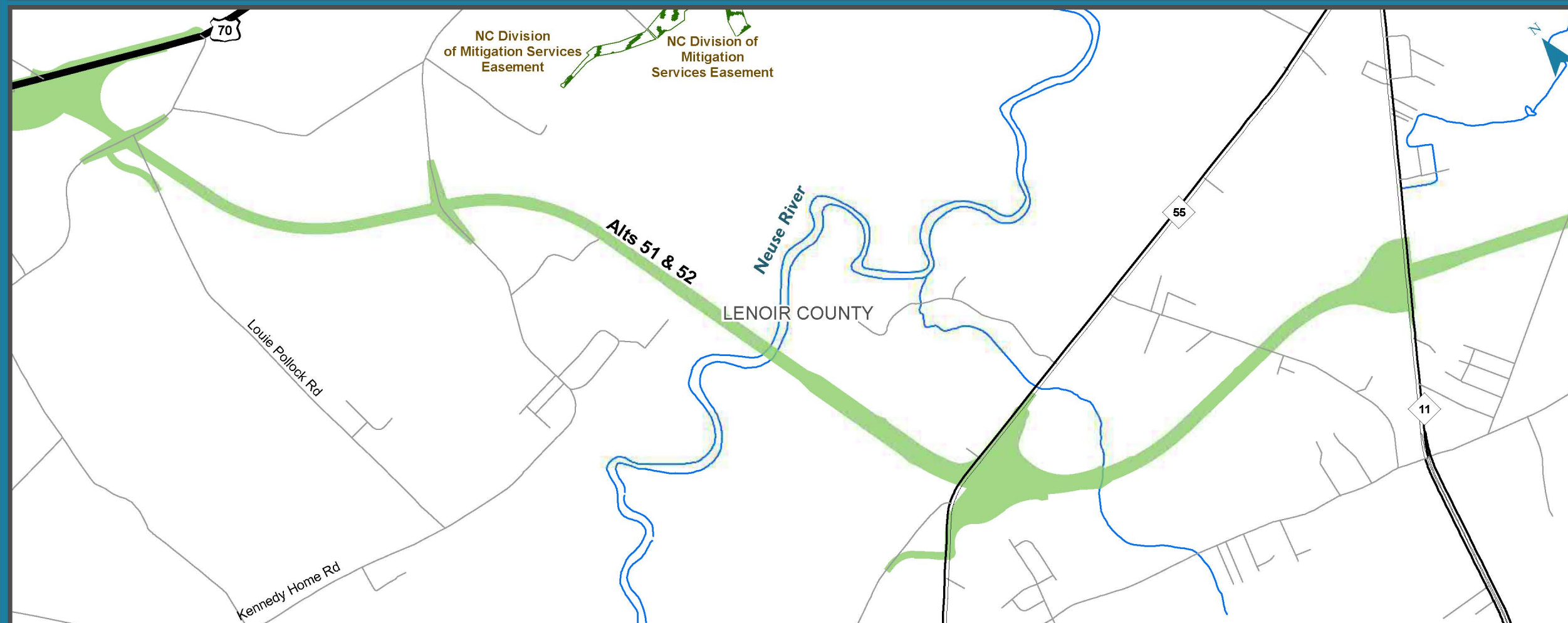


**Figure 4-33:**  
NCNHP and mitigation  
resource impacts -  
Alternatives 51 and 52 - A



**Legend**

- Alts. 51 and 52 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Local Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed



0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS

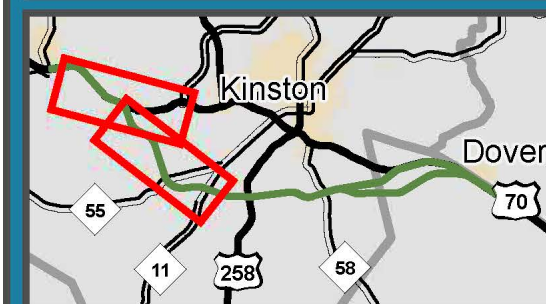




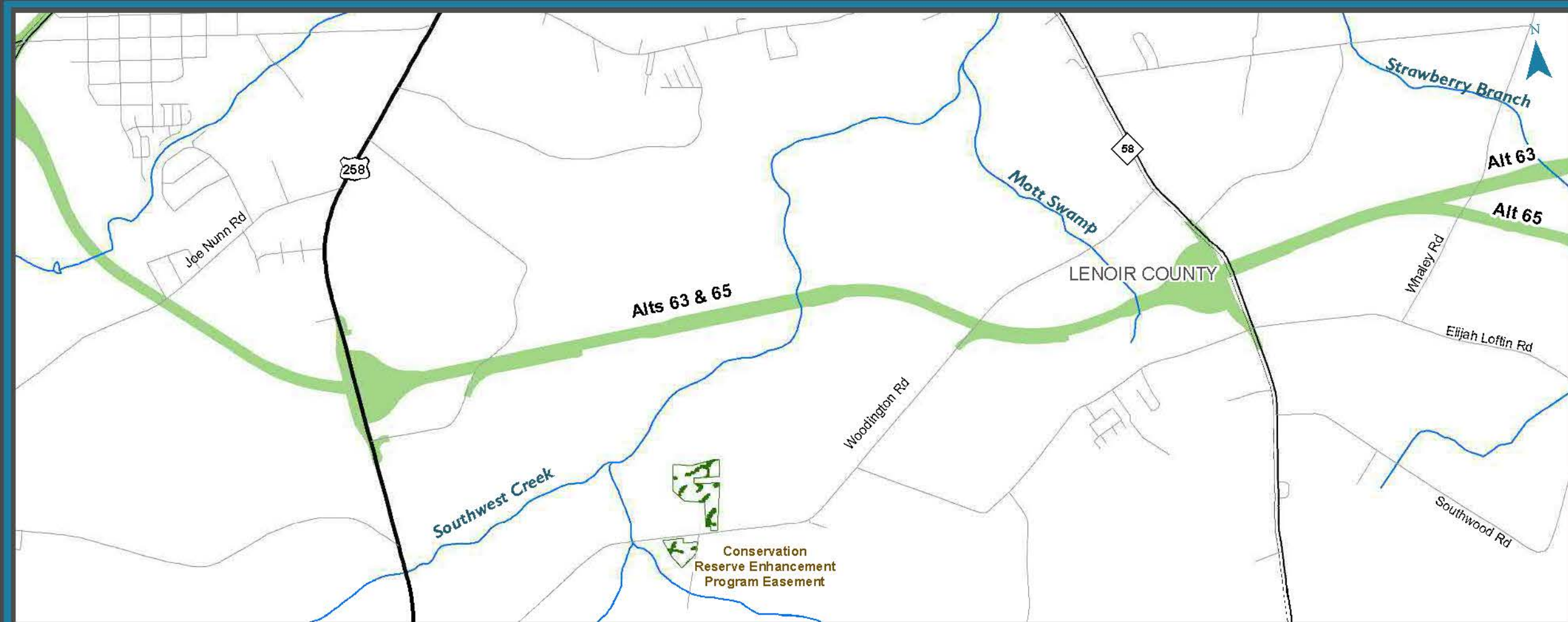






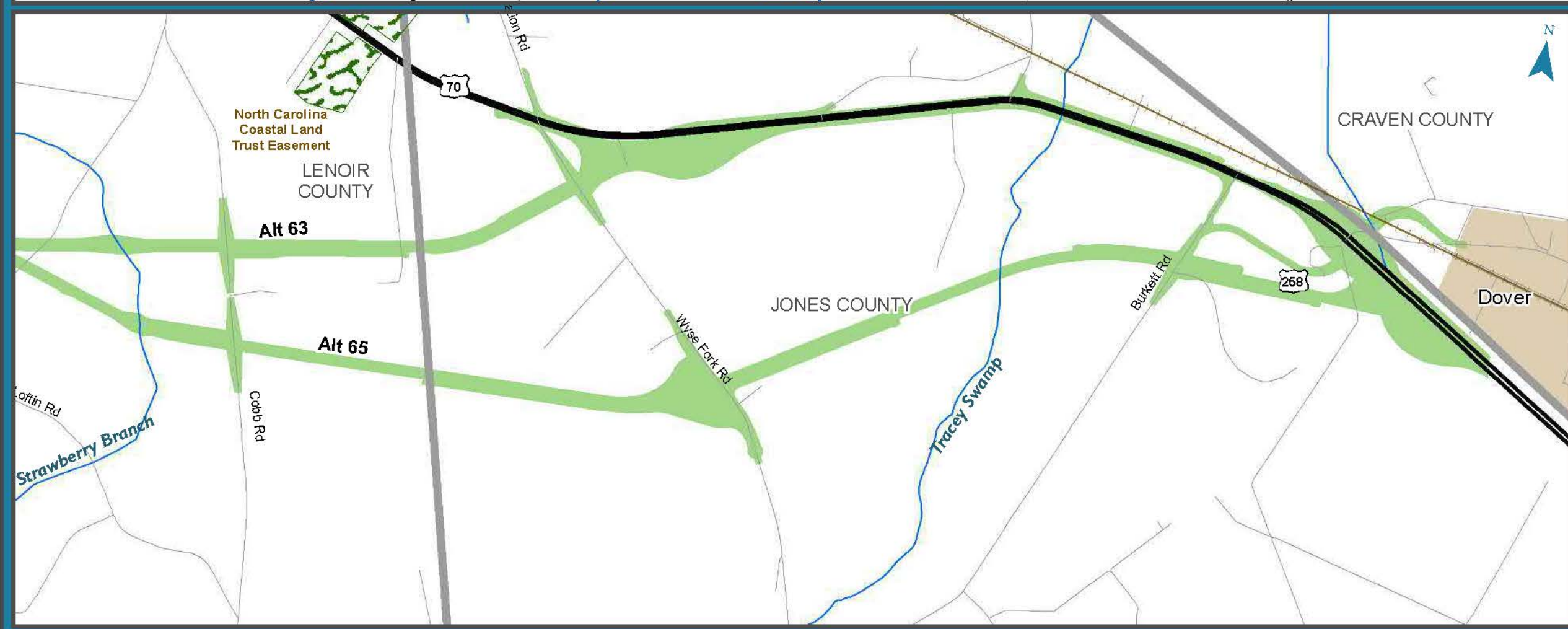
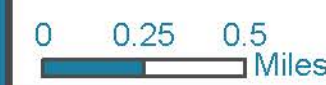


Figure 4-36:  
NCNHP and mitigation  
resource impacts -  
Alternatives 63 and 65 - B

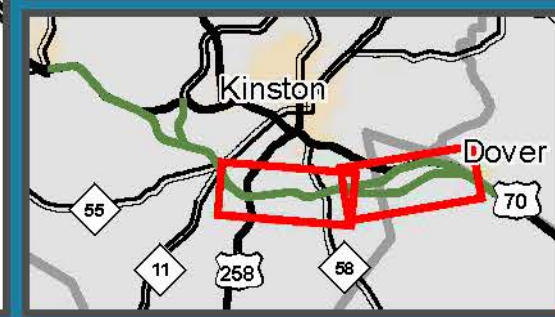


**Legend**

- Alts. 63 and 65 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- NHP Natural Areas
- NHP Managed Areas



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEM, NCDEQ, NCEM,  
NConemap, NRCS, USFWS



The Caswell Research Farm is an agricultural research station owned by the North Carolina Department of Agriculture. The station has 1,259 acres, 150 acres of which are used for field crops and 20 acres of which are used for infrastructure. Woodlands cover 424 acres, and the remaining 700 acres are used for rotational purposes. The primary purpose of the research station is to provide resources in the form of land, equipment, personnel, expertise, labor, facilities, and irrigation to research scientists conducting field research studies on agricultural crops (NCDA&CS 2017). Alternative 1UE would impact 3.5 acres of the Caswell Research Farm. The impact would occur along the edge of one of its planted fields. It would not bisect the property.

The North Carolina Coastal Land Trust Preserve is an 80-acre agricultural preservation located east of British Road, both north and south of existing US 70. The easement is composed primarily of open agricultural fields. Alternatives 1UE and 1SB would each impact 2.3 acres of agricultural fields within the North Carolina Coastal Land Trust Easement. These impacts are located directly adjacent to existing US 70, on both the north and south sides of the highway.

The NCDMS Easement is the conservation easement associated with the Goodman Property Stream Restoration Project, located off Pruitt Road in Kinston. The project contains 632 acres of conservation easement along 4,325 linear feet of restored stream along Swamp Run and 3,205 linear feet of preserved stream along Swamp Run. Swamp Run is a tributary to Falling Creek, just upstream of the Neuse River floodplain. The main goal of the project was to restore traditional pattern and profile to the tributary and remove historic channelization associated with adjacent agricultural activities (NCDENR 2010). Alternatives 31 and 32 would each impact 6.1 acres of the Goodman Property Stream Restoration Project and conservation easement. A portion of the impact would be in the preservation area, and two other portions would be across the restoration reaches. The alignments would bisect the top reach of one of the restoration reaches.

Alternative 1UE would impact a portion of the CSS Neuse/Governor Caswell Memorial State Historic Site near the southern boundary of the property that is adjacent to existing US 70 and the Neuse River.

#### **4.6.5.3 NCNHP Natural Areas**

Only Alternatives 1UE and 1SB would have permanent impacts to NCNHP natural areas. Alternatives 1UE and 1SB would impact 0.7 and 1.0 acres, respectively, of the privately-owned Kelly's Pond Natural Area. The NCNHP natural areas described in section 3.6.5.3 are located along the boundary of the project study area, well outside of the limits of construction, and would not be impacted by any of the DSAs. Figure 4-25 through Figure 4-36 show the potential impacts to NCNHP resources. The No-Build Alternative would not impact NCNHP natural areas.

#### **4.6.5.4 NCDOT On-Site Mitigation Properties**

Only Alternatives 11 and 12 would have permanent impacts to NCDOT on-site mitigation properties. Alternatives 11 and 12 would have 0.4 acre of impact to the easement associated with the Banks School Road Stream Restoration project. Figure 4-25 through Figure 4-36 show the potential impacts to mitigation properties. The No-Build Alternative would not impact NCDOT on-site mitigation properties.



#### 4.6.6 Threatened and Endangered Species

As of October 4, 2018, the USFWS lists three federally protected species for Lenoir County; as of April 25, 2018, nine federally protected species for Craven County; and as of June 27, 2018, three federally protected species for Jones County (USFWS 2018a, 2018b, 2018c). These species are shown in Table 4-13. A brief description of each species' habitat requirements follows. Habitat requirements for each species are based on the best available information from referenced literature and/or USFWS.

**Table 4-13: Federally protected species effects**

Scientific Name	Common Name	Federal Status <sup>a</sup>	County	Biological Conclusion
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	Craven, Jones	Not Required
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon	E	Lenoir, Craven, Jones	Not Required
<i>Chelonia mydas</i>	Green sea turtle	T	Craven	No Effect
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	Craven	No Effect
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	Lenoir, Craven, Jones	Unresolved
<i>Trichechus manatus</i>	West Indian manatee	E	Craven	No Effect
<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E	Craven	No Effect
<i>Aeschynomene virginiana</i>	Sensitive joint-vetch	T	Lenoir, Craven	No Effect
<i>Calidris canutus rufa</i>	Rufa red knot	T	Craven	No Effect
<i>Myotis septentrionalis</i>	Northern long-eared bat	T	Lenoir, Craven, Jones	MALAA <sup>b</sup>

<sup>a</sup> E – Endangered; T – Threatened; T(S/A) – Threatened Due to Similarity in Appearance

<sup>b</sup> MALAA: May affect, likely to adversely affect

In 2013, representatives from Weyerhaeuser and the North Carolina Forest Service were contacted to obtain information pertaining to RCW habitat and presence on their lands within the project study area. Statements were obtained and summarized in the 2017 NRTR. Through coordination with the USFWS, it was determined that once the applicant's preferred alternative is selected, NCDOT should request specific stand information from both Weyerhaeuser and the North Carolina Forest Service to confirm that conditions have not changed. Formal surveys for RCW will be conducted once the applicant's preferred alternative is selected.

Field investigations will be performed, as appropriate, and impacts for all species will be evaluated once the applicant's preferred alternative is selected. The No-Build Alternative would not impact threatened and endangered species.

The USFWS has developed a PBO in conjunction with the FHWA, the USACE, and the NCDOT for the NLEB (USFWS 2016). The PBO covers the entire NCDOT program in Divisions 1 through 8, including all NCDOT projects and activities. The programmatic determination for the NLEB for the NCDOT program is "may affect, likely to adversely affect." The PBO provides incidental coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all projects with a federal nexus in Divisions 1 through 8, which includes Lenoir, Jones, and Craven counties.

#### **4.6.6.1 Bald Eagle and Golden Eagle Protection Act**

No formal field surveys have been conducted for the Kinston Bypass project. Impacts to bald and golden eagles from the DSAs will be evaluated once the applicant's preferred alternative is selected. The No-Build Alternative would not impact bald or golden eagles.

#### **4.6.6.2 Endangered Species Act Critical Habitat Designations**

There are no designated critical habitats in the project study area; therefore, there would be no impacts to ESA critical habitat designations as a result of the Kinston Bypass project.

#### **4.6.6.3 Essential Fish Habitat**

The Atlantic sturgeon was previously listed as federally protected species by the USFWS; however, it is now listed by NOAA Fisheries. There is no habitat for Atlantic sturgeon in the NRTR study area.

Identification of essential fish habitat will be coordinated with NOAA, National Marine Fisheries Service, and NCDOT's Biological Surveys Group once the applicant's preferred alternative is selected. The National Marine Fisheries Service was involved in the development of the NRTR and approved the document and coordination efforts.

#### **4.6.7 Jurisdictional Issues**

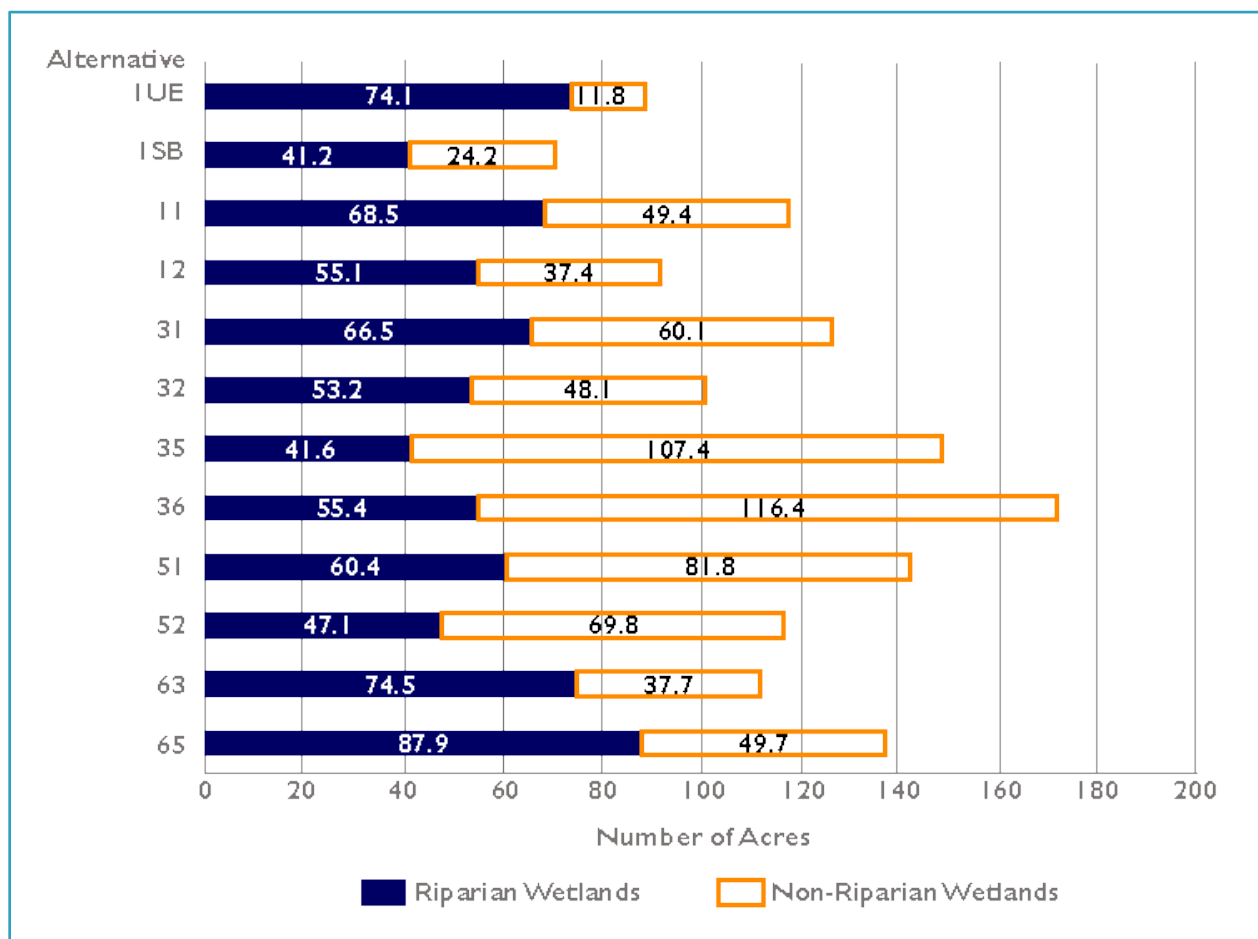
This project has been designated as a pilot project by the North Carolina Interagency Leadership Team, which includes using GIS data as the basis for alternative development, alternative evaluation, and selection of the applicant's preferred alternative. The intention of pilot projects is to reserve detailed field investigations for the applicant's preferred alternative. In order to meet the intent of the pilot project process, two ArcGIS models were used to assess potential stream and wetland impacts for the proposed action. A jurisdictional stream model was created by NCDWR and a jurisdictional wetland model was created by NCDOT (NCDWR 2013; NCDOT 2011a). The models generated were verified through multiple field surveys with resource agencies, including USACE, NCDWR, USFWS, and NCWRC. Additional discussions of the models and methodologies used are included in the 2017 NRTR. Metadata are included in Appendix F.



### 4.6.7.1 Wetlands

Permanent impacts to jurisdictional wetlands for each DSA are summarized in Table 4-14 and shown on Figure 4-37 through Figure 4-48. Jurisdictional wetland impacts were calculated based on the NCDOT wetland model. The NCDOT wetland model utilizes 20-foot grid cell digital elevation models generated from bare-earth Light Detection and Ranging data and subsequent terrain derivatives and other ancillary data as variables. The model is an aggregate of five different models based on ecoregion. The NCDOT wetland model classified wetlands into two wetland types, non-riparian and riparian (NCDOT 2011a). The acreages shown in Table 4-14 do not include areas where bridges would be placed over larger wetland systems. The bridged areas have been removed from the analysis. The No-Build Alternative would have no impact to wetlands.

**Table 4-14: Jurisdictional wetland impacts**



Note: Impacts were calculated using the construction slope stake limits plus a 40-foot buffer of the functional designs.



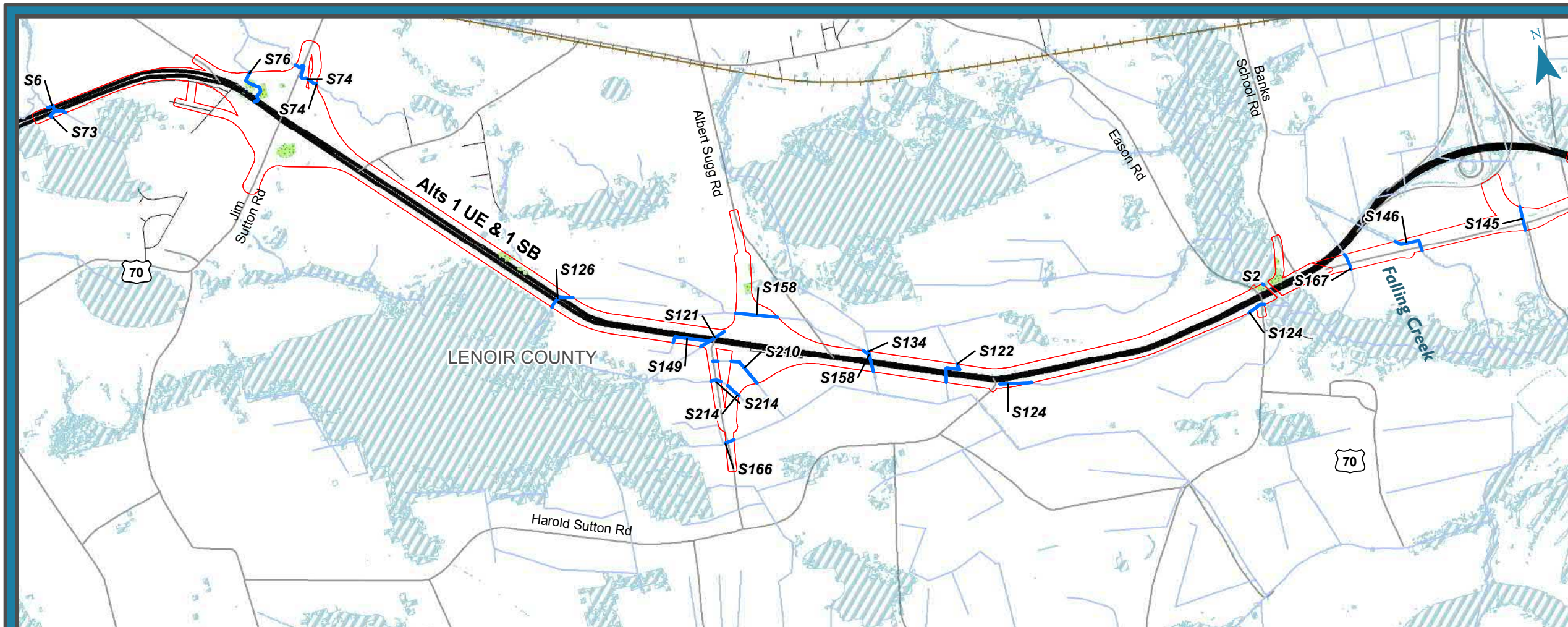
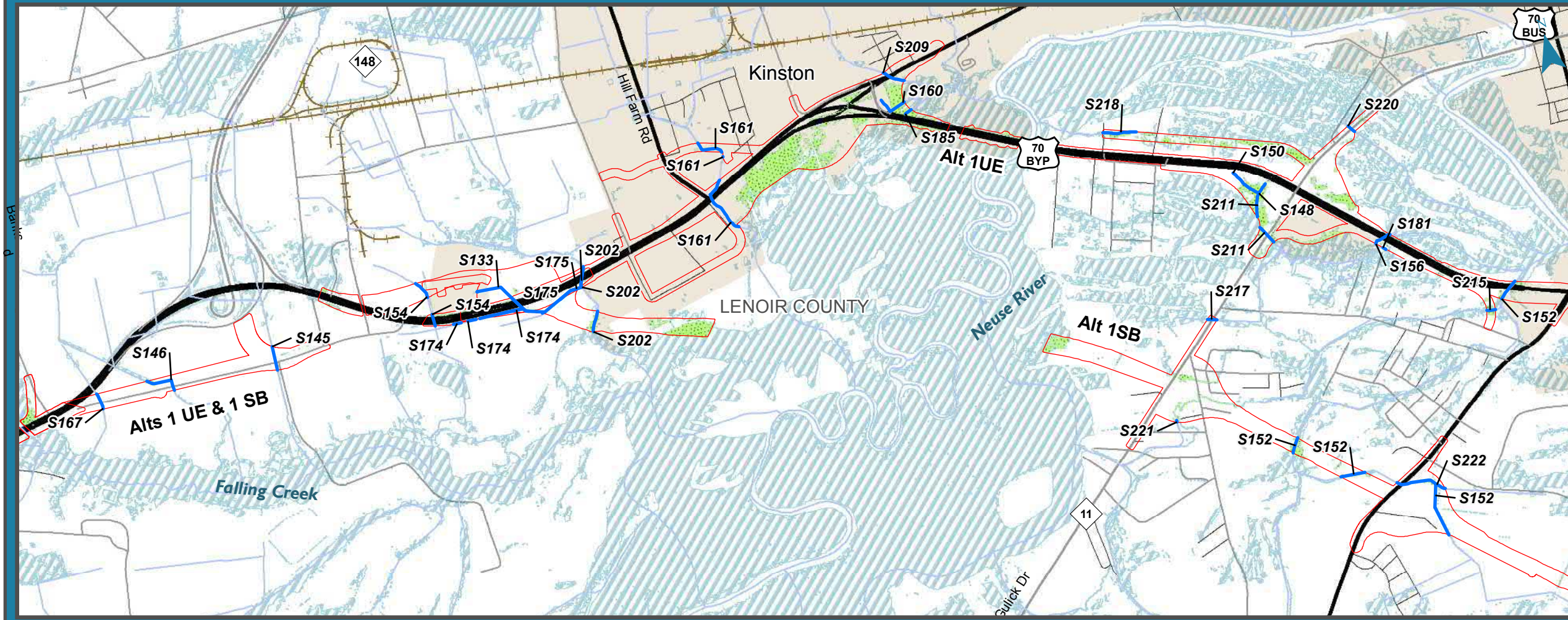


Figure 4-37:  
Wetland and stream impacts -  
Alternatives 1UE and 1SB - A

**Legend**

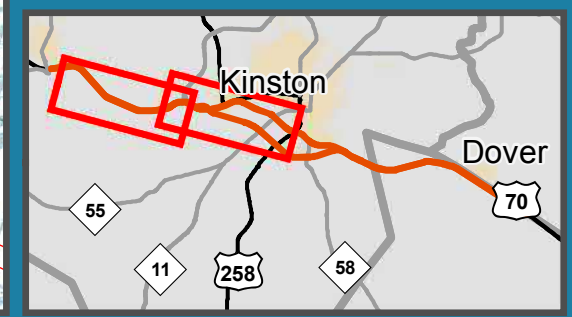
- Slope Stake Limits Plus 40 Feet
- + Railroad
- US Highway
- NC Highway
- State Road
- Municipal Boundary
- County Boundary
- Predicted Streams
- Predicted Wetlands
- Predicted Stream Impacts
- Predicted Wetland Impacts



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Miles



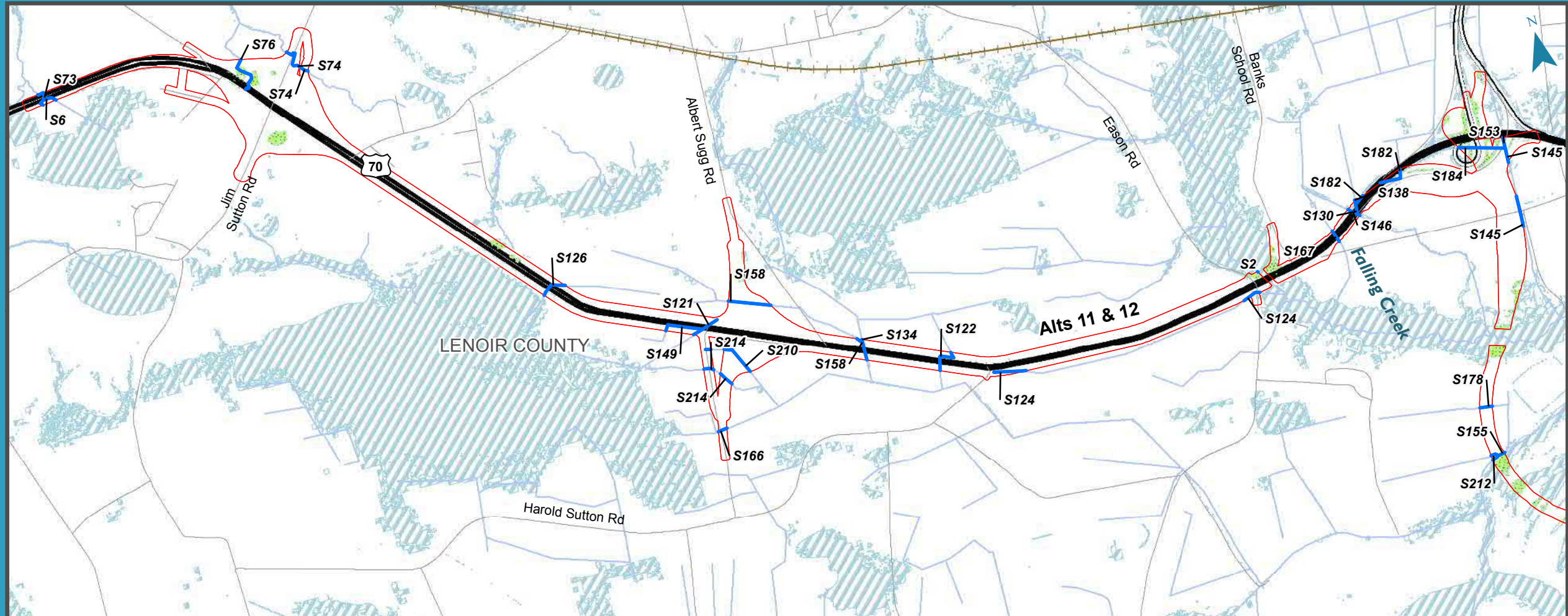
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS











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Figure 4-39:  
Wetland and stream impacts -  
Alternatives 11 and 12 - A

**Legend**

- Alts 11 and 12 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Predicted Streams
- Predicted Wetlands
- Predicted Stream Impacts
- Predicted Wetland Impacts

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Miles



This map is for reference only.  
Sources: CGIA, NCDOT, NCDEQ, NCDCM,  
Craven County, NCEM, Lenoir County,  
Jones County, City of Kinston,  
NCOneMap, NCWRC, NCSHPO, EPA, USFWS,  
USDA, NRCS, DWR, ESRI and AECOM.

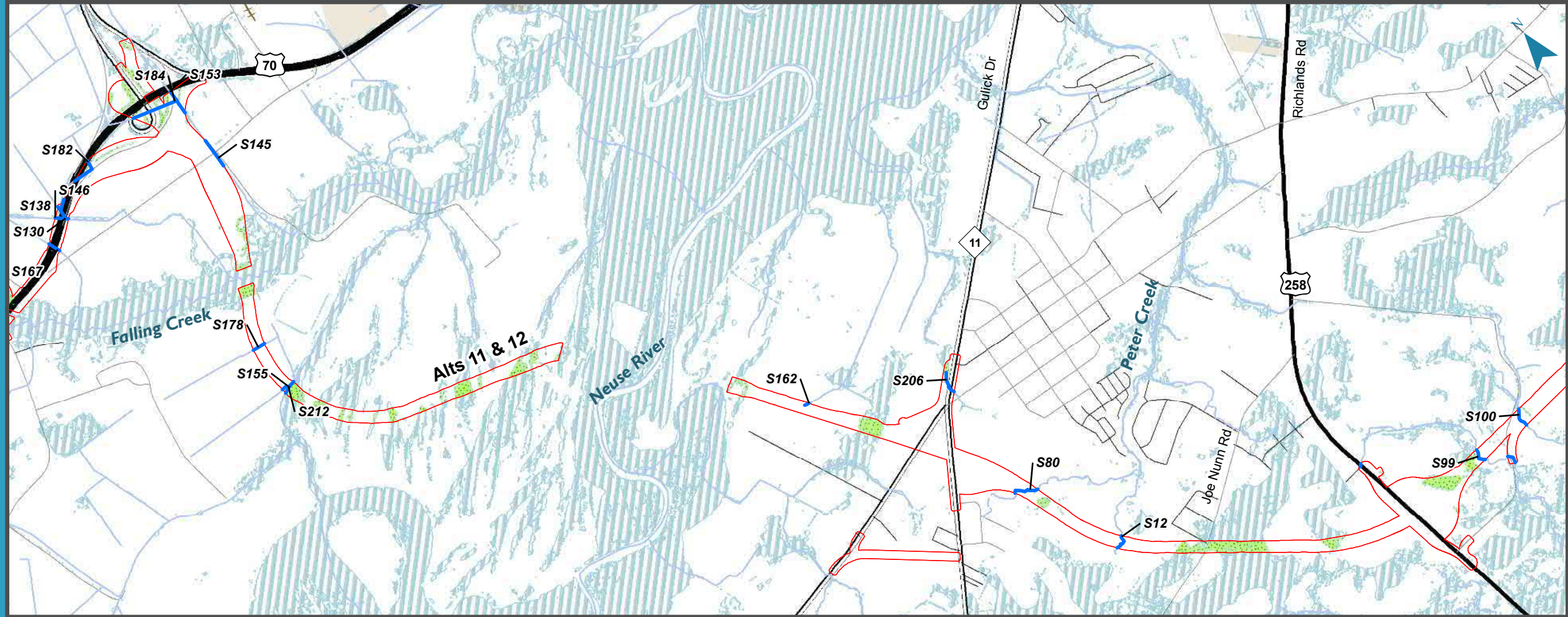




Figure 4-40:  
Wetland and stream impacts -  
Alternatives 11 and 12 - B

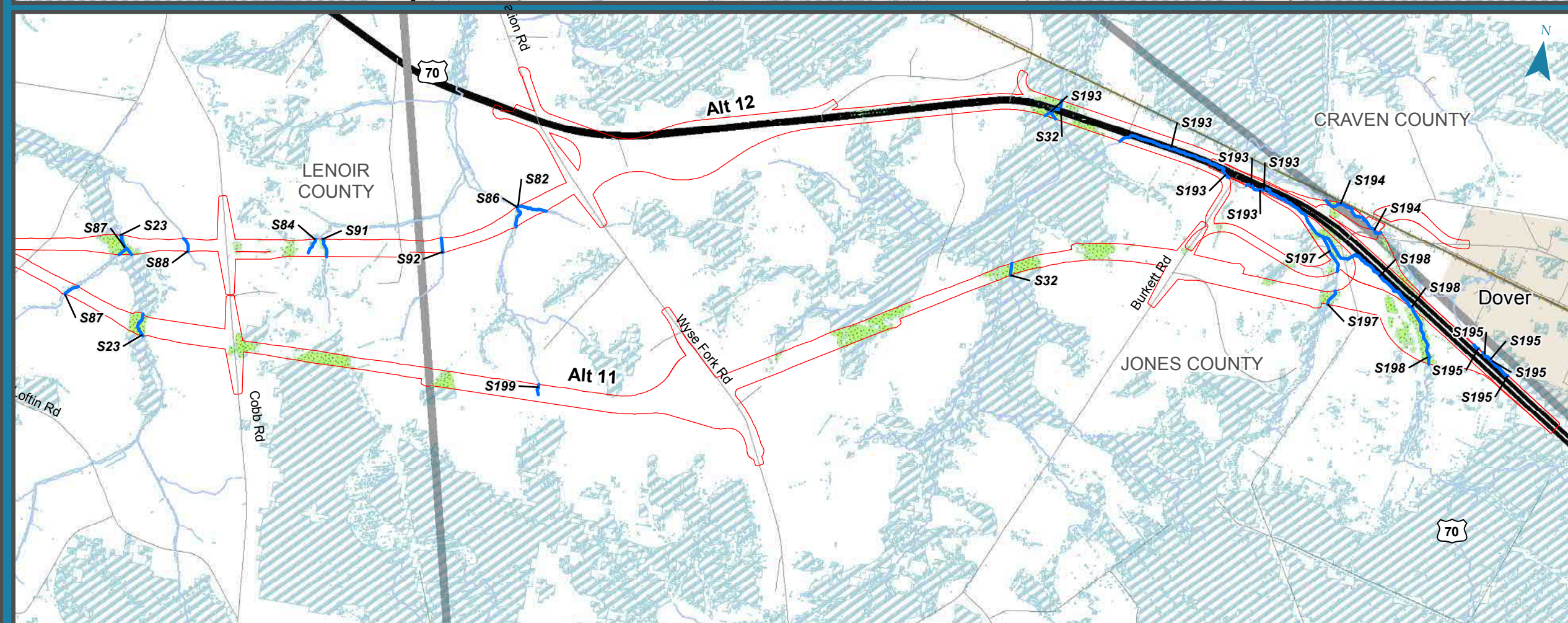
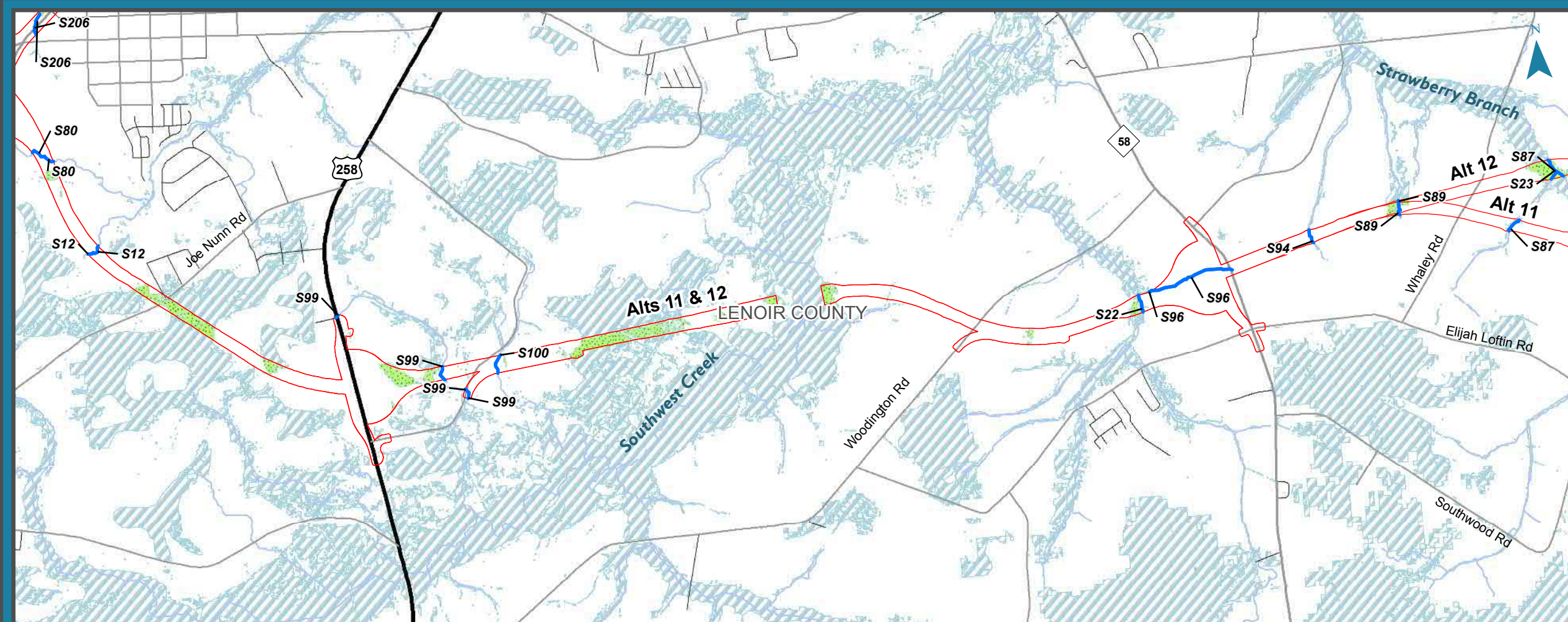
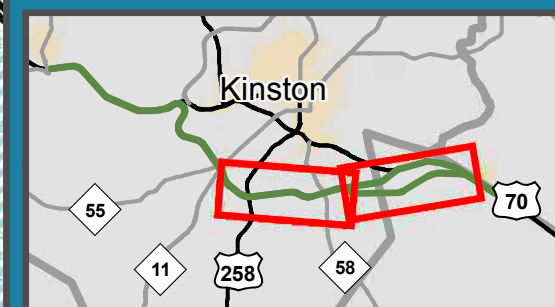
**Legend**

- Alts 11 and 12 Slope Stake Limits Plus 40 Feet
- + Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Predicted Streams
- Predicted Wetlands
- Predicted Stream Impacts
- Predicted Wetland Impacts

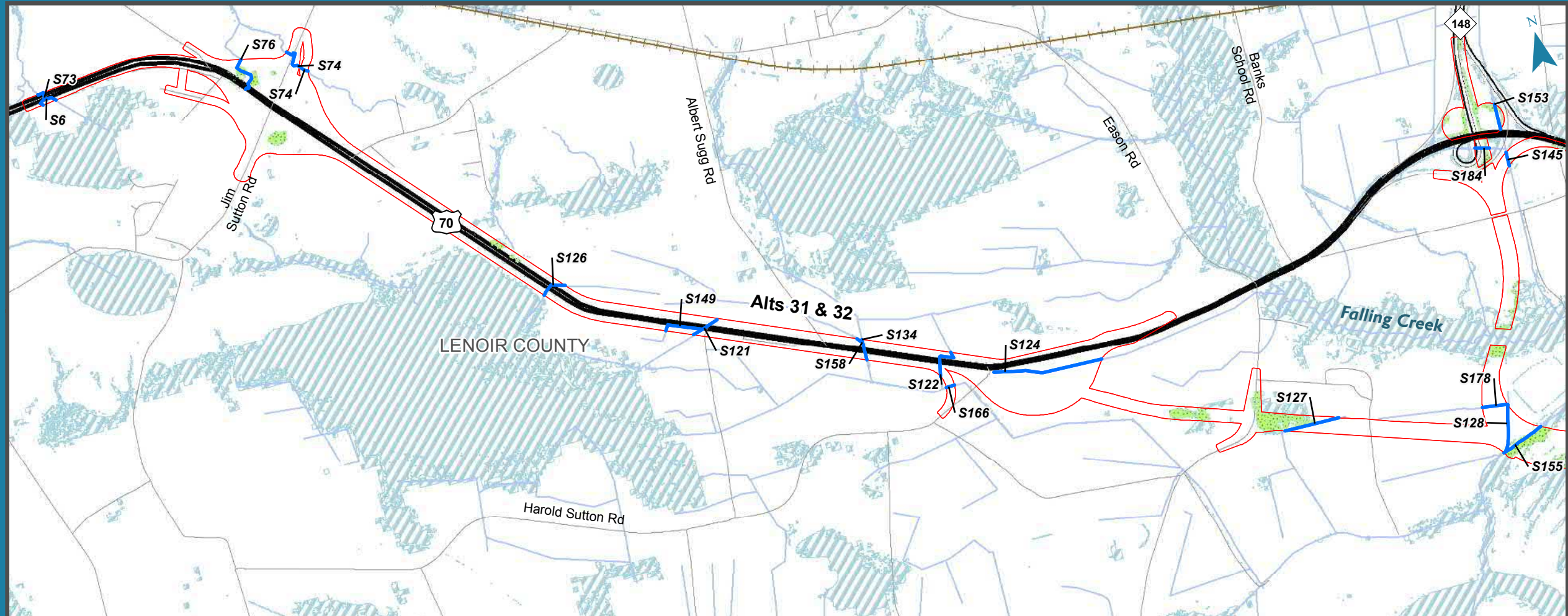
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This map is for reference only.  
Sources: CGIA, NCDOT, NCDEQ, NCDCM,  
Craven County, NCEM, Lenoir County,  
Jones County, City of Kinston,  
NOneMap, HPO, USFWS,  
NRCS, ESRI and AECOM.







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Figure 4-41:  
Wetland and stream impacts -  
Alternatives 31 and 32 - A

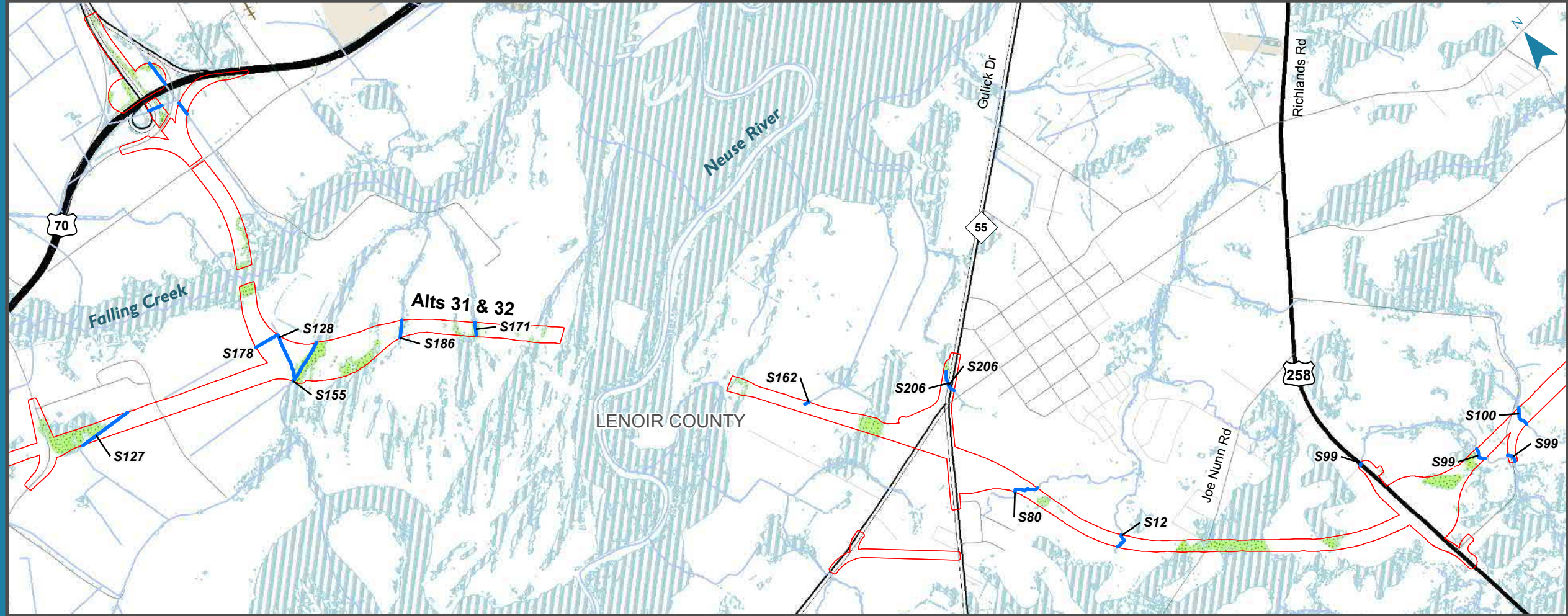
**Legend**

- Alts 31 and 32 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Predicted Streams
- Predicted Wetlands
- Predicted Stream Impacts
- Predicted Wetland Impacts

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Miles



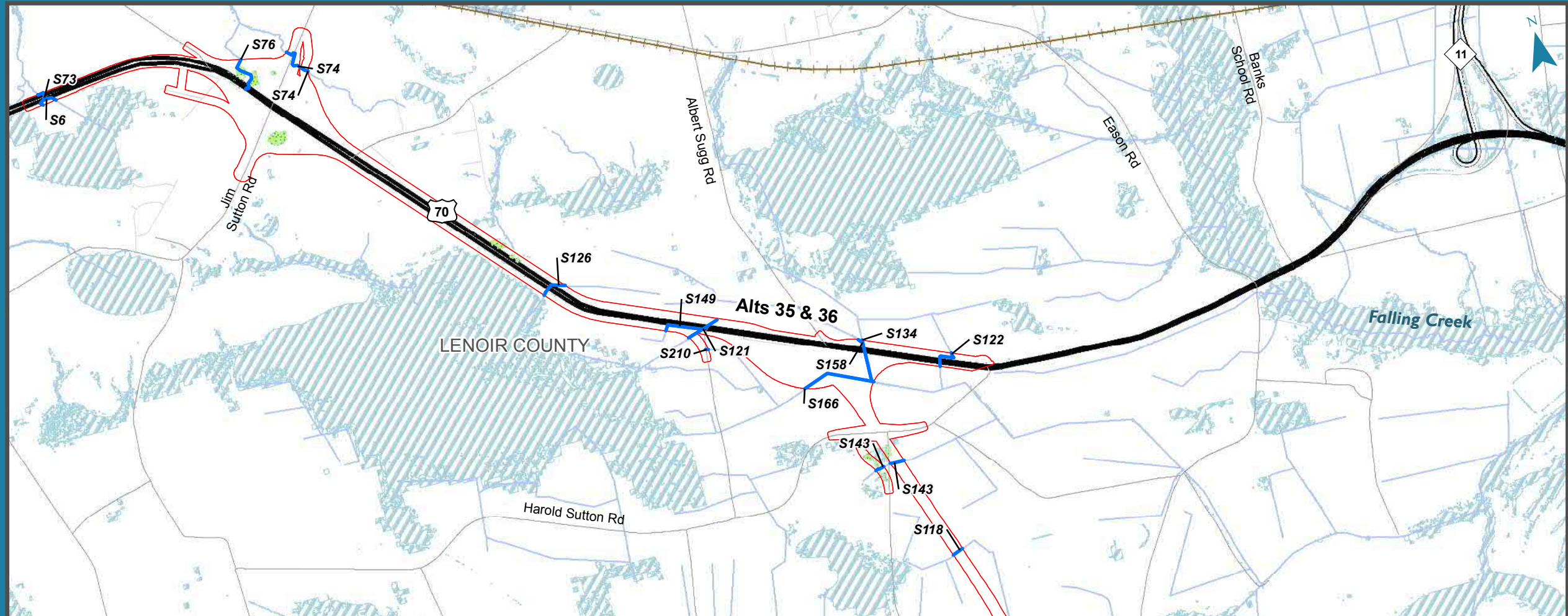
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NOneMap, HPO, USFWS,  
NRCS, ESRI and AECOM.











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Figure 4-43:  
Wetland and stream impacts -  
Alternatives 35 and 36 - A

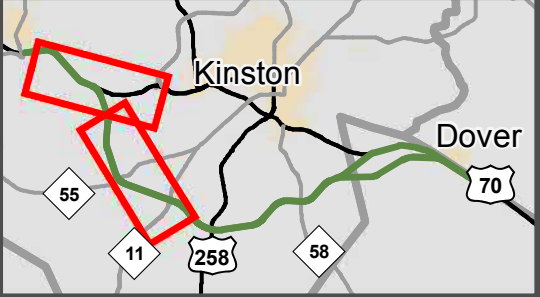
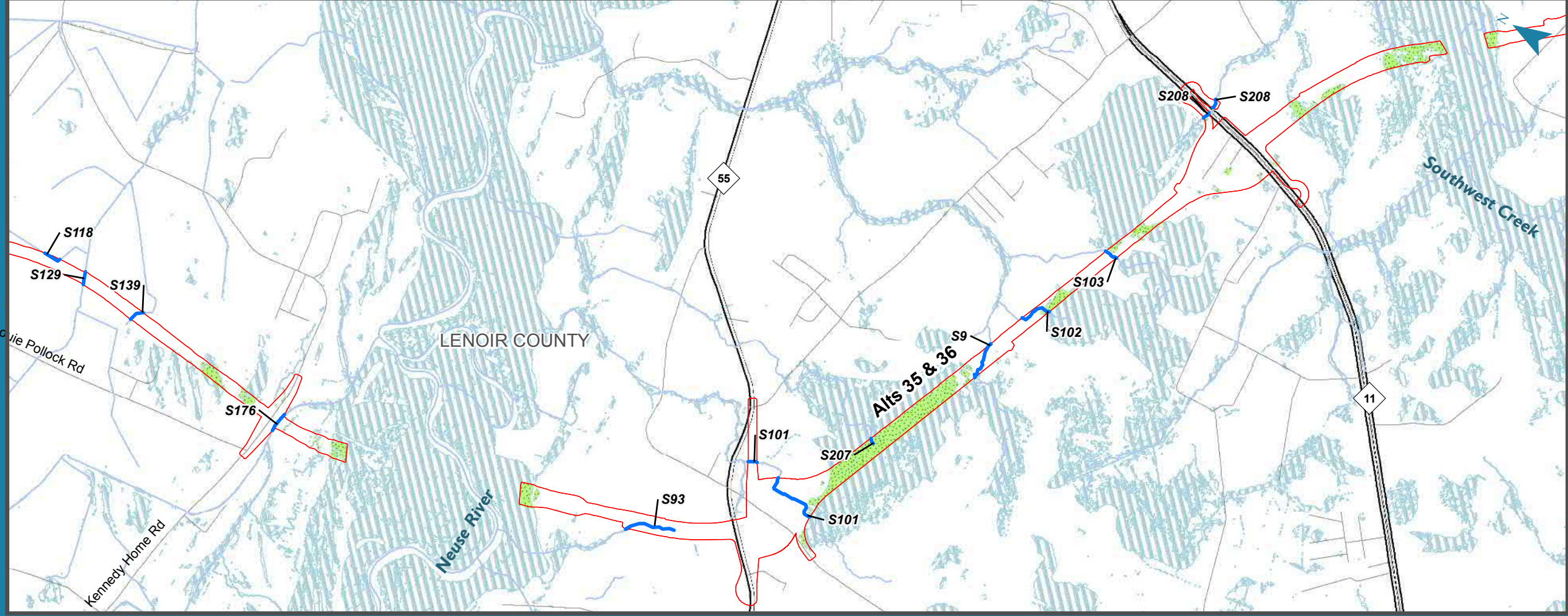
Legend

- Alts 35 and 36 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Predicted Streams
- Predicted Wetlands
- Predicted Stream Impacts
- Predicted Wetland Impacts

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Miles



This map is for reference only.  
Sources: CGIA, NCDOT, NCDEQ, NCDCM,  
Craven County, NCEM, Lenoir County,  
Jones County, City of Kinston,  
NOneMap, HPO, USFWS,  
NRCS, ESRI and AECOM.





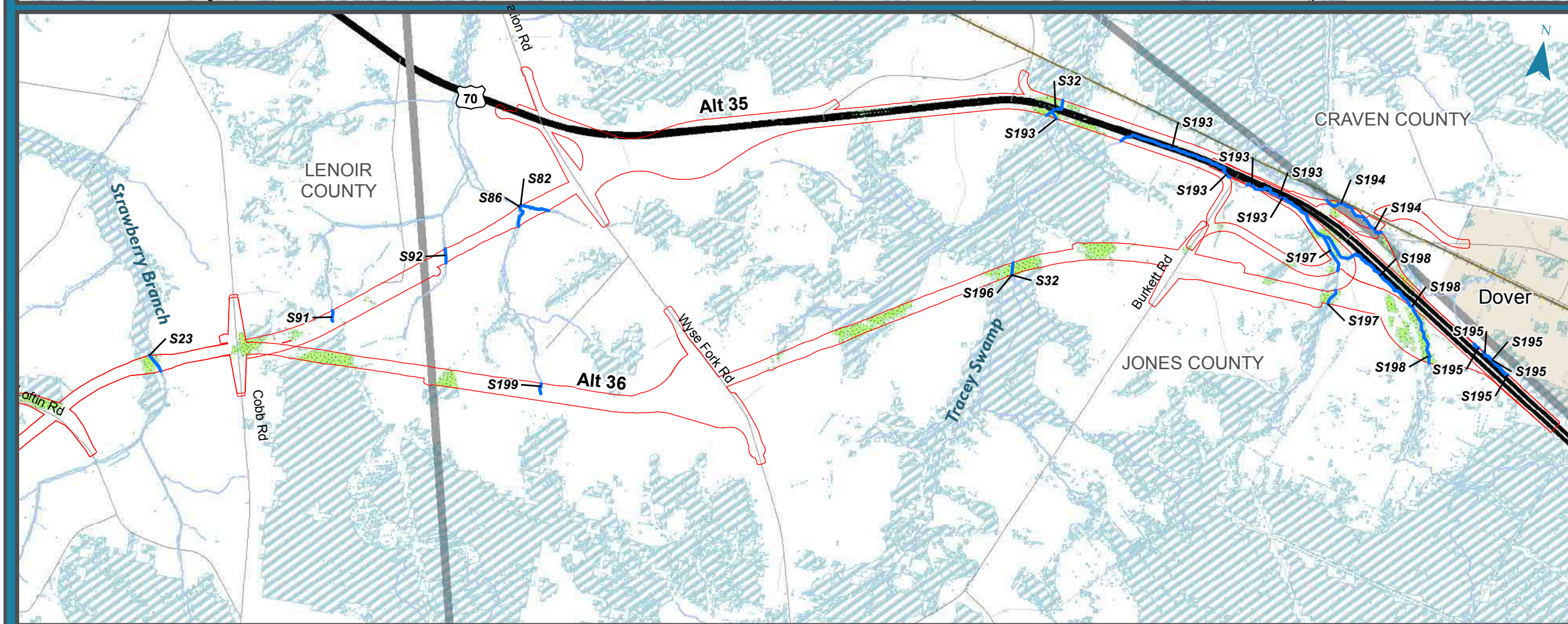
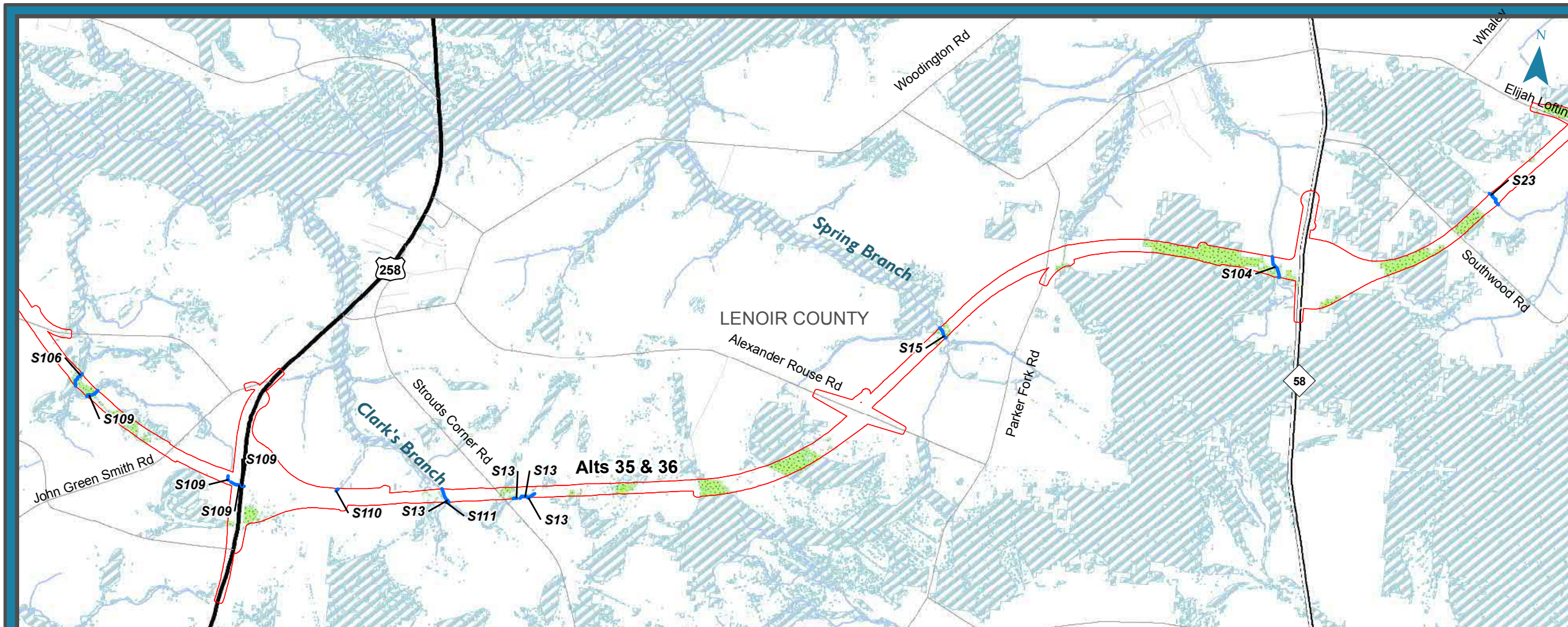


Figure 4-44:

Wetland and stream impacts -

Alternatives 35 and 36 - B

Legend

Alts 35 and 36 Slope Stake Limits Plus 40 Feet

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Predicted Streams

Predicted Wetlands

Predicted Stream Impacts

Predicted Wetland Impacts

0

0.25

0.5

Miles

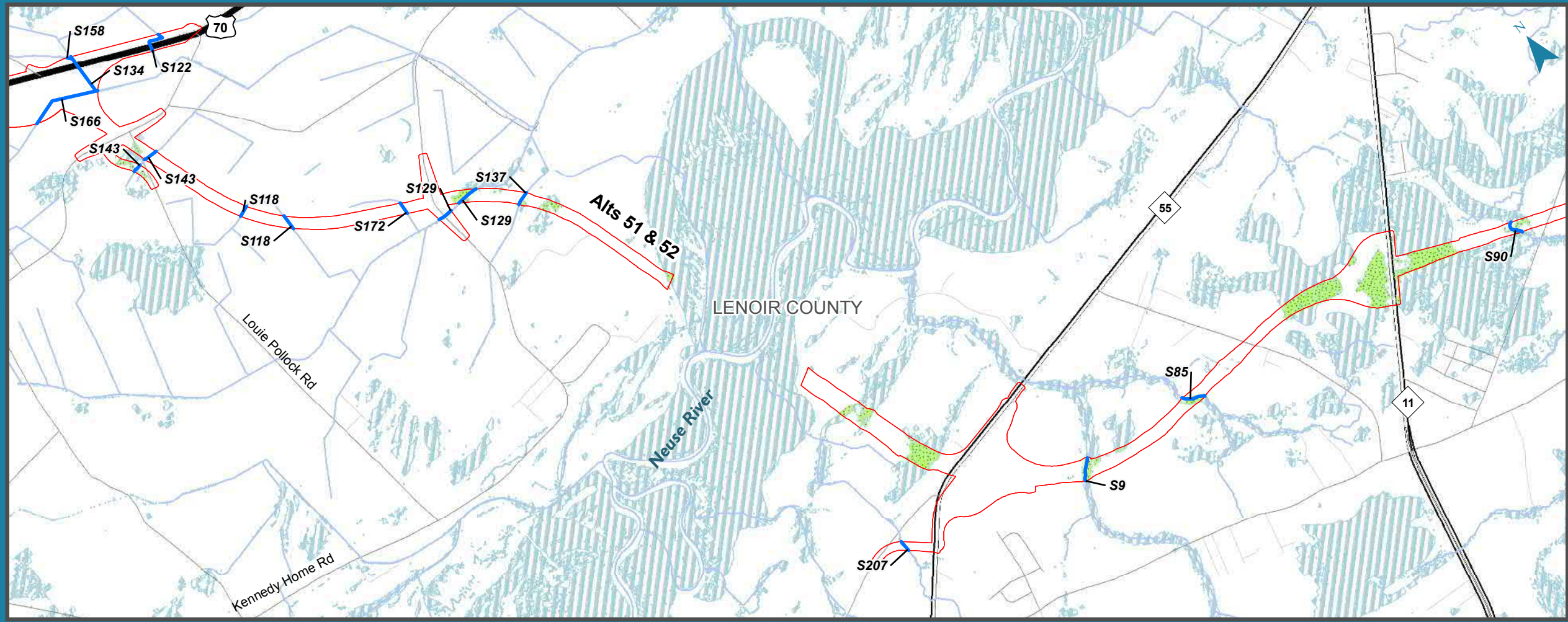
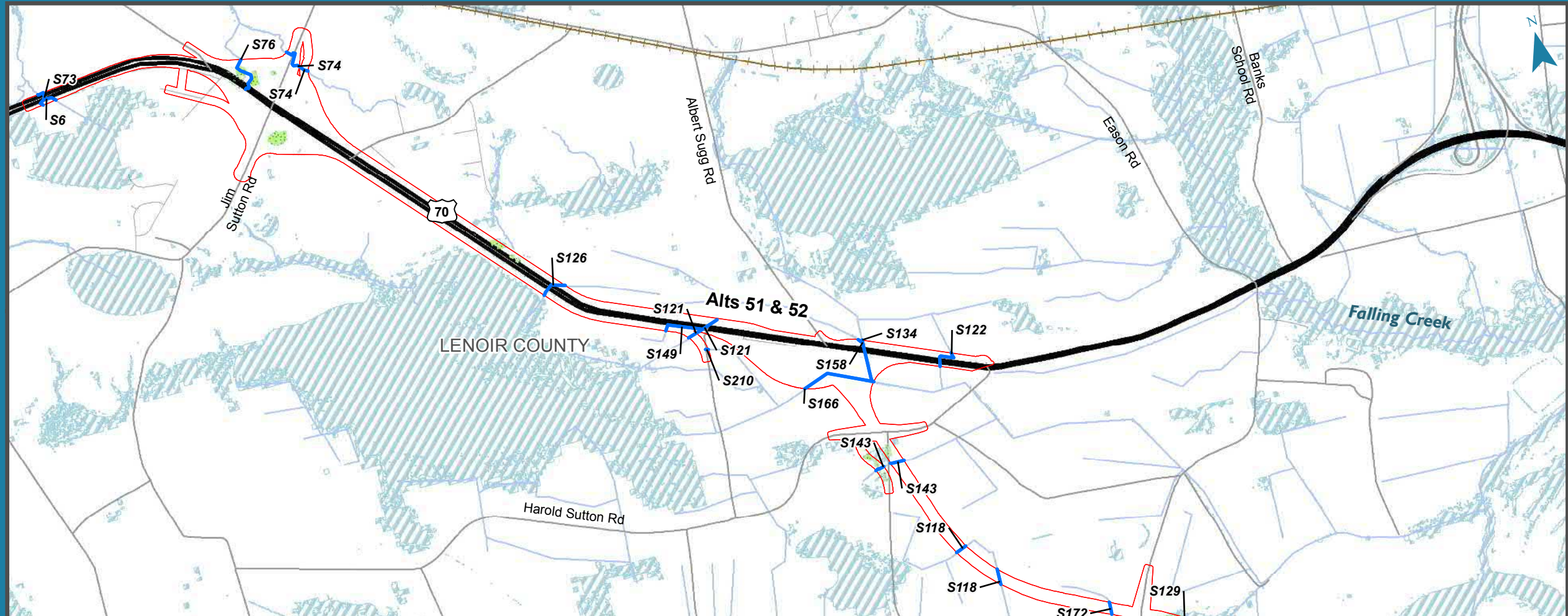
STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

This map is for reference only.

Sources: CGIA, NCDOT, NCDEQ, NCDCM, Craven County, NCEM, Lenoir County, Jones County, City of Kinston, NOneMap, HPO, USFWS, NRCS, ESRI and AECOM.





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Figure 4-45:  
Wetland and stream impacts -  
Alternatives 51 and 52 - A

Legend

- Alts 51 and 52 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Predicted Streams
- Predicted Wetlands
- Predicted Stream Impacts
- Predicted Wetland Impacts

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Miles



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Sources: CGIA, NCDOT, NCDEQ, NCDCM,  
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NRCS, ESRI and AECOM

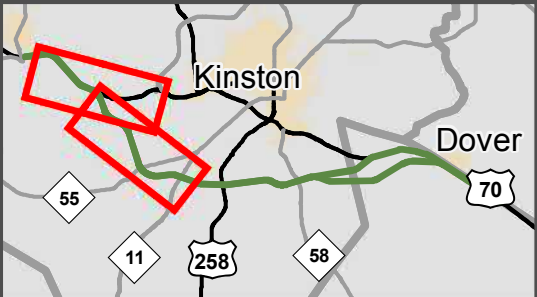




Figure 4-46:  
Wetland and stream impacts -  
Alternatives 51 and 52 - B

**Legend**

- Alts 51 and 52 Slope Stake Limits Plus 40 Feet
- + + + Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Predicted Streams
- Predicted Wetlands
- Predicted Stream Impacts
- Predicted Wetland Impacts

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Miles



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Jones County, City of Kinston,  
NOneMap, HPO, USFWS,  
NRCS, ESRI and AECOM

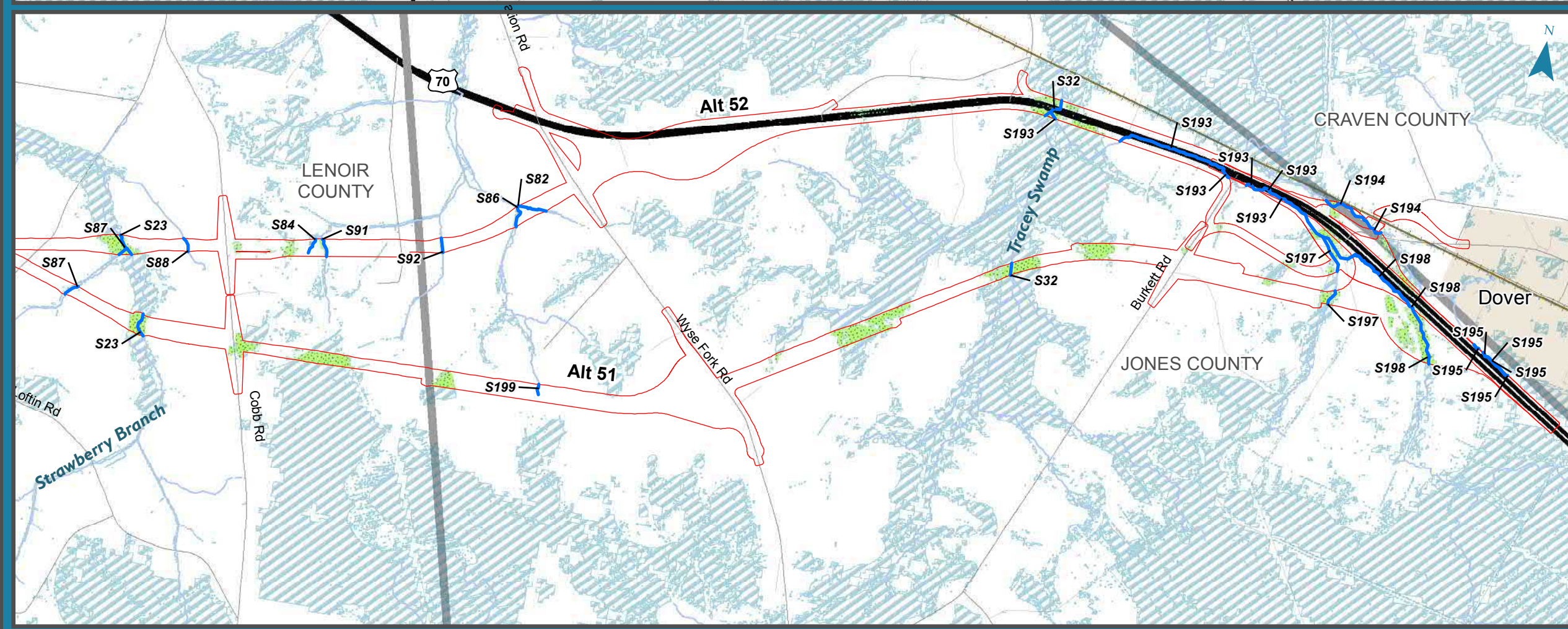
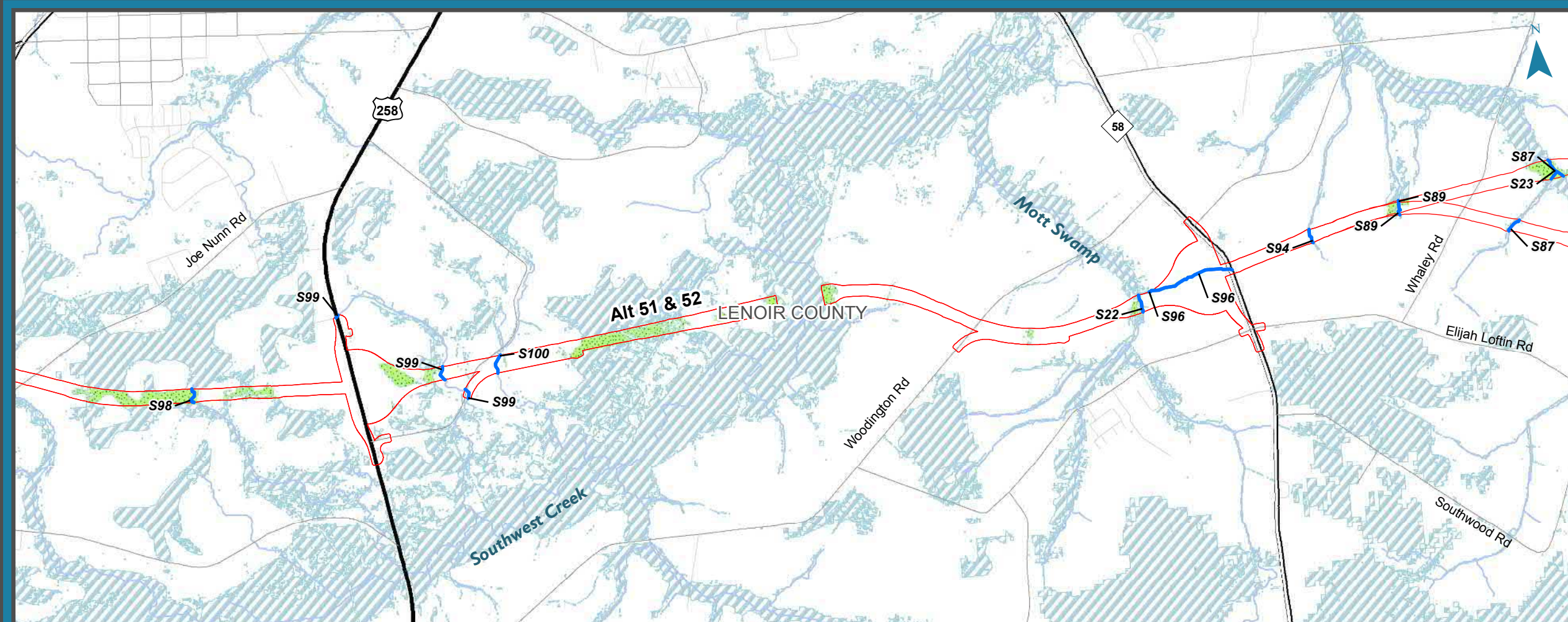
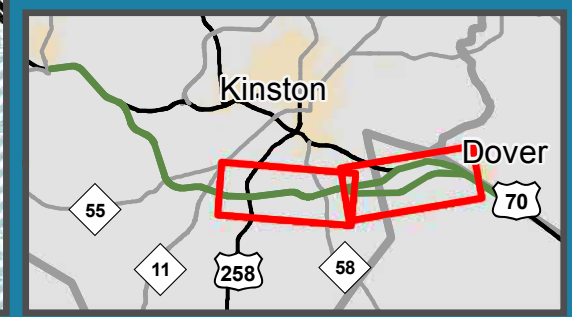
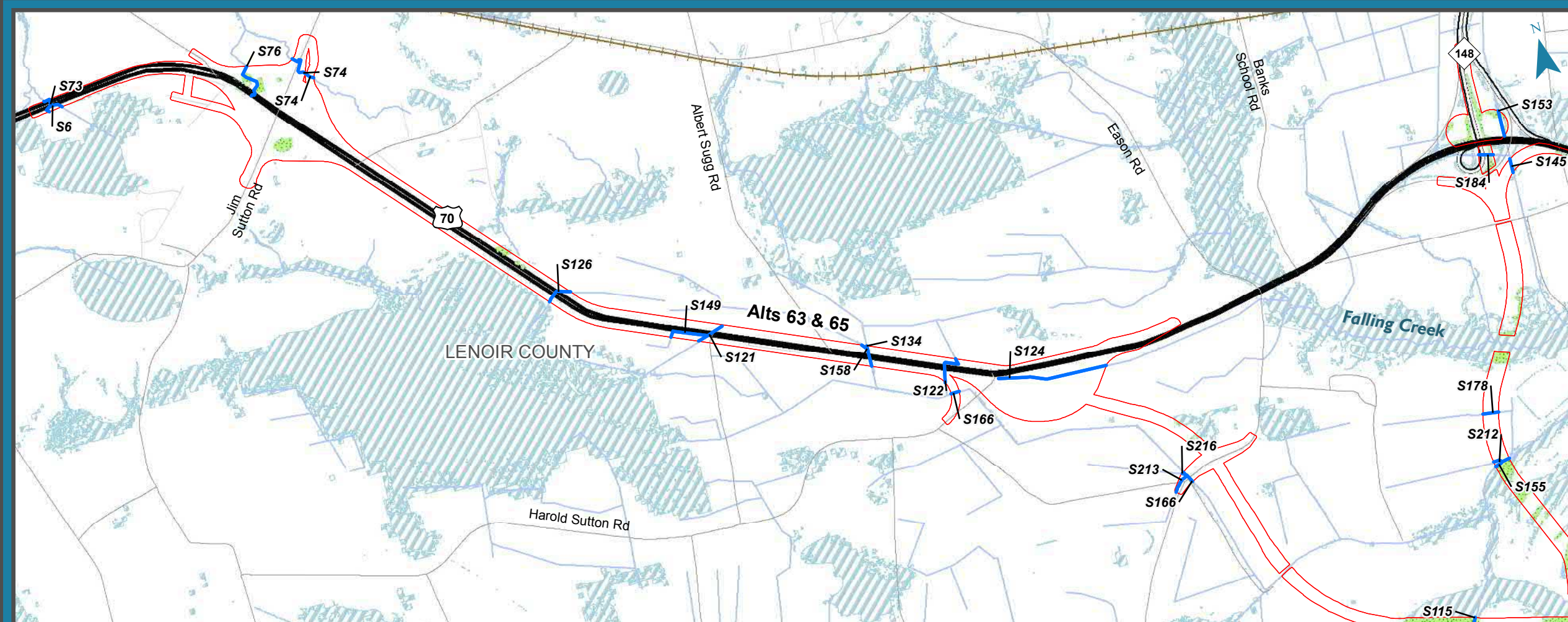
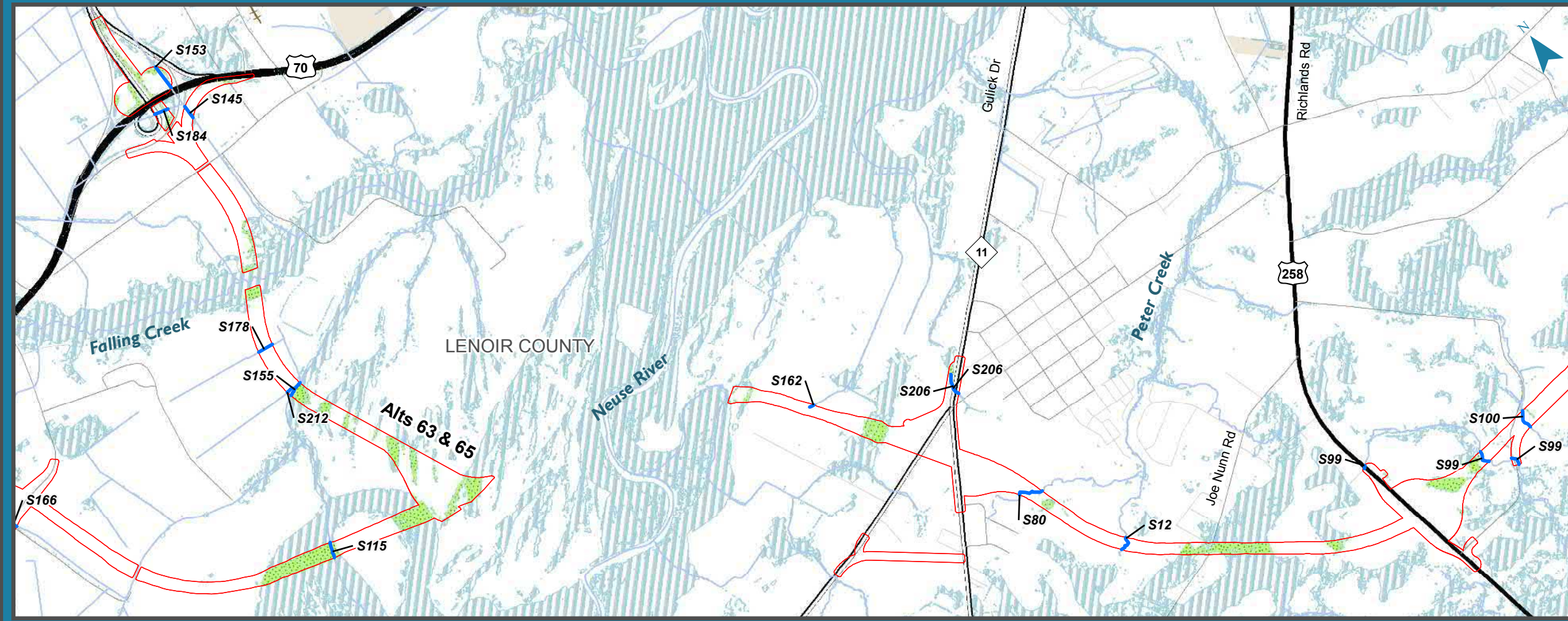




Figure 4-47:  
Wetland and stream impacts -  
Alternatives 63 and 65 - A



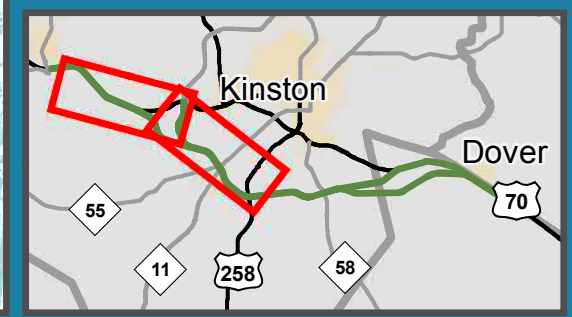
- Legend**
- Slope Stake Limits Plus 40 Feet
  - Railroad
  - US Highway
  - NC Highway
  - Secondary Road
  - Municipal Boundary
  - County Boundary
  - Predicted Streams
  - Predicted Wetlands
  - Predicted Stream Impacts
  - Predicted Wetland Impacts



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Miles



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Sources: AECOM, CGIA, City of Kinston,  
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NConemap, NRCS, USFWS





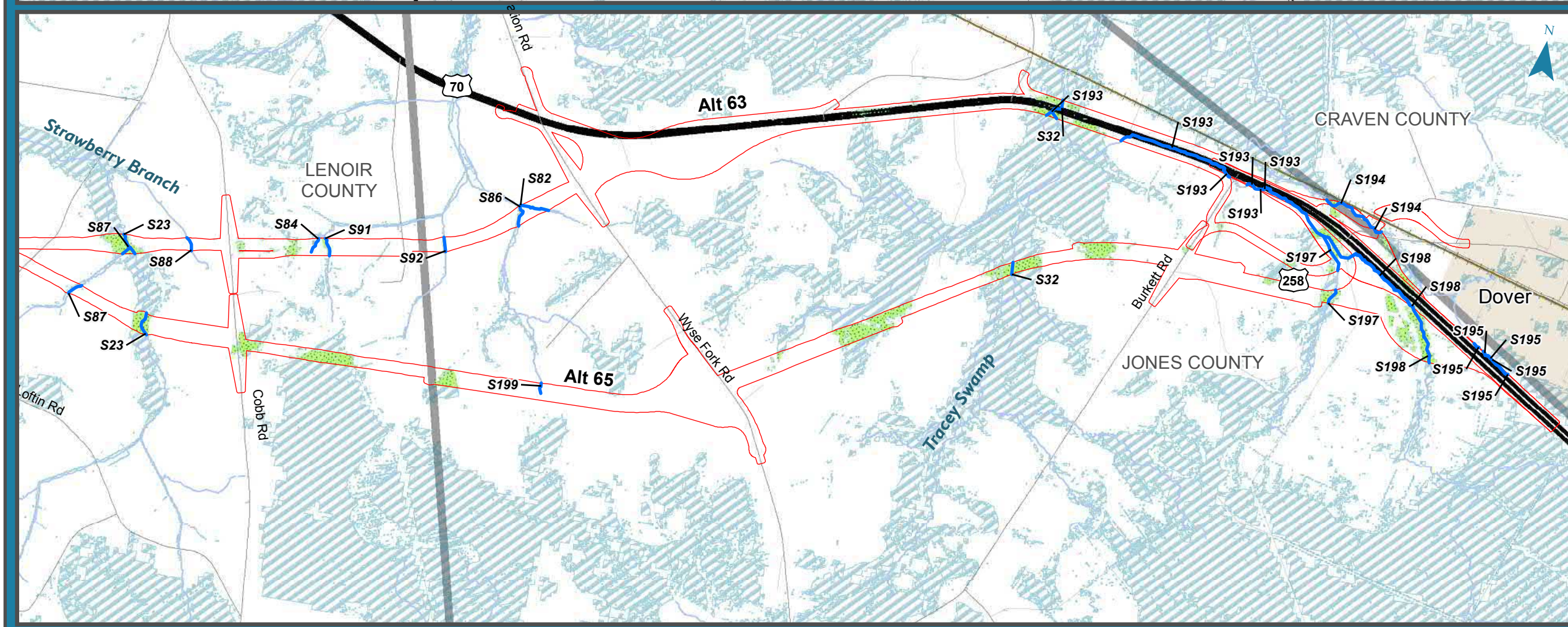
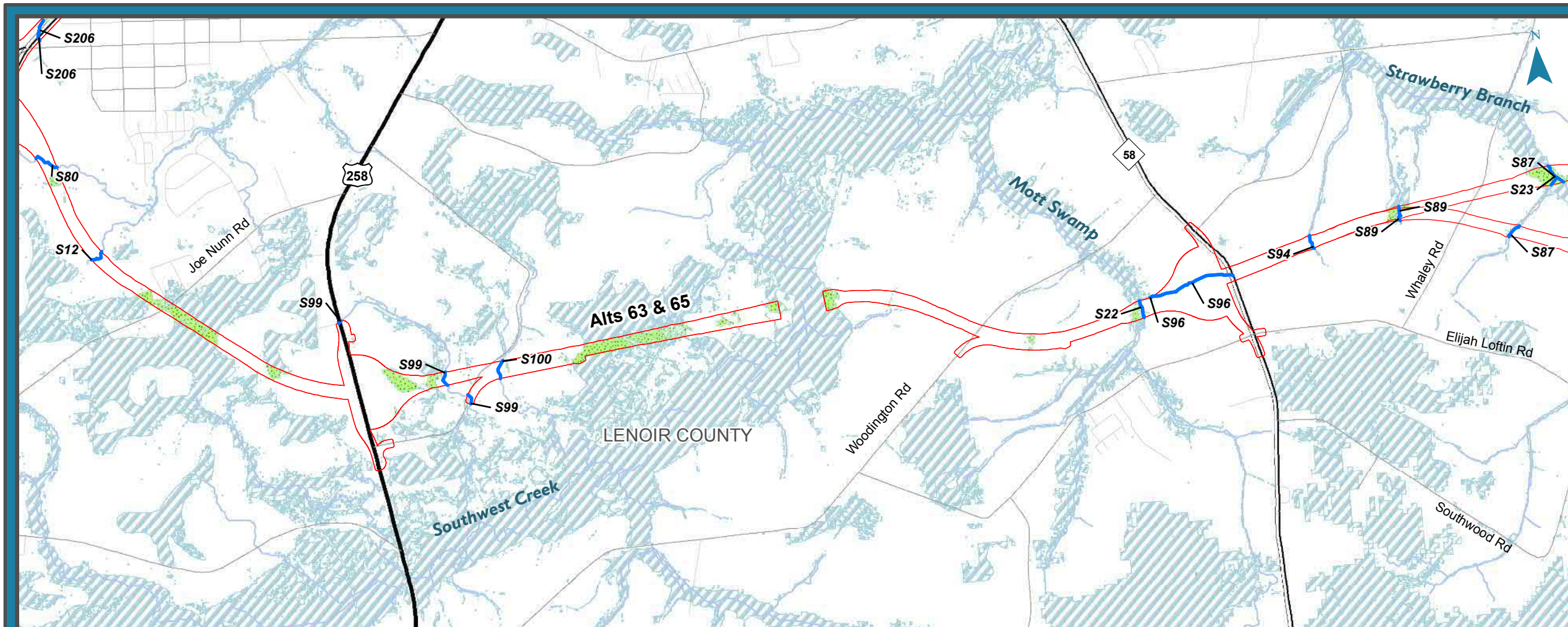


Figure 4-48:

Wetland and stream impacts -

Alternatives 63 and 65 - B

Legend

Alts 63 and 65 Slope Stake Limits Plus 40 Feet

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Predicted Streams

Predicted Wetlands

Predicted Stream Impacts

Predicted Wetland Impacts

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STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

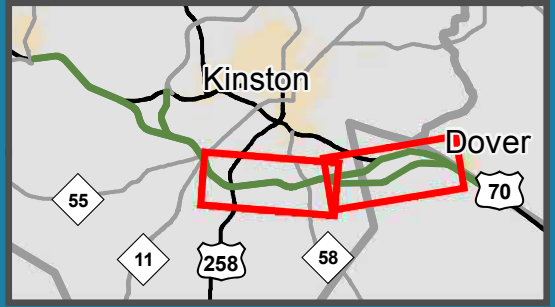
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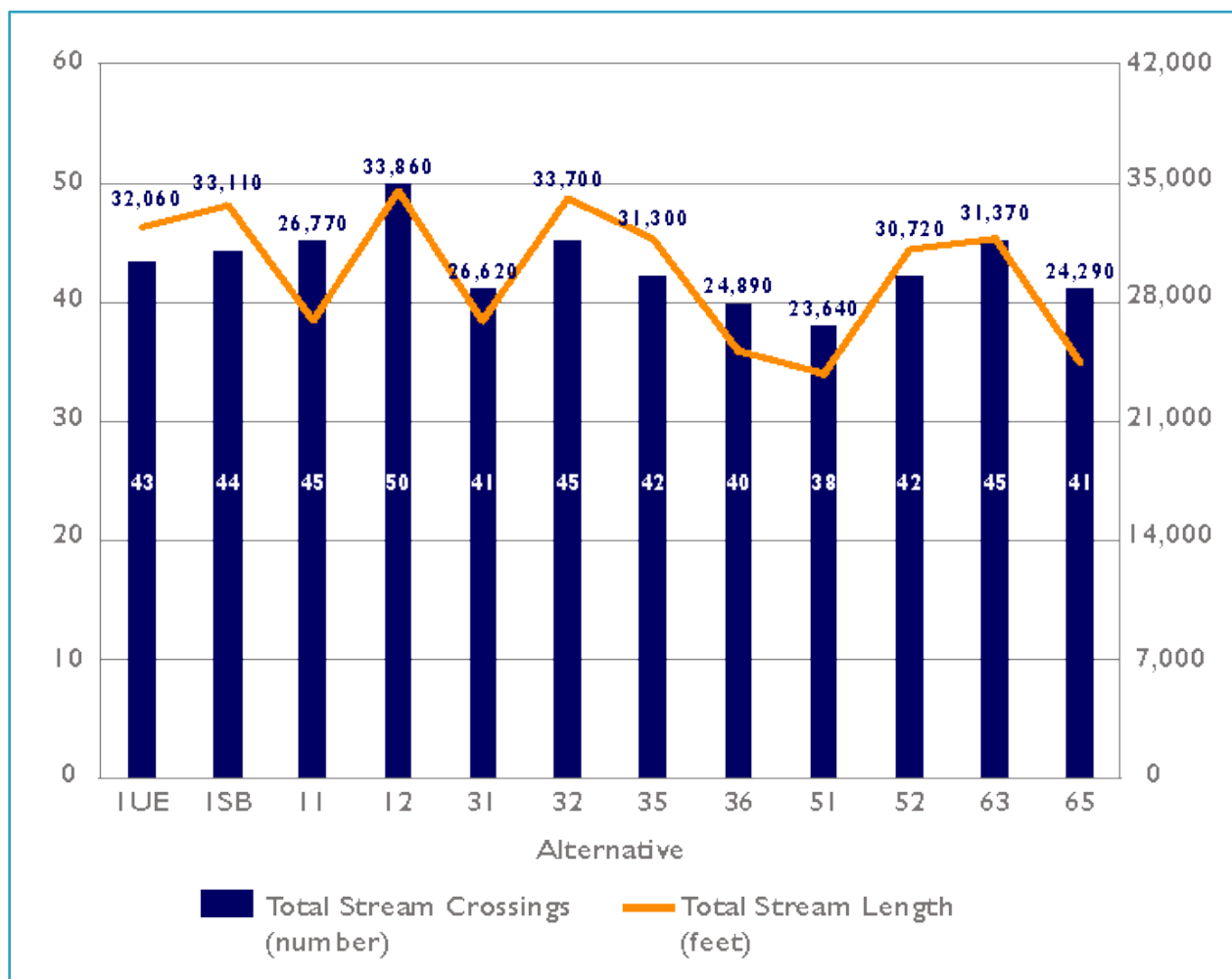




### 4.6.7.2 Streams

Permanent impacts to jurisdictional streams for each DSA are summarized in Table 4-15 and shown on Figure 4-37 through Figure 4-48. Detailed impact numbers for each stream segment and alternative are shown in Table F-4 of Appendix F. A jurisdictional stream model was created by NCDWR. Jurisdictional stream models were developed for the three ecoregions present in the project study area by utilizing 20-foot grid cell digital elevation models generated from bare-earth Light Detection and Ranging data and subsequent terrain derivatives and other ancillary data as variables. Additional discussions of the model and methodology used are included in the 2017 NRTR. The linear feet shown in Table 4-15 do not include areas where bridges would be placed over larger stream systems. The bridged areas have been removed from the analysis. The No-Build Alternative would have no impact to jurisdictional streams.

**Table 4-15: Jurisdictional stream impacts**



Note: Impacts were calculated using the construction slope stake limits plus a 40-foot buffer of the functional designs.



#### 4.6.7.3 Coastal Area Management Act Areas of Environmental Concern

AEC determinations and potential impacts will be established once the applicant's preferred alternative is selected and formal consultation with the NCDCM has been completed. The No-Build Alternative would not impact any AECs.

#### 4.6.7.4 North Carolina River Basin Buffer Rules

Potential impacts to protected stream buffers will be determined once the applicant's preferred alternative is selected and formal stream delineations have been conducted.

#### 4.6.7.5 Rivers and Harbors Act Section 10 Navigable Waters

Impacts to navigable waters in the form of bridge piers will be determined once the applicant's preferred alternative is selected and bridge designs have been completed. Coordination with the USCG will take place through the Merger Team.

#### 4.6.7.6 Wild and Scenic Rivers

No rivers or sections of river within or near the project study area are designated as wild, scenic, or recreational under the National Wild and Scenic Rivers Act or designated under the North Carolina Natural and Scenic Rivers Act. There would be no impacts to these resources. The No-Build Alternative would not impact any natural, wild, and/or scenic rivers.

### 4.7 FLOODPLAINS AND FLOODWAYS

#### 4.7.1 Existing Floodplains and Floodways

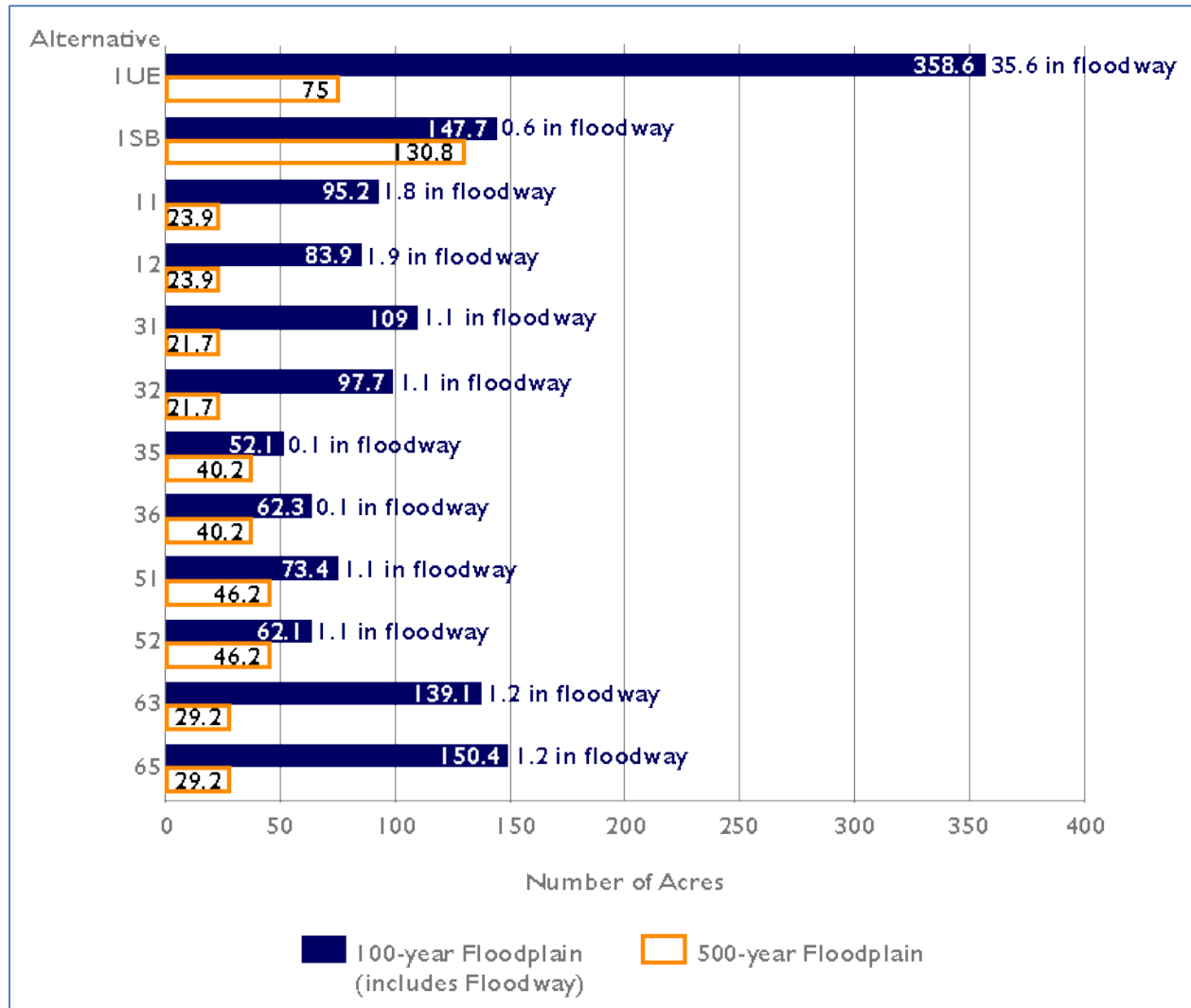
All DSAs would cross floodplains and floodways associated with the Neuse River. A floodway is defined as the channel of a river or watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Some DSAs would also cross floodplains and floodways associated with Southwest Creek, Falling Creek, Strawberry Branch, and Tracey Swamp. Permanent impacts to floodplains and floodways for each DSA are summarized in Table 4-16 and shown on Figure 4-49 through Figure 4-60. The acreages shown in Table 4-16 do not include areas where bridges would be placed over larger stream and wetland systems. Alternatives 1UE and 1SB would cause the most impacts to floodplains and floodways. The No-Build Alternative would not impact floodplains or floodways.

For all new location crossings on FEMA-regulated streams, a Conditional Letter of Map Revision and Letter of Map Revision will be prepared and submitted to the North Carolina Floodplain Mapping Program for approval.

#### National Flood Insurance Regulatory Program

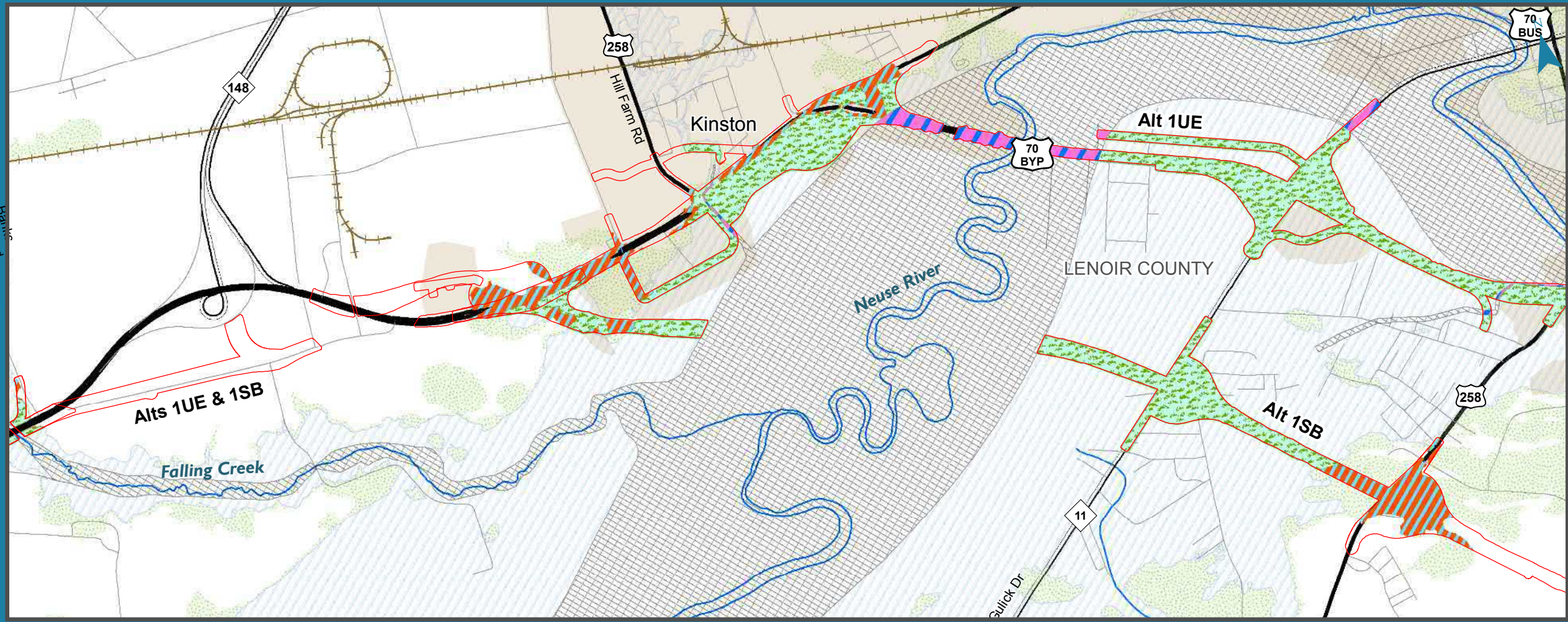
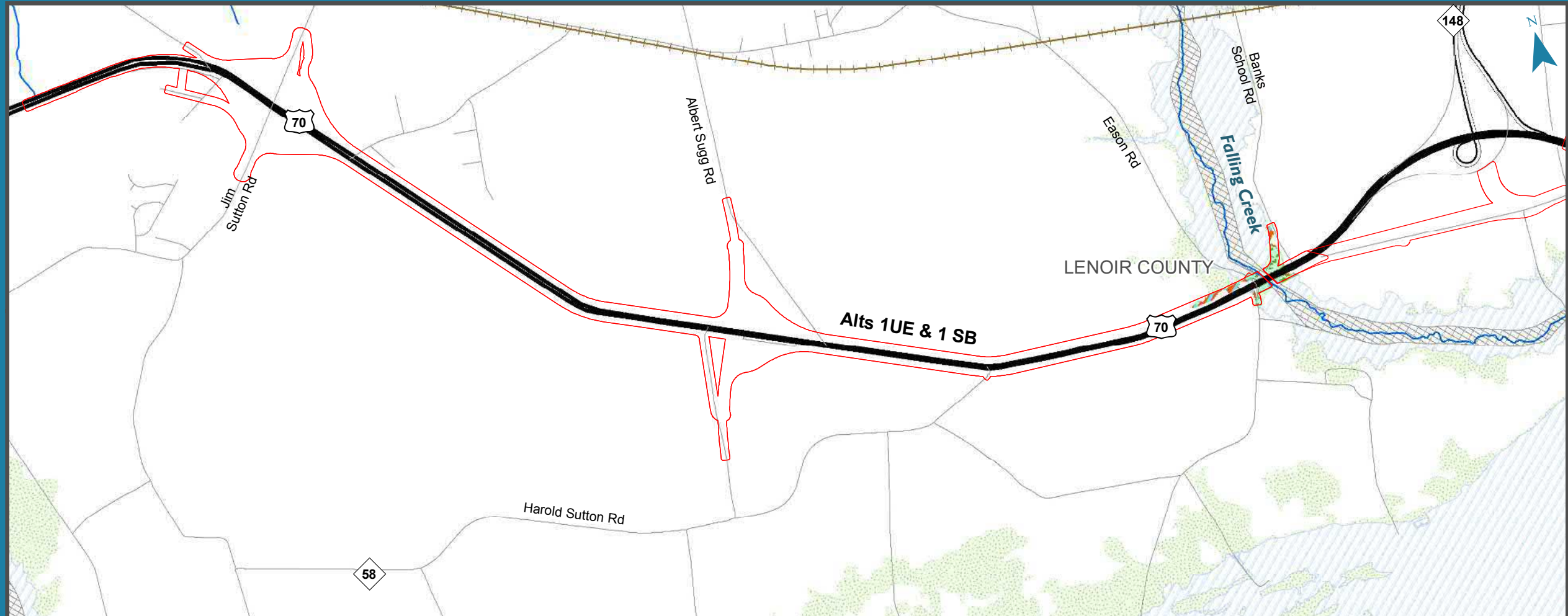
If a proposed action would, upon construction, affect an existing regulatory floodway, FEMA requires a Conditional Letter of Map Revision, which FEMA uses to comment on the proposed action. A Letter of Map Revision, which legally modifies the existing regulatory floodway, is also required from FEMA.



**Table 4-16: Impacts to floodplains and floodways**


Note: Impacts were calculated using right-of-way limits of the functional designs.






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Figure 4-49  
Floodplains and floodways  
impacts - Alternatives 1UE  
and 1SB - A

**Legend**

- Alts 1UE and 1SB Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS






Figure 4-50  
Floodplains and floodways  
impacts - Alternatives 1UE  
and 1SB - B

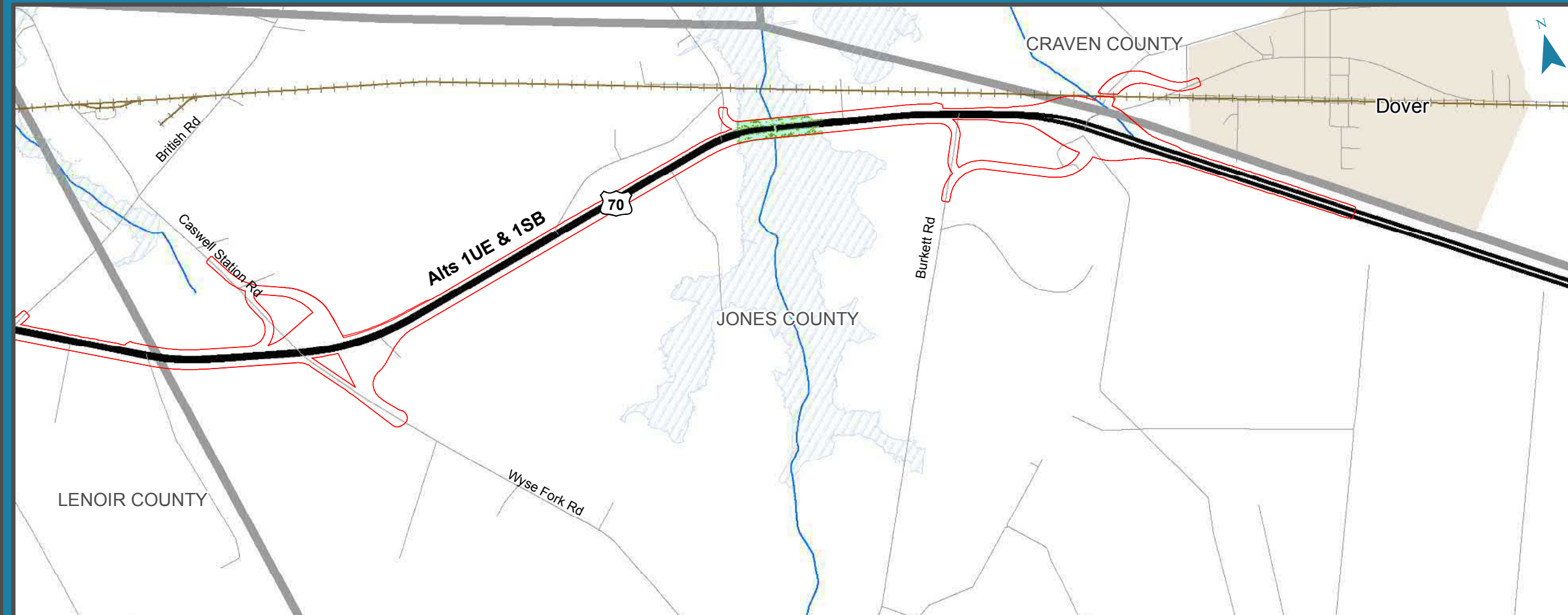
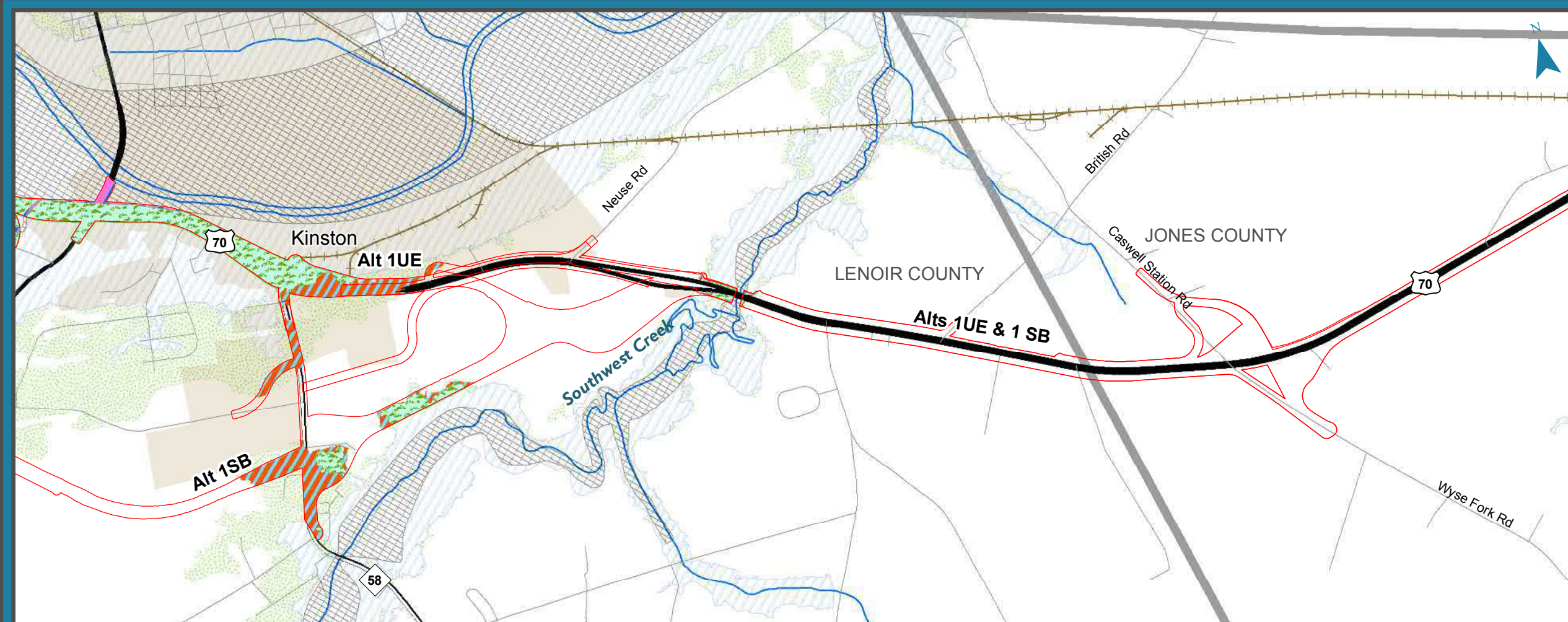
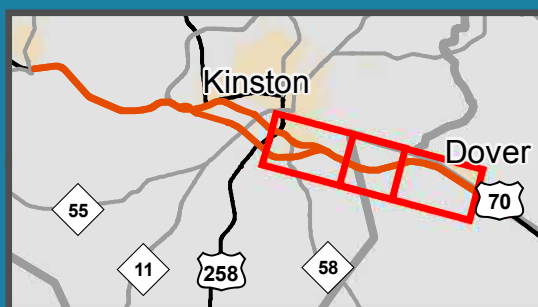
**Legend**

- Alts 1UE and 1SB Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





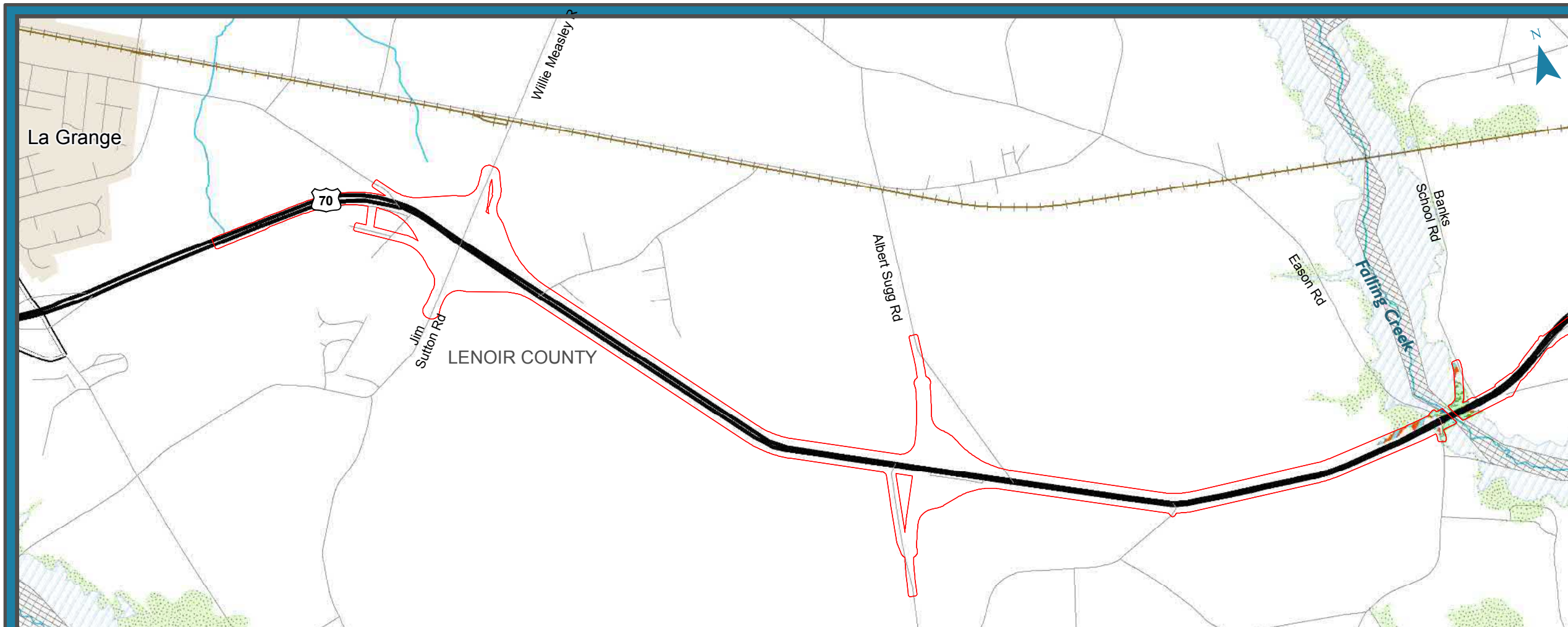


Figure 4-51:  
Floodplains and floodways  
impacts - Alternatives  
11 and 12 - A

**Legend**

- Alts 11 and 12 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS

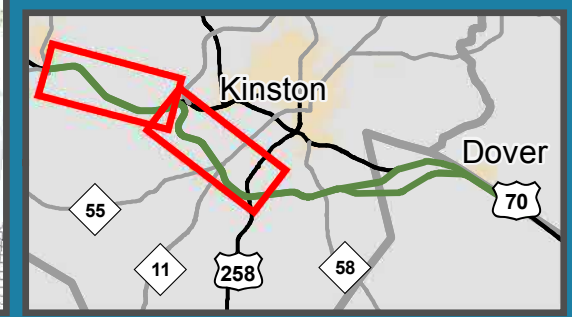
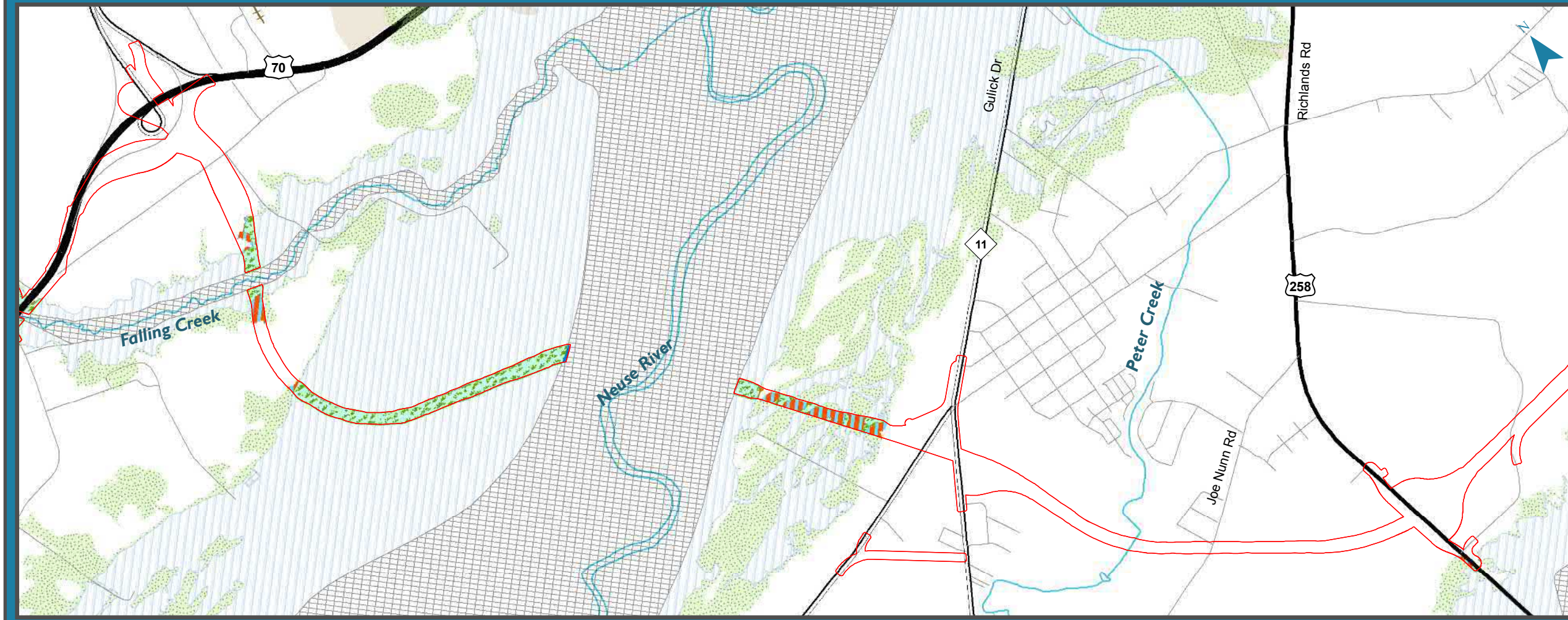




Figure 4-52:  
Floodplains and floodways  
impacts - Alternatives  
11 and 12 - B

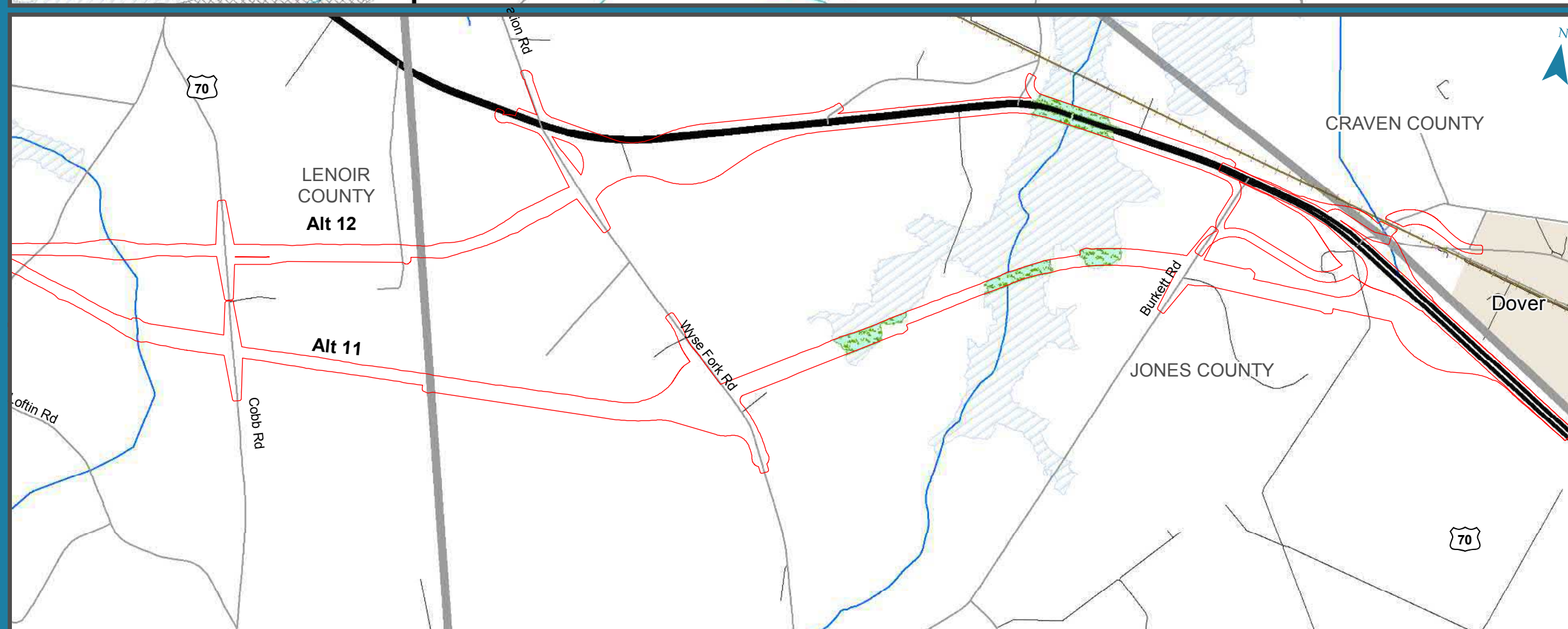
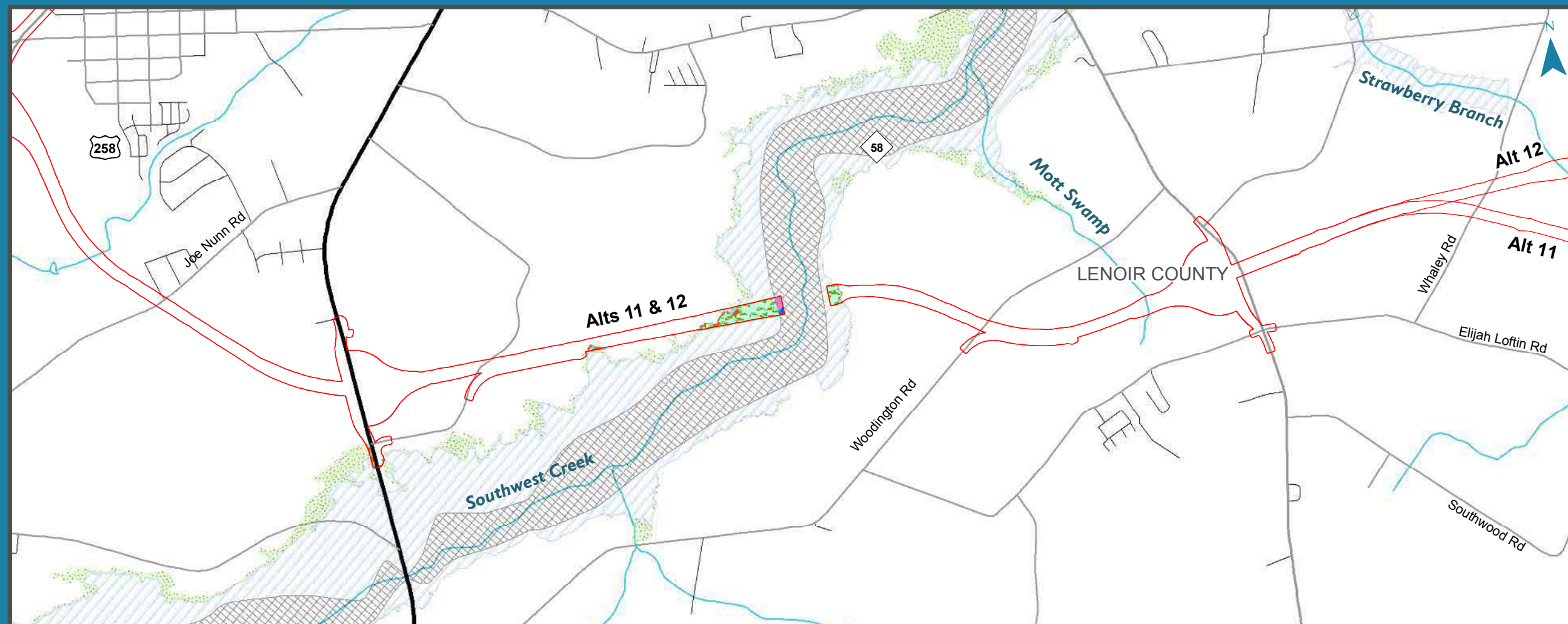
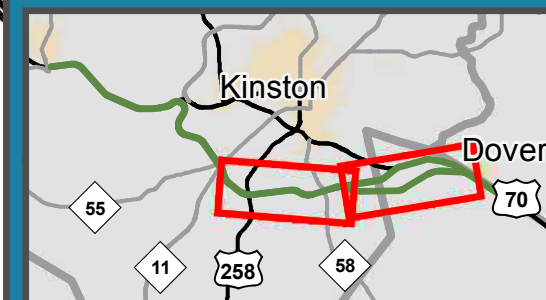
**Legend**

- Alts 11 and 12 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

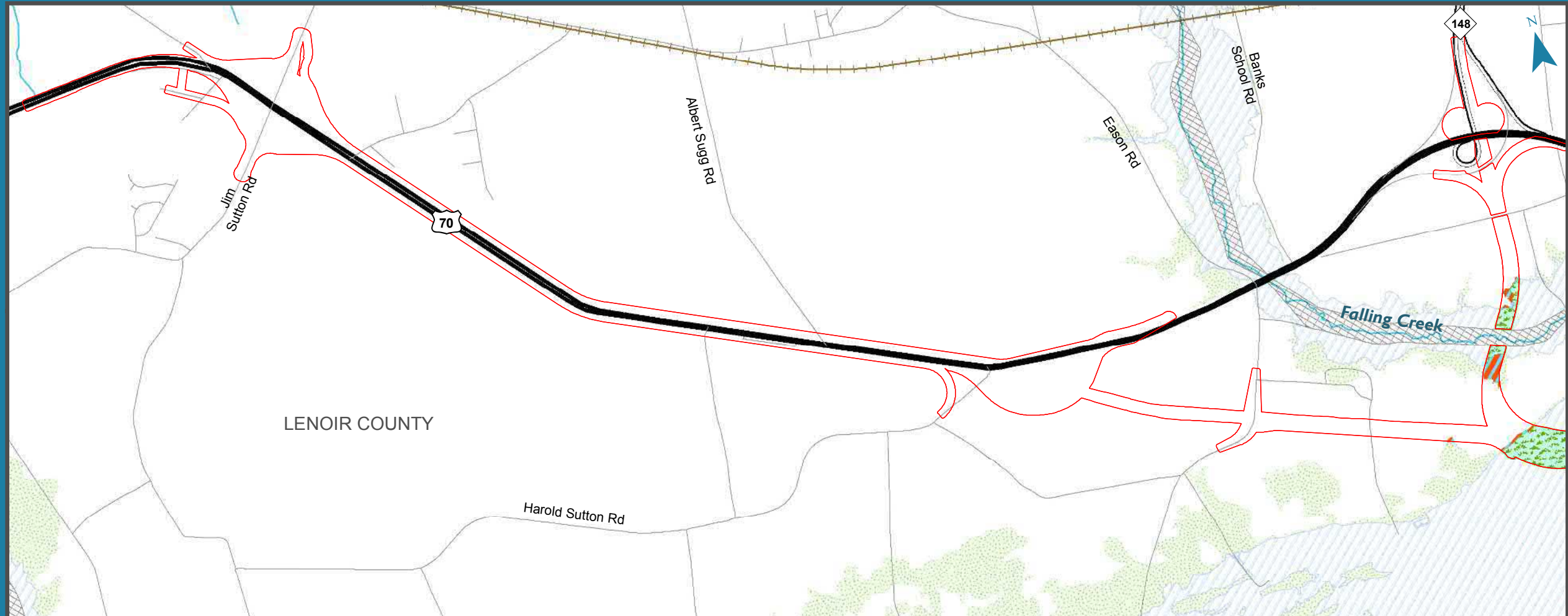
0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS







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Figure 4-53:  
Floodplain and floodways  
impacts - Alternatives  
31 and 32 - A

Legend

- Alts 31 and 32 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





Figure 4-54:  
Floodplains and floodways  
impacts - Alternatives  
31 and 32 -B

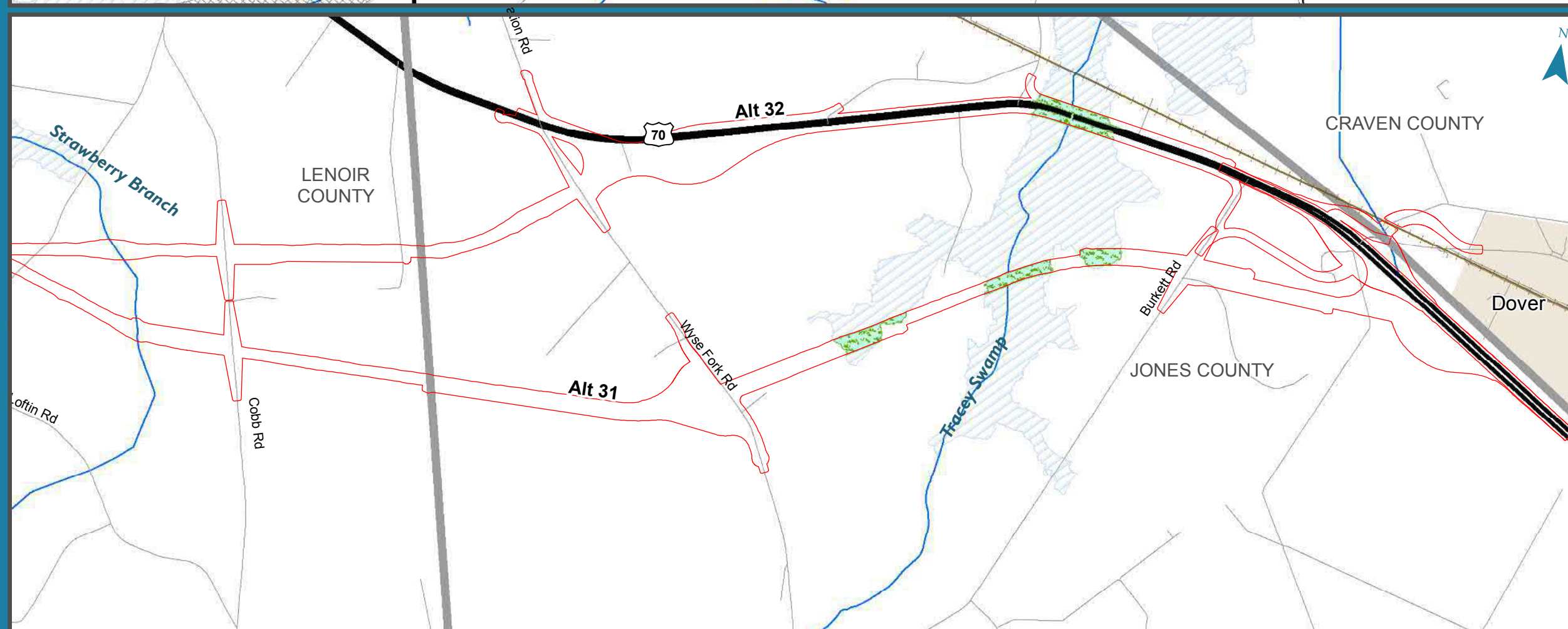
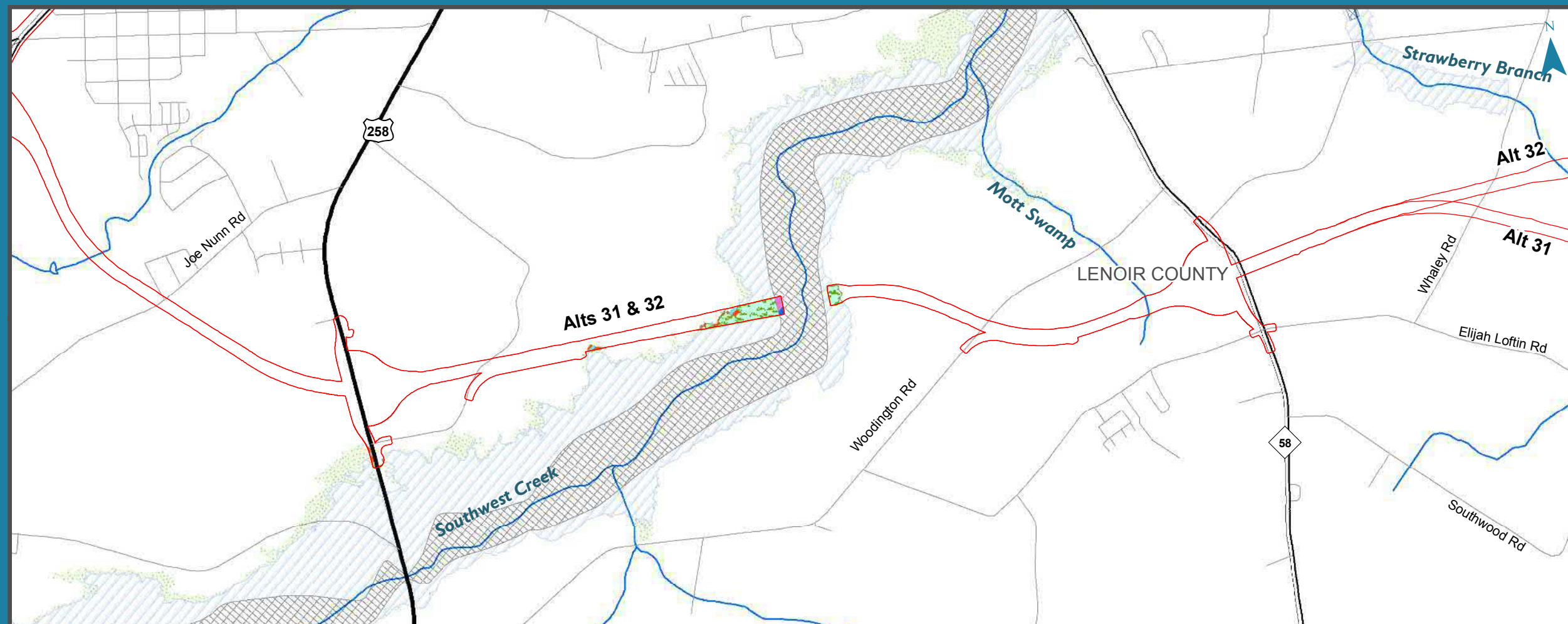
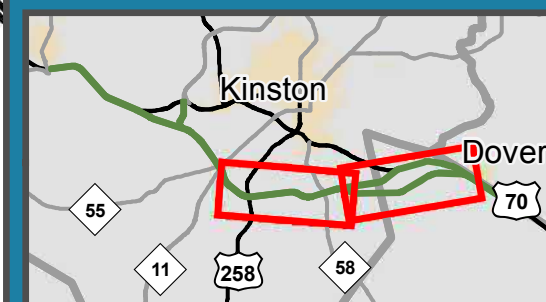
**Legend**

- Alts 31 and 32 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

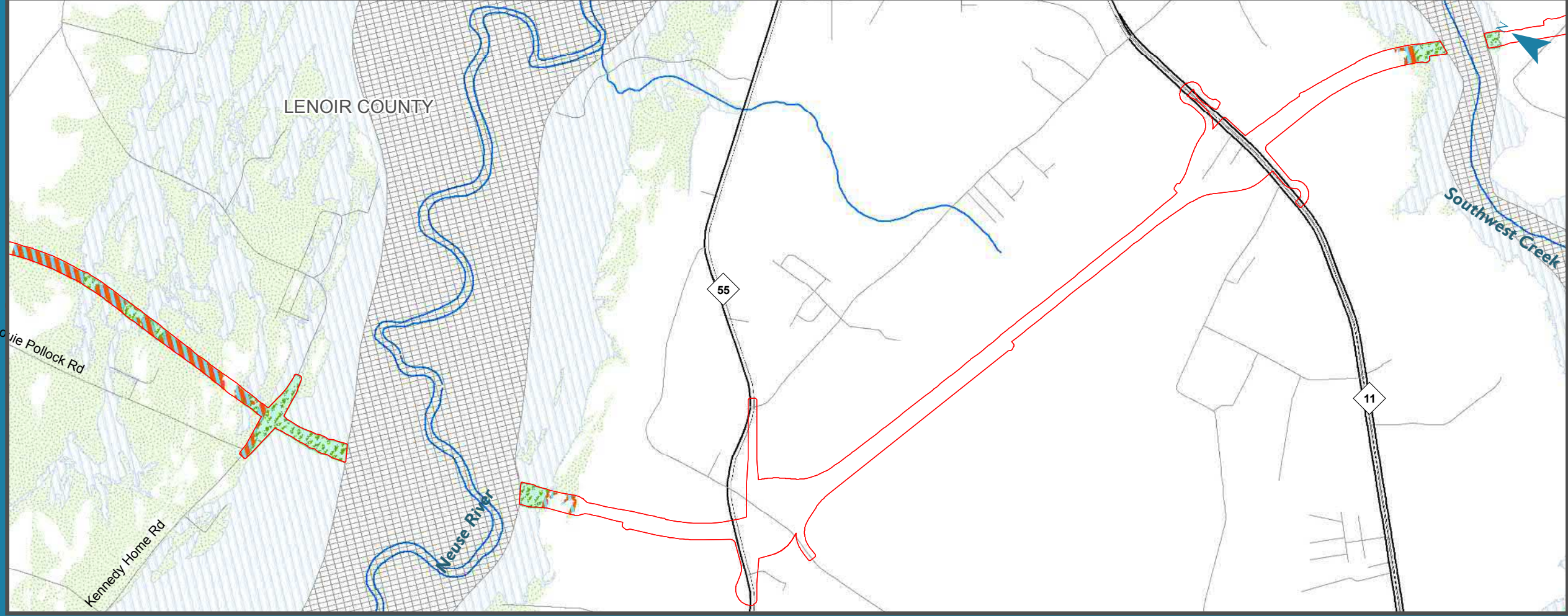
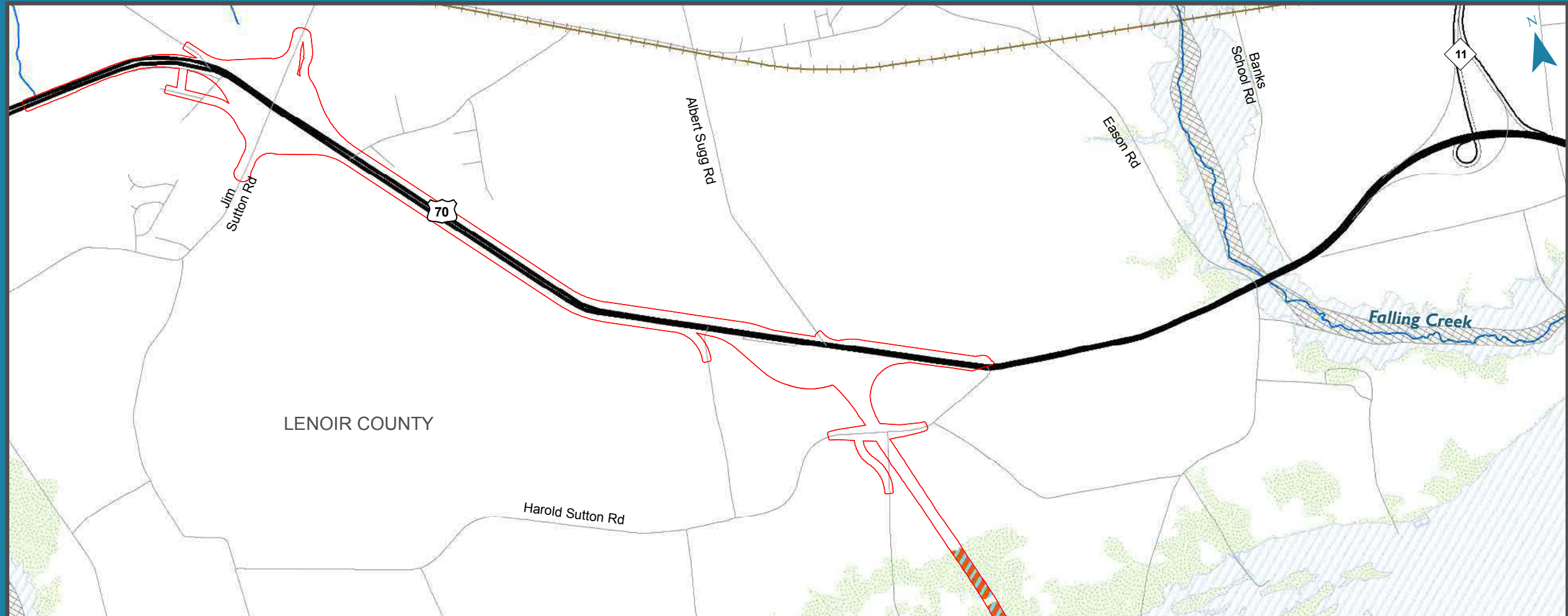
0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS







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Figure 4-55:  
Floodplains and floodways  
impacts - Alternatives  
35 and 36 - A

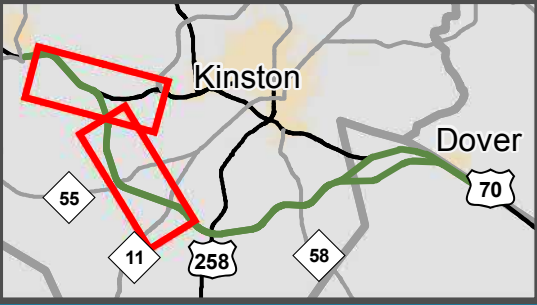
**Legend**

- Alts 35 and 36 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

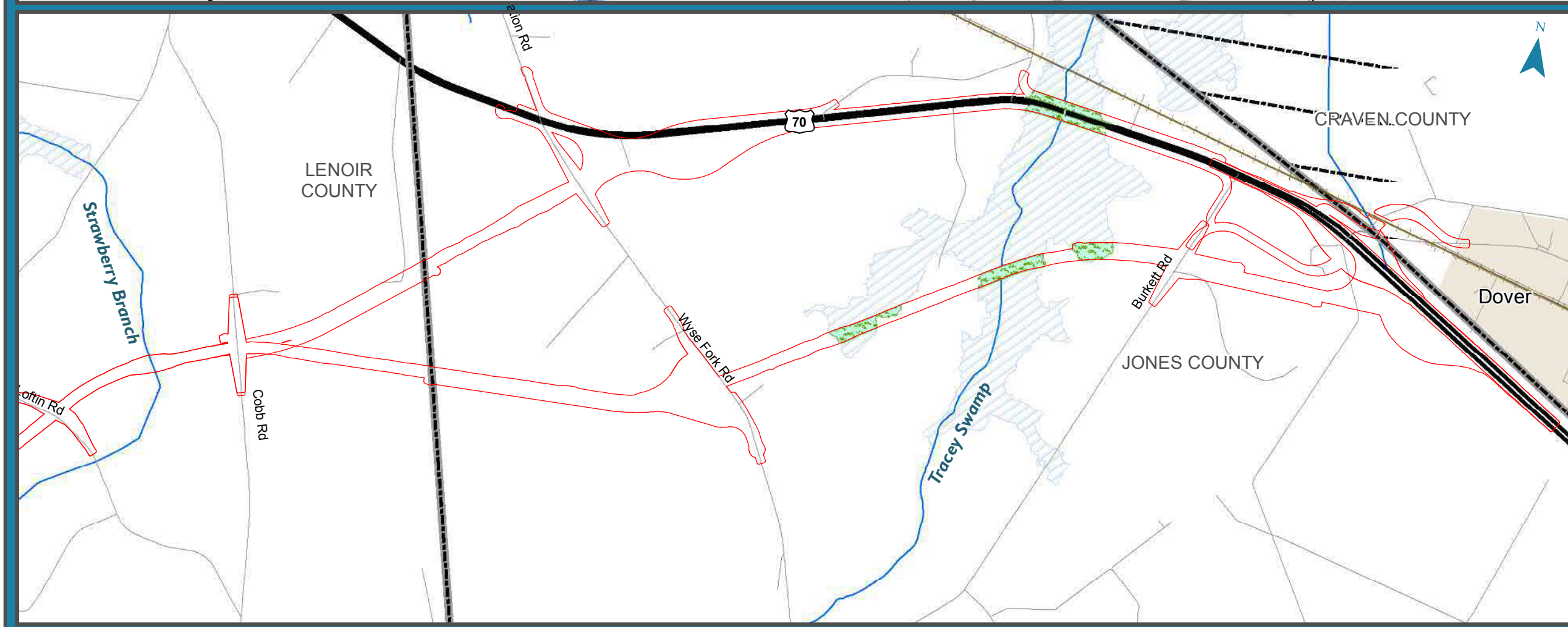
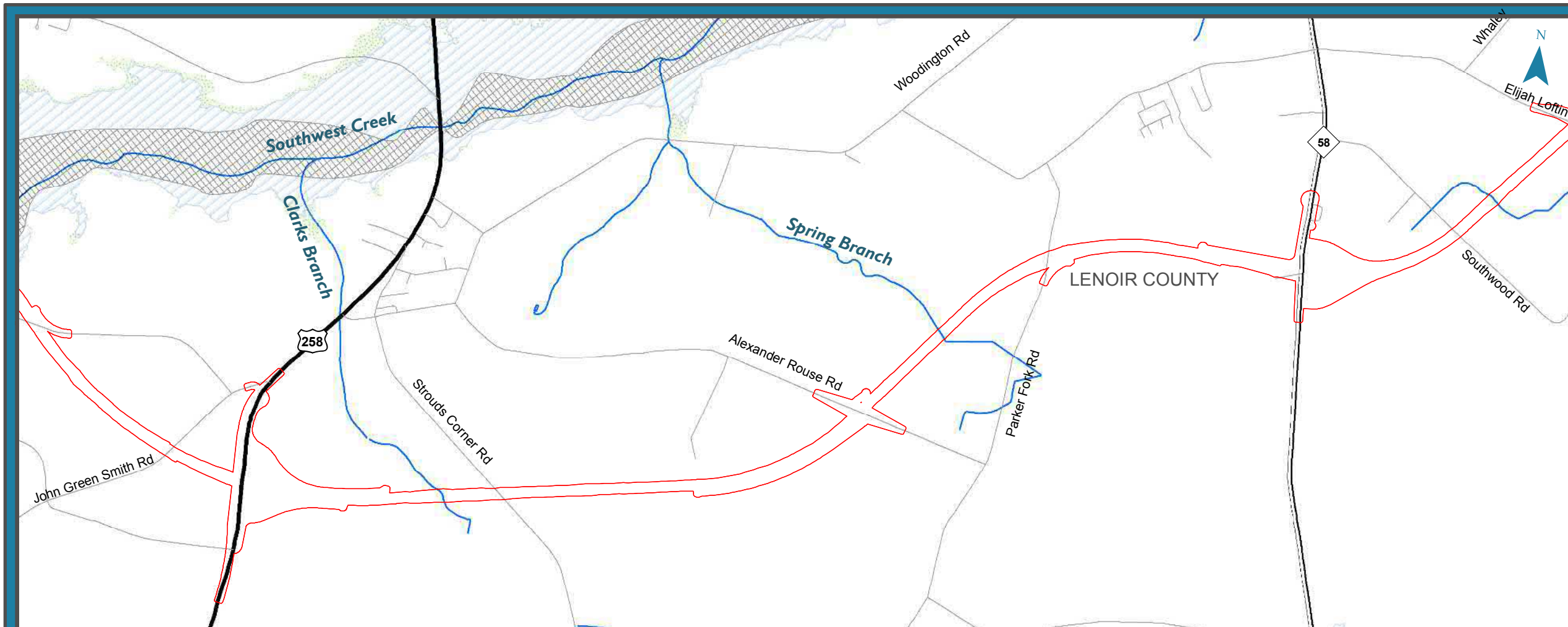
0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS








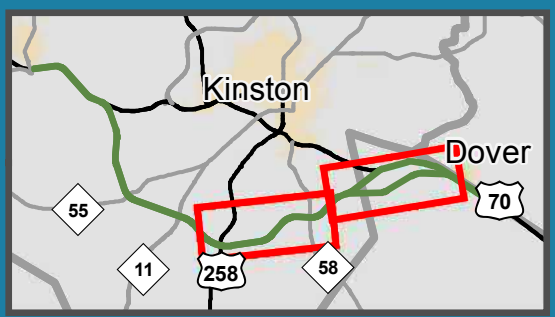
**Figure 4-56:**  
Floodplains and floodways  
impacts - Alternatives  
35 and 36 - B

**Legend**

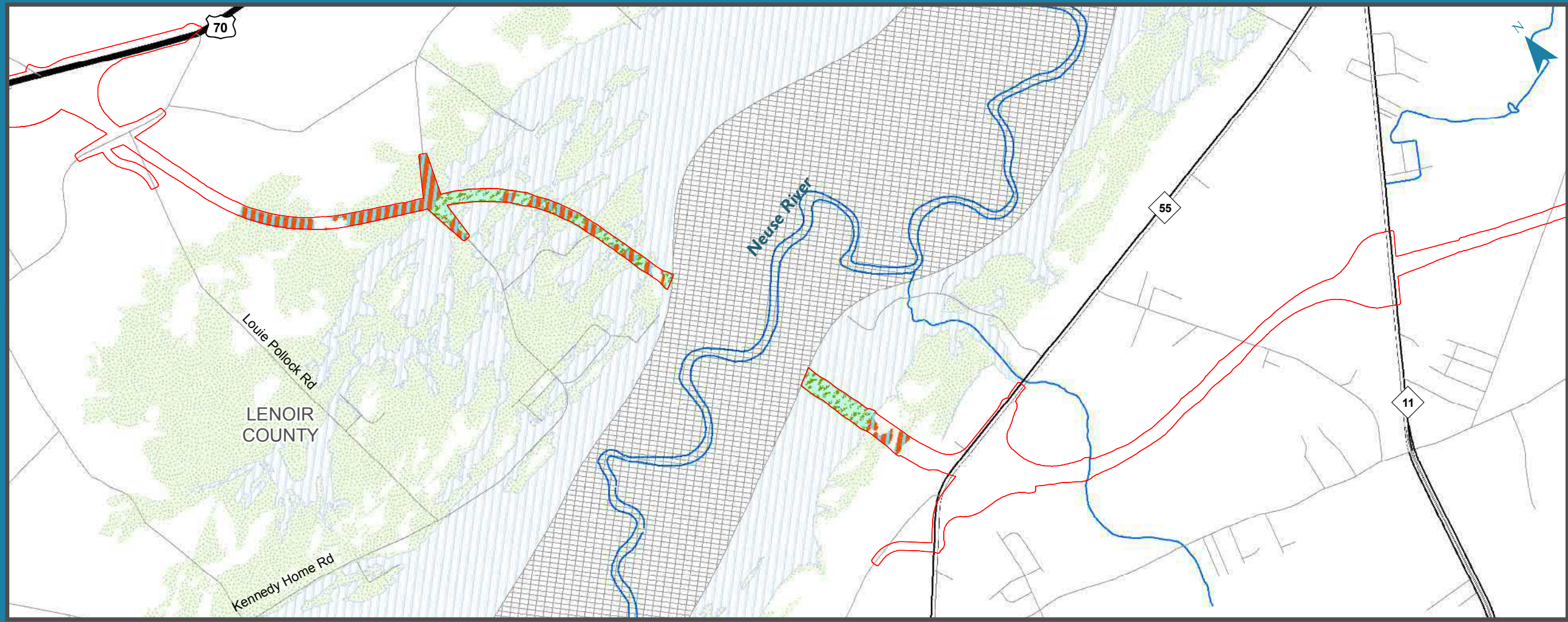
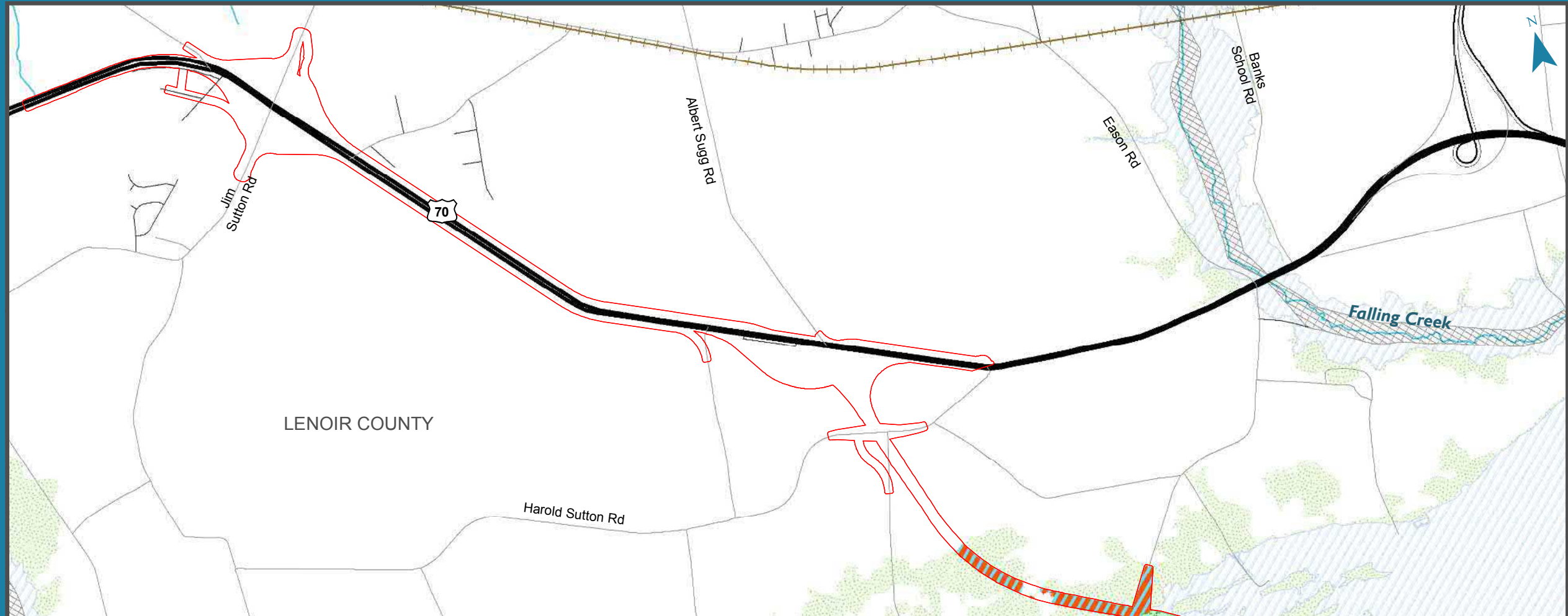
- Alts 35 and 36 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway
- 100-year Floodplain
- 500-year Floodplain

0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS







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Figure 4-57:  
Floodplains and floodways  
impacts - Alternatives  
51 and 52 - A

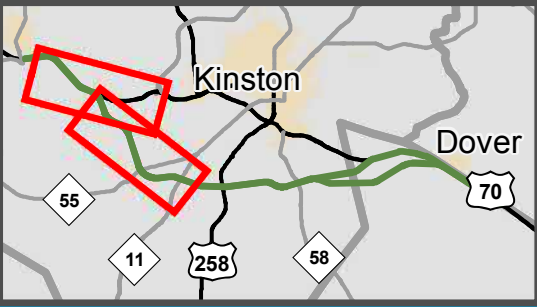
**Legend**

- Alts 51 and 52 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





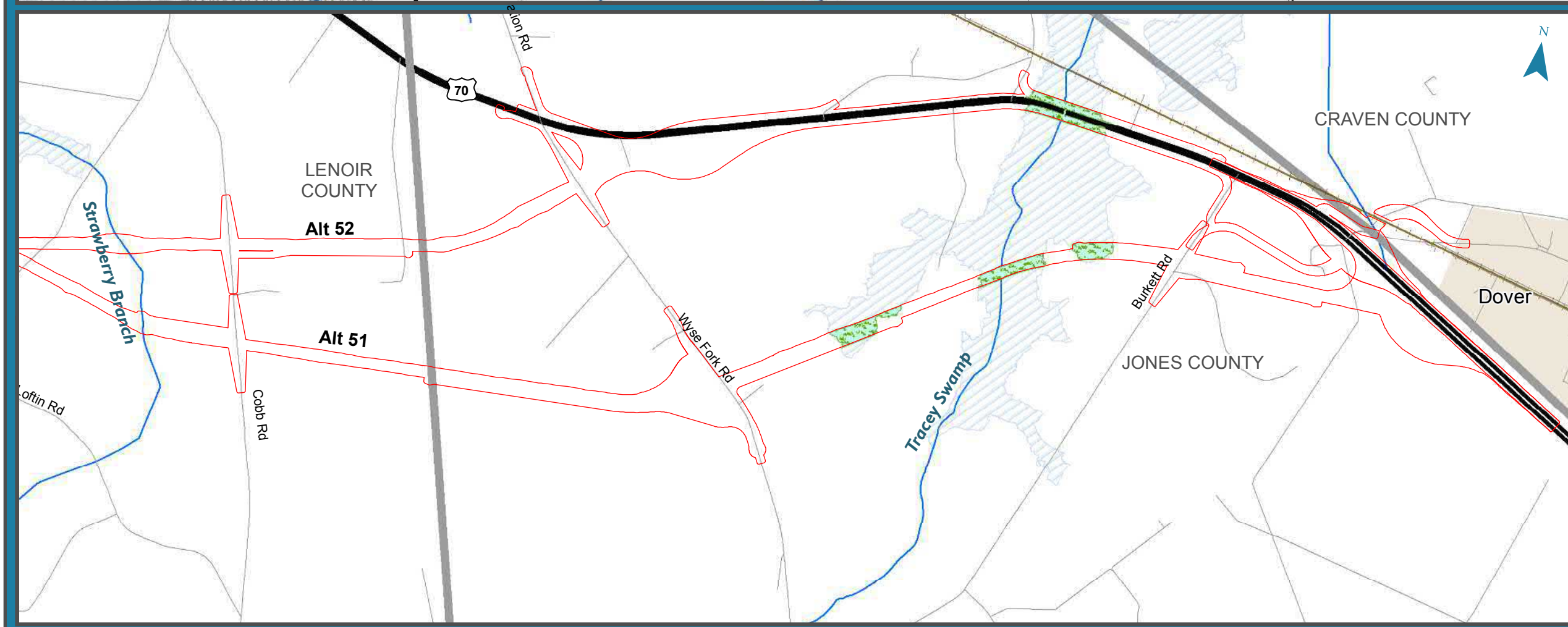
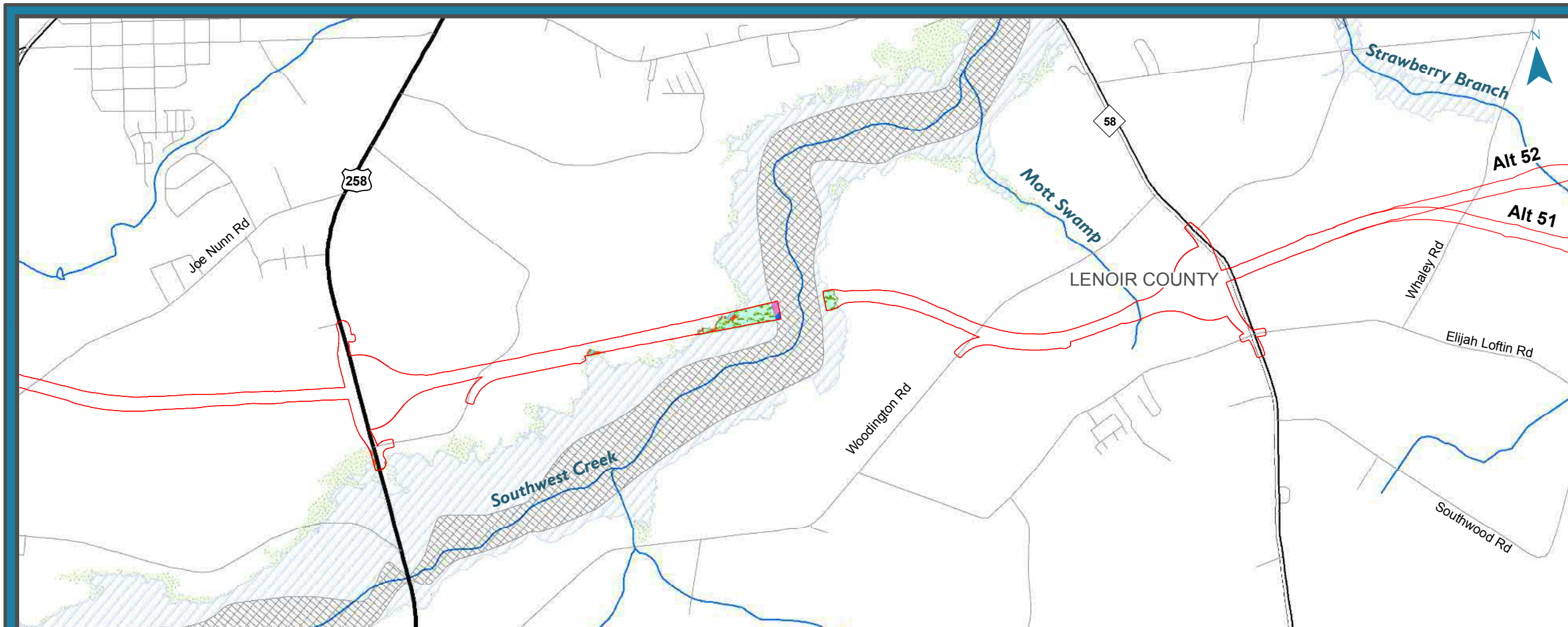


Figure 4-58:

Floodplains and floodways

impacts - Alternatives

51 and 52 - B

Legend

Alts 51 and 52 Slope Stake Limits Plus 40 Feet

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Floodway

100-year Floodplain

500-year Floodplain

Regulatory Floodway Impact

100-year Floodplain Impact

500-year Floodplain Impact

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

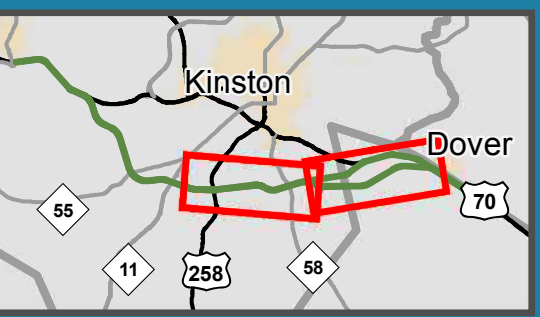
This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NConemap, NRCS, USFWS





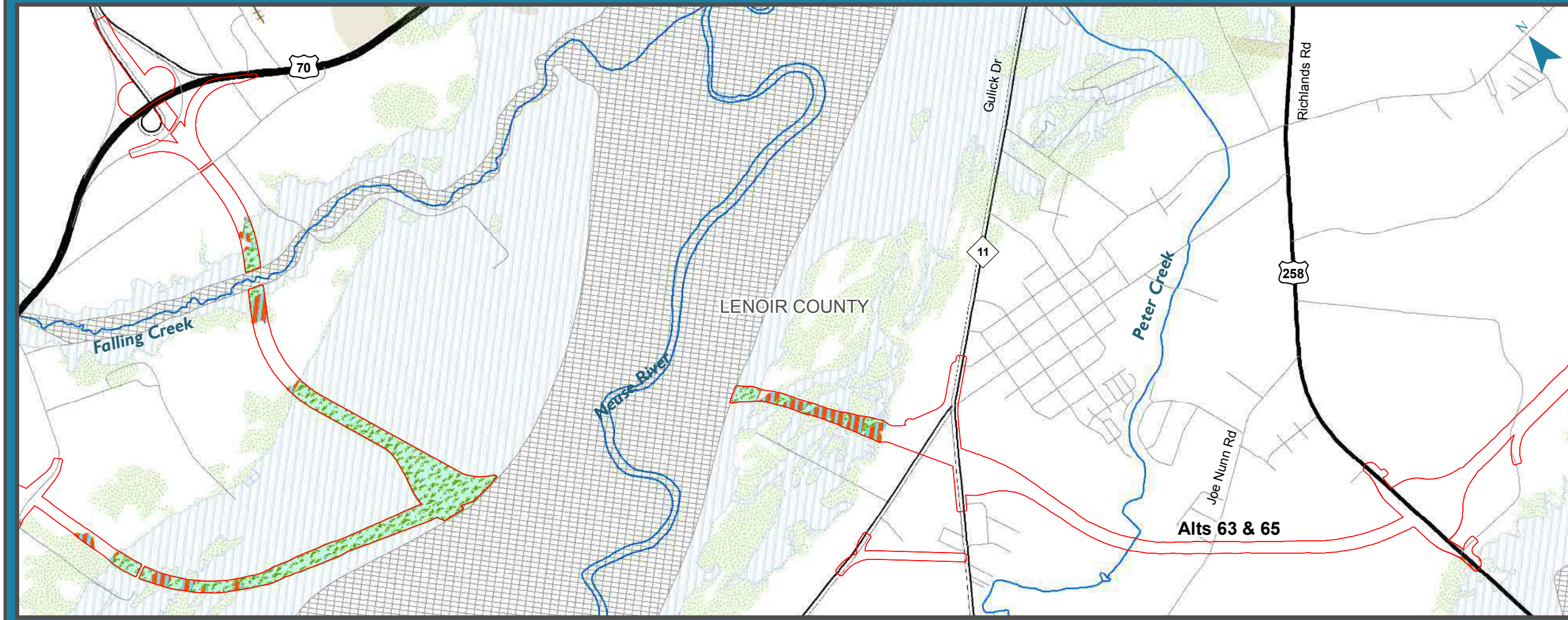
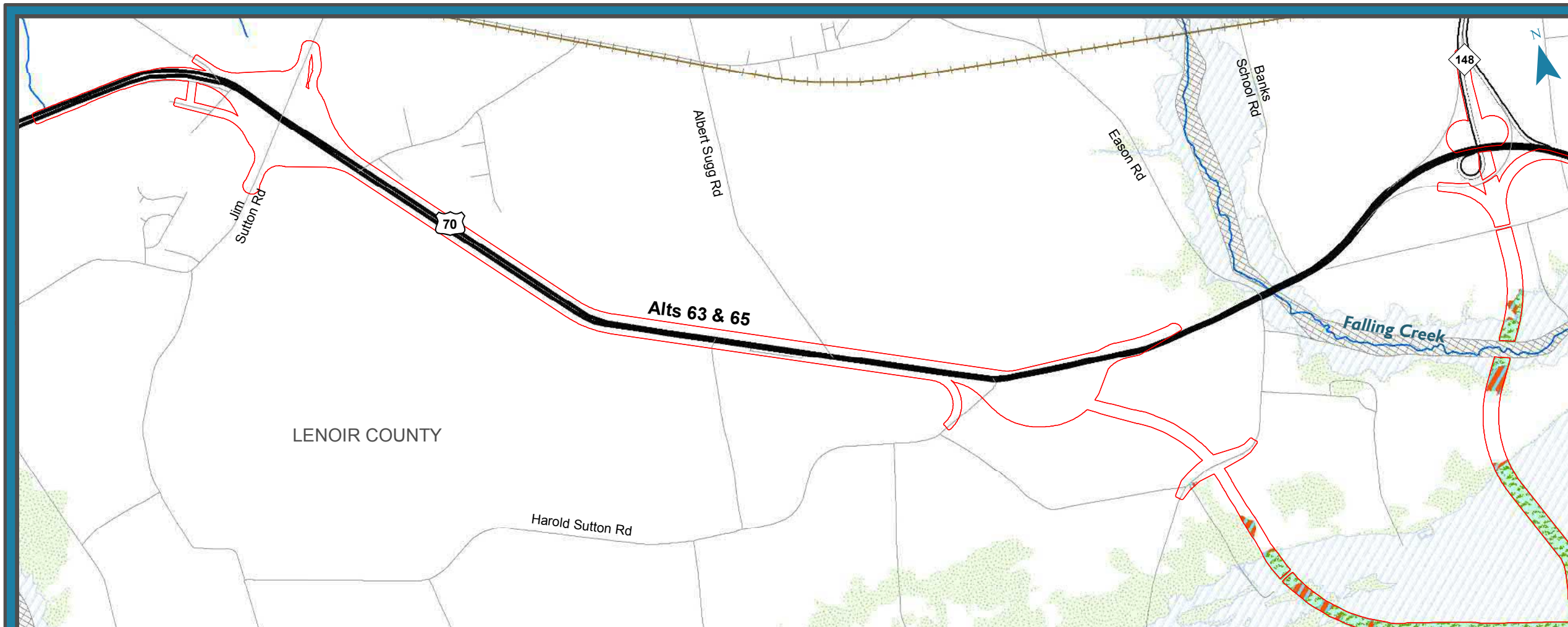


Figure 4-59:

Floodplains and floodways

impacts - Alternatives

63 and 65 - A

Legend

Alts 63 and 65 Slope Stake Limits Plus 40 Feet

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Floodway

100-year Floodplain

500-year Floodplain

Floodway Impact

100-year Floodplain Impact

500-year Floodplain Impact

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NCONemap, NRCS, USFWS

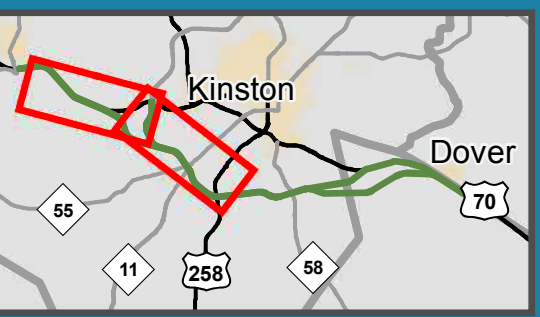




Figure 4-60:  
Floodplains and floodways  
impacts - Alternatives  
63 and 65 - B

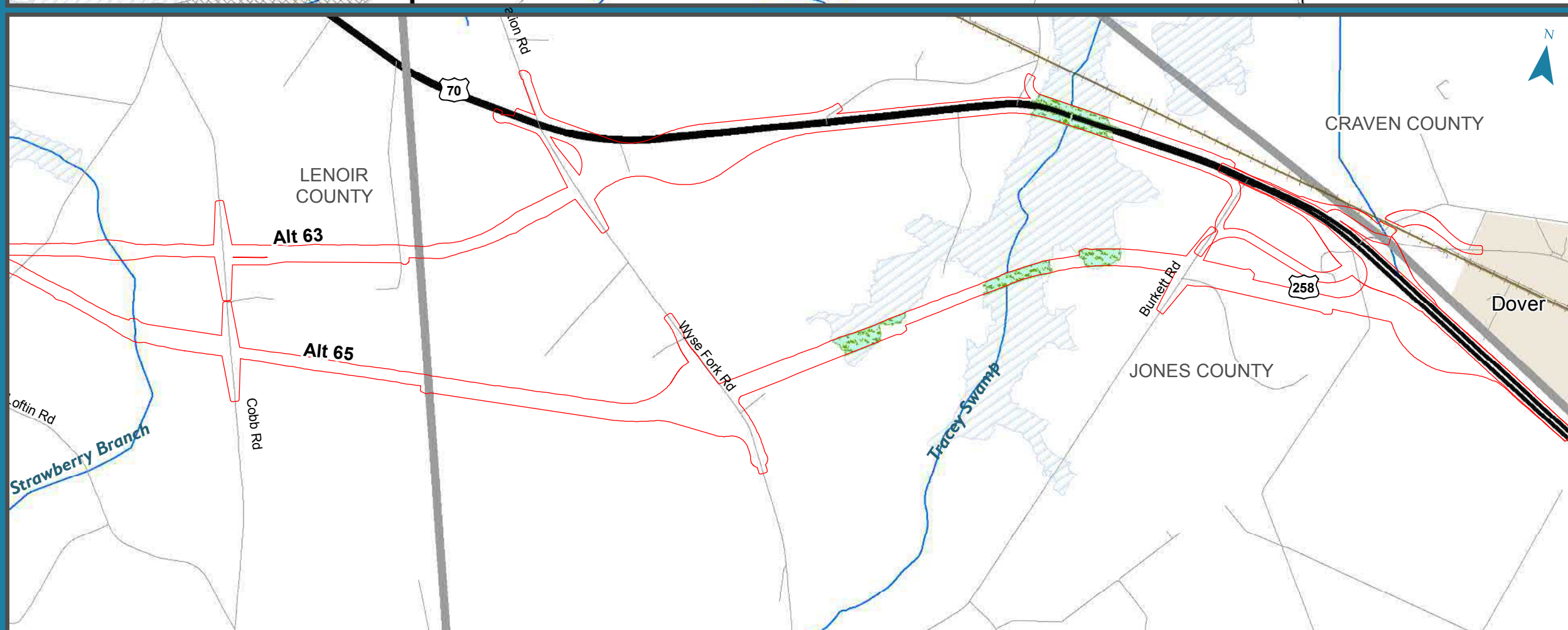
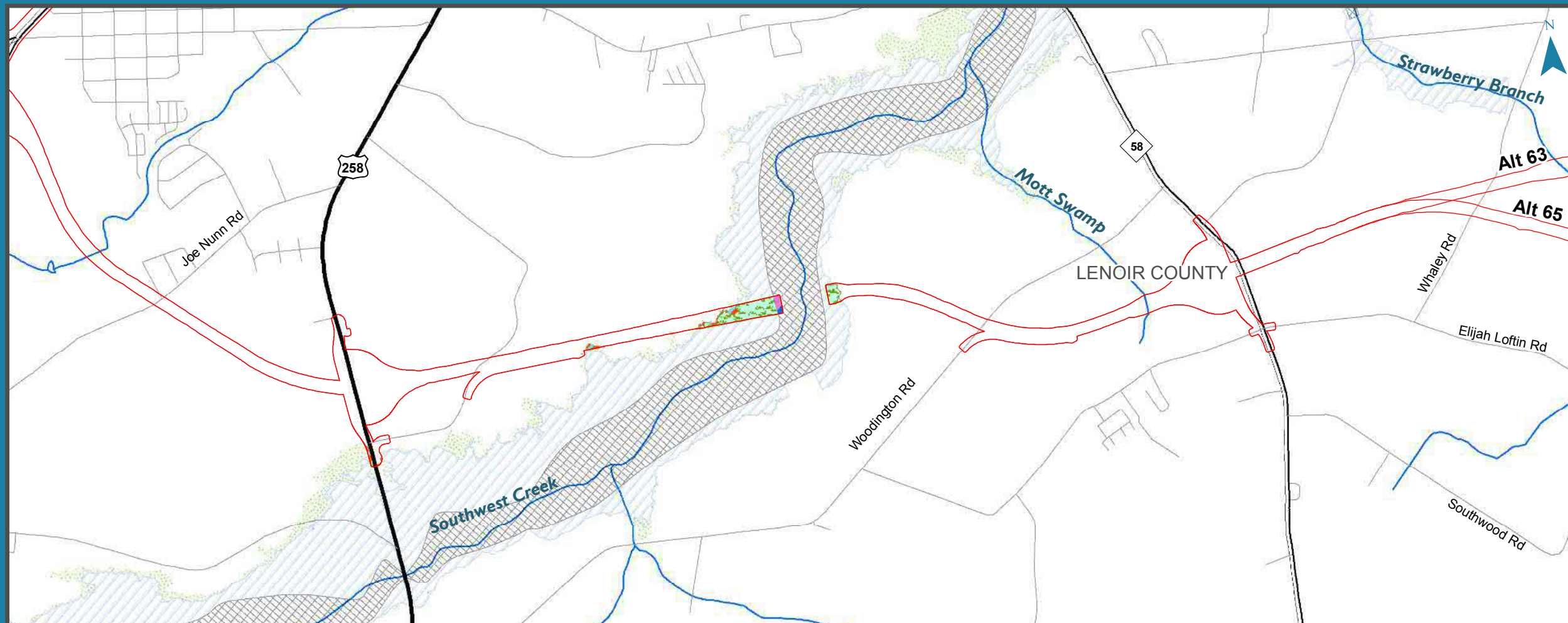
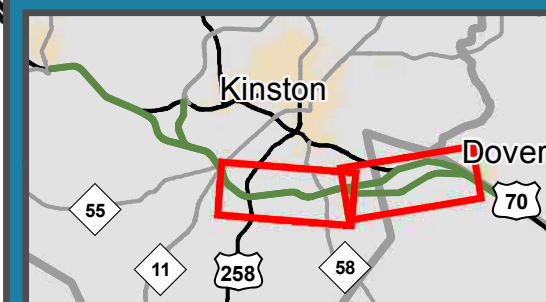
**Legend**

- Alts 63 and 64 Slope Stake Limits Plus 40 Feet
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Floodway
- 100-year Floodplain
- 500-year Floodplain
- Regulatory Floodway Impact
- 100-year Floodplain Impact
- 500-year Floodplain Impact

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





### 4.7.2 Flood Analysis

The flood analysis resulted in data showing the difference between the proposed road surface elevation and the water surface elevation for the 1 percent annual flood chance, 4 percent annual flood chance, and flood levels resulting from Hurricane Matthew. Of the three water surface elevations evaluated, the 1 percent water surface elevation was the highest. Mapping was developed to show the difference in elevation between the proposed roadway and the 1 percent water surface elevation for all areas where the proposed roadway intersected the Neuse River floodplain or crossed the 1 percent floodplain on tributaries to the Neuse River with a freeboard of 3 feet or less. The roadway path was color coded such that areas below the 1 percent water surface elevation are shown in red, areas between 0 and 3 feet above the 1 percent water surface elevation area shown in yellow, and areas that are greater than 3 feet above the 1 percent water surface elevation are shown in green.

According to the analysis, none of the new location DSAs is inundated by the 1 percent annual flood chance event as shown on Figure 4-61 through Figure 4-82. The other two events evaluated have lower water surface elevations than the 1 percent and will therefore not overtop any of the potential routes. The analysis did show potential issues within proposed sag locations along each alternative that would fall between 0 and 3 feet above the 1 percent water surface elevation. If one of the new location DSAs is chosen to be the applicant's preferred alternative, the vertical alignment of the mainline will be revised. During final design, revisions to the sag locations will be made to show a minimum of a 1.5-foot freeboard at the proposed shoulder point during a 1 percent annual chance flooding event.

The analysis was only performed for the Neuse River and backwater to the Neuse River due to data availability. More information regarding methodologies and data used within the analysis is included in the R-2553 Kinston Bypass Flood Analysis Memo that is available on the project website.

#### Flood Analysis Memo

The Flood Analysis Memo for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>





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Figure 4-61:  
Elevation above 1 percent  
water surface elevation -  
Alternative 1UESB

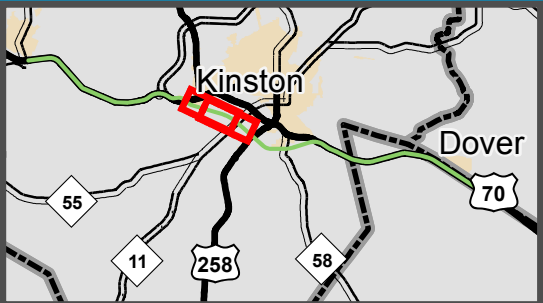
Legend

- Alt. 1UESB ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary
- Elevation Above 1% Water Surface
  - 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
- 100 Year Floodplain

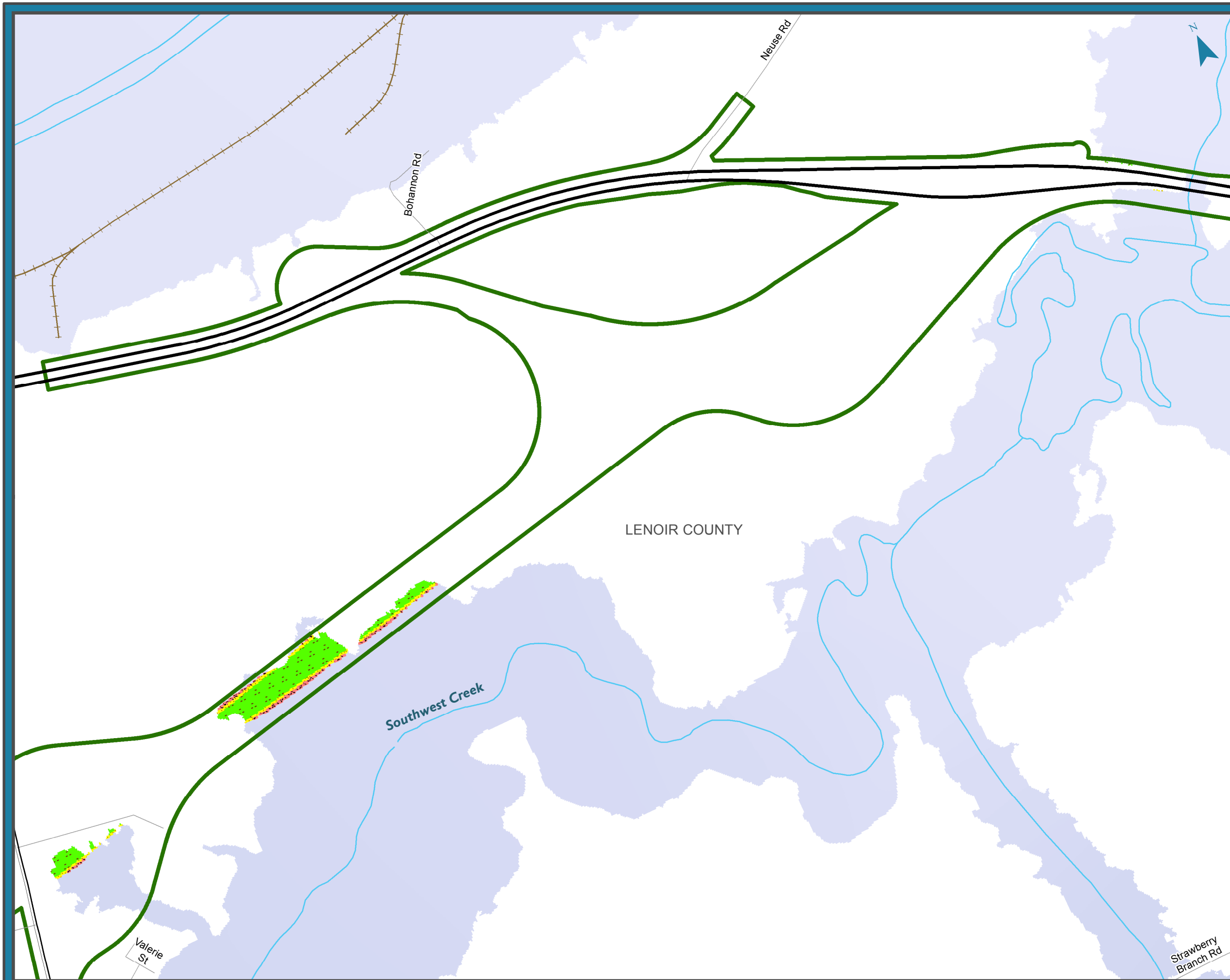
0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS
















**Figure 4-62:**  
Elevation above 1 percent  
water surface elevation -  
Alternative 1UESB - B


**Legend**

-  Alt. 1UESB ROW
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road

Elevation Above 1% Water

-  3 - 35 ft
-  0 - 3 ft
-  -20 - 0 ft
-  100 Year Floodplain

0 0.125 0.25 Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

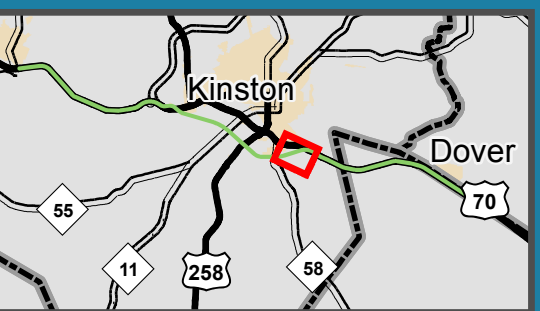




Figure 4-63:

Elevation above 1 percent

water surface elevation -

Alternative 11 - A

Legend

Alt. 11 ROW

Railroad

US Highway

NC Highway

Secondary Road

Elevation Above 1% Water Surface

3 - 35 ft

0 - 3 ft

-20 - 0 ft

100 Year Floodplain



This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NConemap, NRCS, USFWS

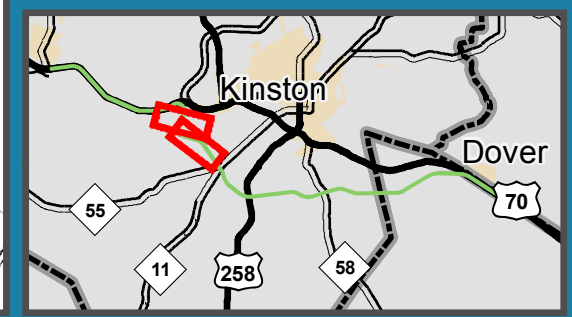




Figure 4-64:

Elevation above 1 percent

water surface elevation -

Alternative 11 - B

Legend

Alt. 11 ROW

Railroad

US Highway

NC Highway

Secondary Road

Elevation Above 1% Water Surface

3 - 35 ft

0 - 3 ft

-20 - 0 ft

100 Year Floodplain



This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NConemap, NRCS, USFWS

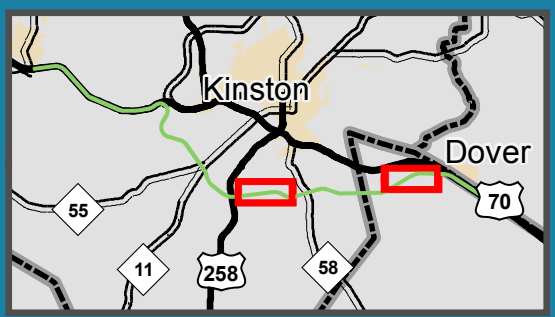




Figure 4-65:

Elevation above 1 percent

water surface elevation -

Alternative 12 - A

Legend

Alt. 12 ROW

Railroad

US Highway

NC Highway

Secondary Road

Elevation Above 1% Water Surface

3 - 35 ft

0 - 3 ft

-20 - 0 ft

100 Year Floodplain



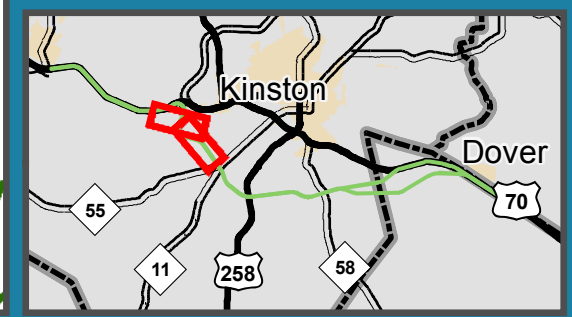
This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NConemap, NRCS, USFWS





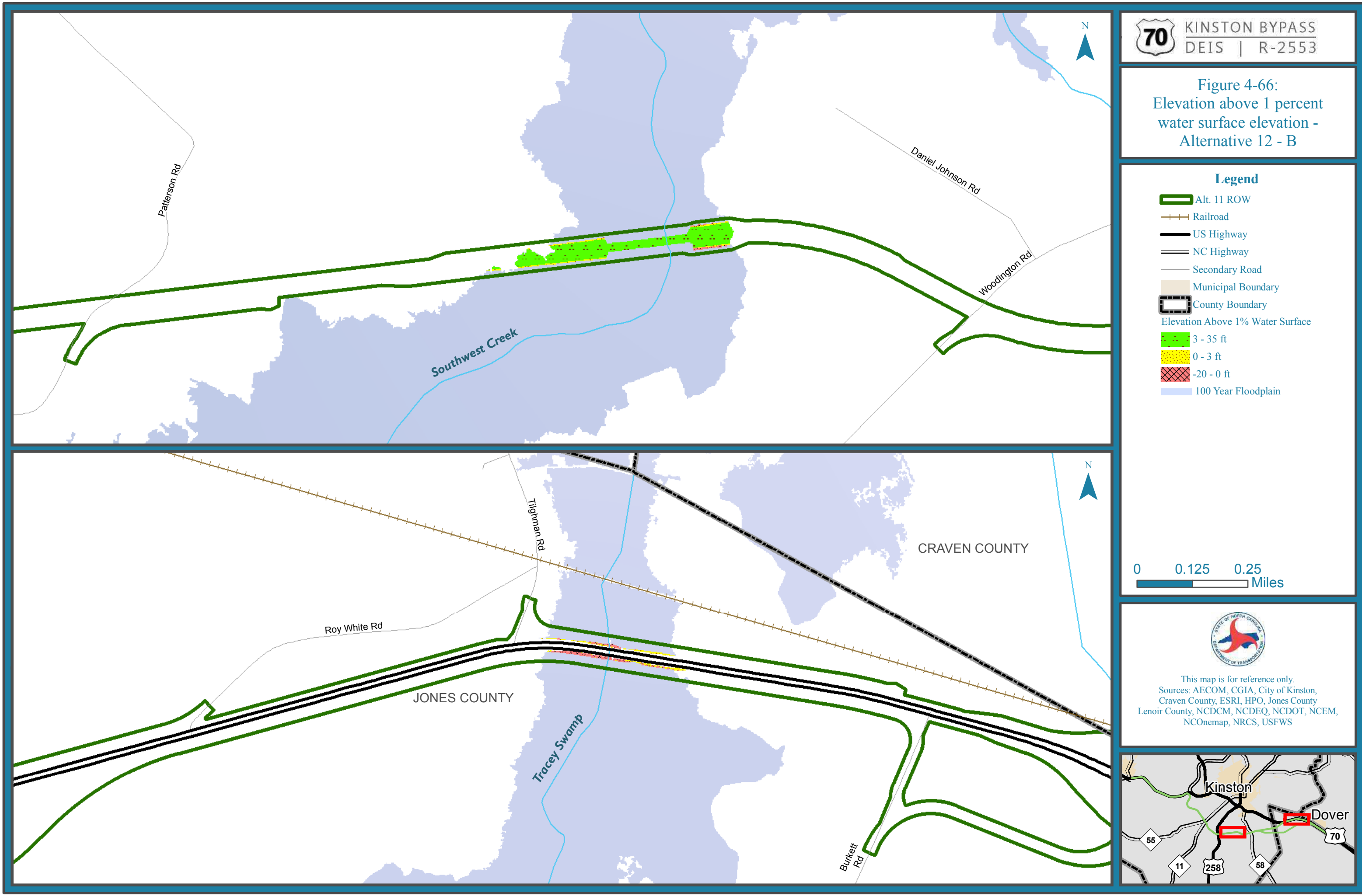




Figure 4-67:  
Elevation above 1 percent  
water surface elevation -  
Alternative 31 - A

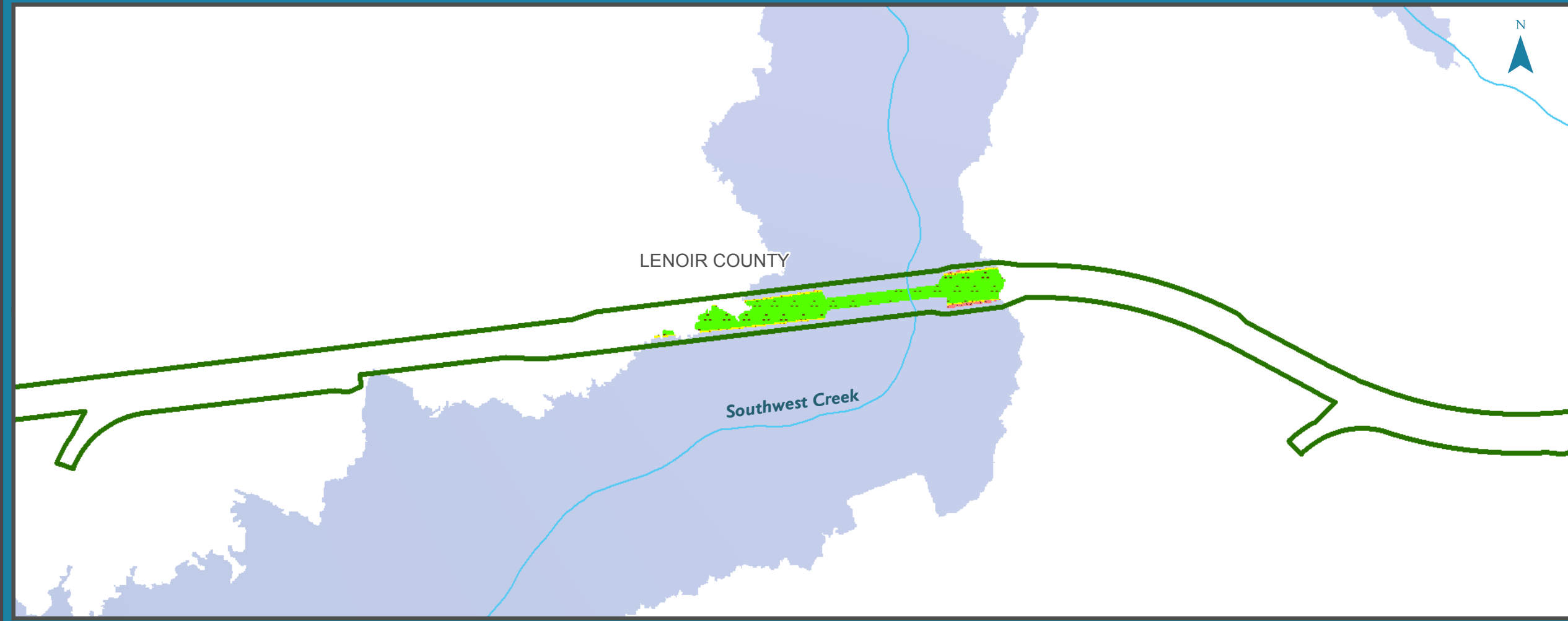
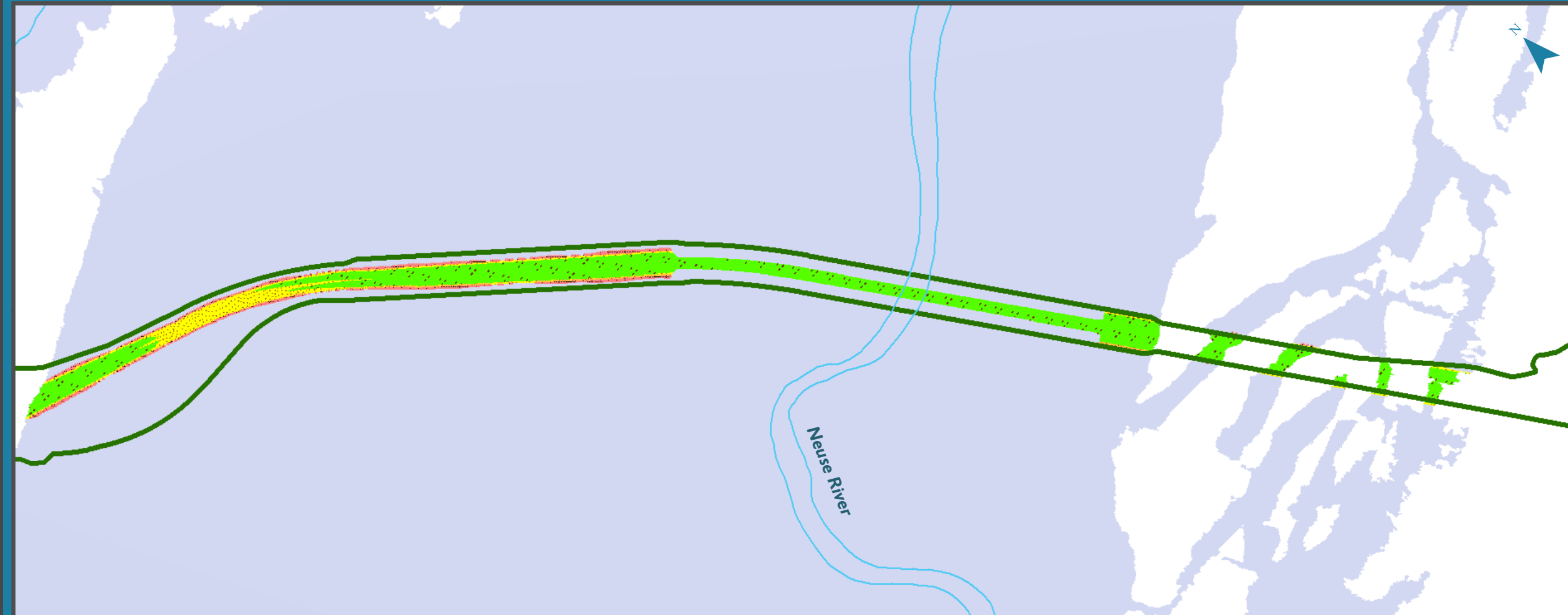
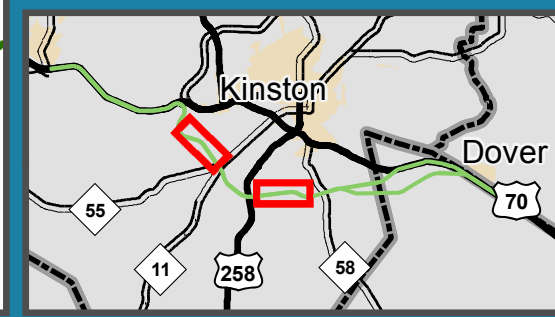
**Legend**

- Alt. 11 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary
- Elevation Above 1% Water Surface**
  - 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
  - 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





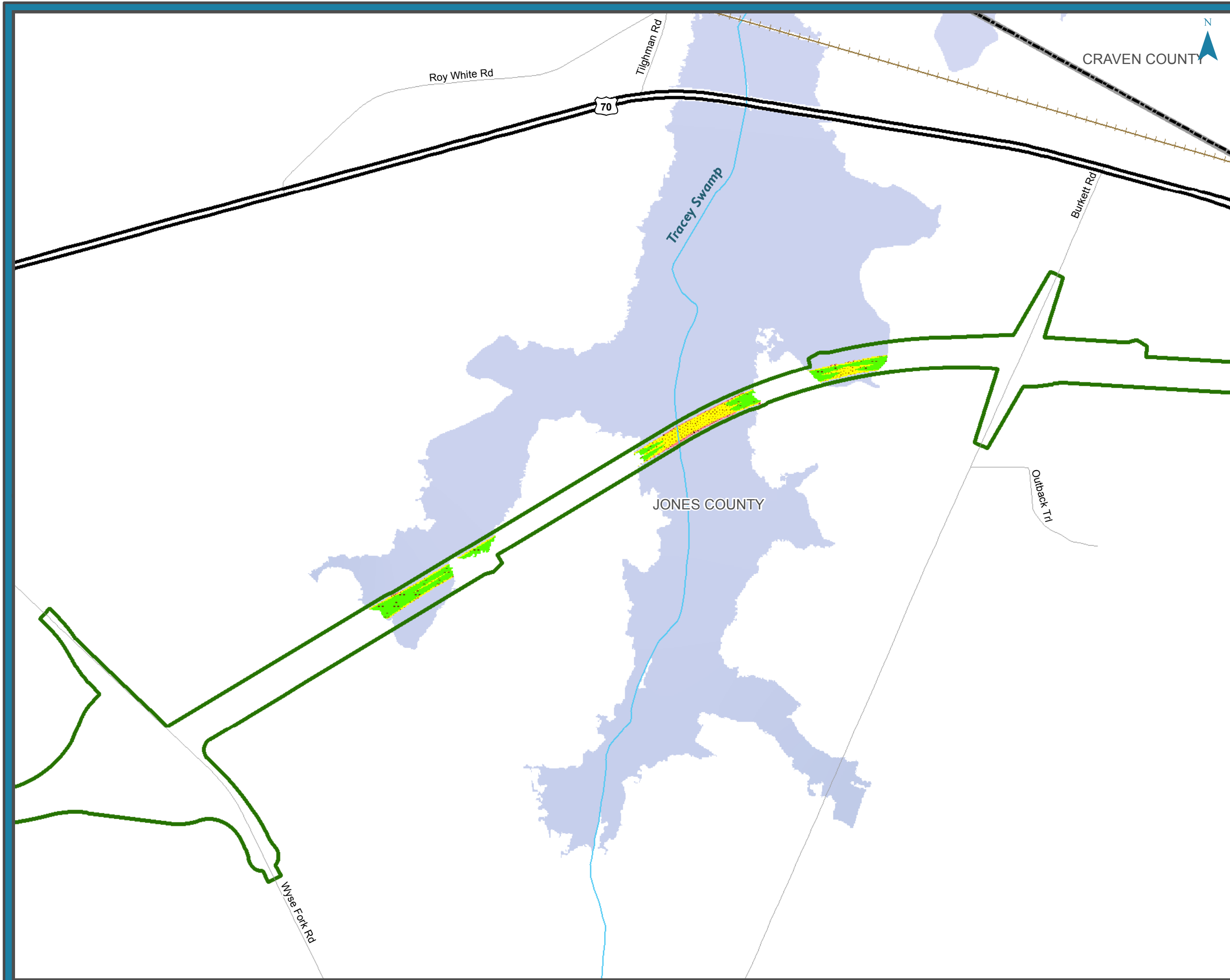


Figure 4-68:  
Elevation above 1 percent  
water surface elevation -  
Alternative 31 - B

**Legend**

- Alt. 31 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary
- Elevation Above 1% Water Surface
  - 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
- 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

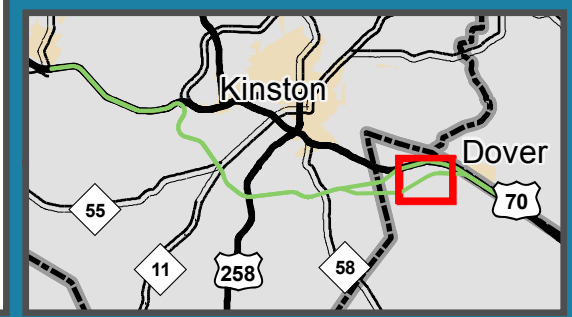




Figure 4-69:

Elevation above 1 percent  
water surface elevation -  
Alternative 32 - A

- Legend
- Alt. 11 ROW
  - Railroad
  - US Highway
  - NC Highway
  - Secondary Road
  - County Boundary
- Elevation Above 1% Water Surface
- 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
  - 100 Year Floodplain



This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS

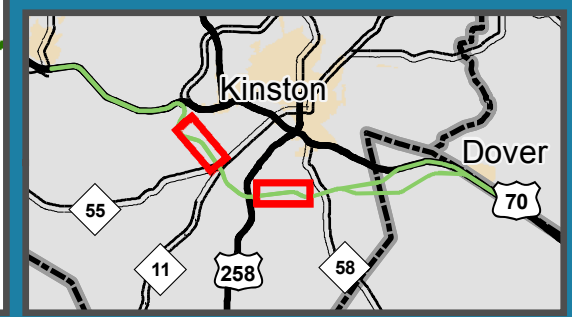




Figure 4-70:  
Elevation above 1 percent  
water surface elevation -  
Alternative 32 - B

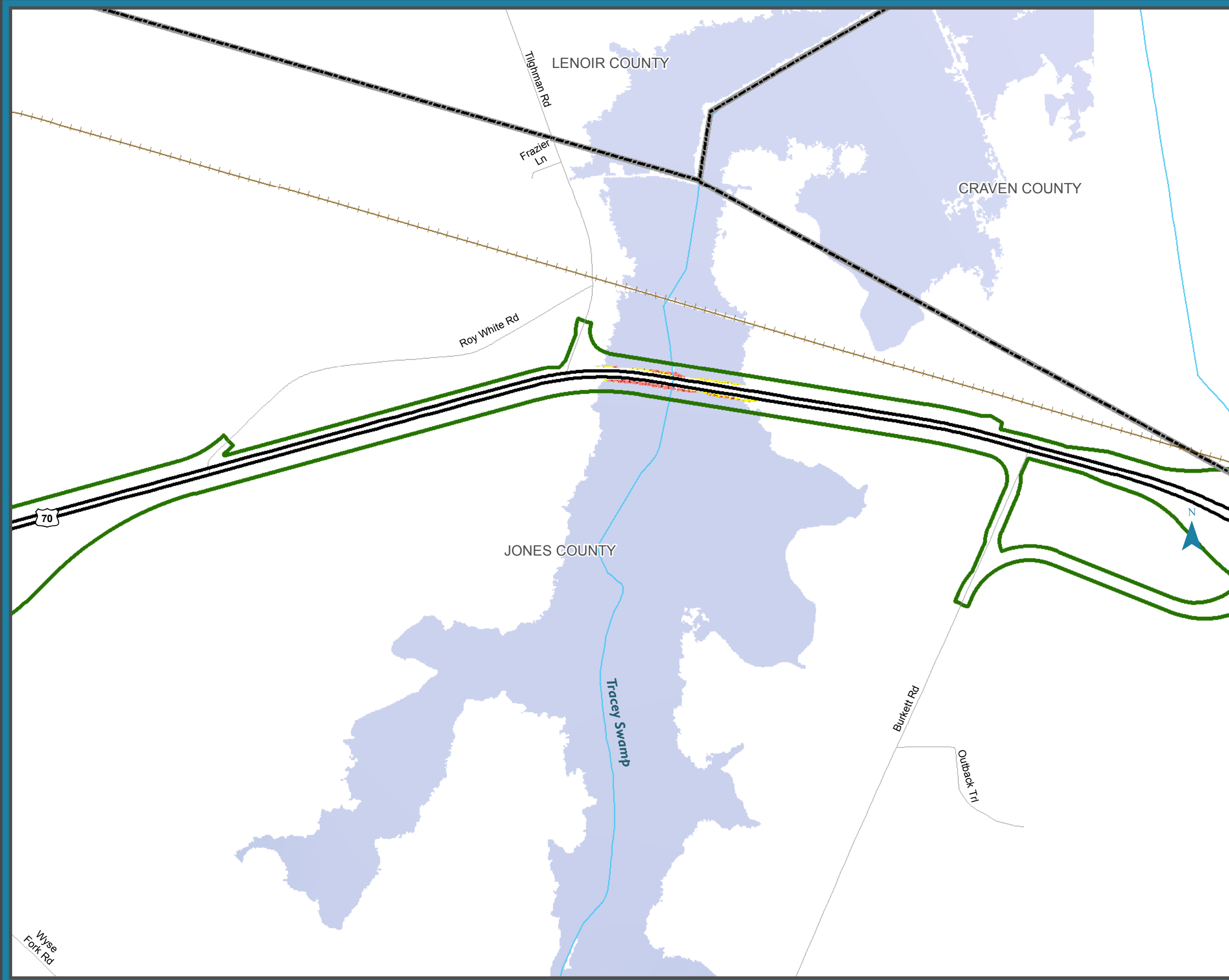
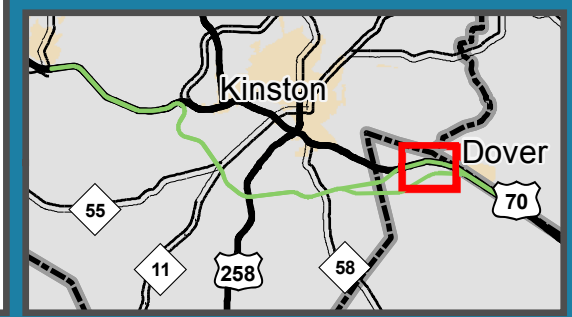
**Legend**

- Alt. 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary
- Elevation Above 1% Water Surface
  - 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
- 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS





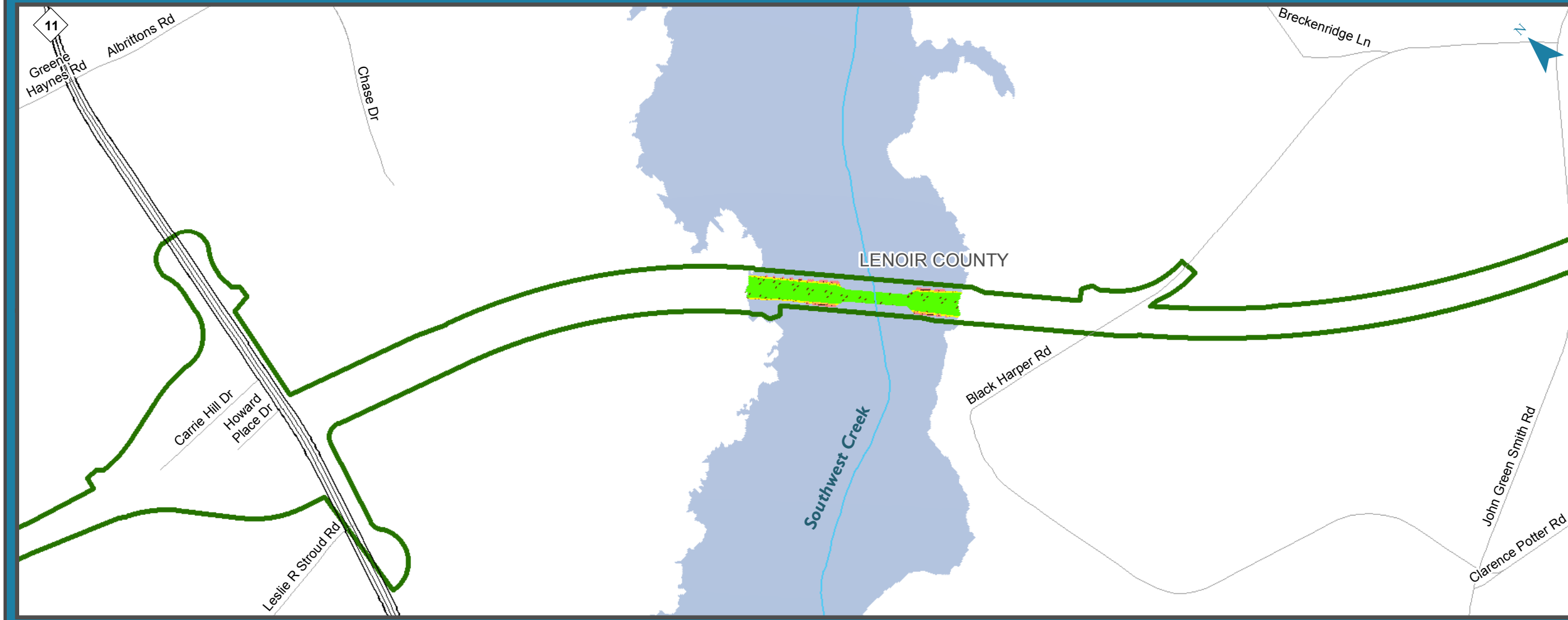
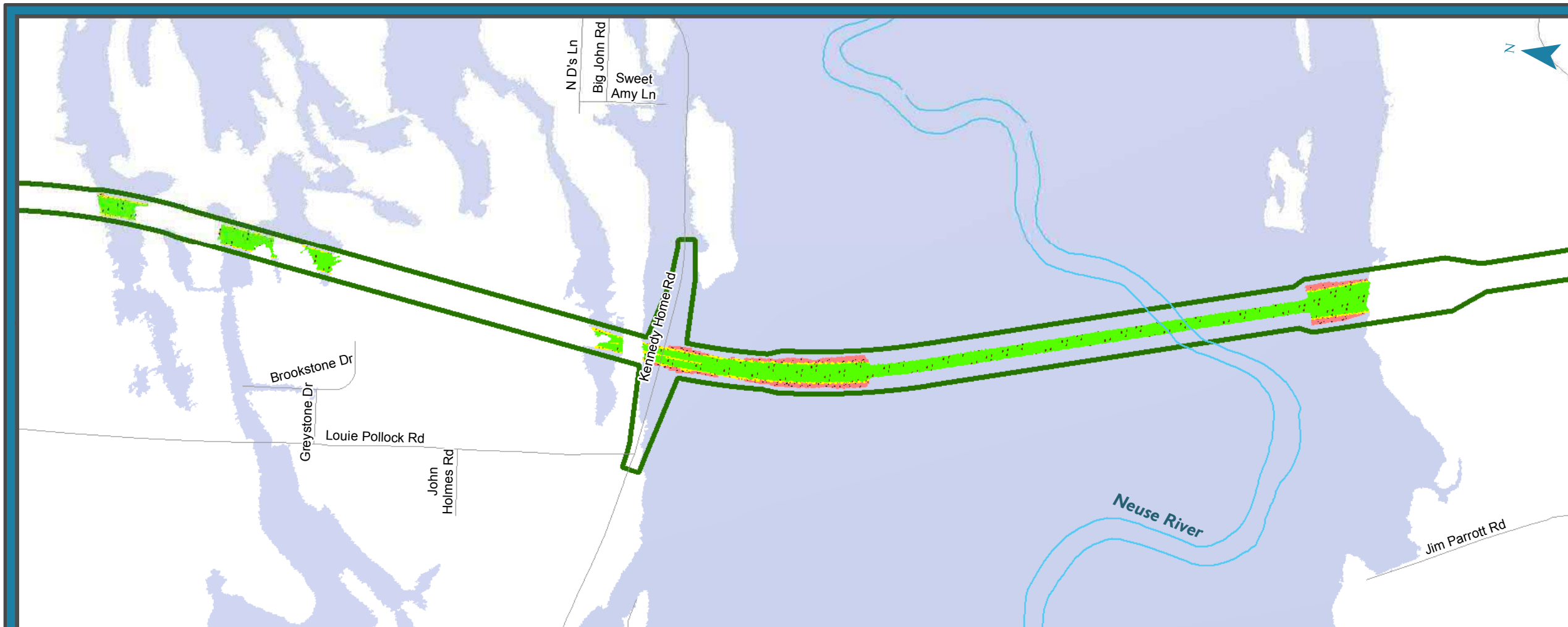


Figure 4-71:  
Elevation above 1 percent  
water surface elevation -  
Alternative 35 - A

Legend

Alt. 35 ROW

Railroad

US Highway

NC Highway

Secondary Road

County Boundary

Elevation Above 1% Water

3 - 35 ft

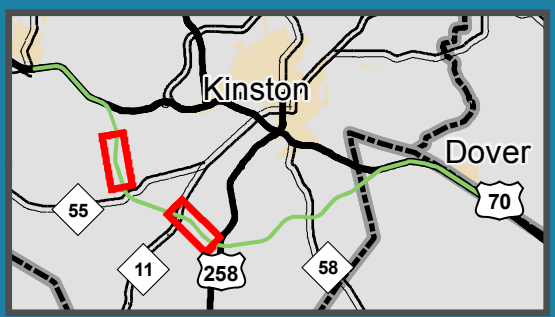
0 - 3 ft

-20 - 0 ft

100 Year Floodplain

0 0.125 0.25 Miles

This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





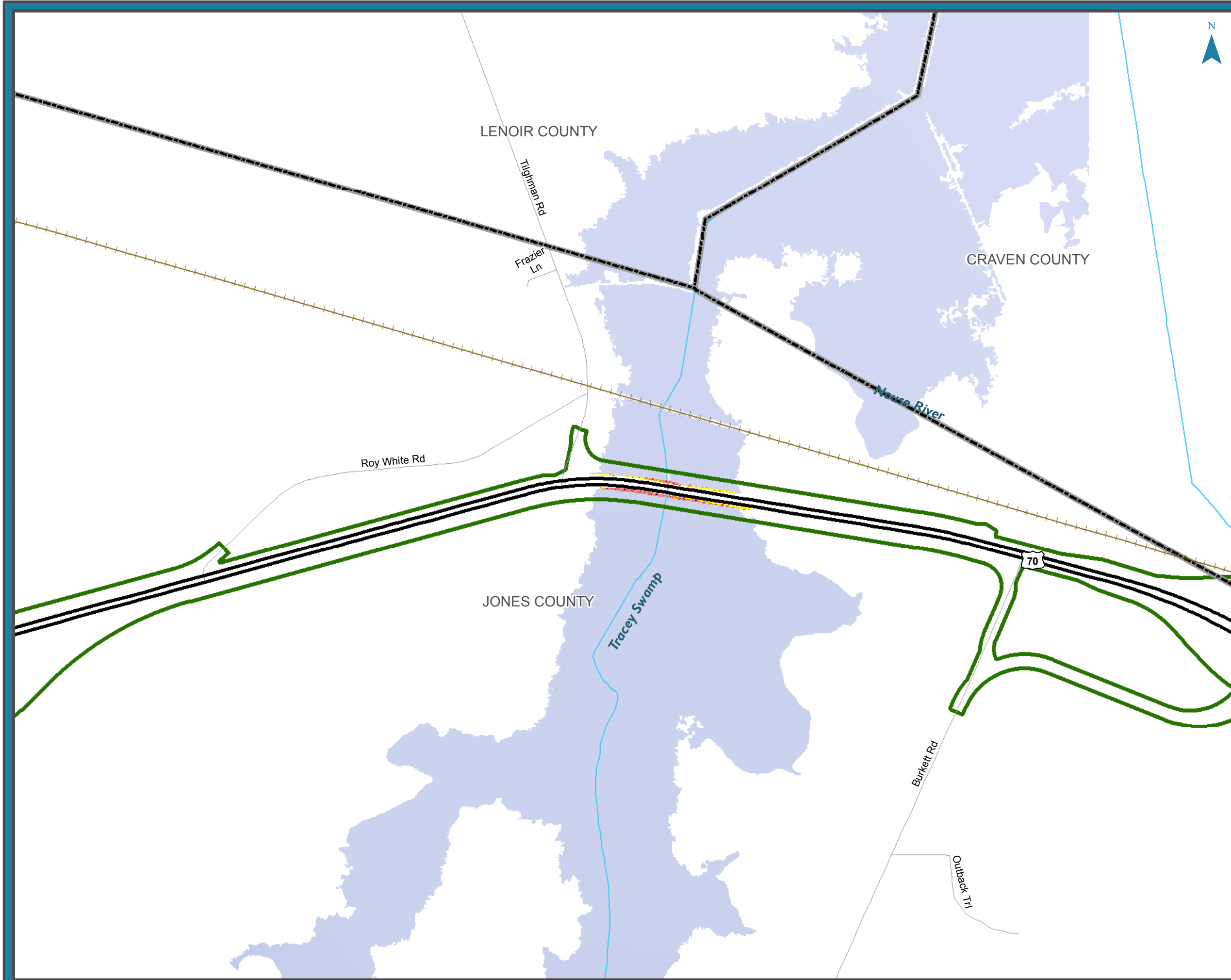












Figure 4-72:  
Elevation above 1 percent  
water surface elevation -  
Alternative 35 - B

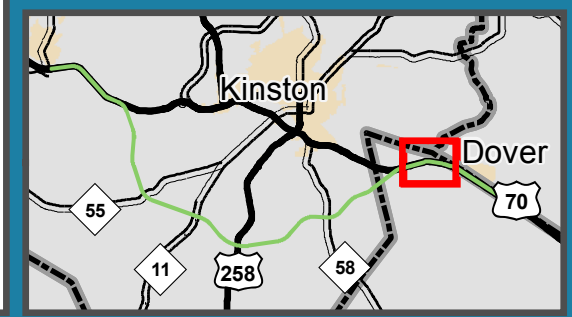
**Legend**

-  Alt. 35 ROW
-  Railroad
-  US Highway
-  NC Highway
-  Secondary Road
-  County Boundary
- Elevation Above 1% Water**
-  3 - 35 ft
-  0 - 3 ft
-  -20 - 0 ft
-  100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS





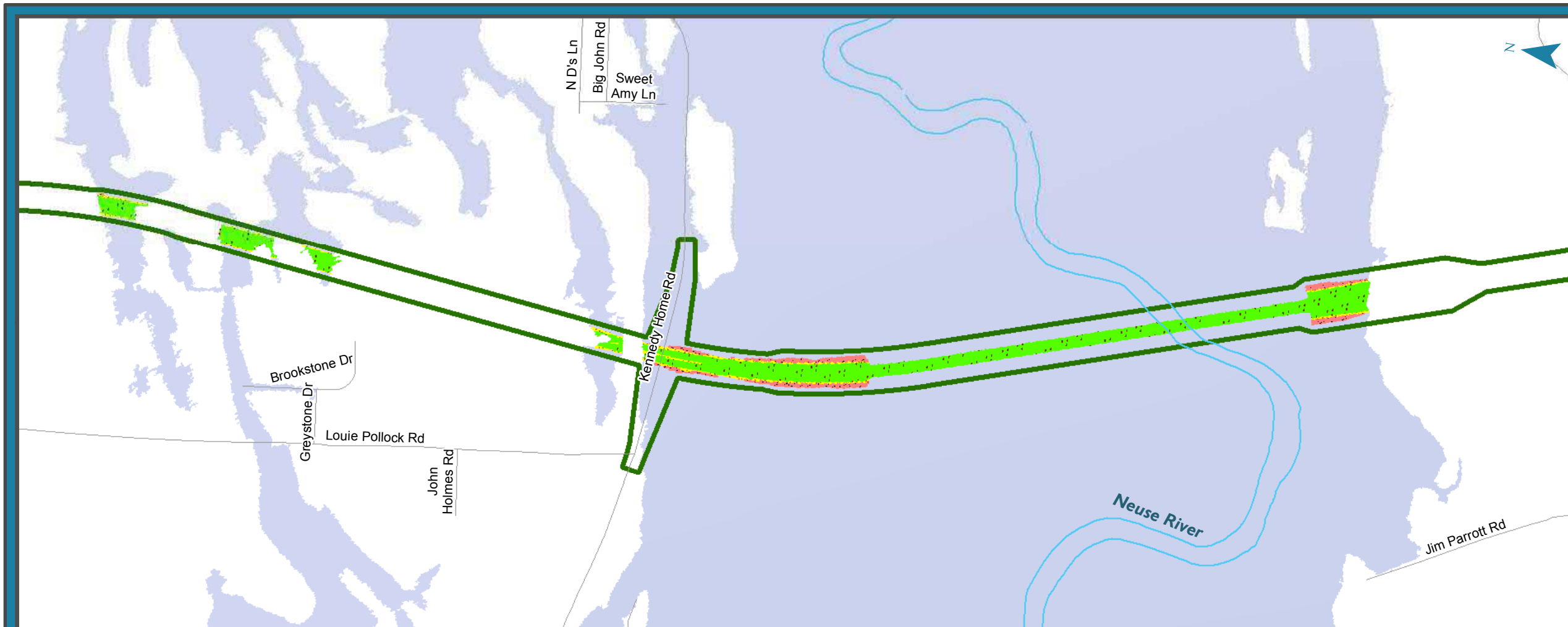


Figure 4-73:  
Elevation above 1 percent  
water surface elevation -  
Alternative 36 - A

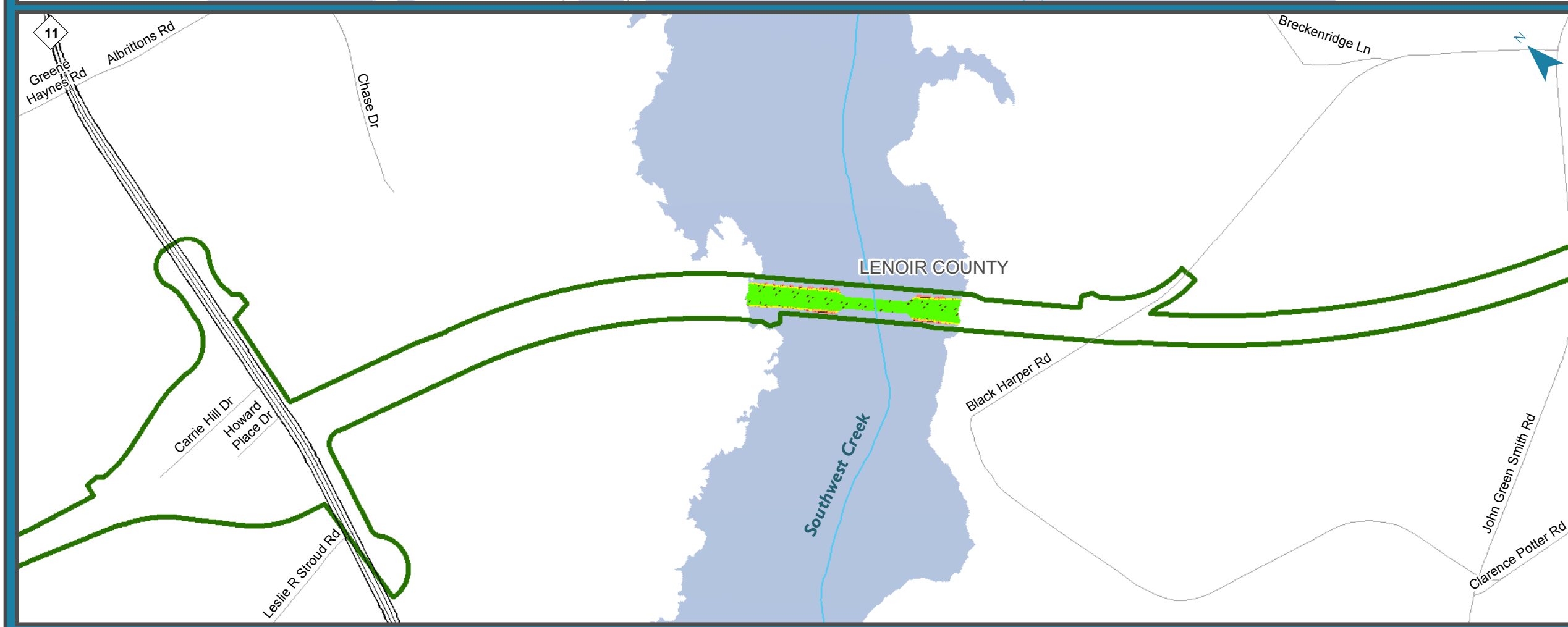
**Legend**


- Alt. 36 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary

Elevation Above 1% Water Surface

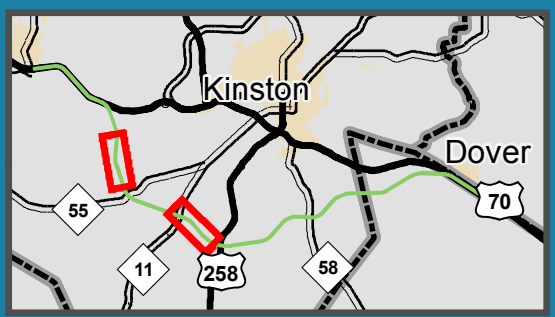
- 3 - 35 ft
- 0 - 3 ft
- 20 - 0 ft
- 100 Year Floodplain

0 0.125 0.25 Miles





This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





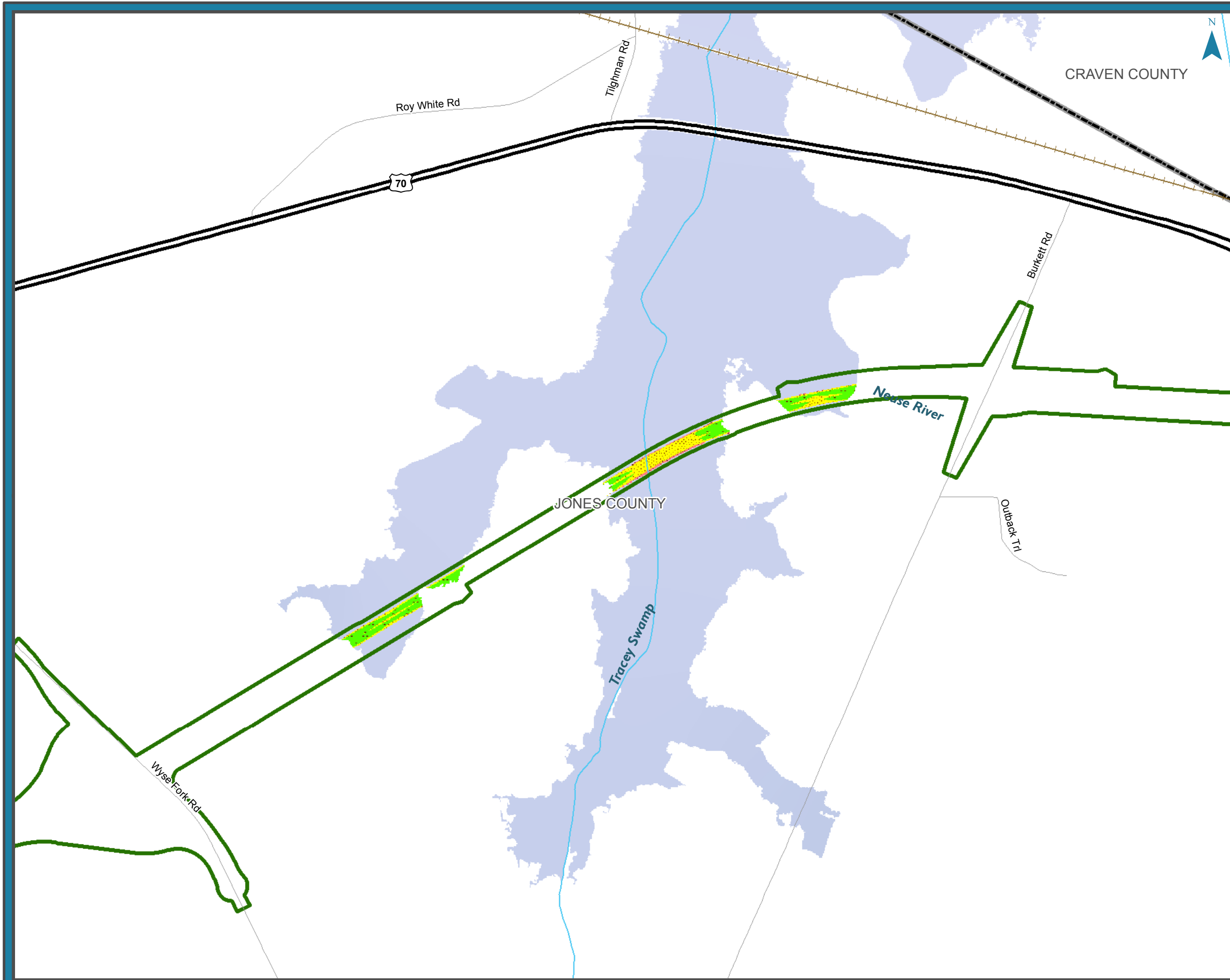


Figure 4-74  
Elevation above 1 percent  
water surface elevation -  
Alternative 36 - B

**Legend**

- Alt. 36 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- County Boundary
- Elevation Above 1% Water Surface
  - 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
- 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

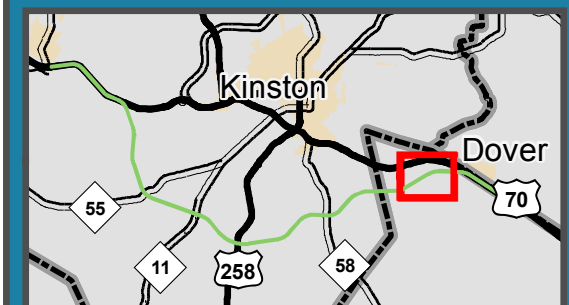




Figure 4-75:  
Elevation above 1 percent  
water surface elevation  
Alternative 51 - A

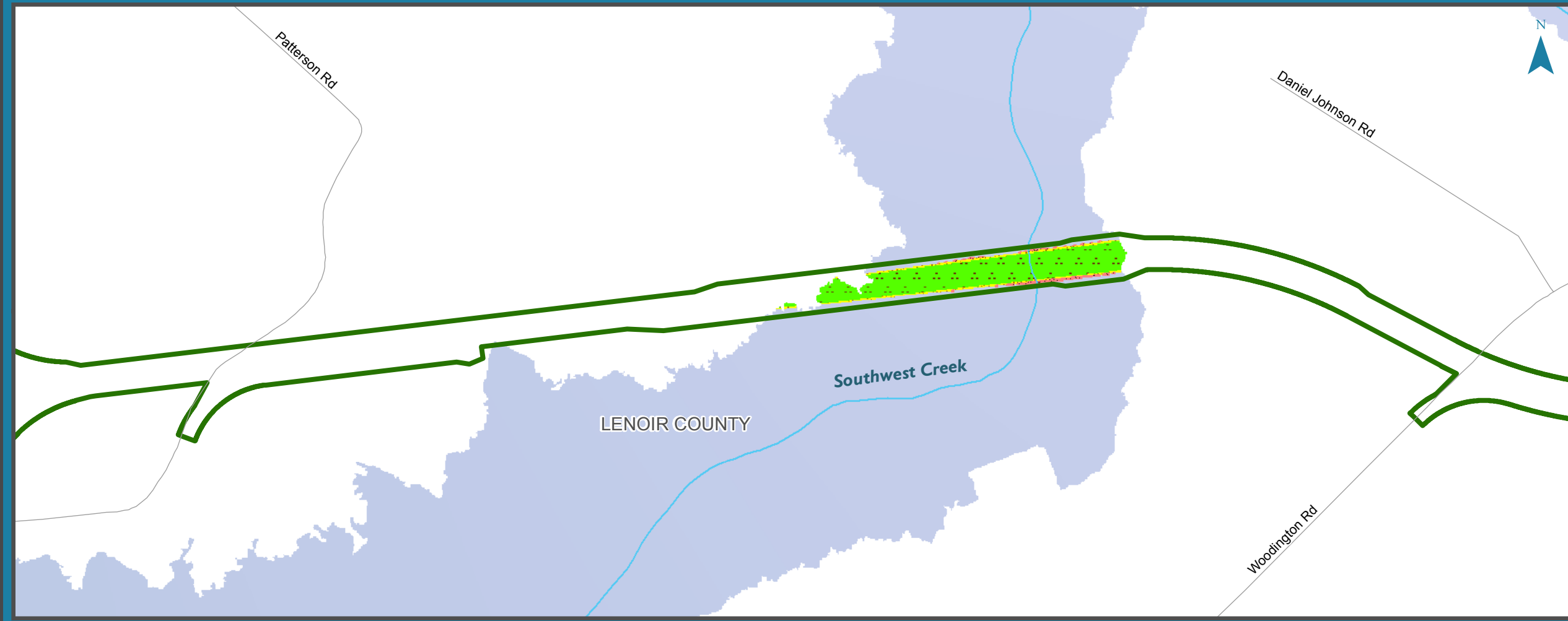
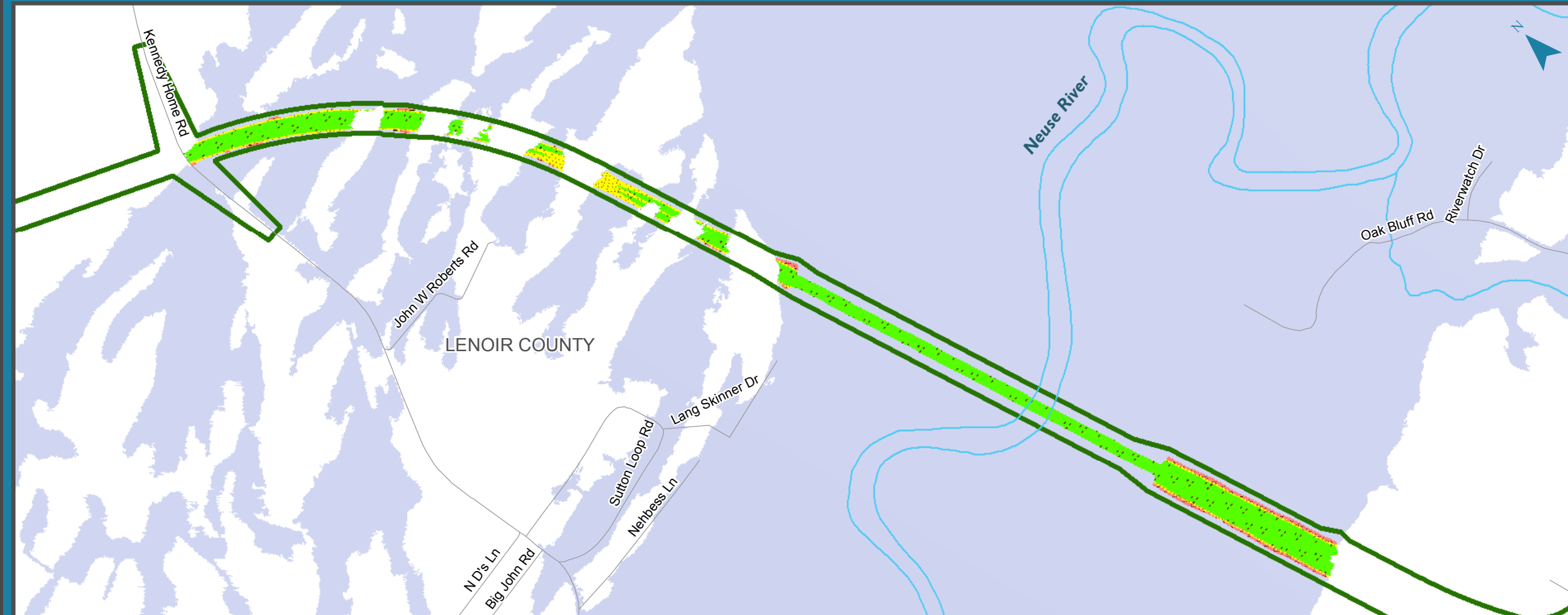
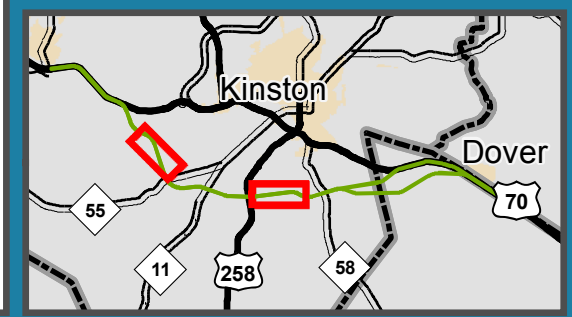
**Legend**

- Alt. 51 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Elevation Above 1% Water Surface
  - 3 - 35 ft
  - 0 - 3 ft
  - 18 - 0 ft
- 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





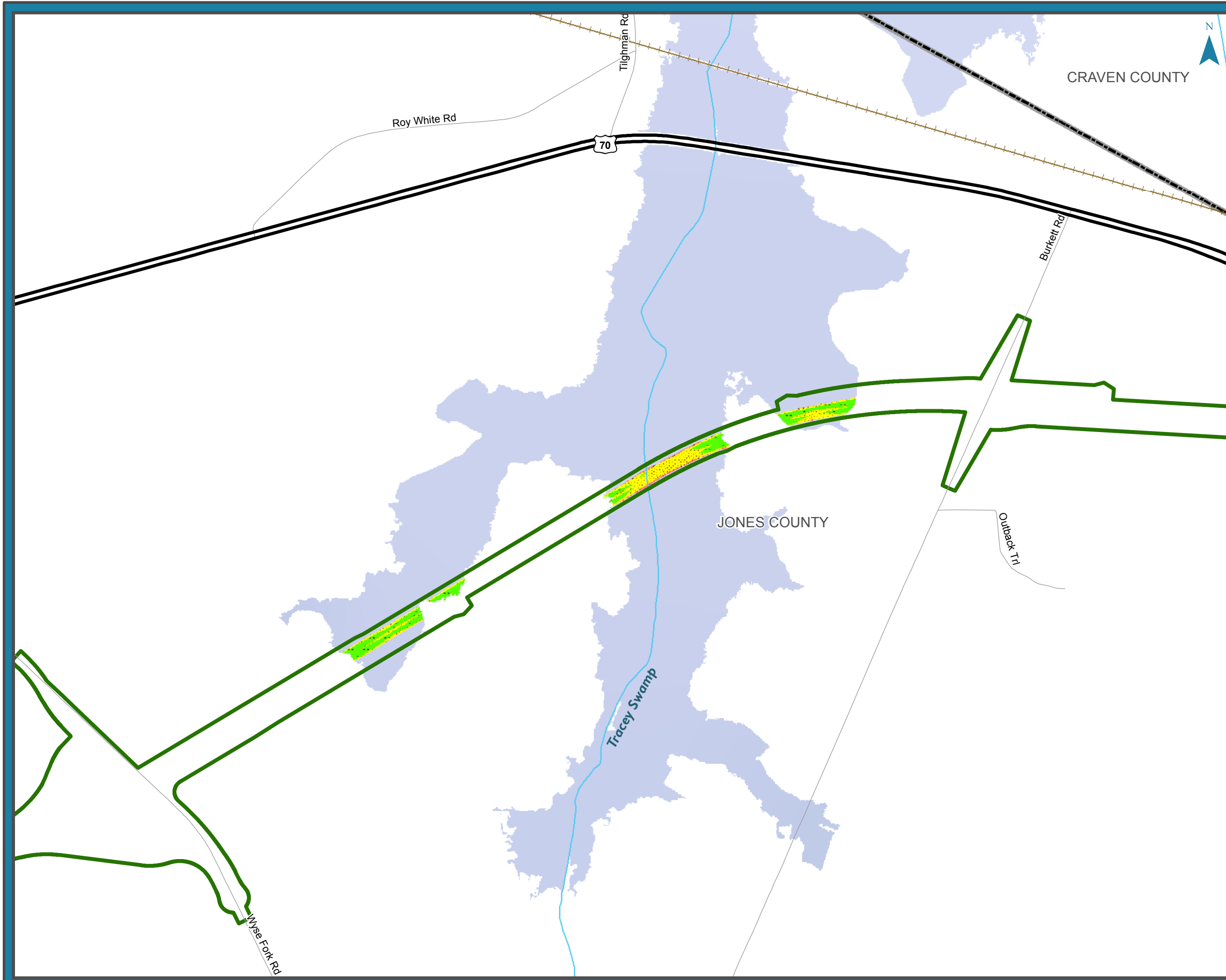






Figure 4-76:  
Elevation above 1 percent  
water surface elevation -  
Alternative 51 - B


**Legend**

 Alt. 51 ROW


 Railroad


 US Highway


 NC Highway


 Secondary Road

**Elevation Above 1% Water Surface**

 3 - 35 ft


 0 - 3 ft

 -18 - 0 ft

 100 Year Floodplain

00.1250.25

Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

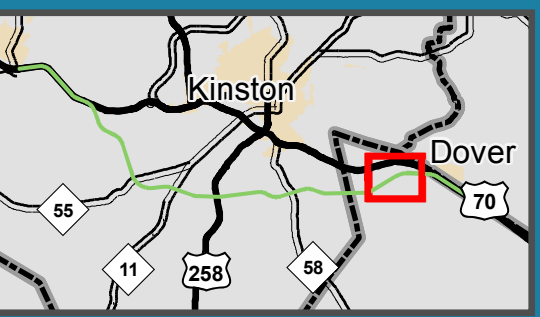




Figure 4-77:

Elevation above 1 percent

water surface elevation -

Alternative 52 - A

Legend

Alt. 52 ROW

Railroad

US Highway

NC Highway

Secondary Road

Elevation Above 1% Water Surface

3 - 35 ft

0 - 3 ft

-20 - 0 ft

100 Year Floodplain



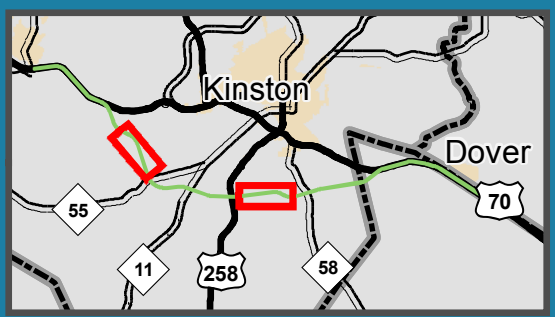
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Sources: AECOM, CGIA, City of Kinston,

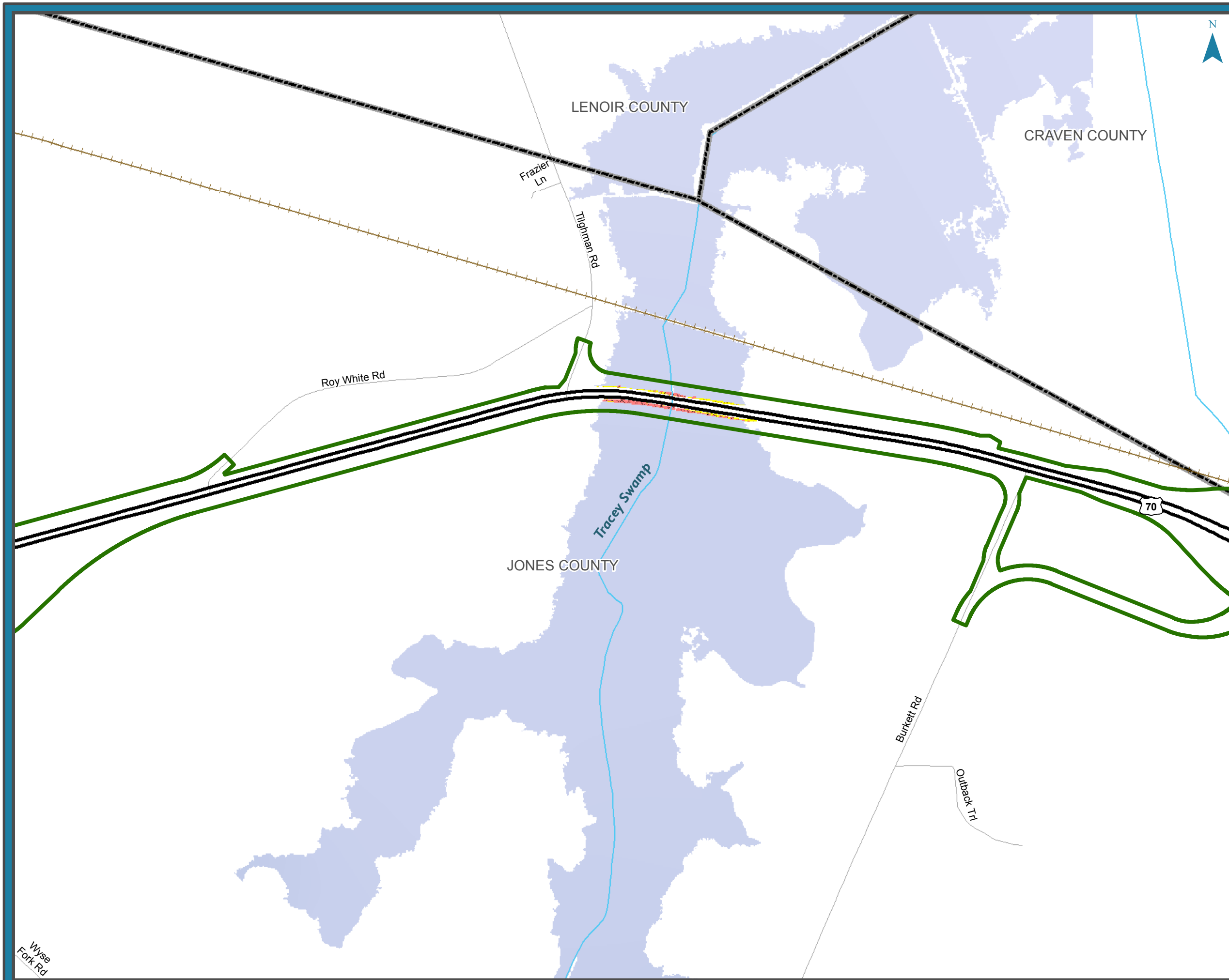
Craven County, ESRI, HPO, Jones County

Lenoir County, NCDOT, NCDEQ, NCEM,

NCONemap, NRCS, USFWS







KINSTON BYPASS  
DEIS | R-2553

Figure 4-78:  
Elevation above 1 percent  
water surface elevation -  
Alternative 52 - B

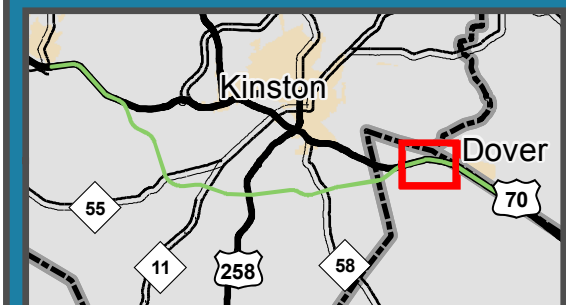
Legend

- Alt. 52 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Elevation Above 1% Water Surface
  - 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
- 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS



Wyse  
Fork Rd



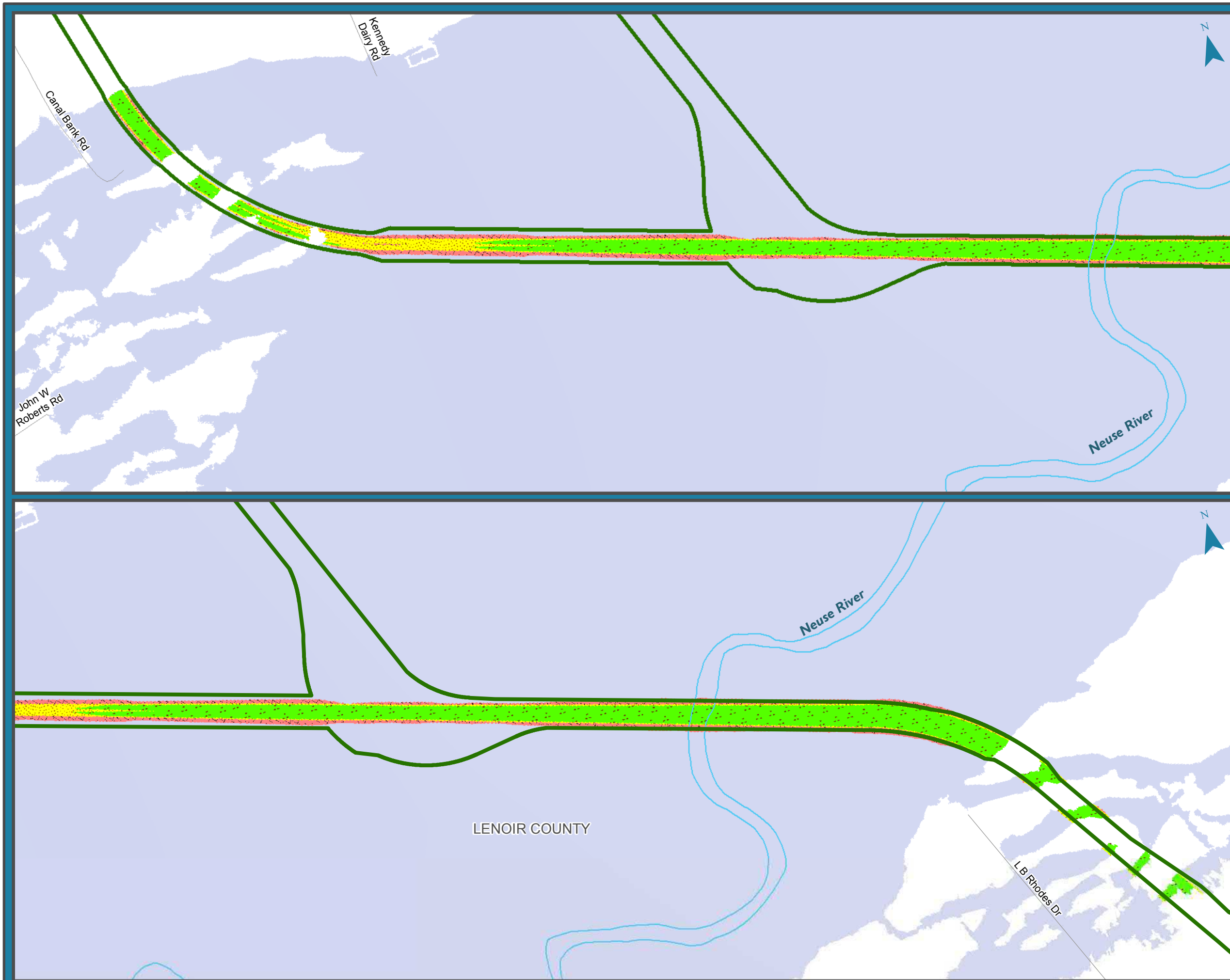


Figure 4-79:  
Elevation above 1 percent  
water surface elevation -  
Alternative 63 - A

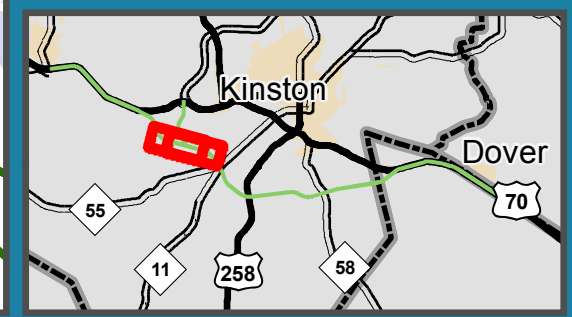
**Legend**

- Alt. 63 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Elevation Above 1% Water Surface
  - 3-35 ft
  - 0 - 3 ft
  - 20 - 0 ft
  - 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS









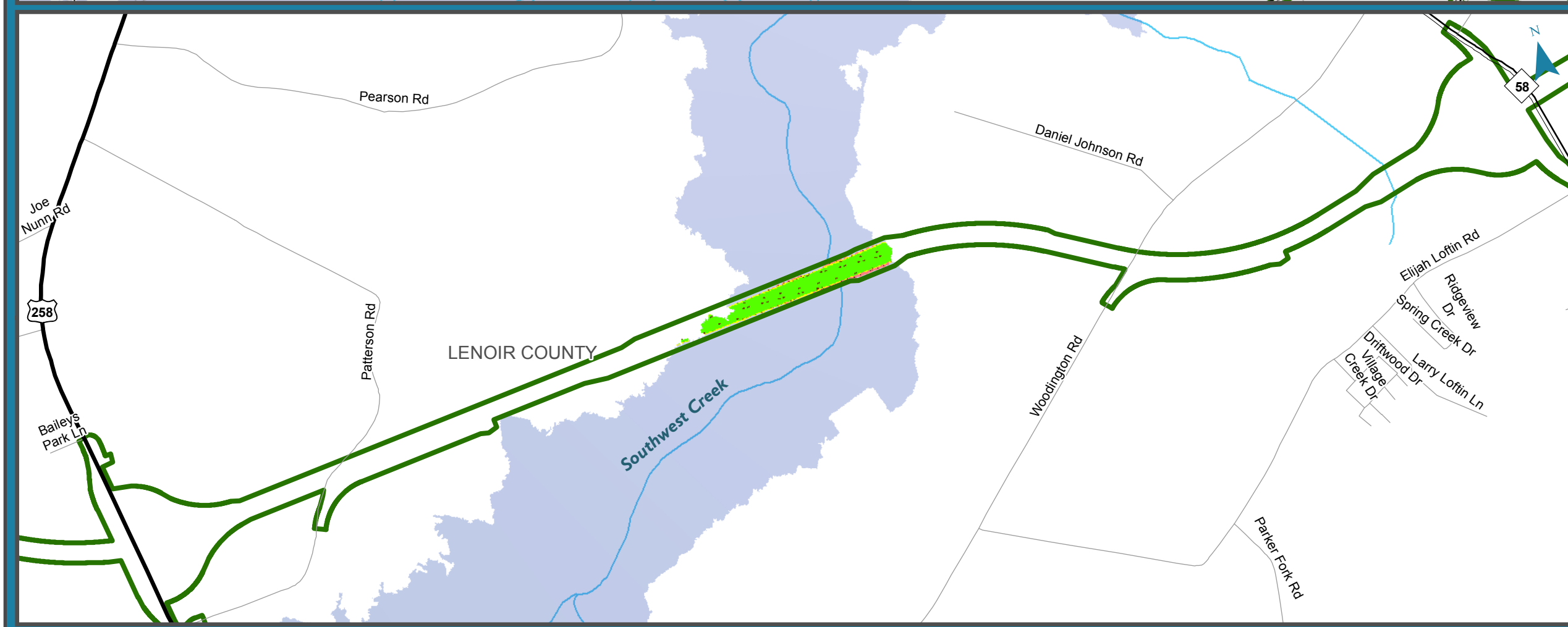
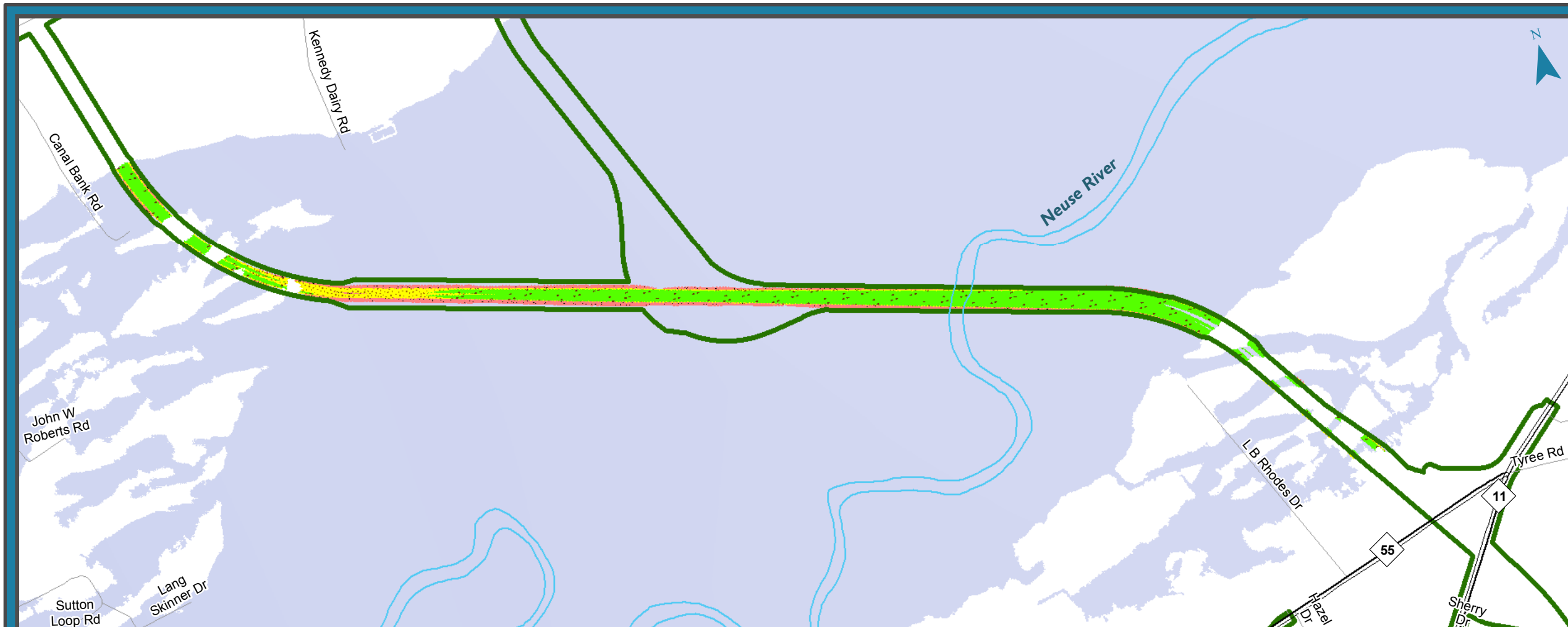


Figure 4-81:  
Elevation above 1 percent  
water surface elevation -  
Alternative 65 - A

Legend

Alt. 65 ROW

Railroad

US Highway

NC Highway

Secondary Road

County Boundary

Elevation Above 1% Water Surface

3-35 ft

0 - 3 ft

-20 - 0 ft


100 Year Floodplain

0

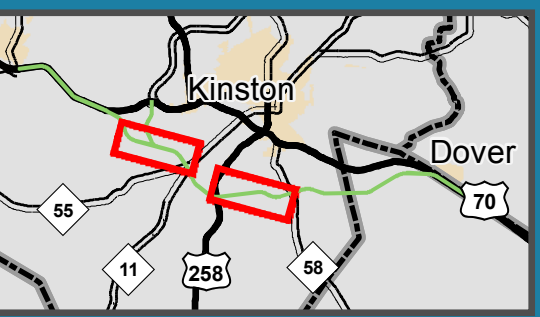
0.25

0.5

Miles



This map is for reference only.  
 Sources: AECOM, CGIA, City of Kinston,  
 Craven County, ESRI, HPO, Jones County  
 Lenoir County, NCDOT, NCDEQ, NCEM,  
 NCONemap, NRCS, USFWS





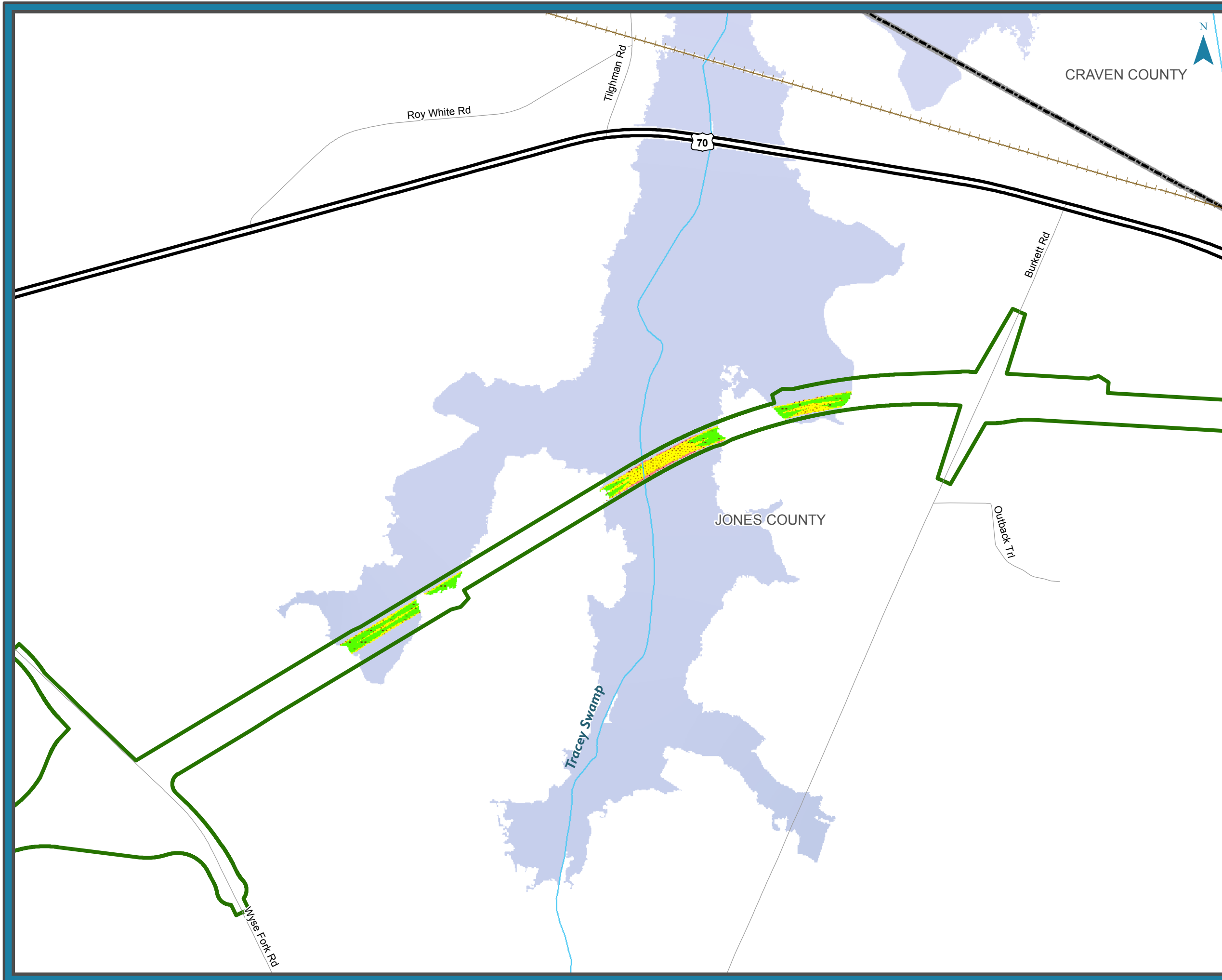


Figure 4-82:  
Elevation above 1 percent  
water surface elevation -  
Alternative 65 - B

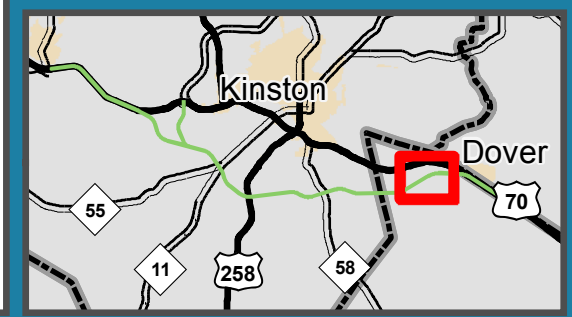
**Legend**

- Alt. 65 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Elevation Above 1% Water Surface
  - 3 - 35 ft
  - 0 - 3 ft
  - 20 - 0 ft
- 100 Year Floodplain

0 0.125 0.25  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





## 4.8 FARMLAND

North Carolina Executive Order 96, Conservation of Prime Agricultural and Forest Lands, requires all state agencies to consider the impact of land acquisition and construction projects on prime farmland soils, as designated by the NRCS (State of North Carolina 1983).

The Farmland Protection Policy Act does not regulate nonfederal land or private farmland, but is intended to minimize the impact federal programs have on the conversion of farmland to nonagricultural uses. Table 4-17 summarizes impacts to farmland soils, including prime and unique farmland soils. Impacts to prime farmland would be lower with Alternatives 1UE and 1SB. Alternatives 11 and 12 would have the highest impacts to unique farmland.

**Table 4-17: Acreage impacts to farmland soils by alternative**

	Prime Farmland (acres)	Farmland of Statewide Importance (acres)	Farmland of Unique Importance (acres)	Prime Farmland if Drained (acres)
Alt 1UE	282.2	172.2	53.3	305.9
Alt 1SB	302.3	222.4	53.3	361.5
Alt 11	392.5	236.8	56.7	423.0
Alt 12	422.3	210.2	56.7	439.0
Alt 31	404.3	263.7	51.7	365.5
Alt 32	434.0	236.6	51.7	382.3
Alt 35	432.4	203.4	47.3	589.4
Alt 36	415.2	225.6	47.3	553.8
Alt 51	410.2	224.4	48.8	426.2
Alt 52	440.1	198.3	48.8	443.2
Alt 63	420.5	218.2	51.7	379.0
Alt 65	390.6	243.7	51.7	362.0

Note: Impacts were calculated using right-of-way limits of the functional designs.

### 4.8.1 Agricultural Resources

Impacts to individual agricultural operations are likely with any of the DSAs under consideration including changes in access and division of farms and agriculture fields. Alternatives 1UE, 1SB, 11, 12, 31, 32, 63, and 65 would result in temporary and permanent changes in access to the Sanderson Farms Processing Plant.

NCDOT will ensure that access is maintained during construction for farm equipment and impacts to agricultural operations are minimized during construction.

### 4.8.2 Voluntary Agricultural Districts

The LUSA identified one VAD in Lenoir County that is comprised of two parcels that has the potential to be impacted (NCDOT 2018g). The two parcels, PINs 450200425447 and 450200523932, are located near Alternatives 35 and 36 along Black Harper Road. The VAD



may be impacted by right-of-way acquisition and land within the VAD may be temporarily converted to non-agricultural use as part of a temporary construction easement. If right-of-way is acquired from the VAD property through eminent domain, the Lenoir County VAD Ordinance requires that the Agricultural Advisory Board hold a public hearing on the proposed condemnation before condemnation may be initiated. Any VAD lands converted to non-agricultural use as part of a temporary construction easement must be returned to farmable condition by the project's completion. Three VADs are located south of Alternative 36. These properties would not be impacted by any of the DSAs under consideration.

The LUSA also identified six VADs in Craven County and two VADs in Jones County within the project study area. These properties would not be impacted by any of the DSAs under consideration.

## **4.9 AIR QUALITY**

### **4.9.1 Attainment Status**

The project study area is located in an attainment area; therefore, 40 CFR 51 and 93 are not applicable. The Kinston Bypass project is not anticipated to create any adverse effects on the air quality of this attainment area. Therefore, regional and microscale analyses are not required.

### **4.9.2 Mobile Source Air Toxics**

The proposed alignment of the DSAs for the Kinston Bypass project would move traffic closer to nearby homes and businesses. Localized areas could exist where ambient concentrations of MSATs could be higher under the DSAs than under the No-Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along Alternatives 1SB, 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 around existing developments, especially in the vicinity of proposed new service interchanges. However, the magnitude and the duration of these potential increases when compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts.

New highways or the widening of existing highways increases localized levels of vehicle emissions, but these increases could be offset due to increases in speeds from reductions in congestion (which are associated with lower MSAT emissions) and because vehicle emissions will decrease in areas where traffic shifts to the new roadway. However, on a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time result in substantial reductions that in almost all cases will cause region-wide MSAT levels to be substantially lower than exist currently (USEPA 2016).

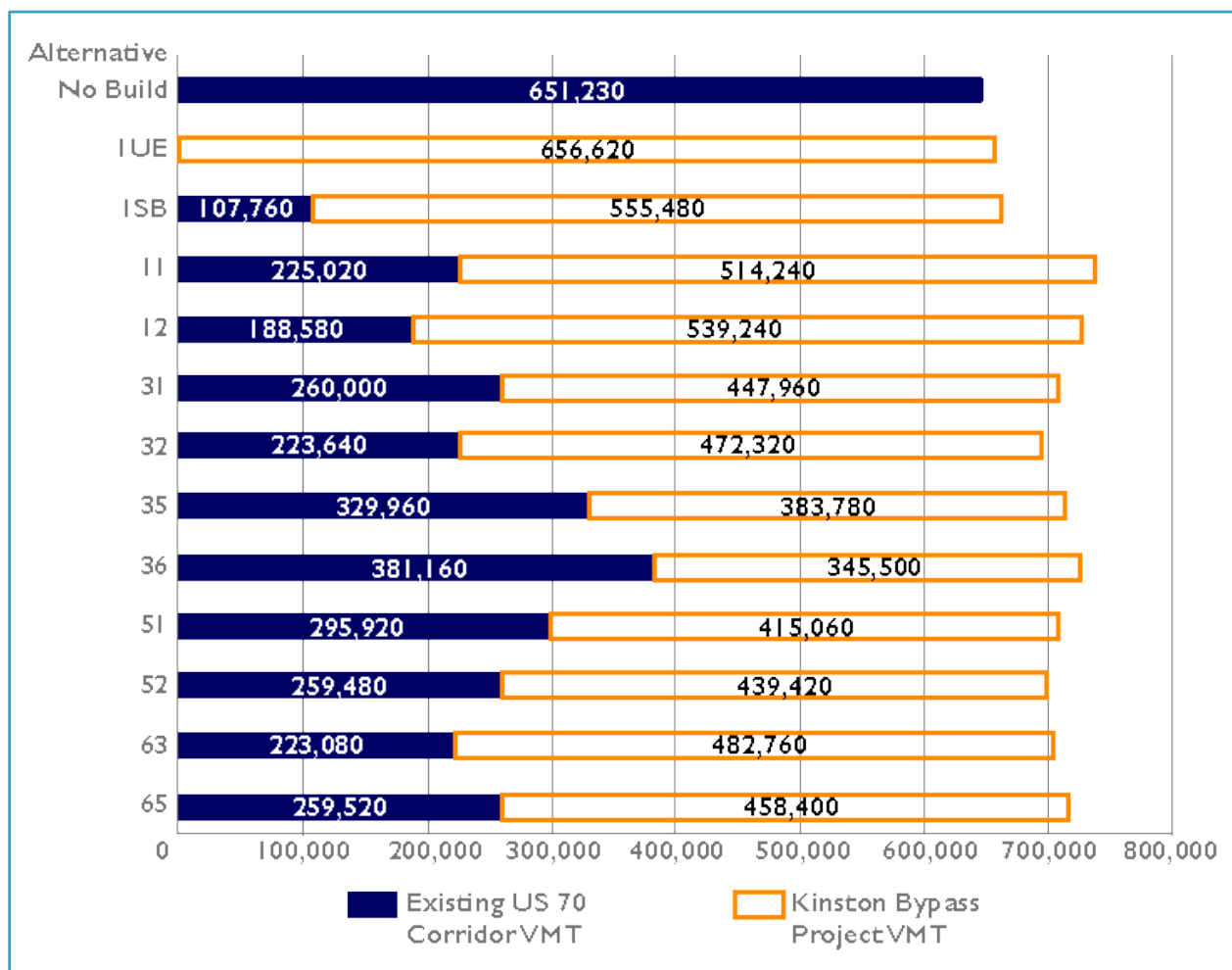
For the DSAs being considered, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each of the DSAs. Table 4-18 shows the VMT per DSA along both the existing US 70 corridor and the proposed US 70 Bypass alignments. While it is assumed that traffic traveling through Kinston via the US 70 alignments would remain similar among all the DSAs, the total daily VMT varies among the DSAs based on the local traffic that would utilize the new or upgraded facilities. Because the estimated VMT under all DSAs (build and no-build) are similar, varying by less than 14 percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various DSAs. Also, regardless of the DSA chosen, emissions would likely be lower than present



levels in the design year as a result of USEPA’s national control programs that are projected to reduce annual MSAT emissions by over 90 percent from 2010 to 2050 (FHWA 2016a). Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the project study area are likely to be lower in the future in virtually all locations.

For each DSA there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced for the new location portions of Alternative 1SB near NC 11/55, US 258, and NC 58. However, even if these increases do occur, they too will be substantially reduced in the future due to implementation of USEPA’s vehicle and fuel regulations. In sum, under DSAs in the design year it is expected there would be reduced MSAT emissions in the immediate area of the project, relative to the No-Build Alternative, due to USEPA’s MSAT reduction programs.

**Table 4-18: Vehicle miles travelled (per day) - US 70 Kinston Bypass from US 70 near La Grange to US 70 near Dover**





## 4.10 NOISE IMPACT ANALYSIS

The *Traffic Noise Report* presents the preliminary analysis of the probable traffic noise impacts of the US 70 Kinston Bypass project (NCDOT 2018j). The *Traffic Noise Report* is available on the project website. In accordance with the NCDOT *Traffic Noise Policy* (NCDOT 2016c), the *Traffic Noise Report* utilized validated computer models created with the FHWA Traffic Noise Model version 2.5 (FHWA TNM v2.5) to predict future noise levels and define impacted receptors along the proposed action (FHWA 2004). The functional designs for the DSAs were used to update the base year models, as well as create new models in order to predict future year noise levels as a direct result of the project. Base year noise levels were based on traffic and roadway conditions present in the year 2015, and future year noise levels were based on roadway conditions predicted for the year 2040.

Because noise impacts may affect the quality of life for residents and may be disruptive at other community facilities, a detailed process for calculating noise impacts from projects, such as Kinston Bypass, is followed. Table 4-19 shows the number of impacted receptors by approaching or exceeding NAC, the number of receptors that would experience a substantial noise level increase (predicted design year noise levels are 10 dB(A) or more than existing noise levels), the number of receptors that would experience both impacts (exceeding NAC and increase in noise level), and the number of NSAs that are likely candidates for noise abatement by DSA.

The results of this analysis conclude that the quantity of noise-impacted receptors varies among the DSAs. Alternatives 1SB and 32 would result in the most potential noise impacts. Alternatives 35, 36, and 51 would generally have the fewest number of impacted receptors and likely noise abatement requirements. Table 4-19 presents the number of traffic noise impacts predicted for the DSAs. The locations of noise study areas and receptors are shown on Figure 4-83 through Figure 4-106. Additional details regarding the analysis of traffic noise impacts at each noise sensitive receptor location are included in the *Traffic Noise Report* (NCDOT 2018j).

Consideration for noise abatement measures was given to all impacted receptors in the 2040 build conditions. Following the criteria for feasibility and reasonableness as prescribed in the NCDOT *Traffic Noise Policy*, noise abatement for this project was found to be preliminarily feasible and reasonable for three unique locations, each location applicable to one to six different DSAs (NCDOT 2016c). Noise abatement measures would likely be installed at one location for Alternative 1UE, one location for Alternatives 11 and 12, two locations for Alternatives 31 and 32, and two locations for Alternatives 63 and 65. These analyses are preliminary in nature and meant solely to describe noise study areas where potential noise barriers may be successfully employed in accordance with NCDOT reasonableness and feasibility criteria. Once the applicant's preferred alternative is selected, a design noise report will determine more specific details regarding the noise abatement measures.

### Traffic Noise Report

The Traffic Noise Report for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>



**Table 4-19: Summary of noise-impacted receptors by DSA**

Alternative	Number of NAC Receptors Impacted <sup>a</sup>	Substantial Noise Level Increase <sup>b</sup>	Both (NAC and Increase) <sup>c</sup>	NSAs with Likely Abatement
Alt 1UE	38	7	2	1
Alt 1SB	56	15	8	0
Alt 11	34	22	8	1
Alt 12	37	26	9	1
Alt 31	41	34	13	2
Alt 32	44	37	14	2
Alt 35	23	25	10	0
Alt 36	21	23	10	0
Alt 51	24	21	5	0
Alt 52	27	25	6	0
Alt 63	41	28	11	2
Alt 65	38	26	10	2

NAC-Noise abatement criteria

<sup>a</sup> Predicted traffic noise level impact due to approaching or exceeding NAC (refer to Table 3-17).

<sup>b</sup> Predicted “substantial increase” traffic noise level impact (predicted design year noise levels >10 dB(A) more than existing noise levels.

<sup>c</sup> Predicted traffic noise level impact due to exceeding NAC *and* “substantial increase” in noise levels.



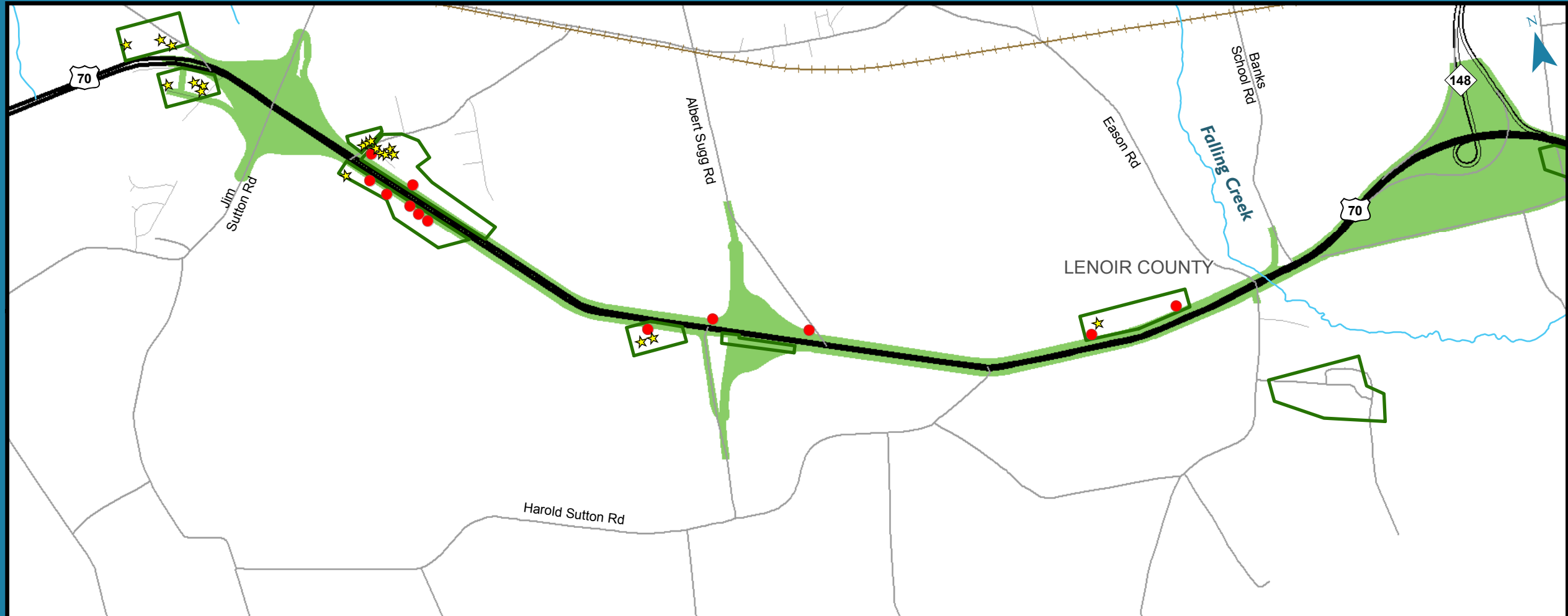


Figure 4-83:  
Noise receptors and  
noise study areas -  
Alternative 1UE - A

**Legend**

- Alt. 1 UE ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors**
  - Impacted, Not Benefited
  - Impacted and Benefited
  - ▲ Benefited, Not Impacted
  - ★ Not Impacted, Not Benefited
  - ◆ Not Noise Sensitive
- Noise Study Area

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS

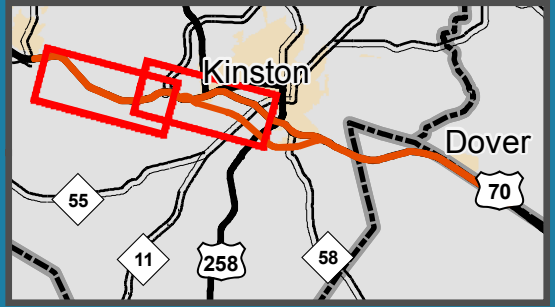
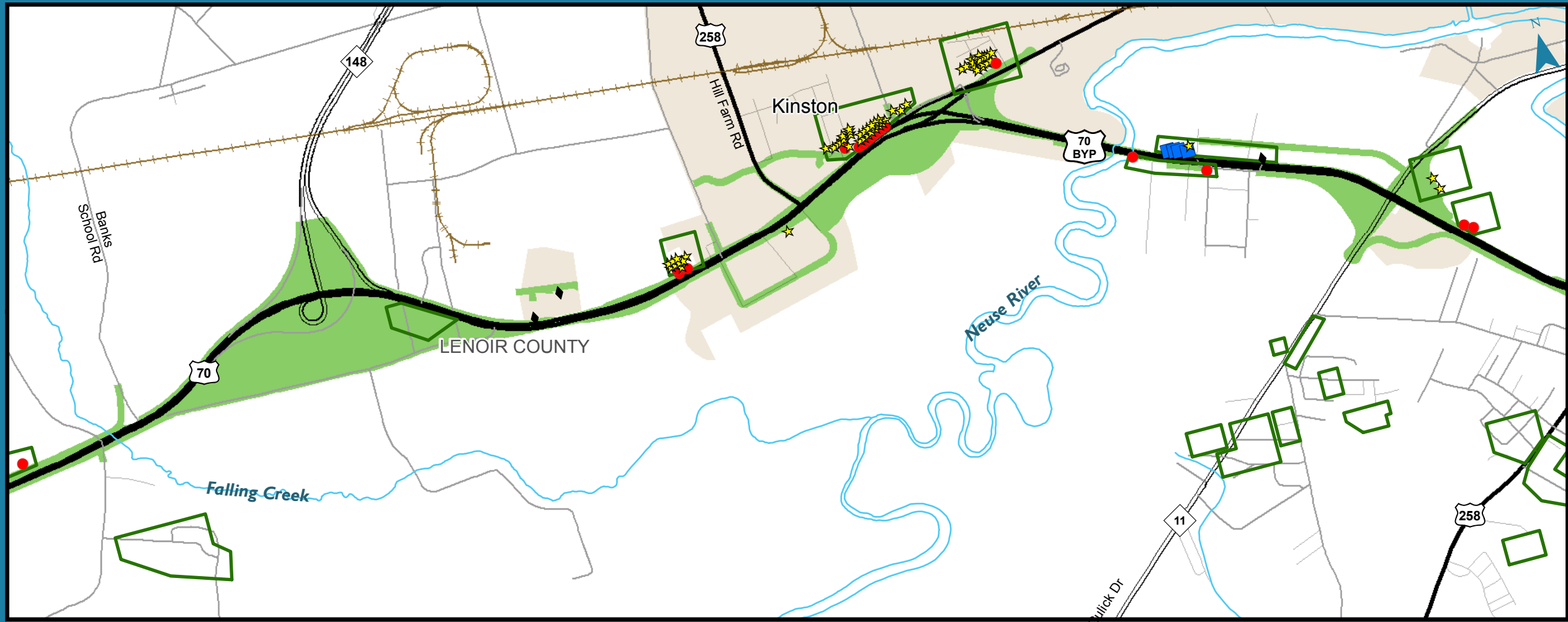




Figure 4-84:  
Noise receptors and  
noise study areas -  
Alternative 1UE - B

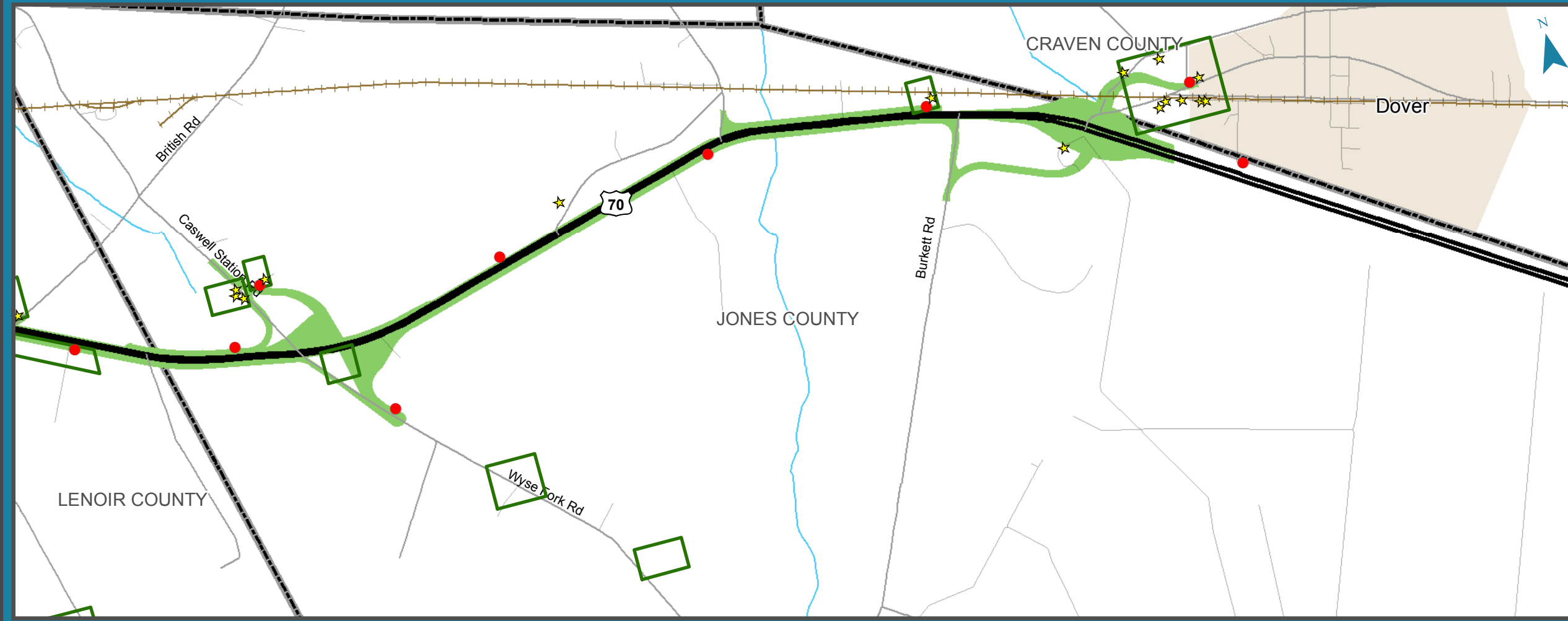
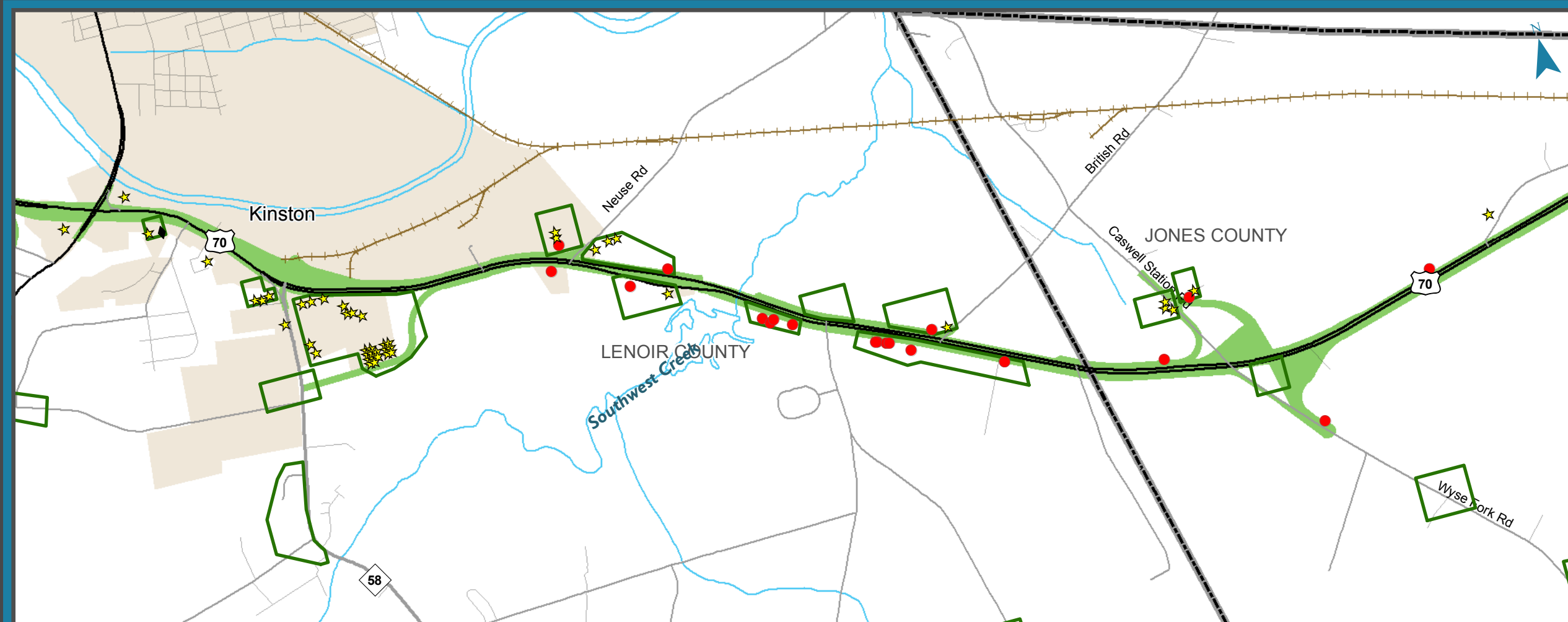
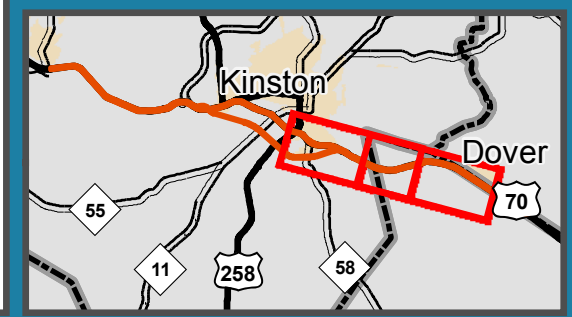
**Legend**

- Alt. 1 UE ROW
- +— Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - ▲ Benefited, Not Impacted
  - ★ Not Impacted, Not Benefited
  - ◆ Not Noise Sensitive
  - Noise Study Area

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS





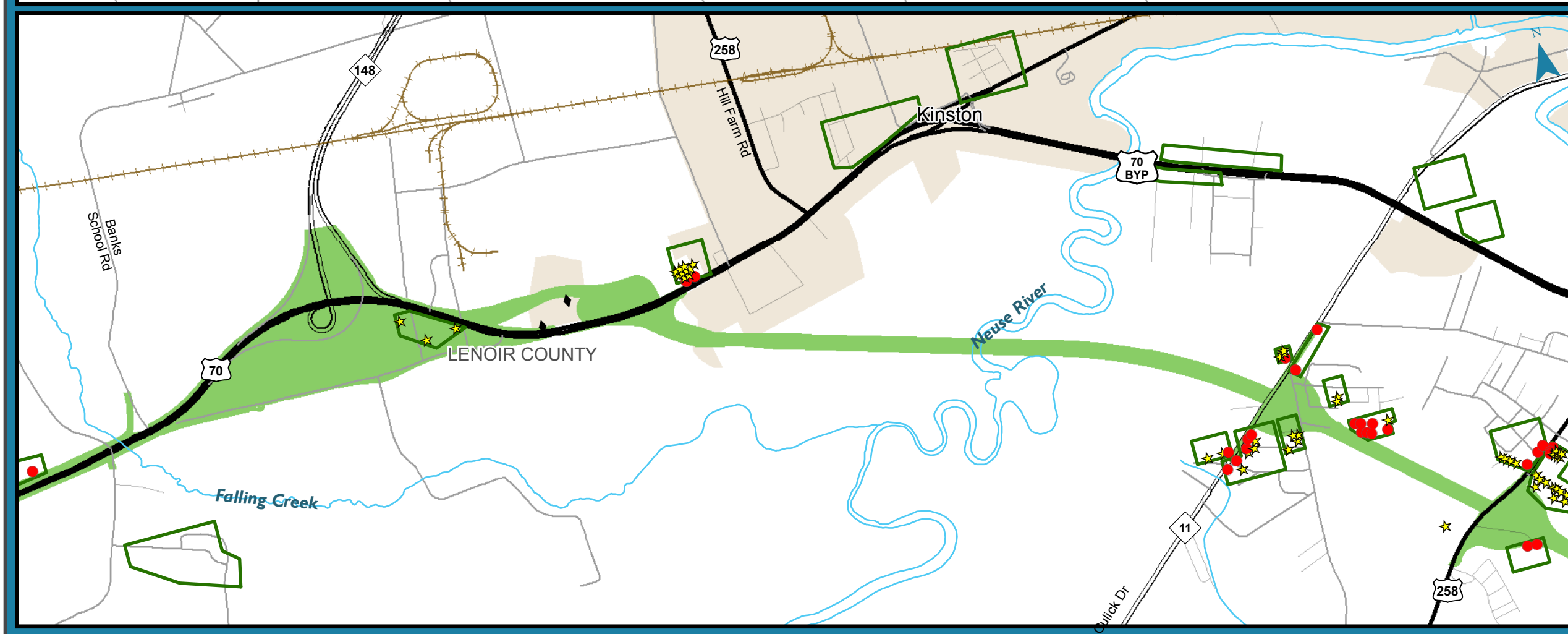
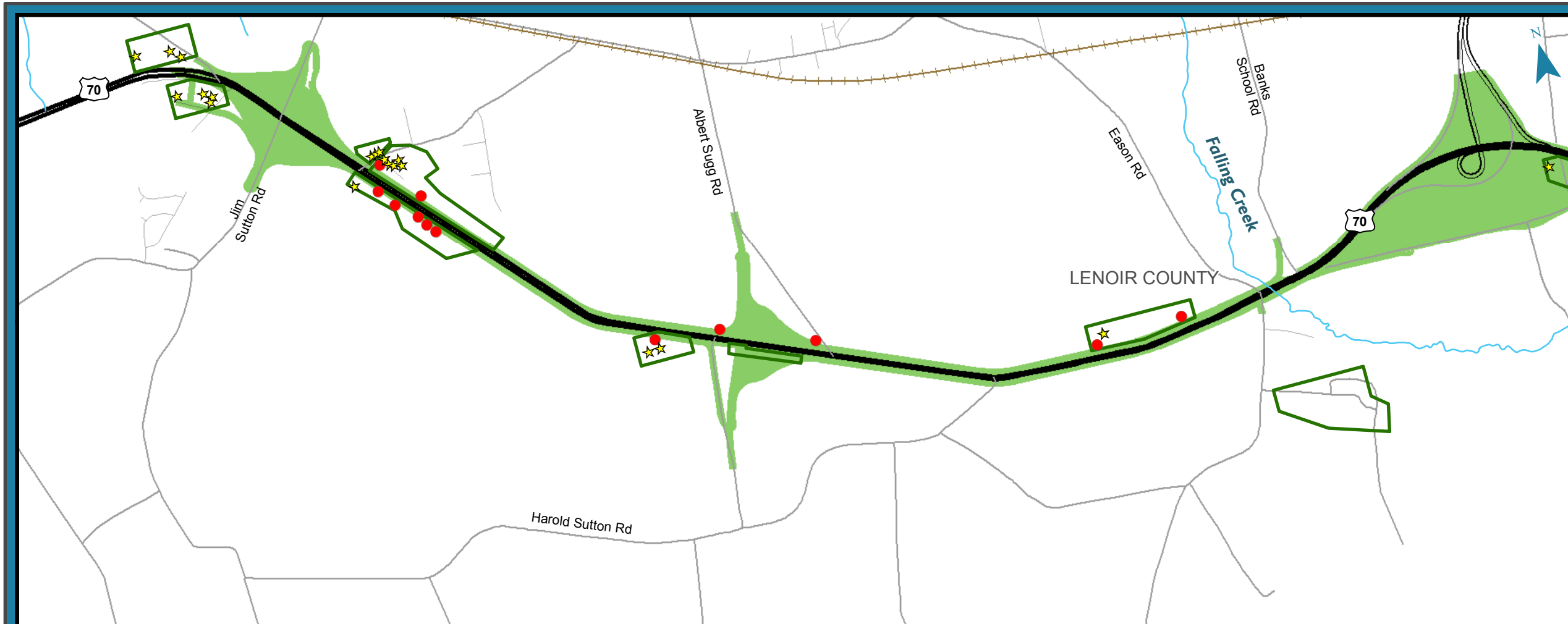


Figure 4-85:  
Noise receptors and  
noise study areas -  
Alternative 1SB - A

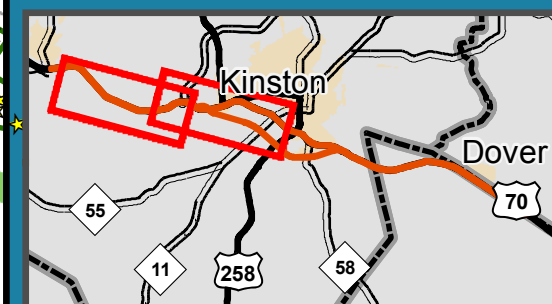
**Legend**

- Alt. 1SB ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - Benefited, Not Impacted
  - Not Impacted, Not Benefited
  - Not Noise Sensitive
  - Noise Study Area

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDOT, NCEM,  
NCONemap, NRCS, USFWS



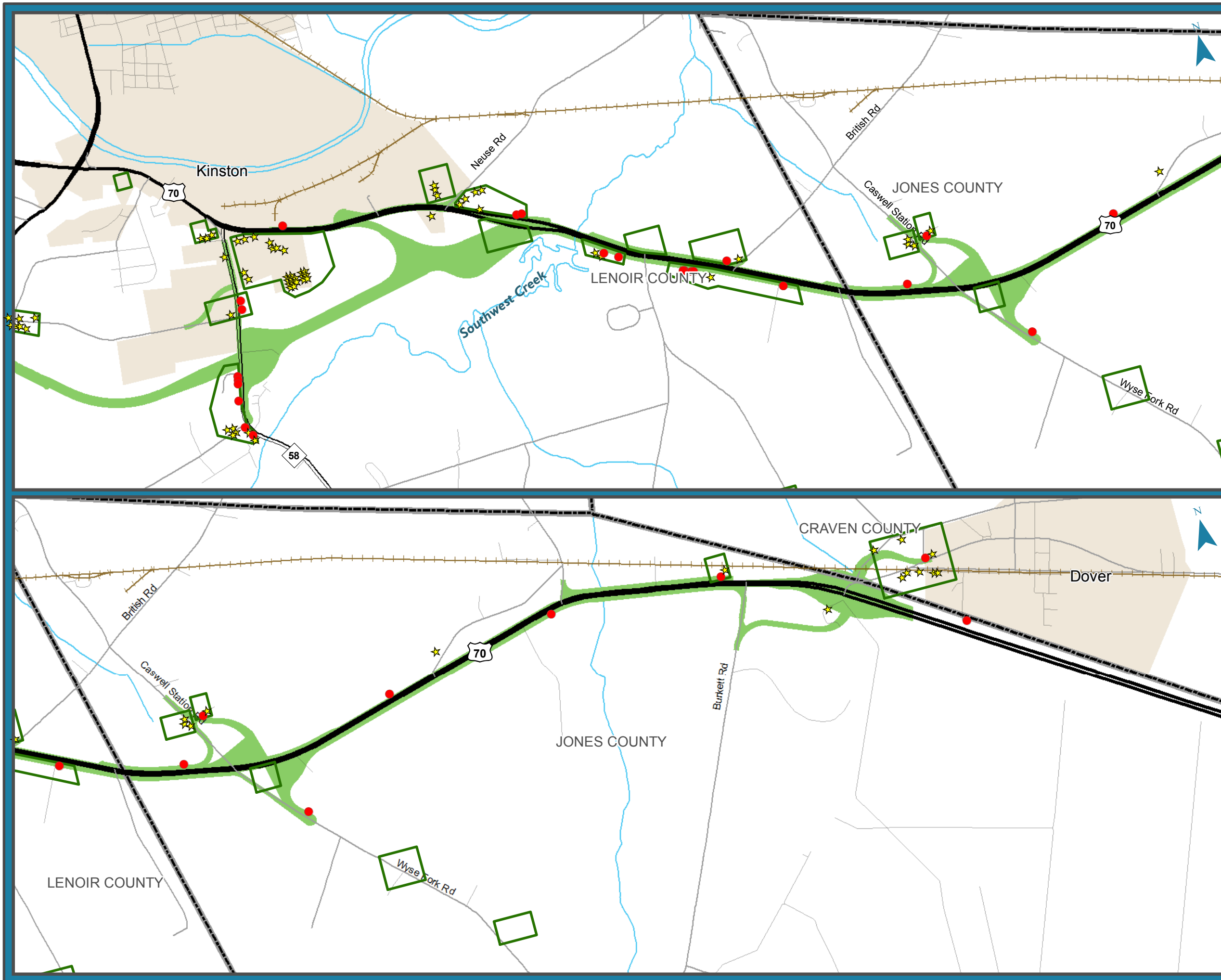
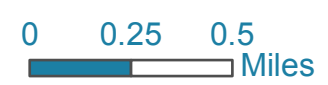
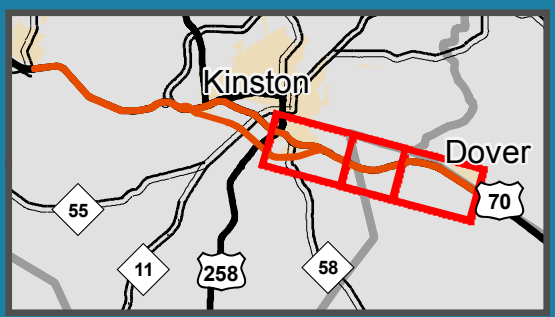


Figure 4-86:  
Noise receptors and  
noise study areas -  
Alternative 1SB - B

- Legend**
- Alt. 1SB ROW
  - Railroad
  - US Highway
  - NC Highway
  - Secondary Road
  - Municipal Boundary
  - County Boundary
- Noise Receptors
- Impacted, Not Benefited
  - Impacted and Benefited
  - Benefited, Not Impacted
  - Not Impacted, Not Benefited
  - Not Noise Sensitive
  - Noise Study Area



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





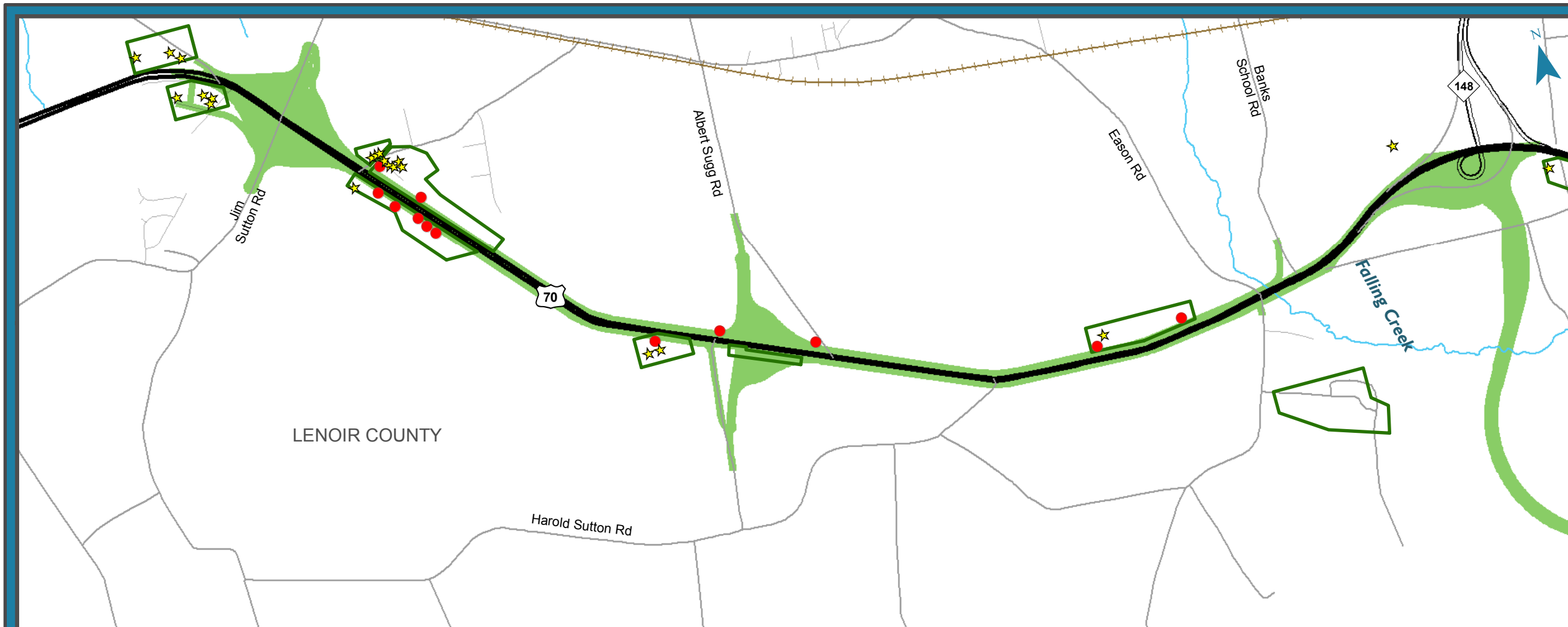


Figure 4-87:

Noise receptors and noise study areas - Alternative 11 - A

Legend

Alt. 11 ROW

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Noise Receptors

Impacted, Not Benefited

Impacted and Benefited

Benefited, Not Impacted

Not Impacted, Not Benefited

Not Noise Sensitive

Noise Study Area

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

This map is for reference only.

Sources: AECOM, CGIA, City of Kinston, Craven County, ESRI, HPO, Jones County, Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM, NCONemap, NRCS, USFWS

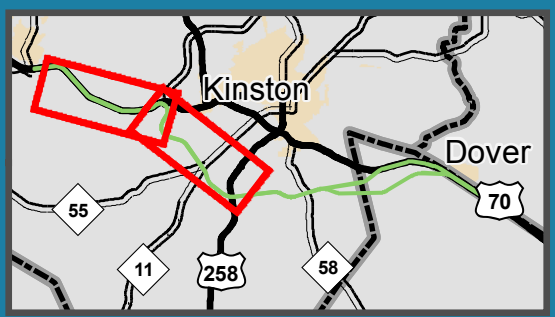
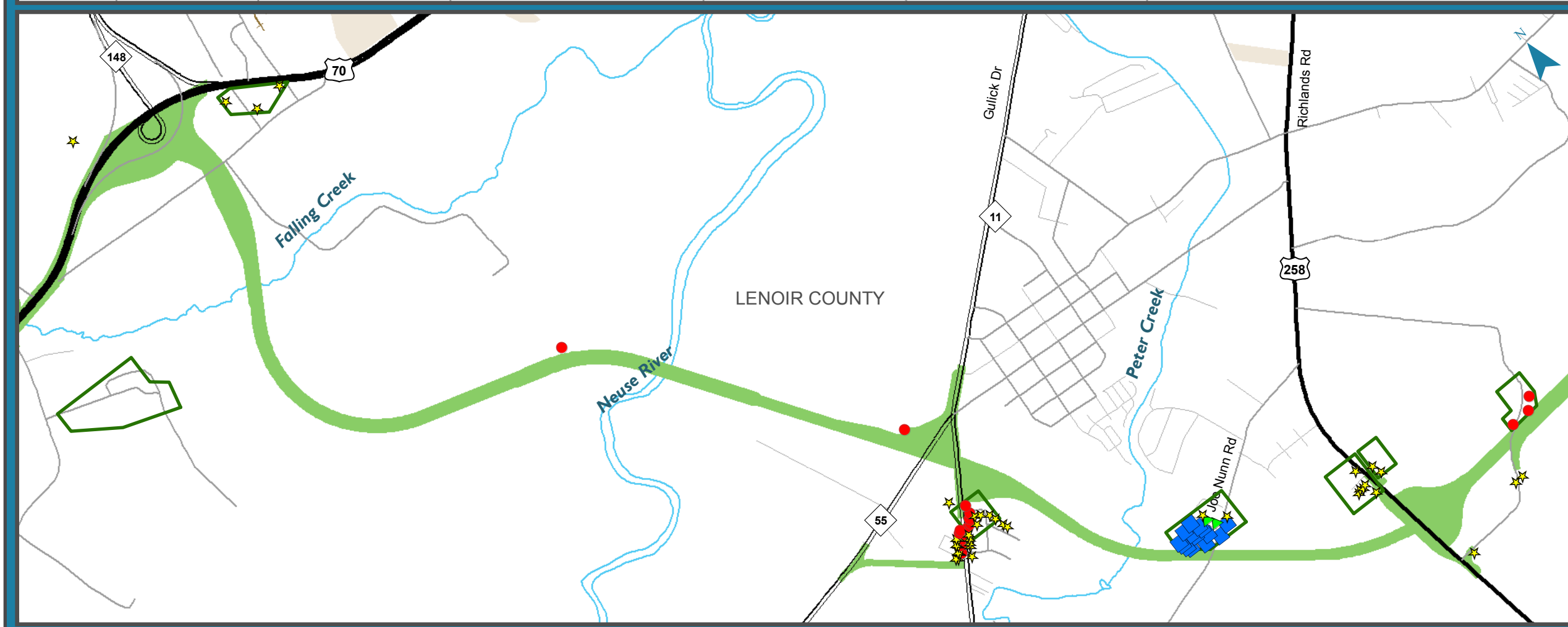


Figure 4-88:  
Noise receptors and  
noise study areas -  
Alternative 11 - B

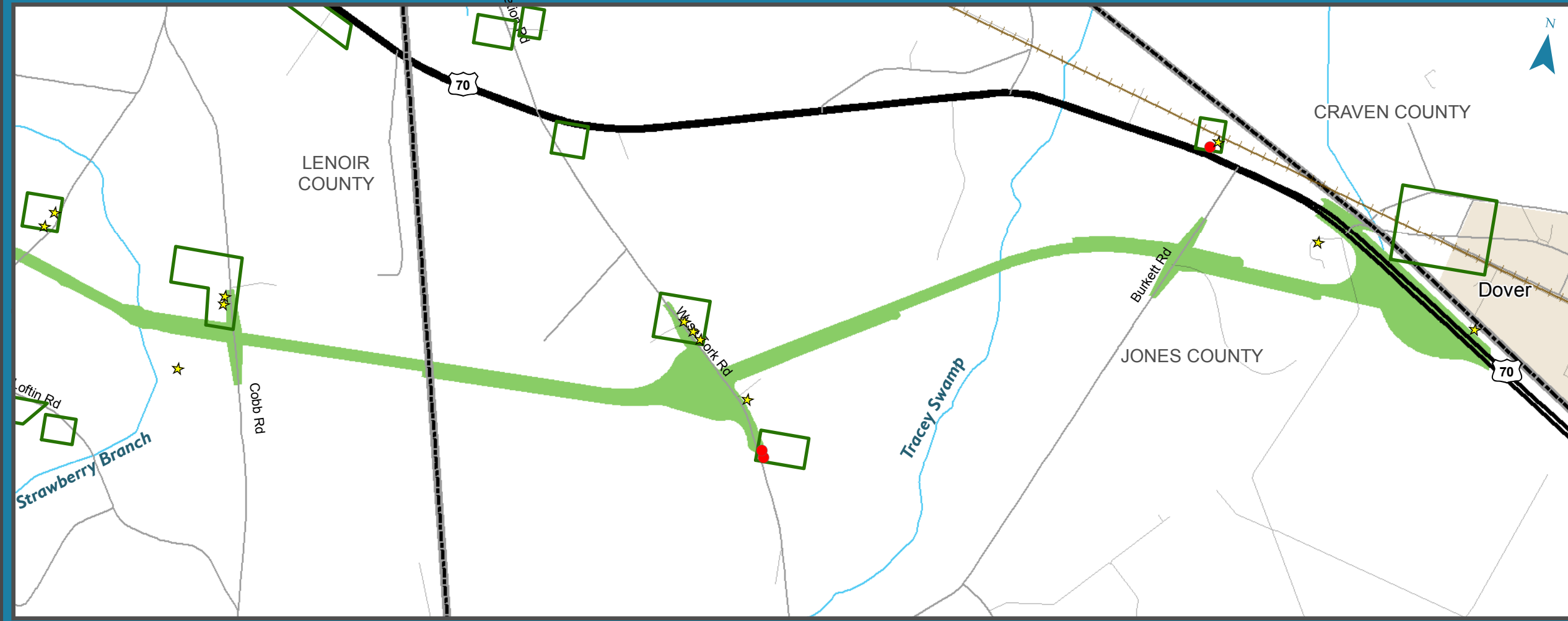
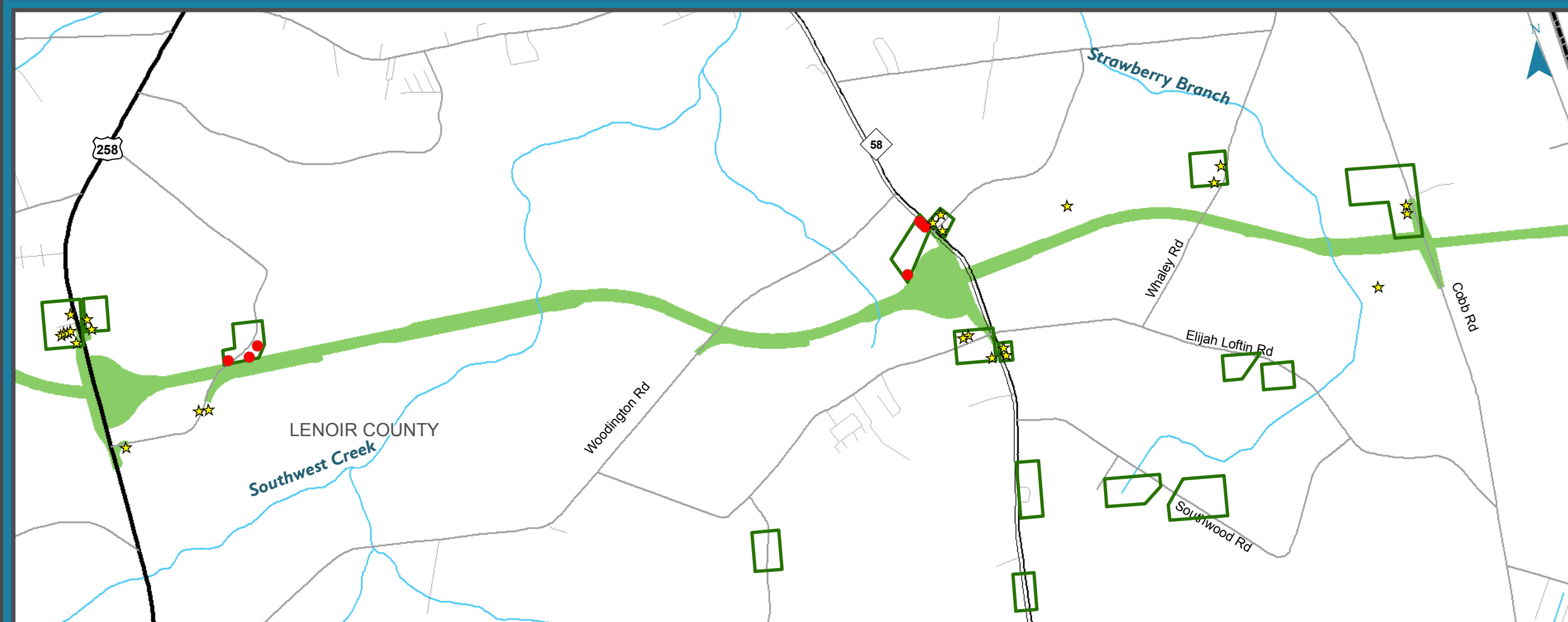
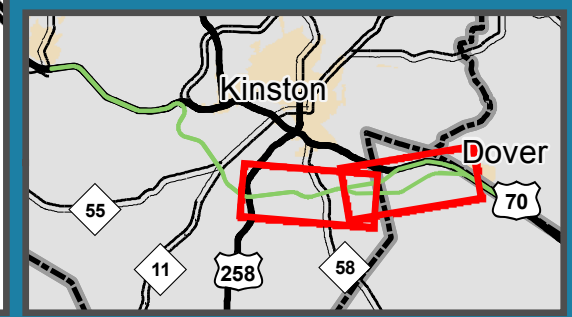
**Legend**

- Alt. 11 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - Benefited, Not Impacted
  - Not Impacted, Not Benefited
  - Not Noise Sensitive
- Noise Study Area

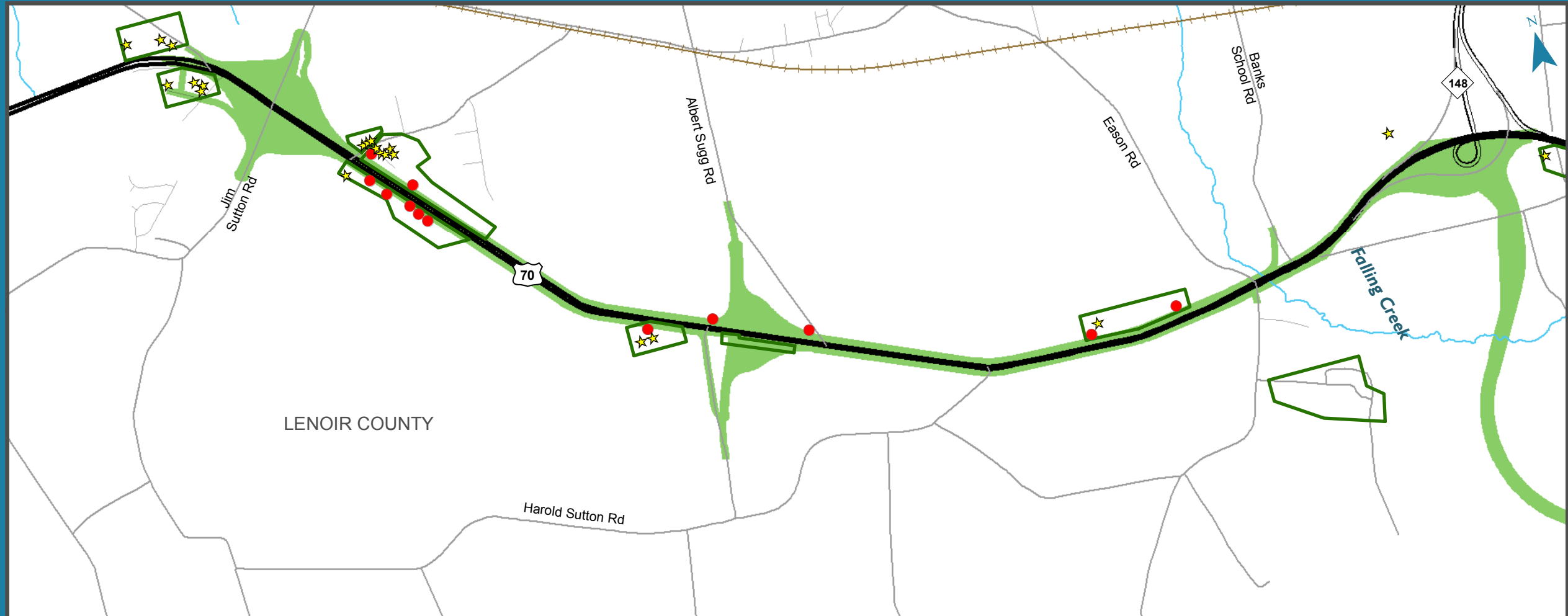
0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS







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Figure 4-89:  
Noise receptors and  
noise study areas -  
Alternative 12 - A

**Legend**

- Alt 12
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - ▲ Benefited, Not Impacted
  - ★ Not Impacted, Not Benefited
  - ◆ Not Noise Sensitive
  - Noise Study Area



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

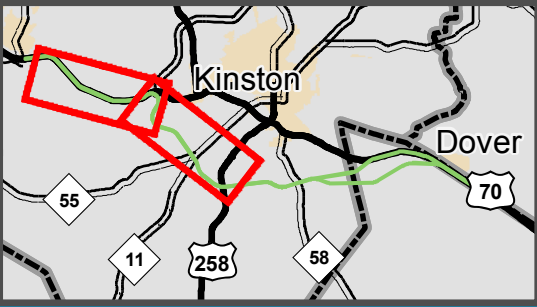


Figure 4-90:  
Noise receptors and  
noise study areas -  
Alternative 12 - B

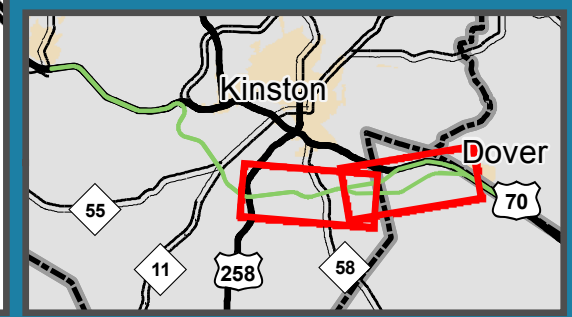
**Legend**

- Alt 12 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - Benefited, Not Impacted
  - Not Impacted, Not Benefited
  - Not Noise Sensitive
- Noise Study Area

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





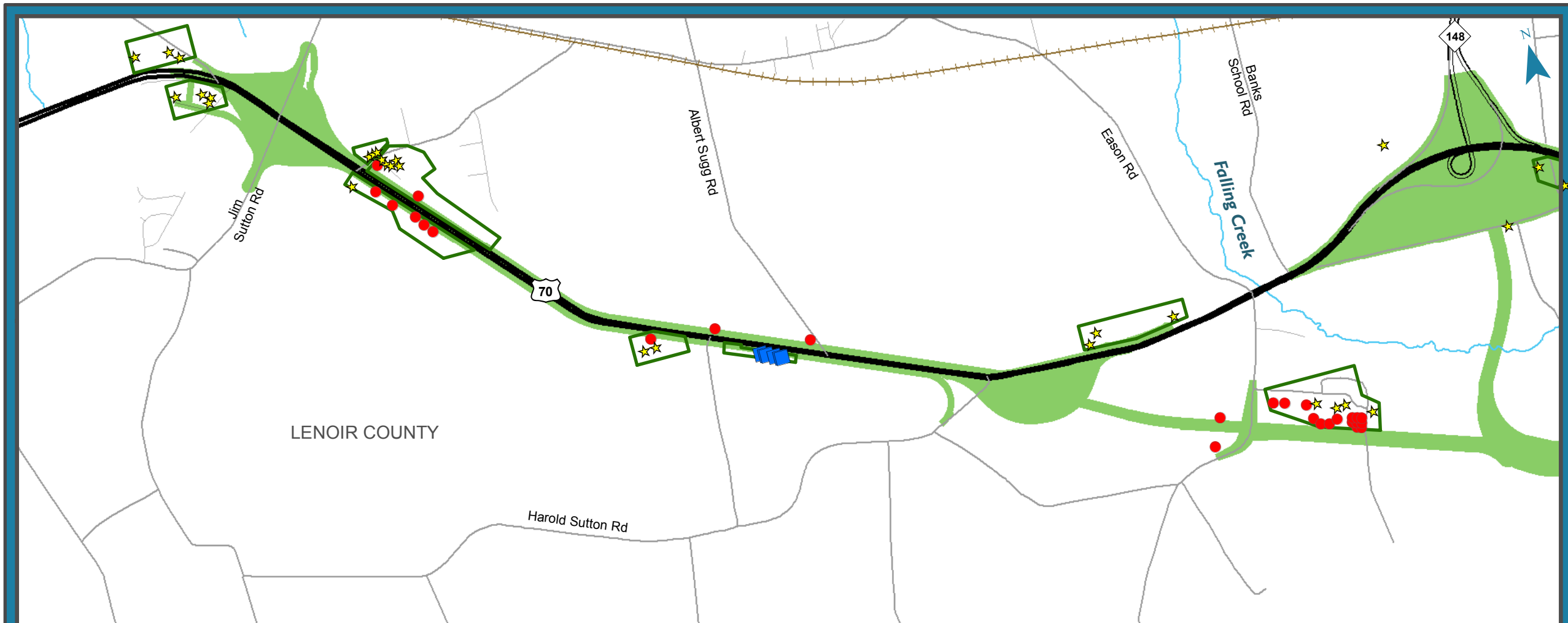


Figure 4-91:

Noise receptors and noise study areas - Alternative 31 - A

Legend

Alt. 31 ROW

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Noise Receptors

Impacted, Not Benefited

Impacted and Benefited

Benefited, Not Impacted

Not Impacted, Not Benefited

Not Noise Sensitive

Noise Study Area

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

This map is for reference only.

Sources: AECOM, CGIA, City of Kinston, Craven County, ESRI, HPO, Jones County, Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM, NConemap, NRCS, USFWS

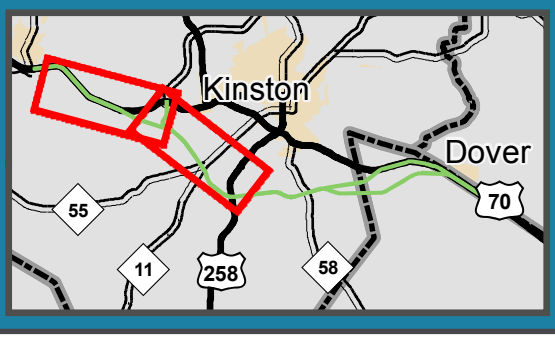
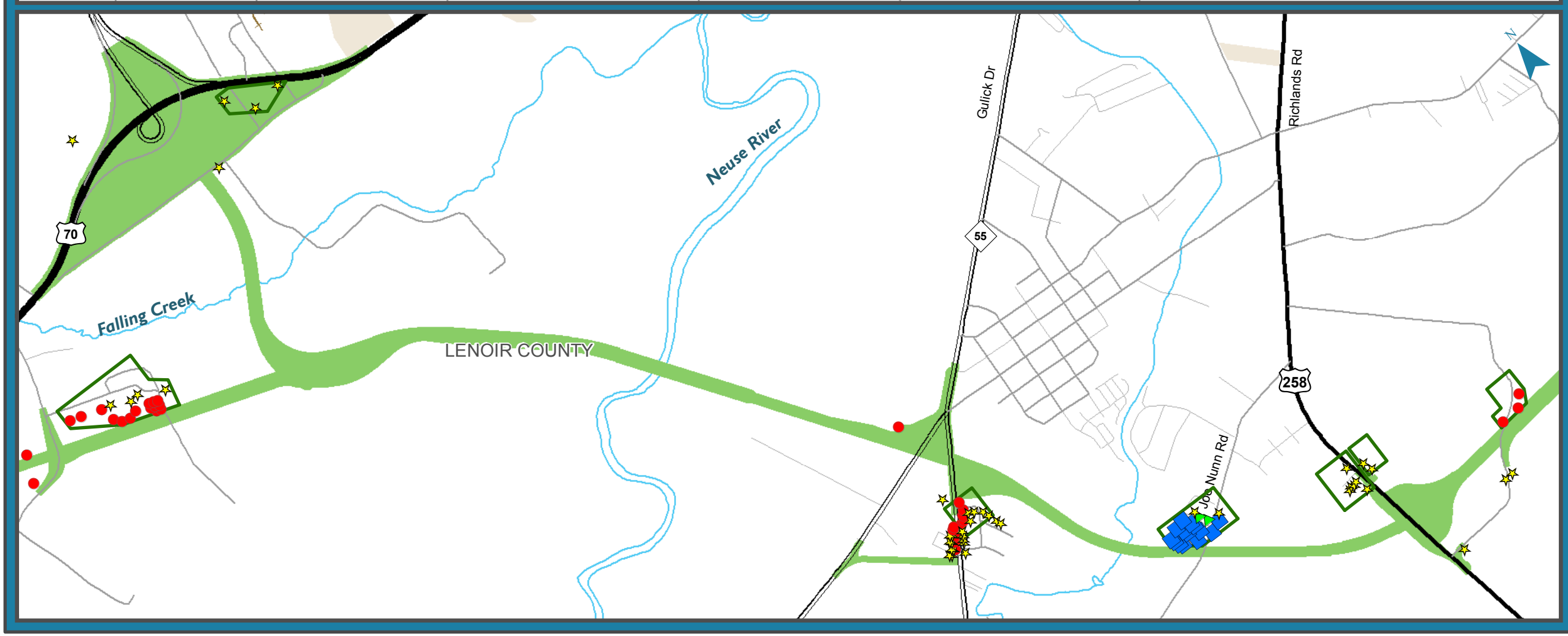


Figure 4-92:  
Noise receptors and  
noise study areas -  
Alternative 31 - B

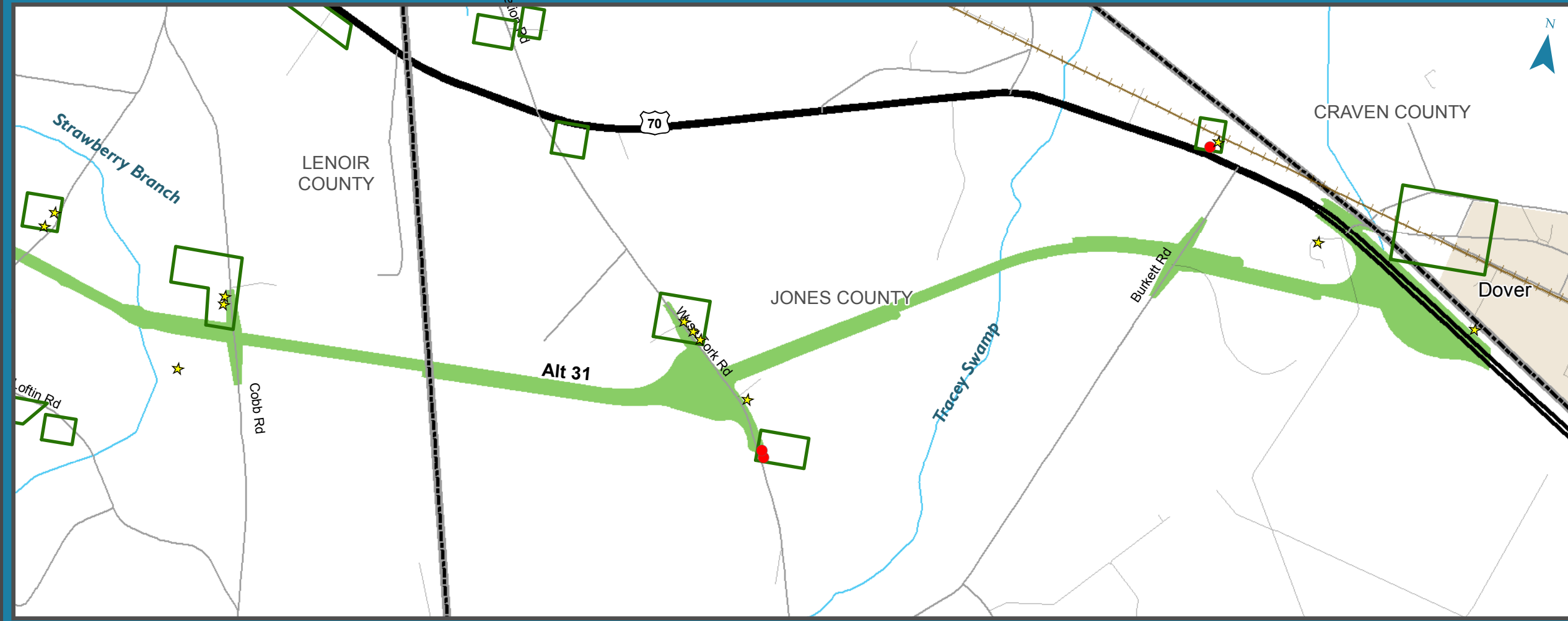
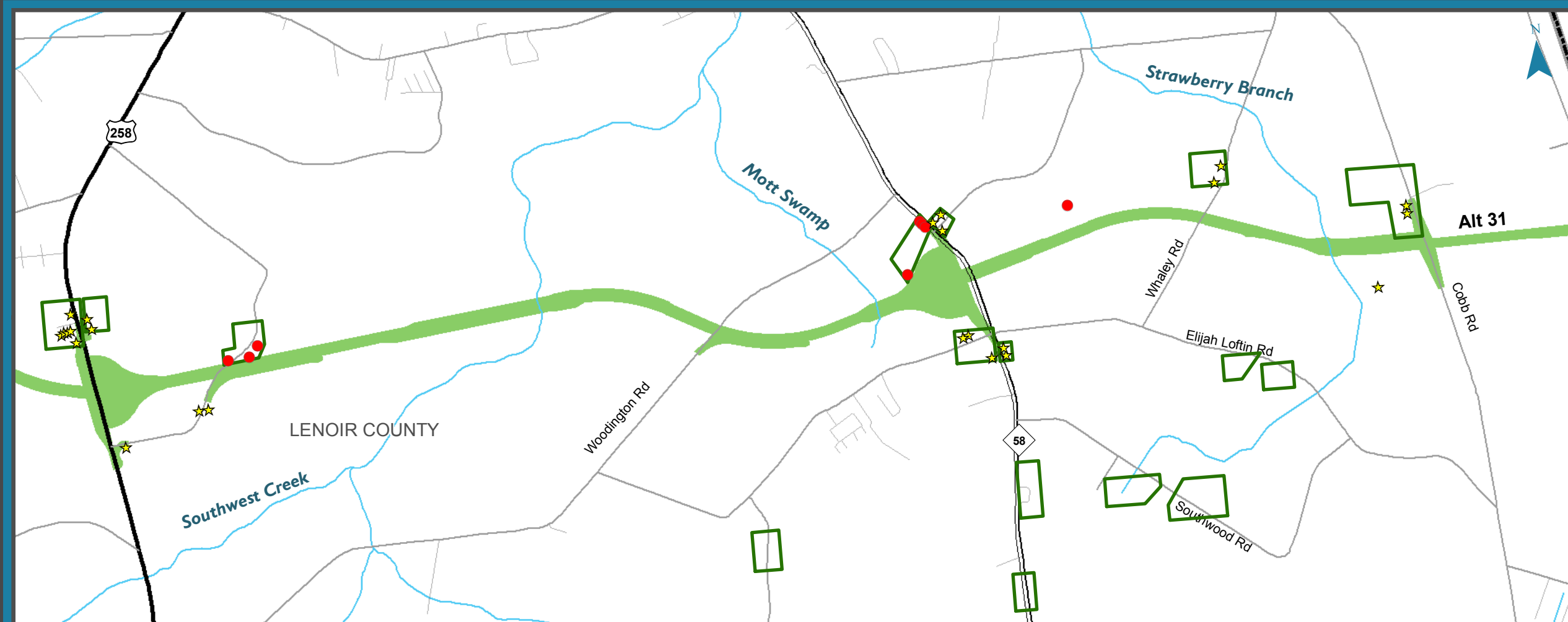
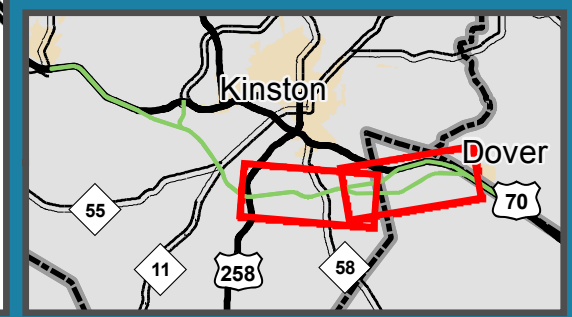
**Legend**

- Alt. 31 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors**
  - Impacted, Not Benefited
  - Impacted and Benefited
  - ▲ Benefited, Not Impacted
  - ★ Not Impacted, Not Benefited
  - ◆ Not Noise Sensitive
- Noise Study Area

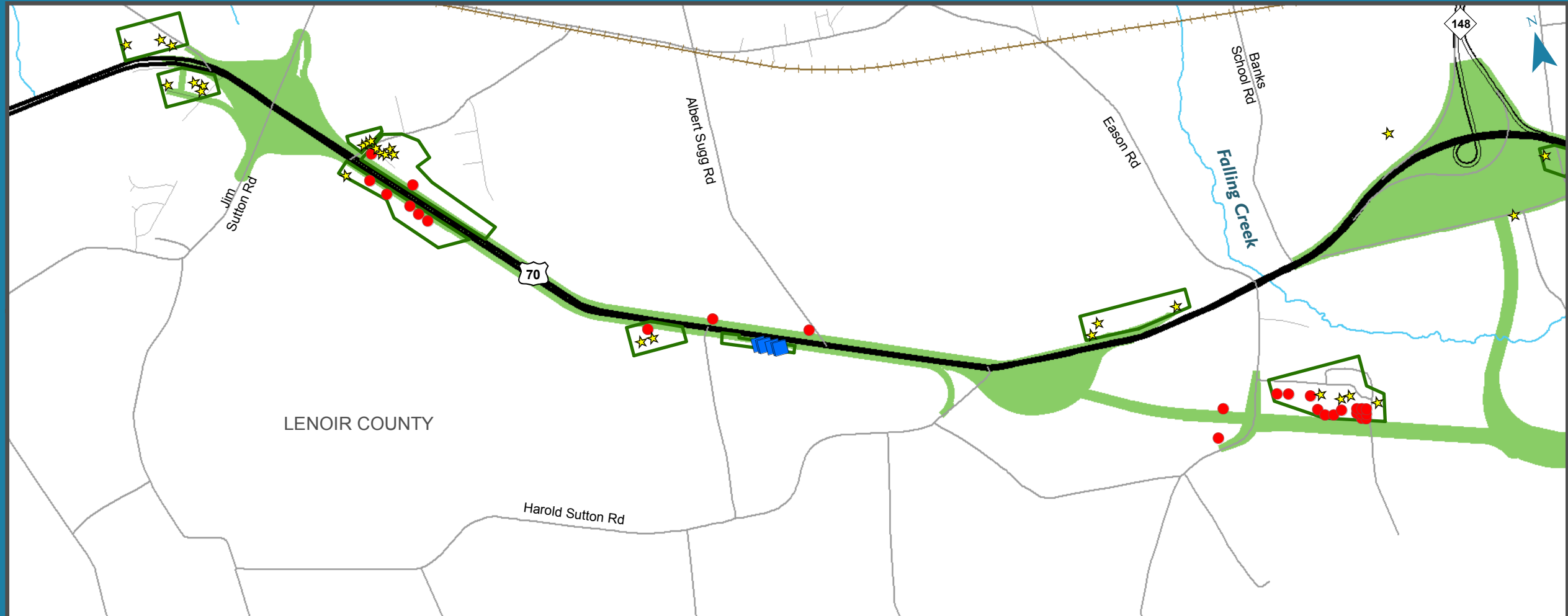
0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





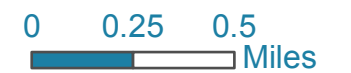


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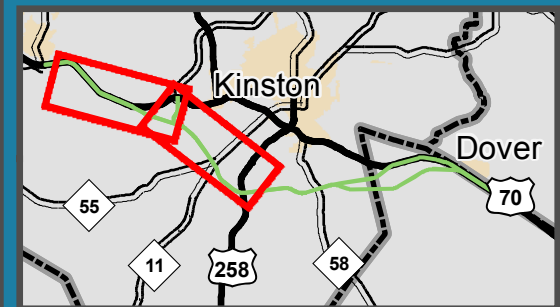
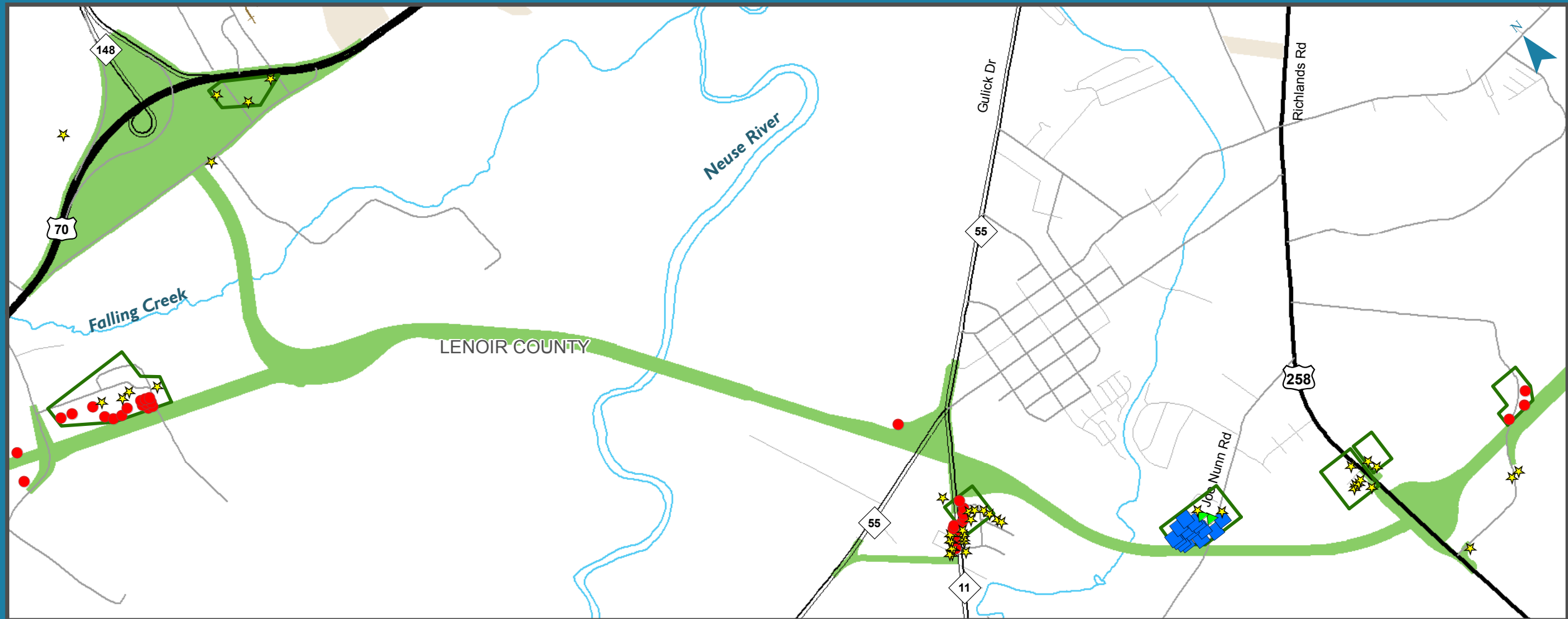
Figure 4-93:  
Noise receptors and  
noise study areas -  
Alternative 32 - A

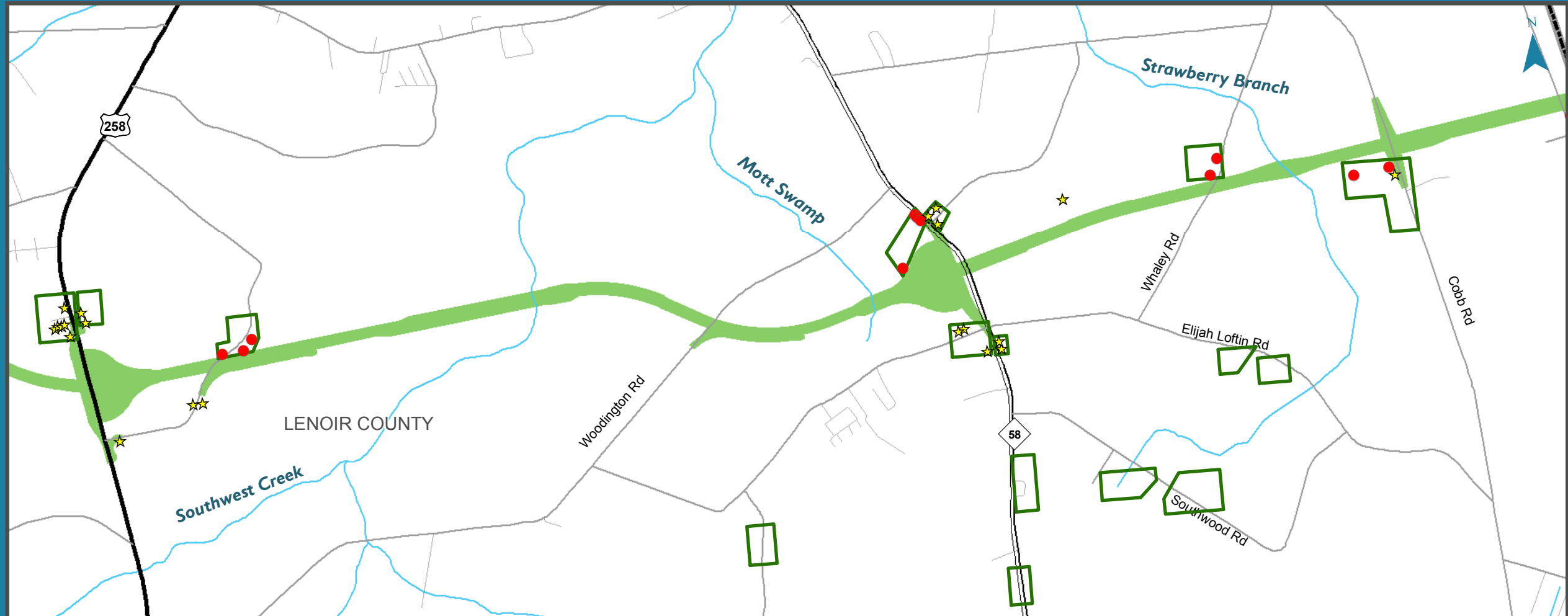
**Legend**

- Alt. 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - ▲ Benefited, Not Impacted
  - ★ Not Impacted, Not Benefited
  - ◆ Not Noise Sensitive
- Noise Study Area



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





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Figure 4-94:  
Noise receptors and  
noise study areas -  
Alternative 32 - B

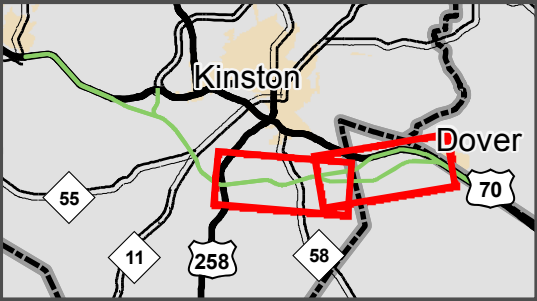
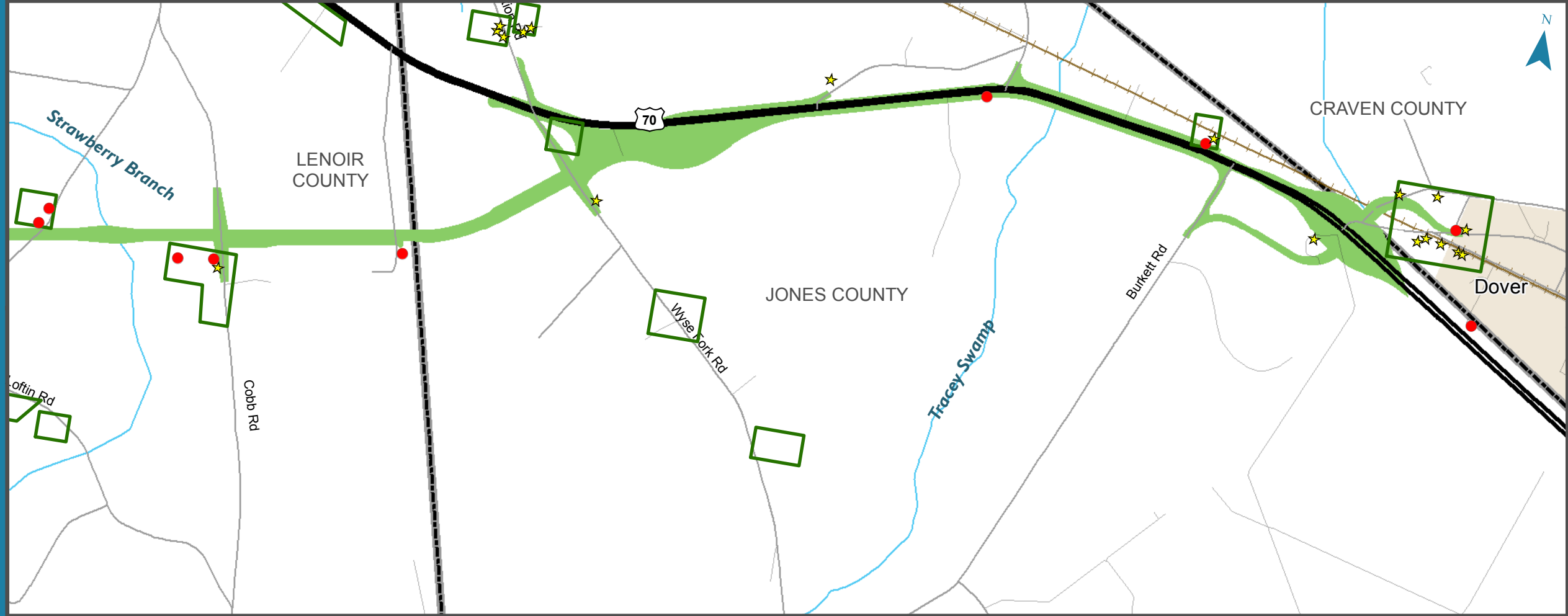
**Legend**

- Alt. 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - Benefited, Not Impacted
  - Not Impacted, Not Benefited
  - Not Noise Sensitive
- Noise Study Area

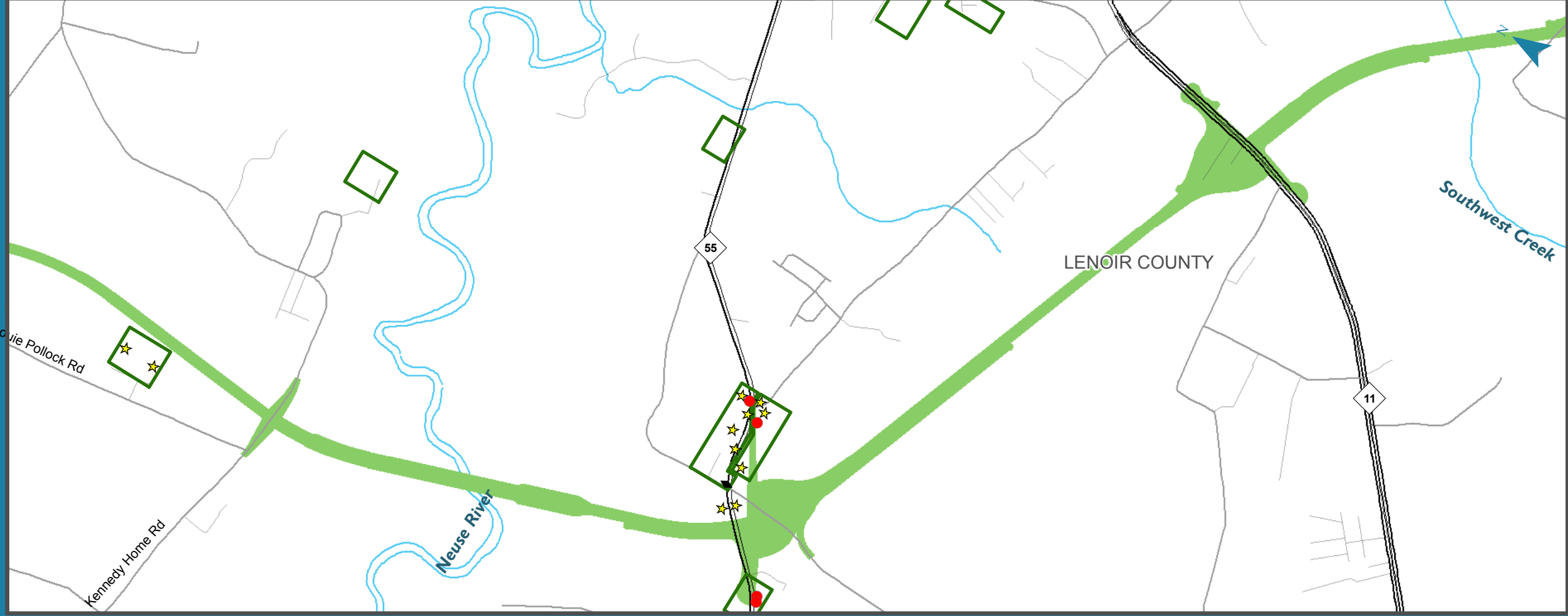
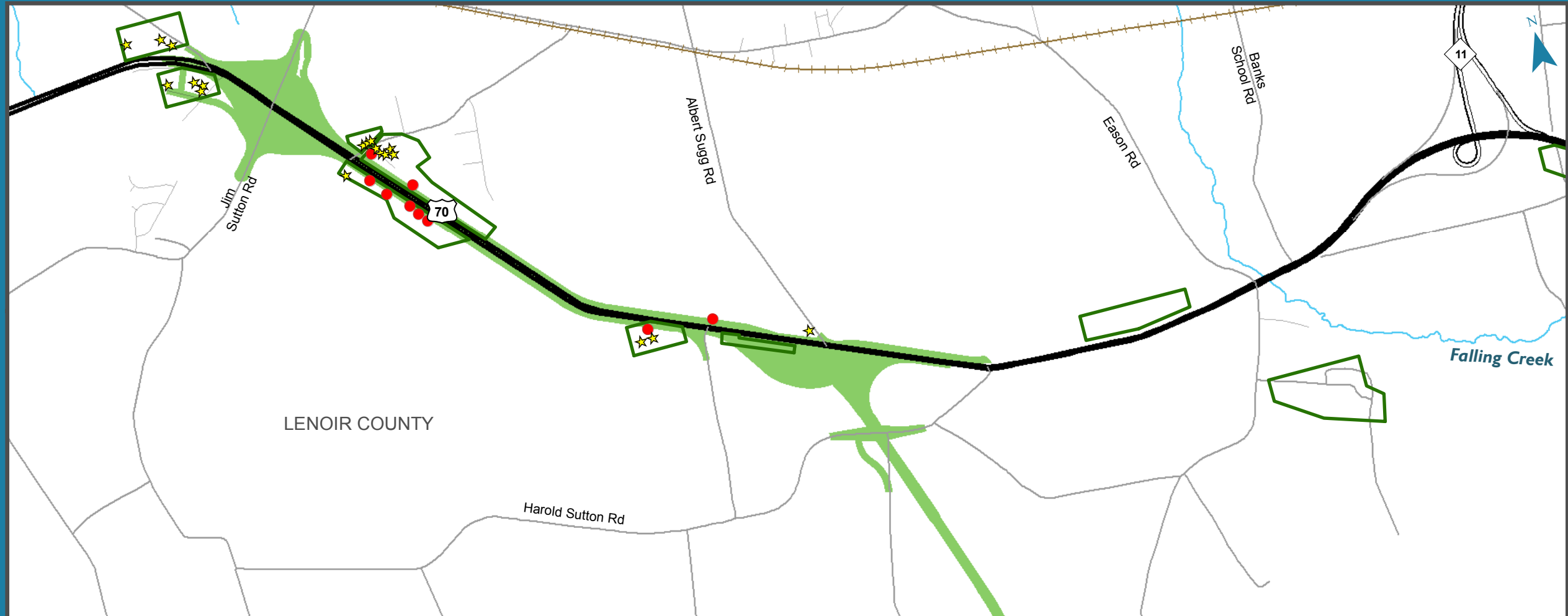
0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS







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Figure 4-95:  
Noise receptors and  
noise study areas -  
Alternative 35 - A

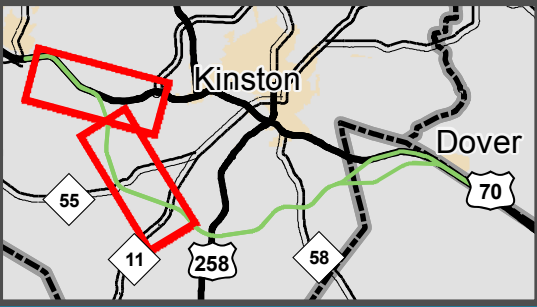
**Legend**

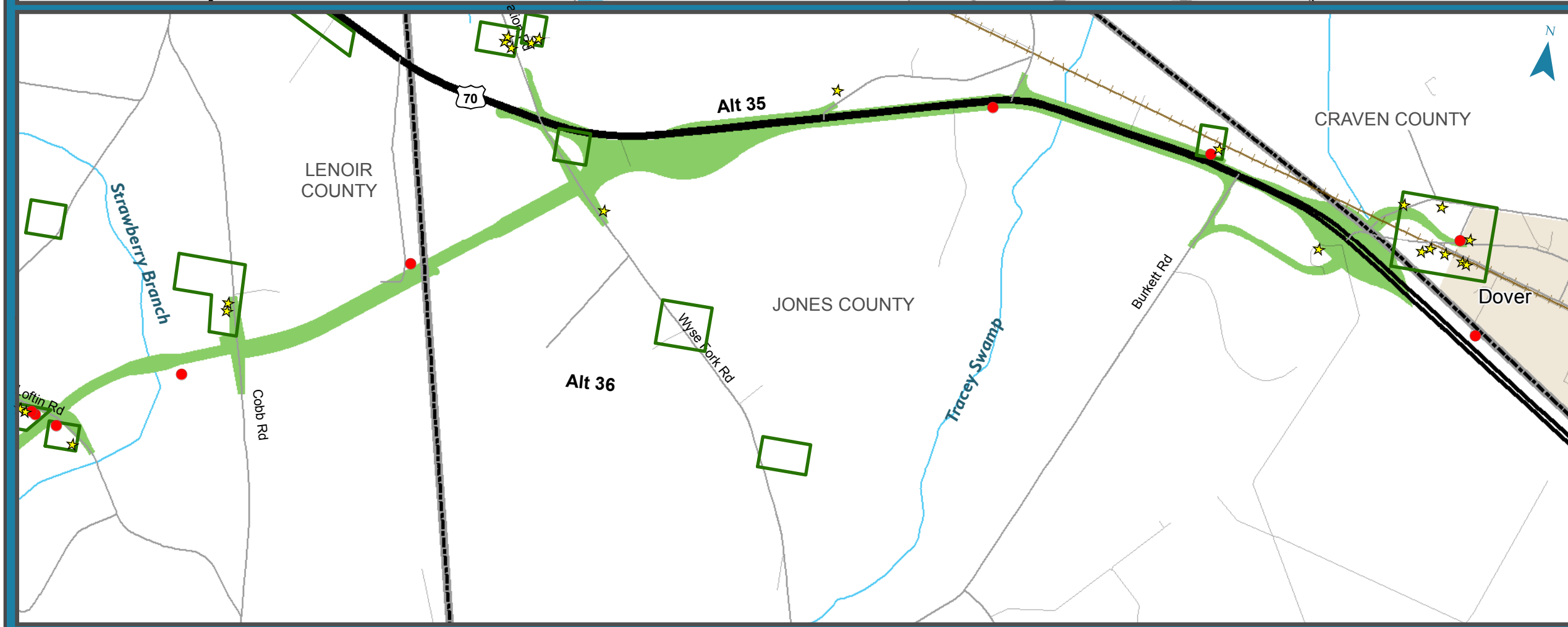
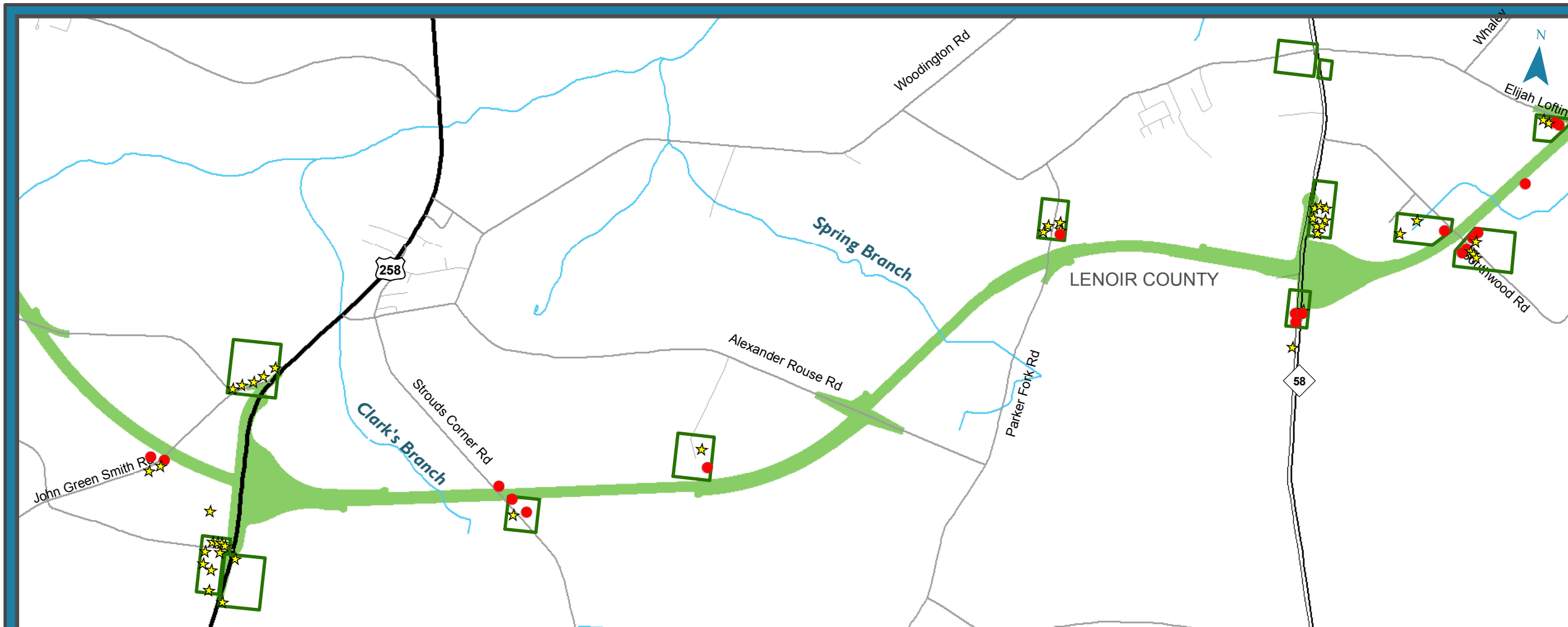
- Alt. 35 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - Benefited, Not Impacted
  - Not Impacted, Not Benefited
  - Not Noise Sensitive
- Noise Study Area

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





**Figure 4-96:**  
Noise receptors and  
noise study areas -  
Alternative 35 - B


**Legend**

- Alt. 35 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

**Noise Receptors**

- Impacted, Not Benefited
- Impacted and Benefited
- Benefited, Not Impacted
- Not Impacted, Not Benefited
- Not Noise Sensitive
- Noise Study Area

0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS

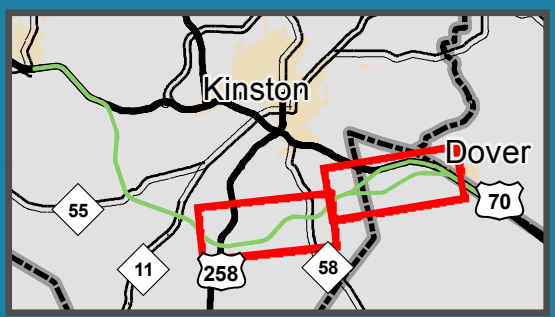






Figure 4-97:  
Noise receptors and  
noise study areas -  
Alternative 36 - A


**Legend**

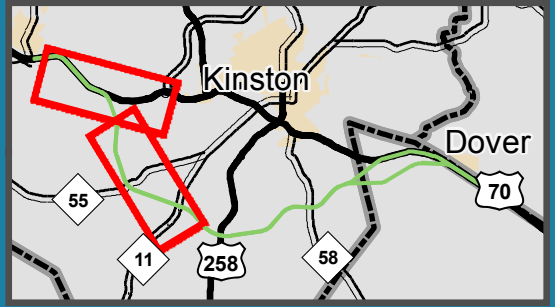
- Alt. 36 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

Noise Receptors

- Impacted, Not Benefited
- Impacted and Benefited
- Benefited, Not Impacted
- Not Impacted, Not Benefited
- Not Noise Sensitive
- Noise Study Area

0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS



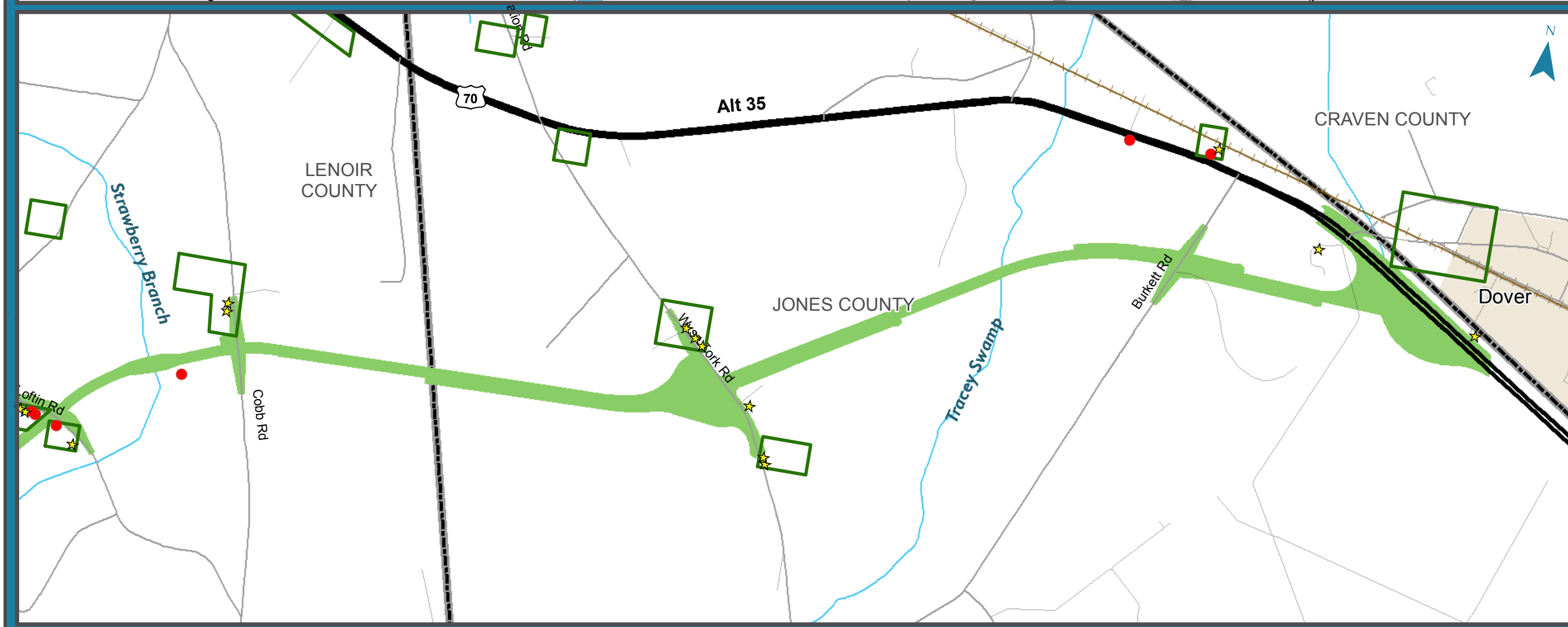
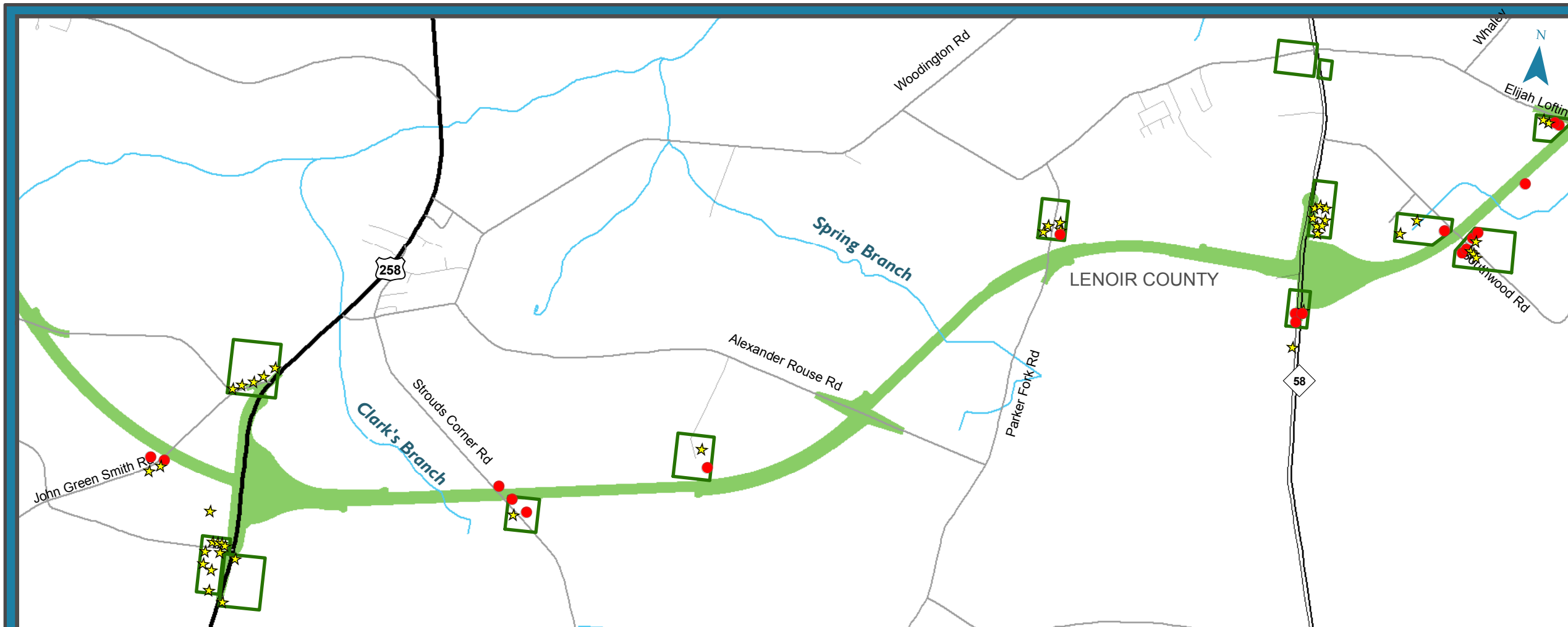


Figure 4-98:

Noise receptors and noise study areas - Alternative 36 - B

Legend

Alt. 36 ROW

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Noise Receptors

Impacted, Not Benefited

Impacted and Benefited

Benefited, Not Impacted

Not Impacted, Not Benefited

Not Noise Sensitive

Noise Study Area

0

0.25

0.5

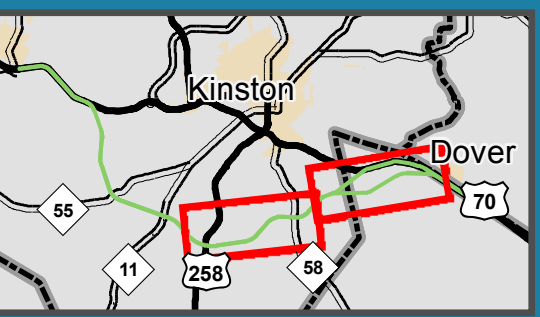
Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

This map is for reference only.

Sources: AECOM, CGIA, City of Kinston, Craven County, ESRI, HPO, Jones County Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM, NCONemap, NRCS, USFWS





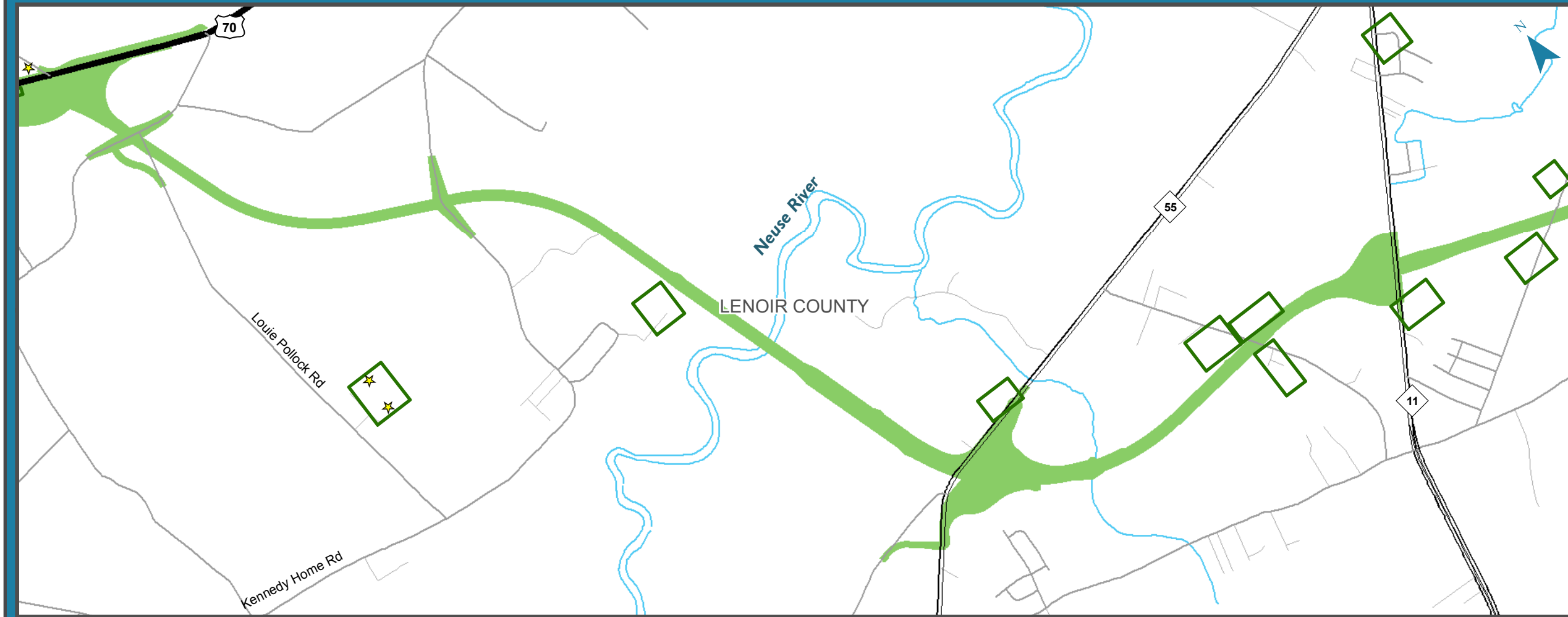
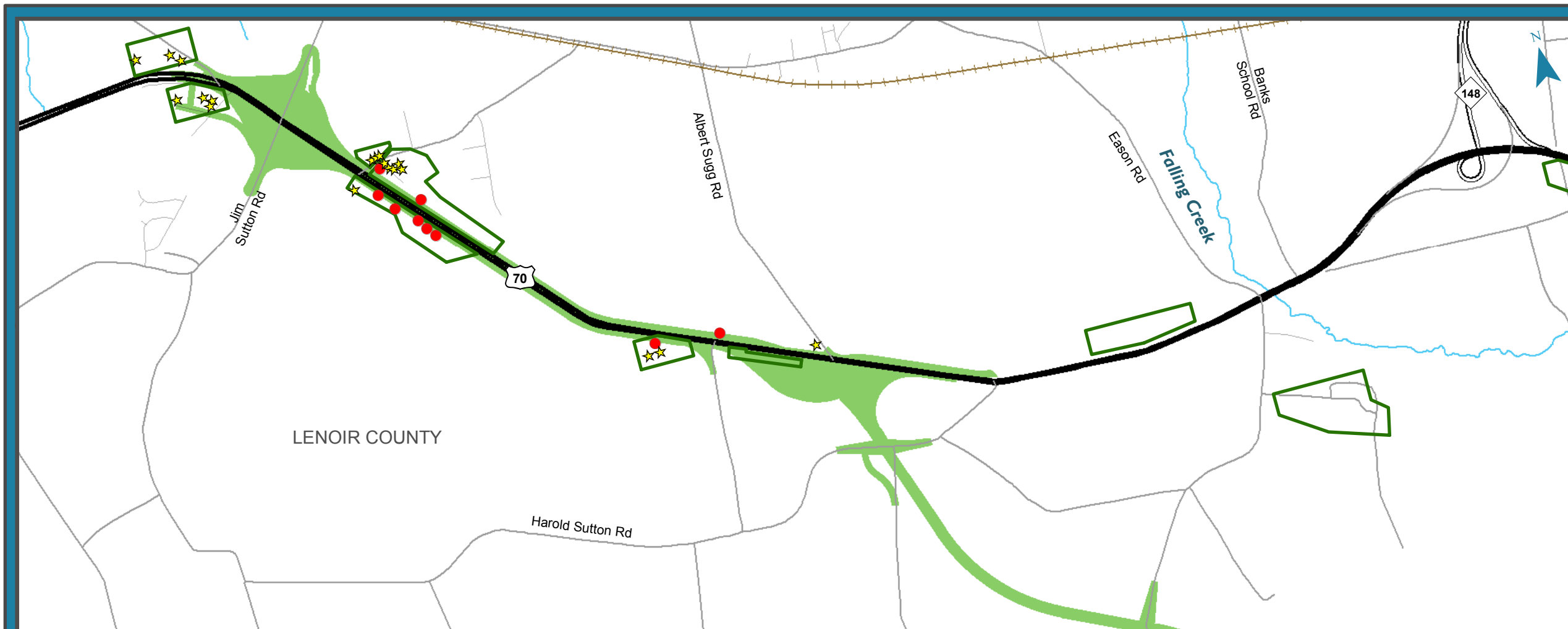


Figure 4-99:  
Noise receptors and  
noise study areas -  
Alternative 51 - A

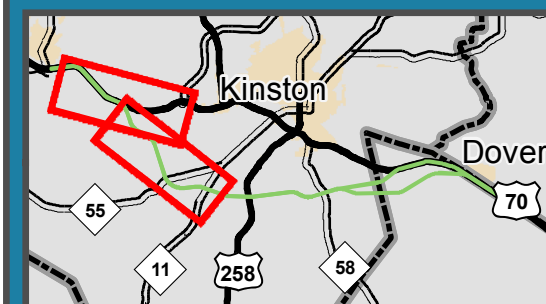
**Legend**

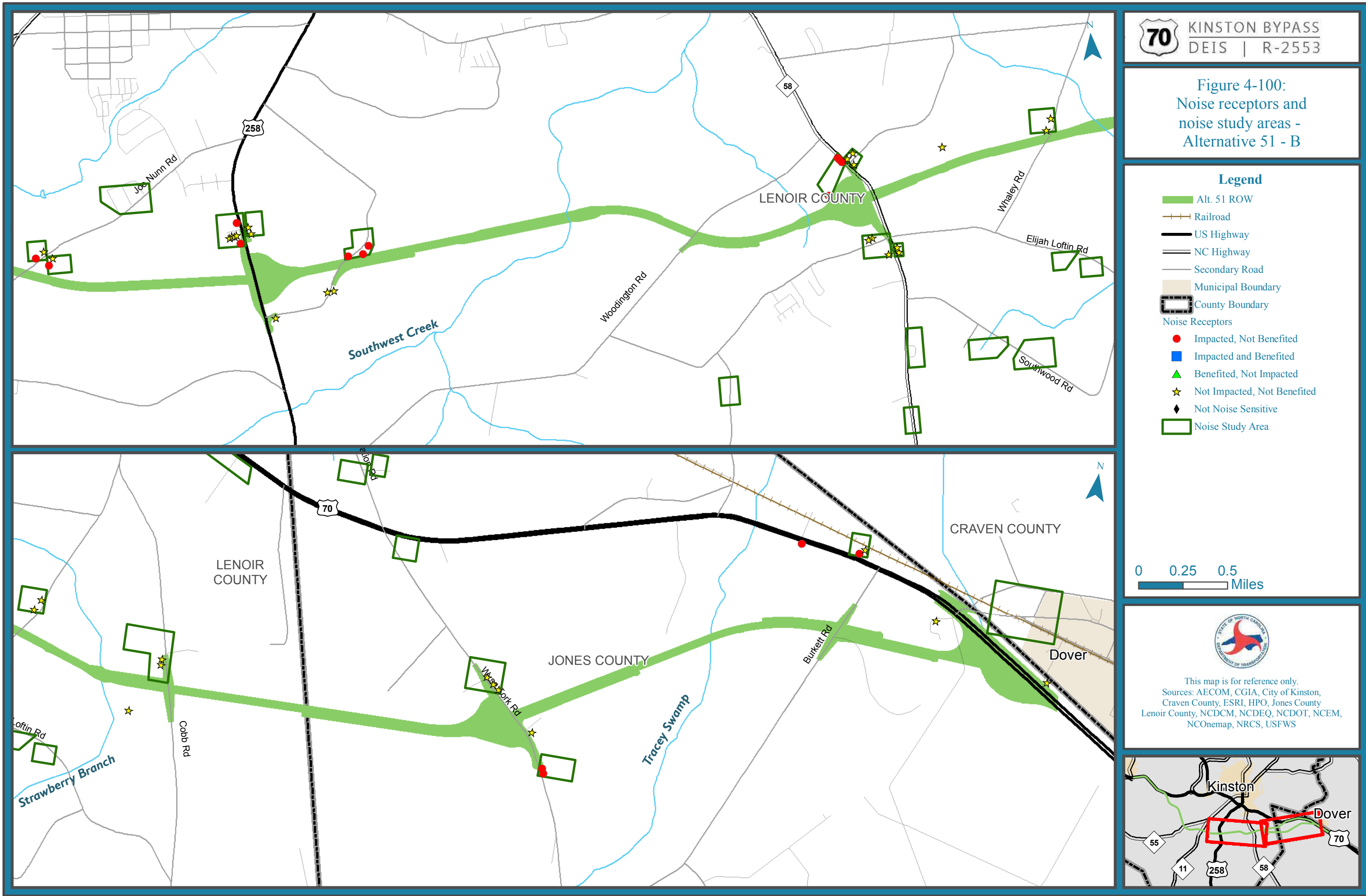
- Alt. 51 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors**
- Impacted, Not Benefited
- Impacted and Benefited
- Benefited, Not Impacted
- Not Impacted, Not Benefited
- Not Noise Sensitive
- Noise Study Area

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCEM,  
NCONemap, NRCS, USFWS







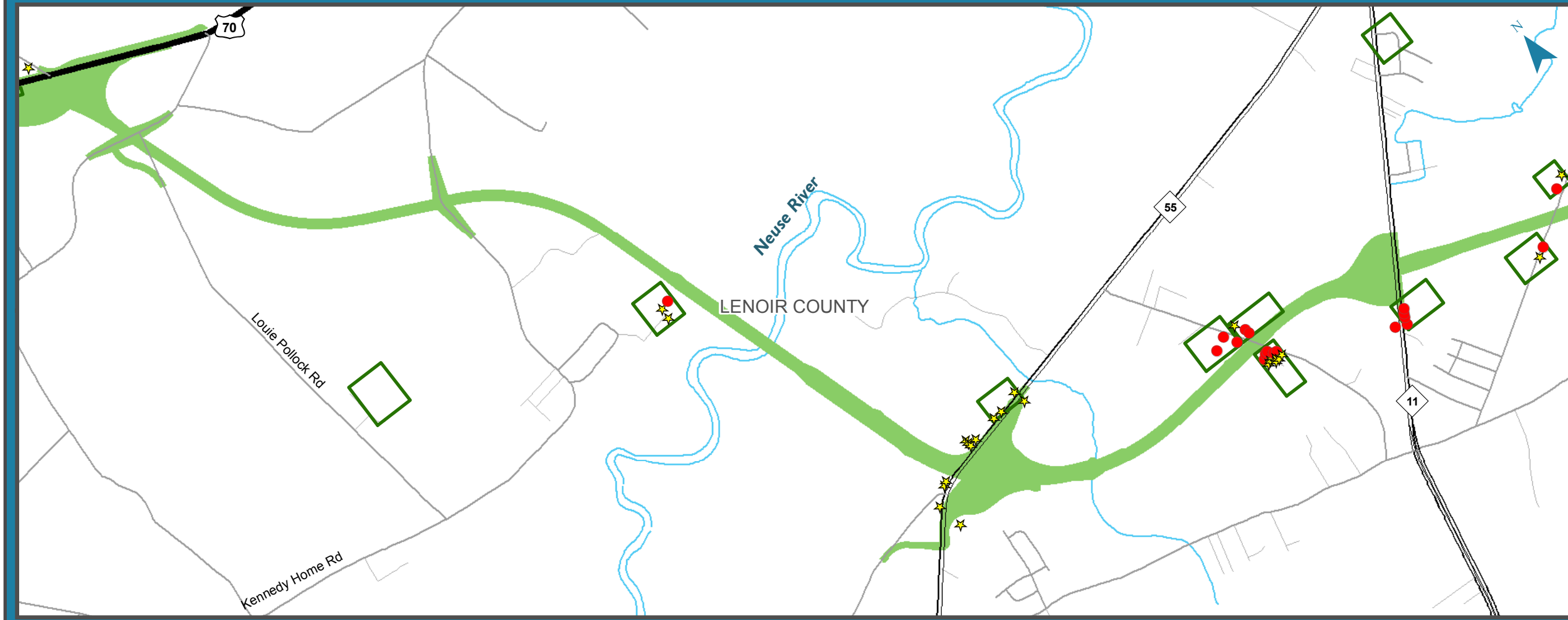
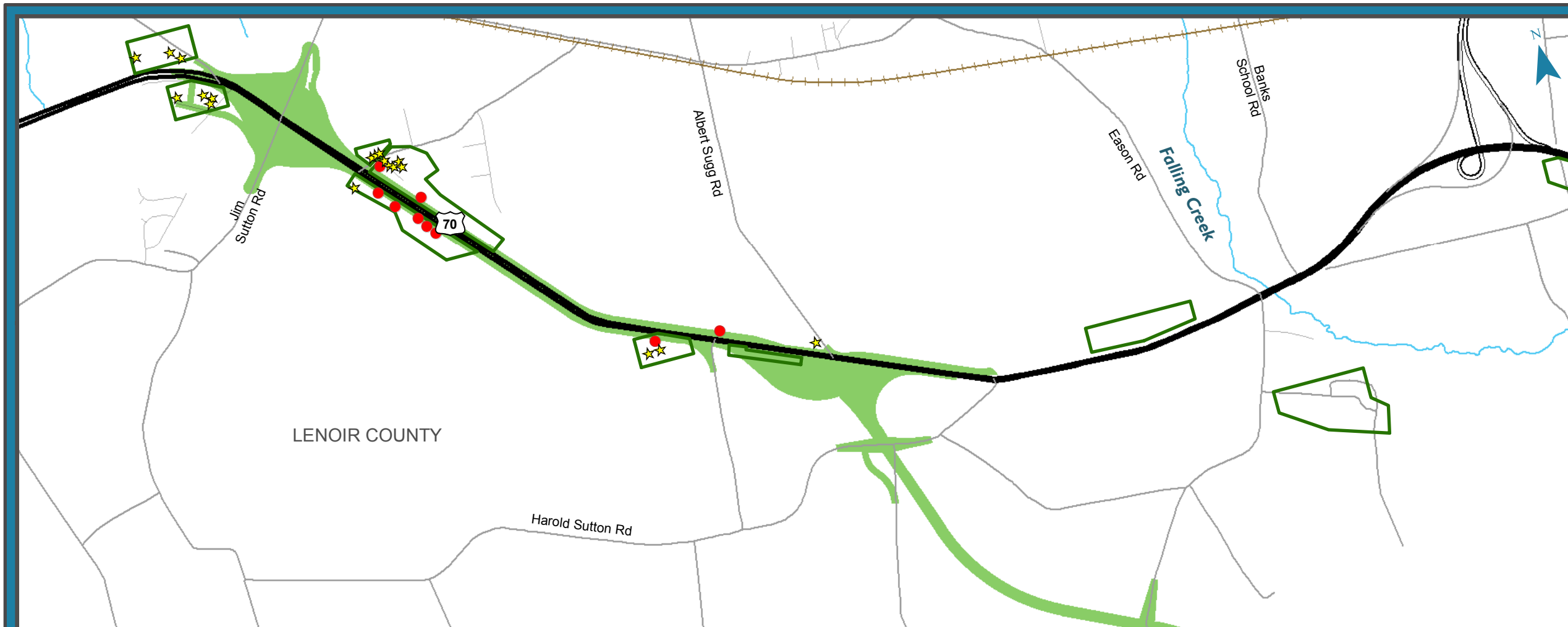


Figure 4-101:  
Noise receptors and  
noise study areas -  
Alternative 52 - A


**Legend**

- Alt. 52 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

**Noise Receptors**

- Impacted, Not Benefited
- Impacted and Benefited
- Benefited, Not Impacted
- Not Impacted, Not Benefited
- Not Noise Sensitive
- Noise Study Area

0 0.25 0.5  
Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

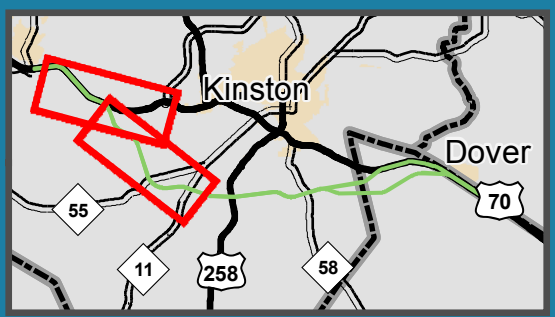


Figure 4-102:  
Noise receptors and  
noise study areas -  
Alternative 52 - B

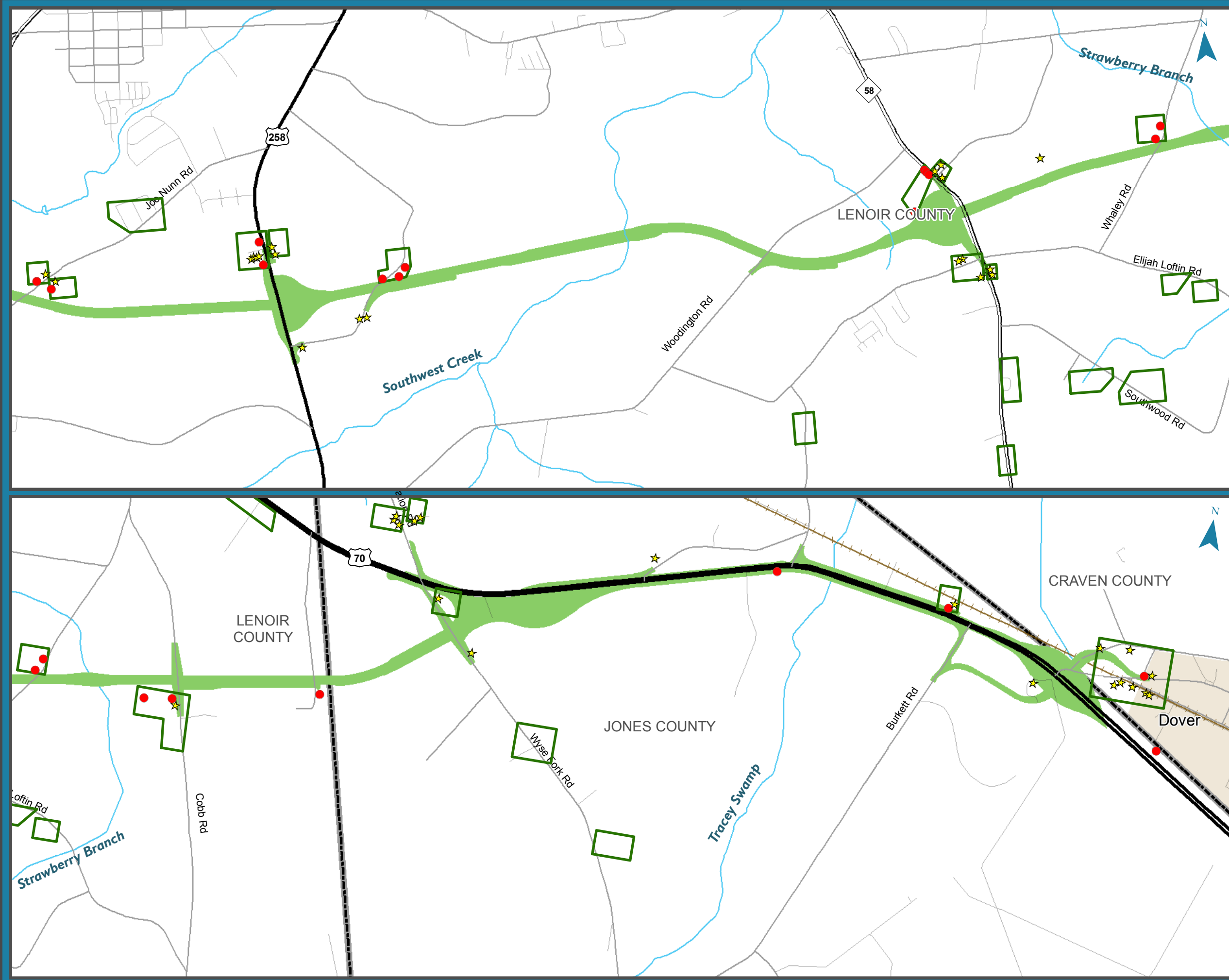
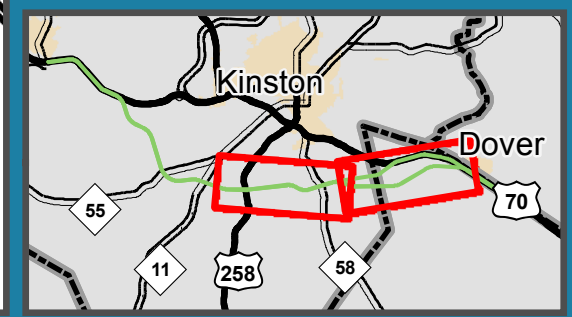
**Legend**

- Alt. 52 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors
  - Impacted, Not Benefited
  - Impacted and Benefited
  - Benefited, Not Impacted
  - Not Impacted, Not Benefited
  - Not Noise Sensitive
- Noise Study Area

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS





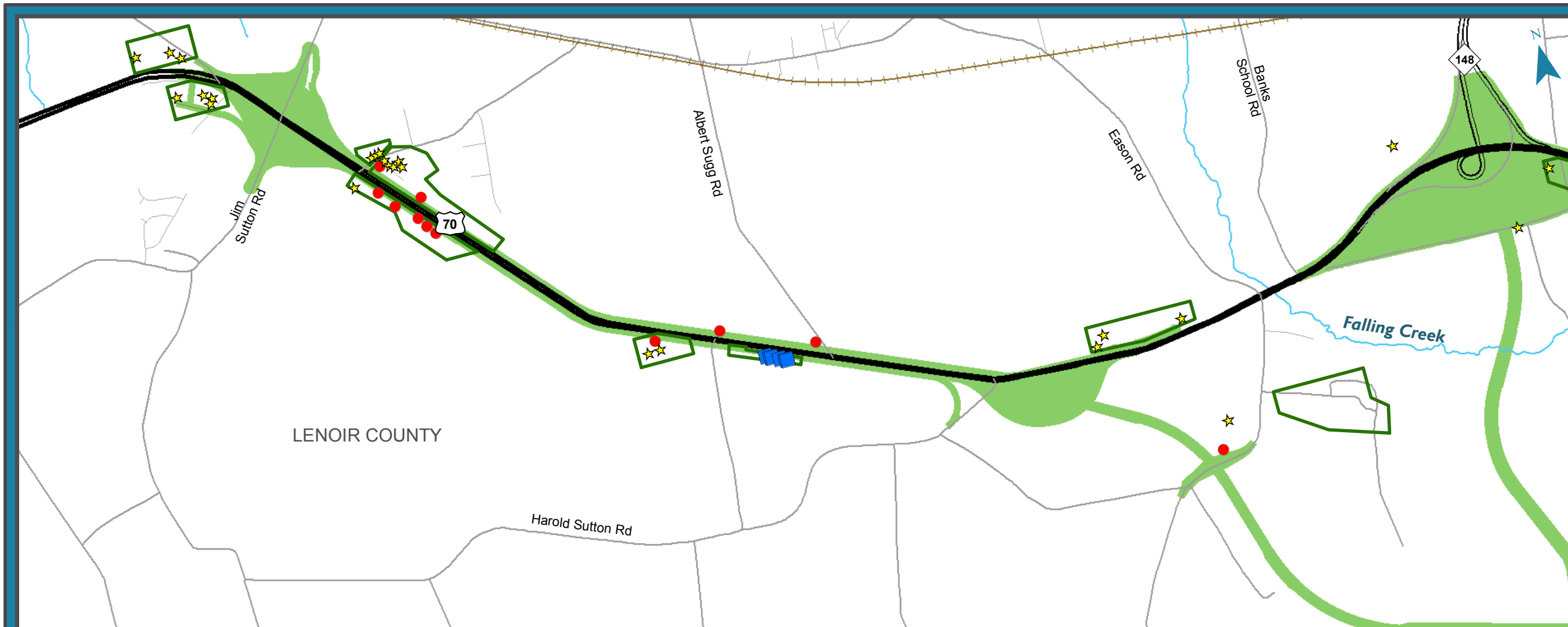


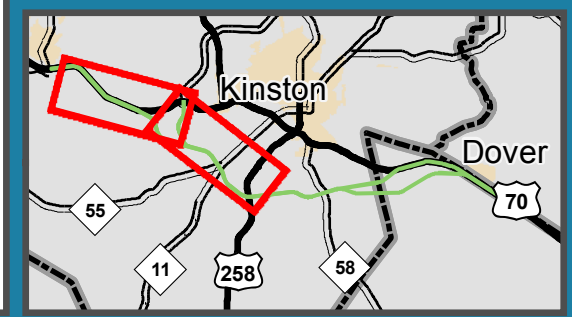
Figure 4-103:  
Noise receptors and  
noise study areas -  
Alternative 63 - A

**Legend**

- Alt. 63 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Noise Receptors**
  - Impacted, Not Benefited
  - Impacted and Benefited
  - ▲ Benefited, Not Impacted
  - ★ Not Impacted, Not Benefited
  - ◆ Not Noise Sensitive
- Noise Study Area



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS



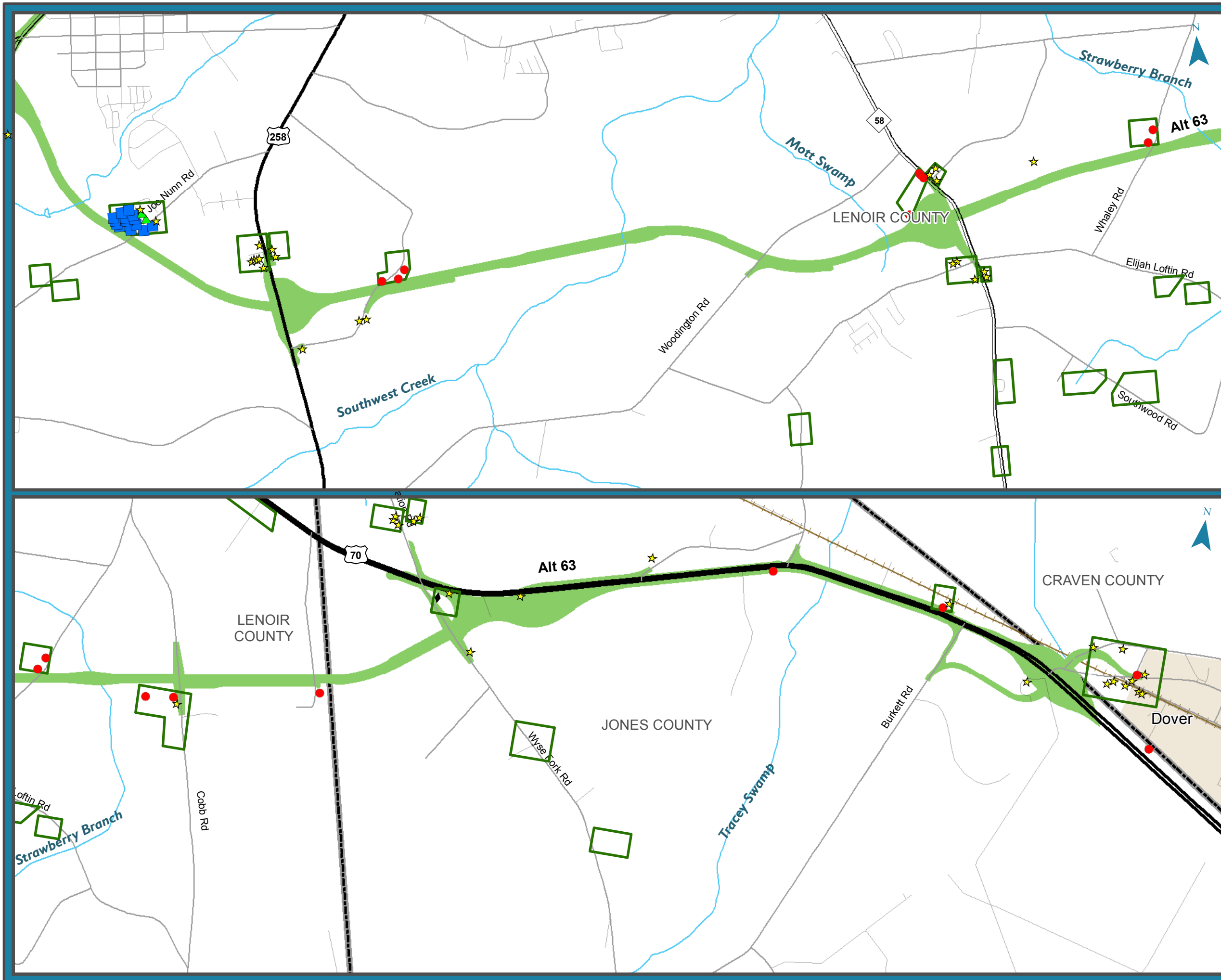


Figure 4-104:  
Noise receptors and  
noise study areas -  
Alternative 63 - B


**Legend**

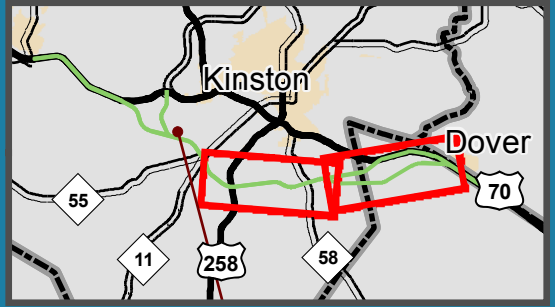
- Alt. 63 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

Noise Receptors

- Impacted, Not Benefited
- Impacted and Benefited
- Benefited, Not Impacted
- Not Impacted, Not Benefited
- Not Noise Sensitive
- Noise Study Area

0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





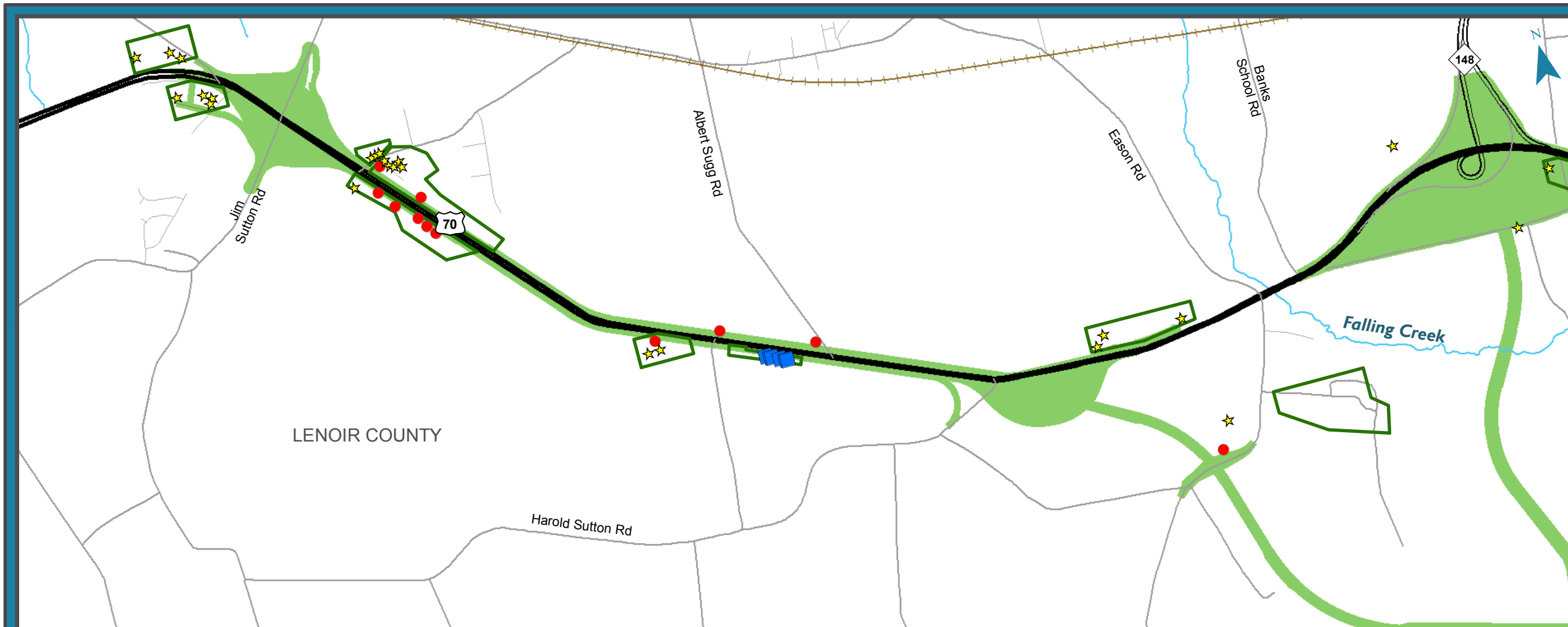


Figure 4-105:

Noise receptors and

noise study areas -

Alternative 65 - A

Legend

Alt. 65 ROW

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Noise Receptors

Impacted, Not Benefited

Impacted and Benefited

Benefited, Not Impacted

Not Impacted, Not Benefited

Not Noise Sensitive

Noise Study Area

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

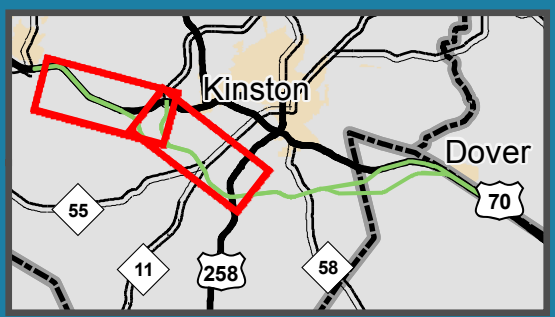
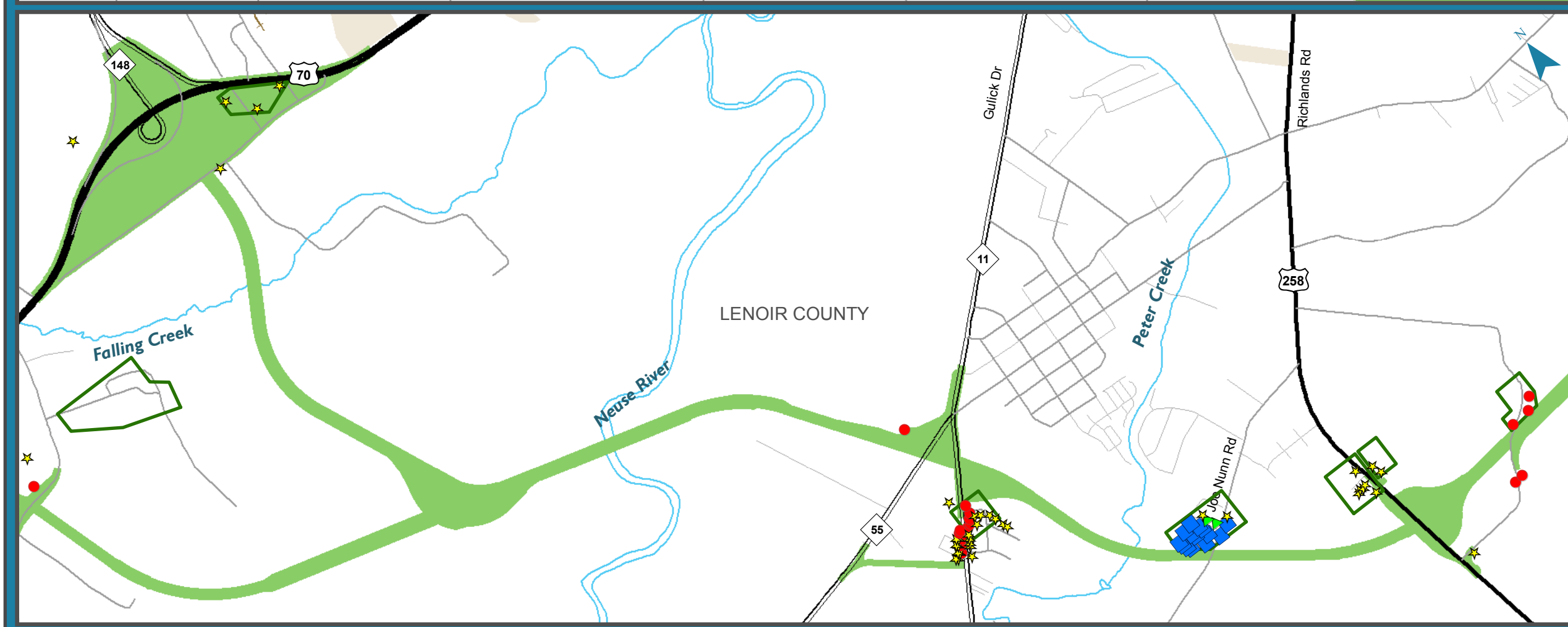
This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NConemap, NRCS, USFWS



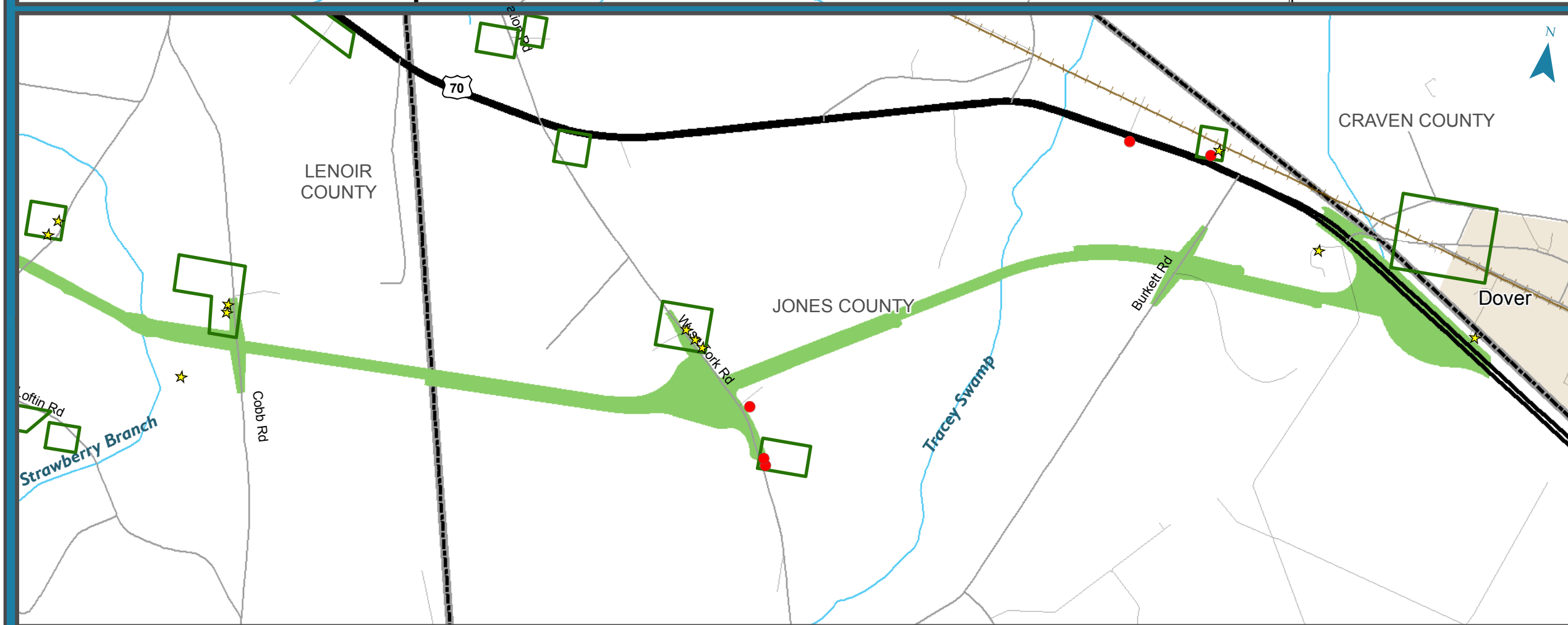
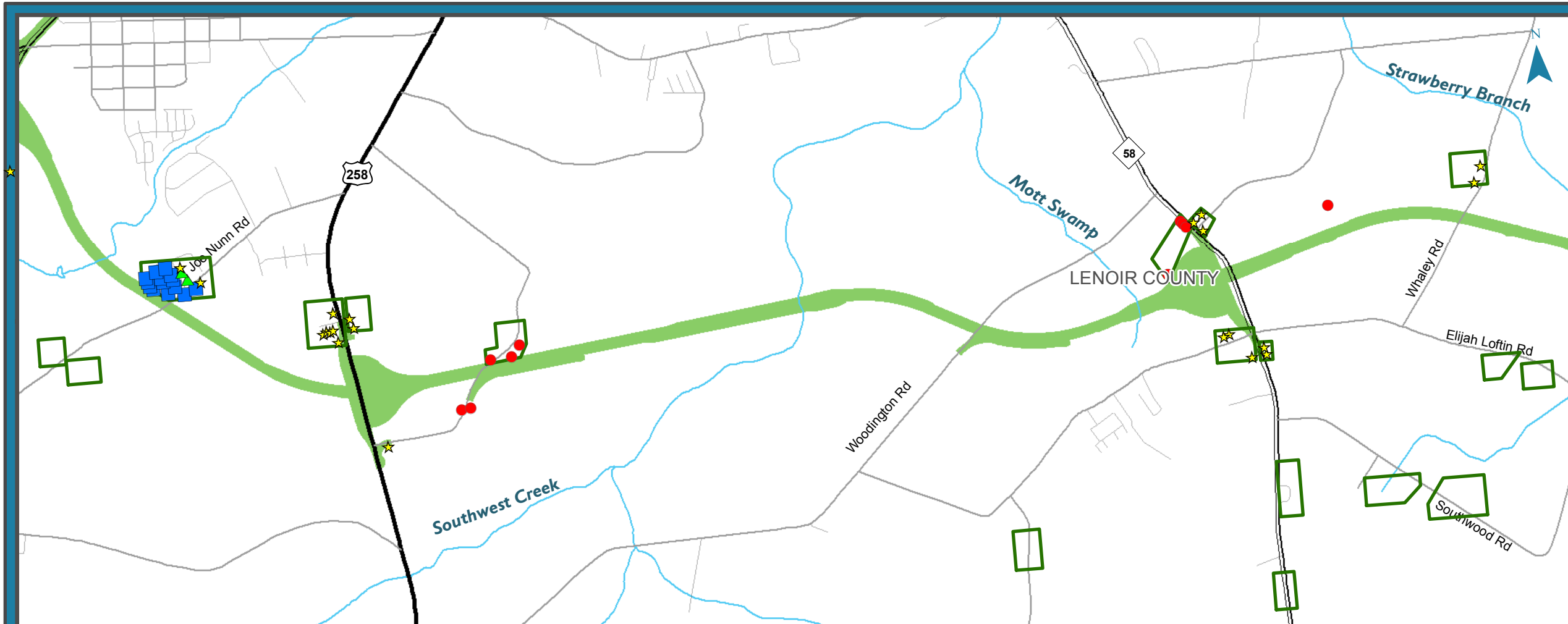


Figure 4-106:

Noise receptors and

noise study areas -

Alternative 65 - B

Legend

Alt. 65 ROW

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Noise Receptors

Impacted, Not Benefited

Impacted and Benefited

Benefited, Not Impacted

Not Impacted, Not Benefited

Not Noise Sensitive

Noise Study Area

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

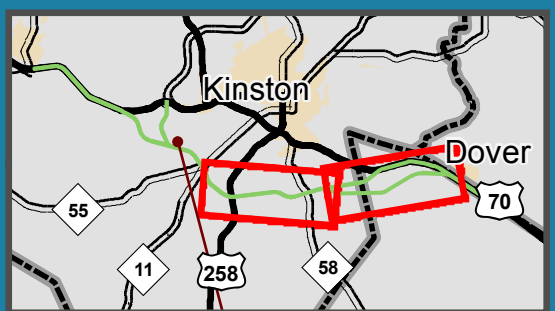
This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

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Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NConemap, NRCS, USFWS





## 4.11 UTILITIES

All the DSAs would impact both public and private utilities. Impacts would include the relocation, adjustment, or modification of gas, water, electric, sewer, telephone, and fiber optic cable lines. The relocation of power poles would also be required as a result of the proposed action. Any disruption to utility service during construction would be minimized by close coordination with utility providers and property owners in affected areas, as well as phased adjustments to utilities.

Recycling Site 5, located at 3185 Willie Measley Road in La Grange, would be directly impacted from the implementation of any DSA. The Sanderson Farm Wastewater Treatment Plant would be directly impacted by Alternatives 11, 12, 31, 32, 63, and 65. The spray fields associated with the New Water Treatment Plant would be impacted by Alternatives 35, 36, 51, and 52. Figure 4-107 through Figure 4-118 show the potential impacts to utilities.

Several solar power farms will be directly impacted by multiple DSAs. Innovative Solar 54 would be directly impacted by Alternatives 35 and 36. The Hood Farm would be directly impacted by Alternatives 12, 32, 35, 52, and 63. The Crockett Farm would be directly impacted by Alternative 1SB.

## 4.12 ENERGY

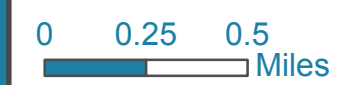
A substantial amount of energy would be required to construct any of the DSAs. However, the energy use would be temporary and should ultimately result in energy use reductions upon project completion, due to the potential for increased efficiency of the region's roadway system.

Construction of any of the DSAs would require routine maintenance that would result in energy use. Traffic delays accompanying maintenance activities may also result in temporary increases in energy use when compared to normal conditions in the area, as vehicles may be on the road for longer than they would have been otherwise. The No-Build Alternative would also require energy use for maintenance of existing infrastructure.

Figure 4-107:  
Utility impacts -  
Alternatives 1UE and 1SB - A

**Legend**

- Alts 1UE and 1SB ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant



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Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS

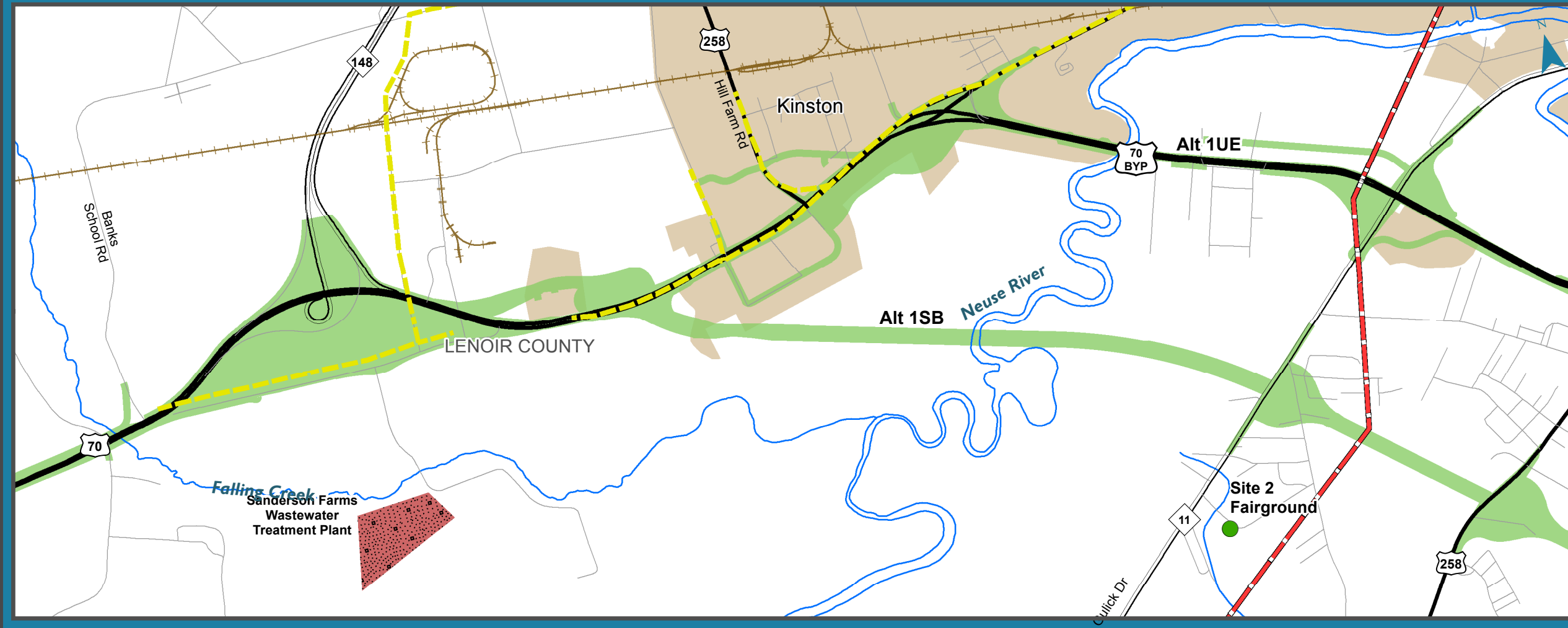
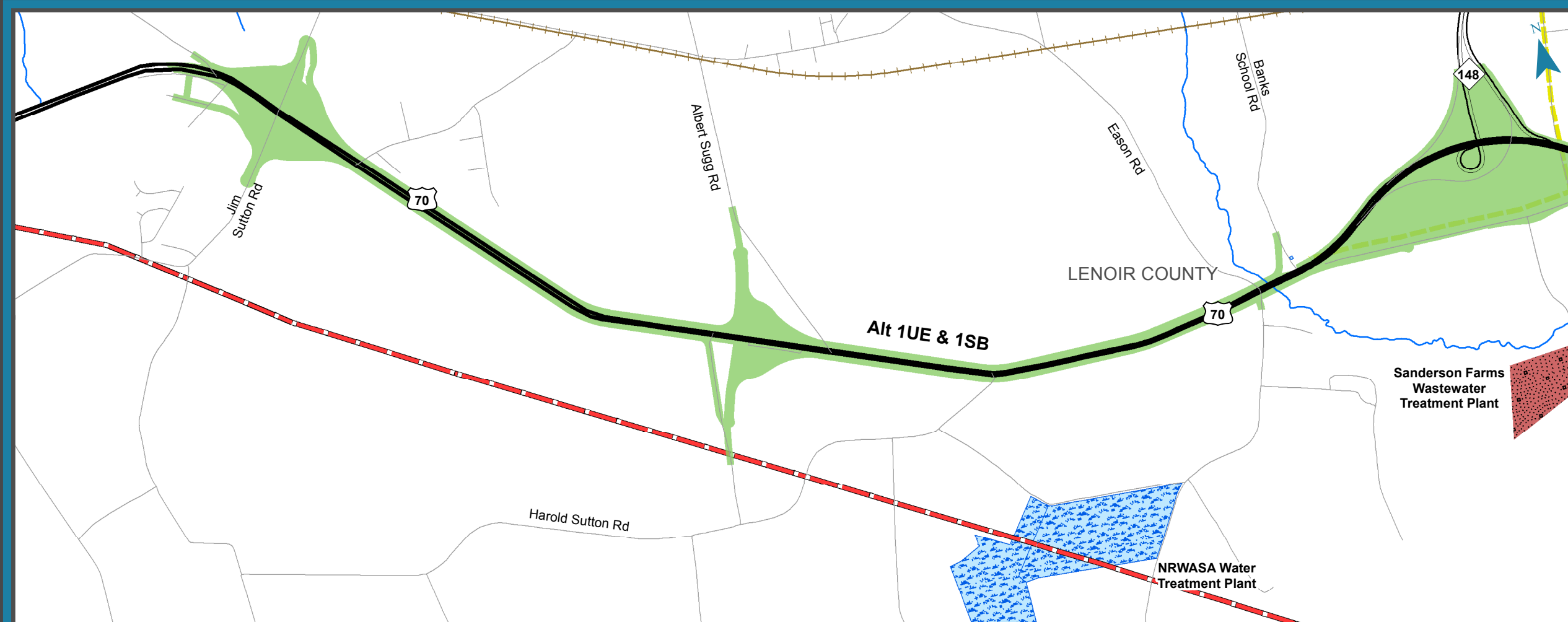
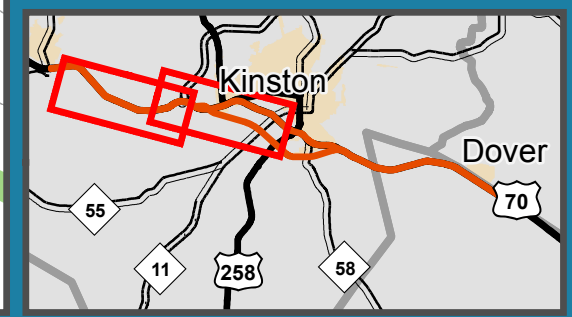




Figure 4-108:  
Utility impacts -  
Alternatives 1UE and 1SB - B

**Legend**

- Alts 1UE and 1SB ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant



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Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS

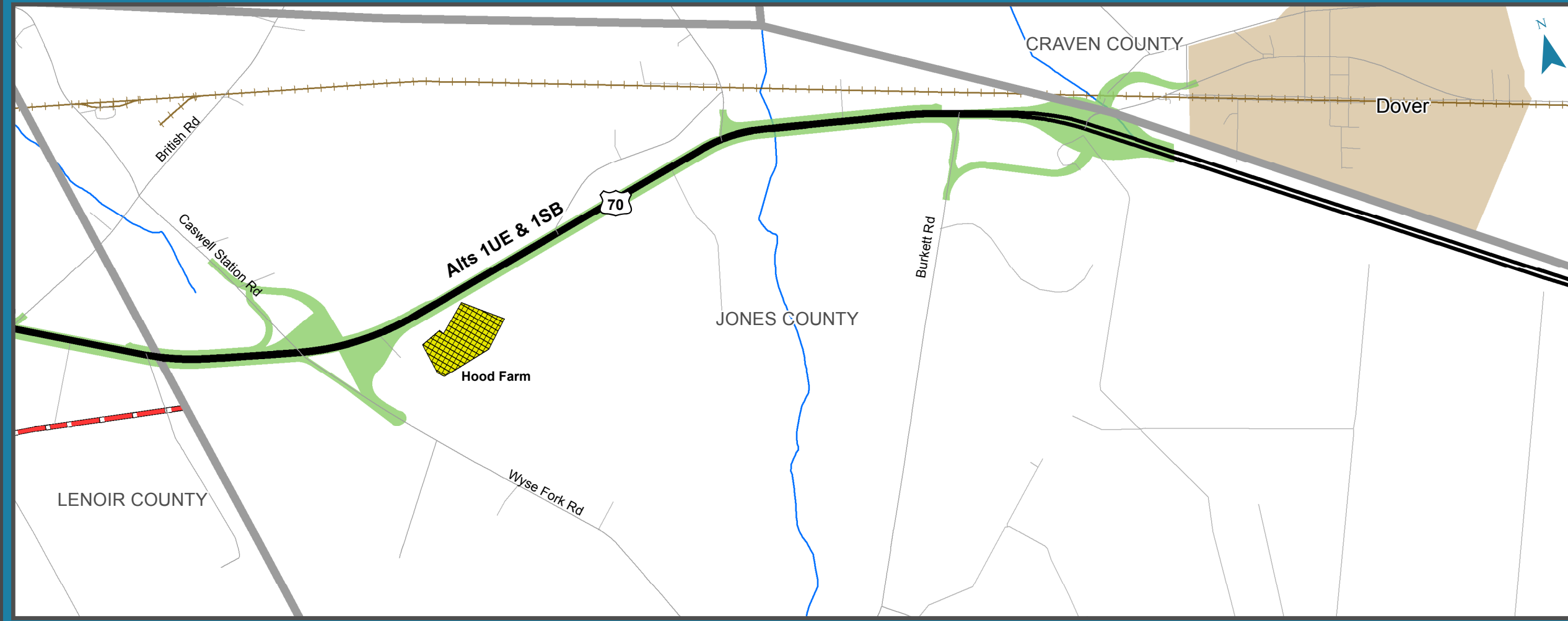
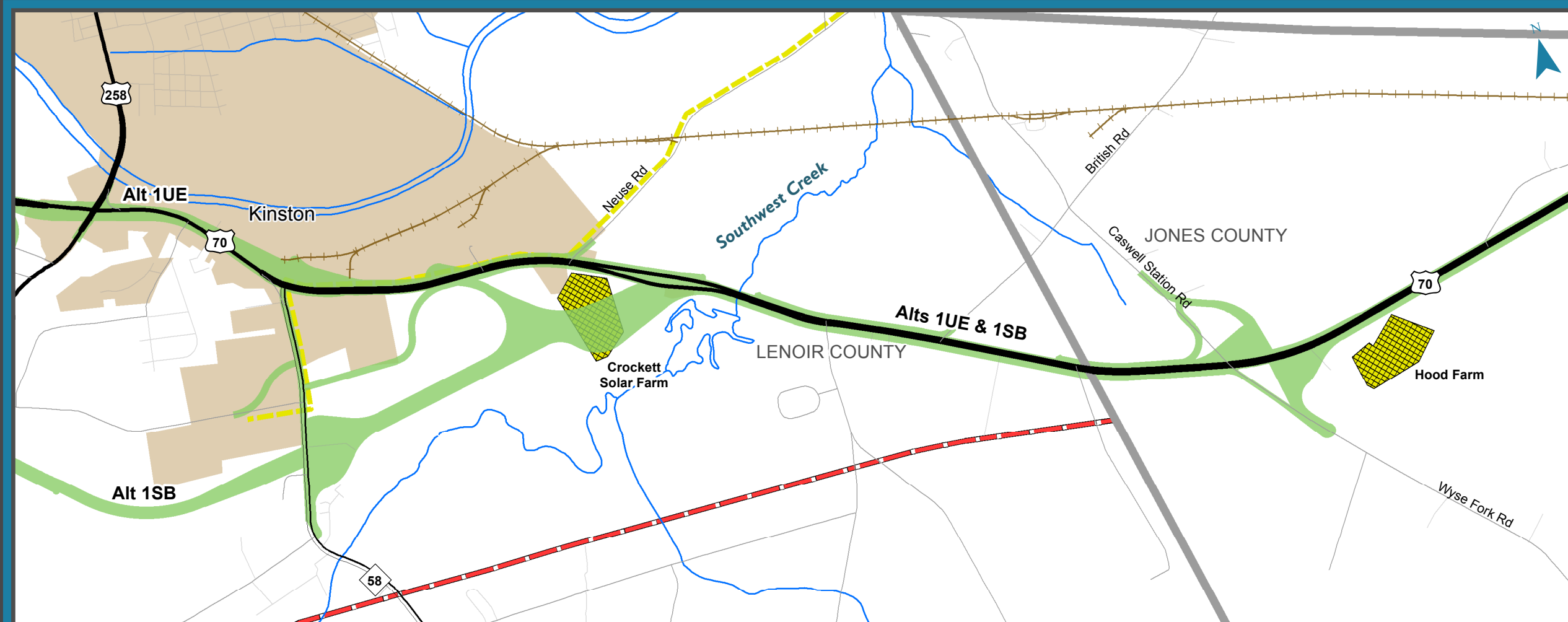
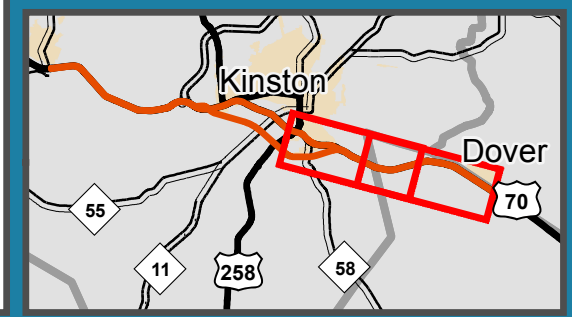
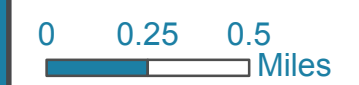


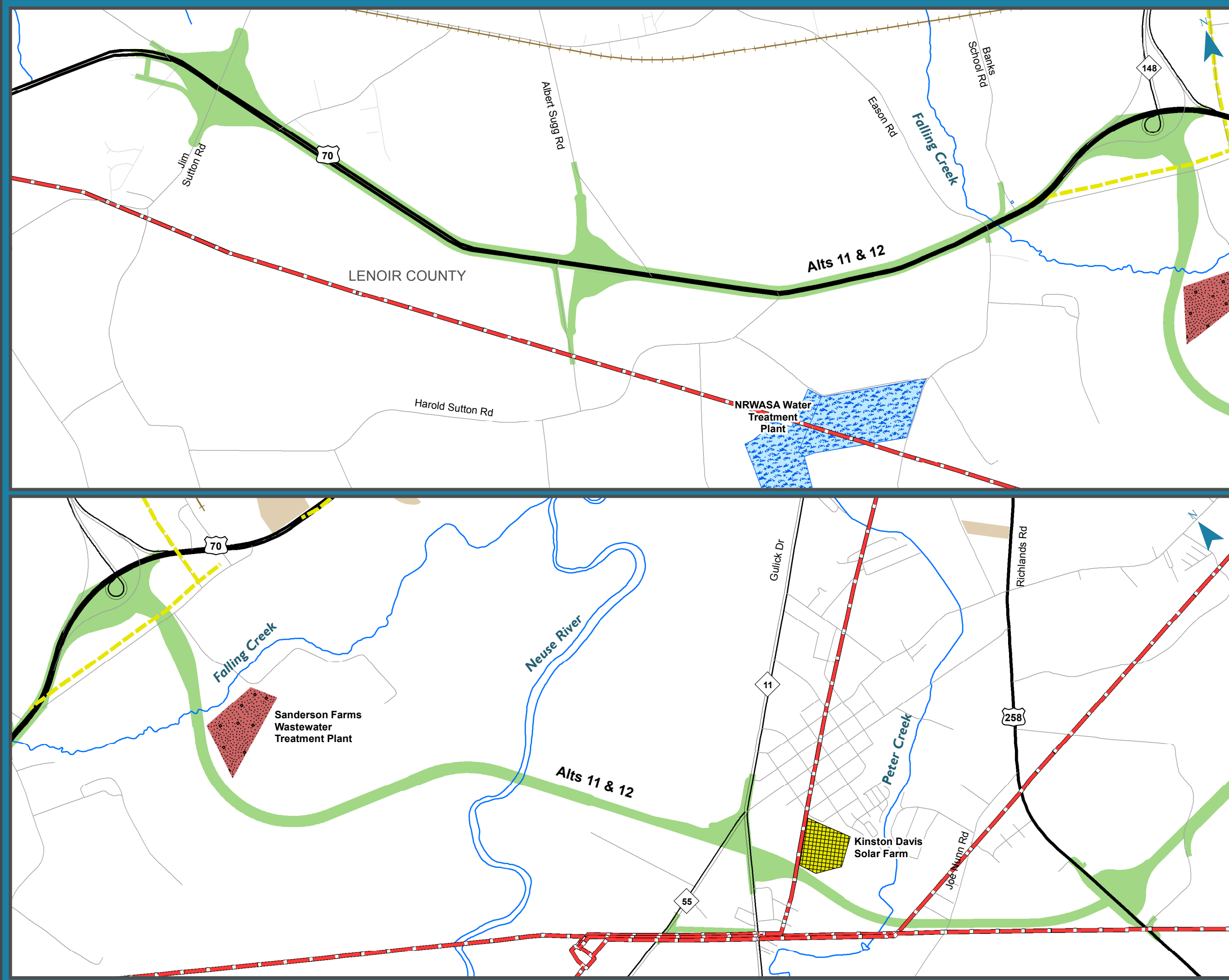
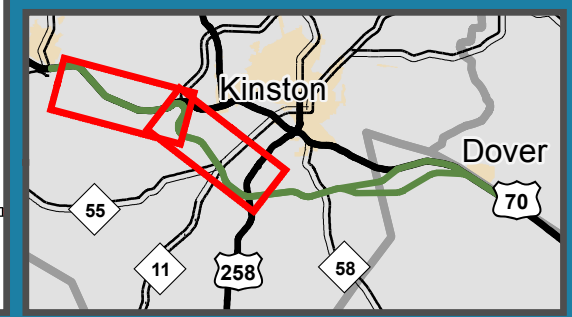
Figure 4-109:  
Utility impacts -  
Alternatives 11 and 12 - A

**Legend**

- Alts. 11 and 12 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant



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Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS





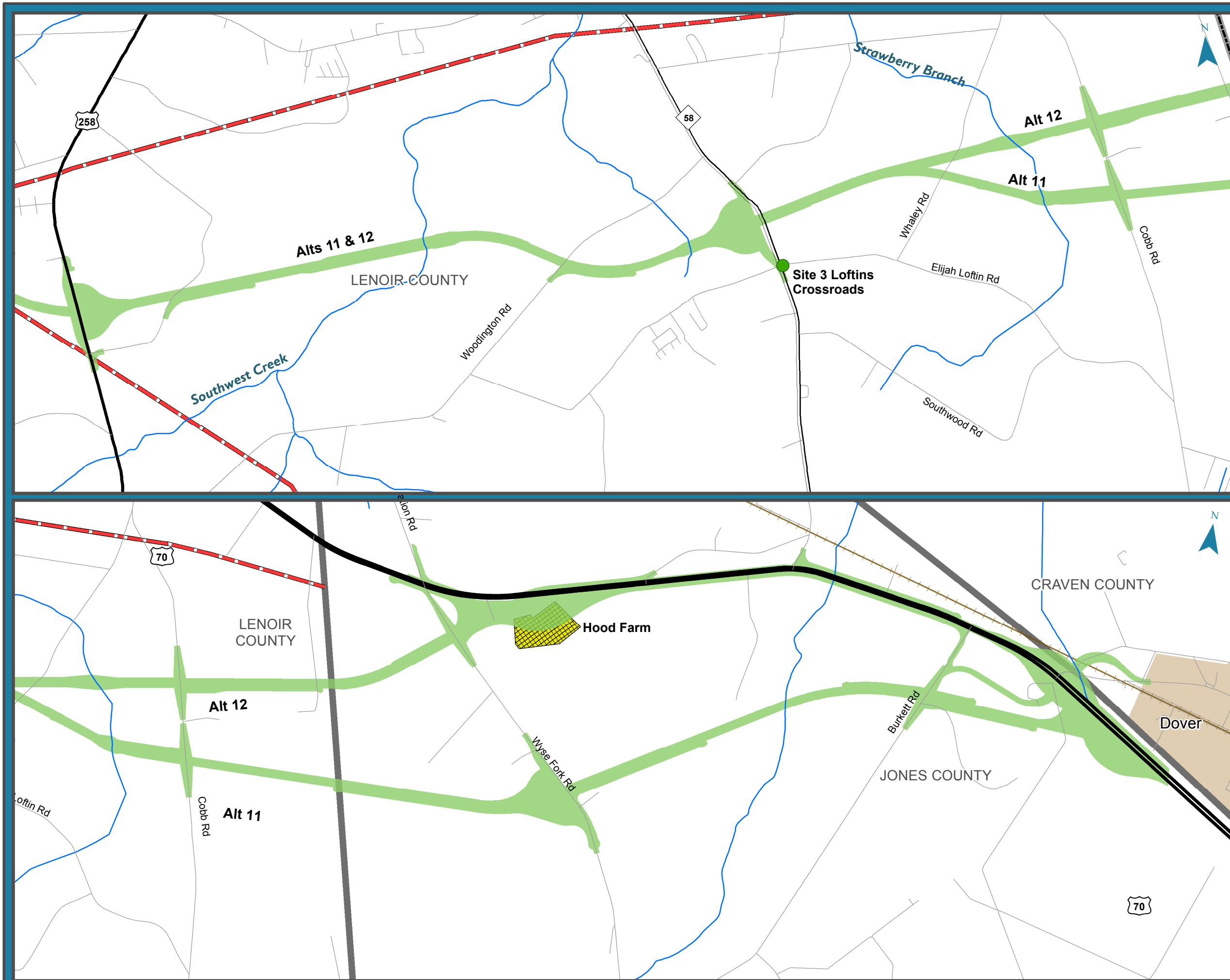


Figure 4-110:  
Utility impacts -  
Alternatives 11 and 12 - B

**Legend**

- Alts. 11 and 12 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant

0 0.25 0.5  
Miles



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Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS

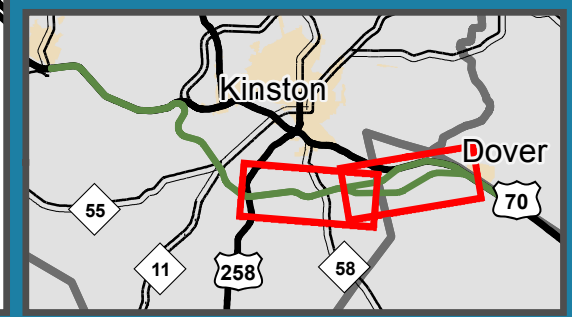


Figure 4-111:  
Utility impacts -  
Alternatives 31 and 32 - A

**Legend**

- Alt. 31 and 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS

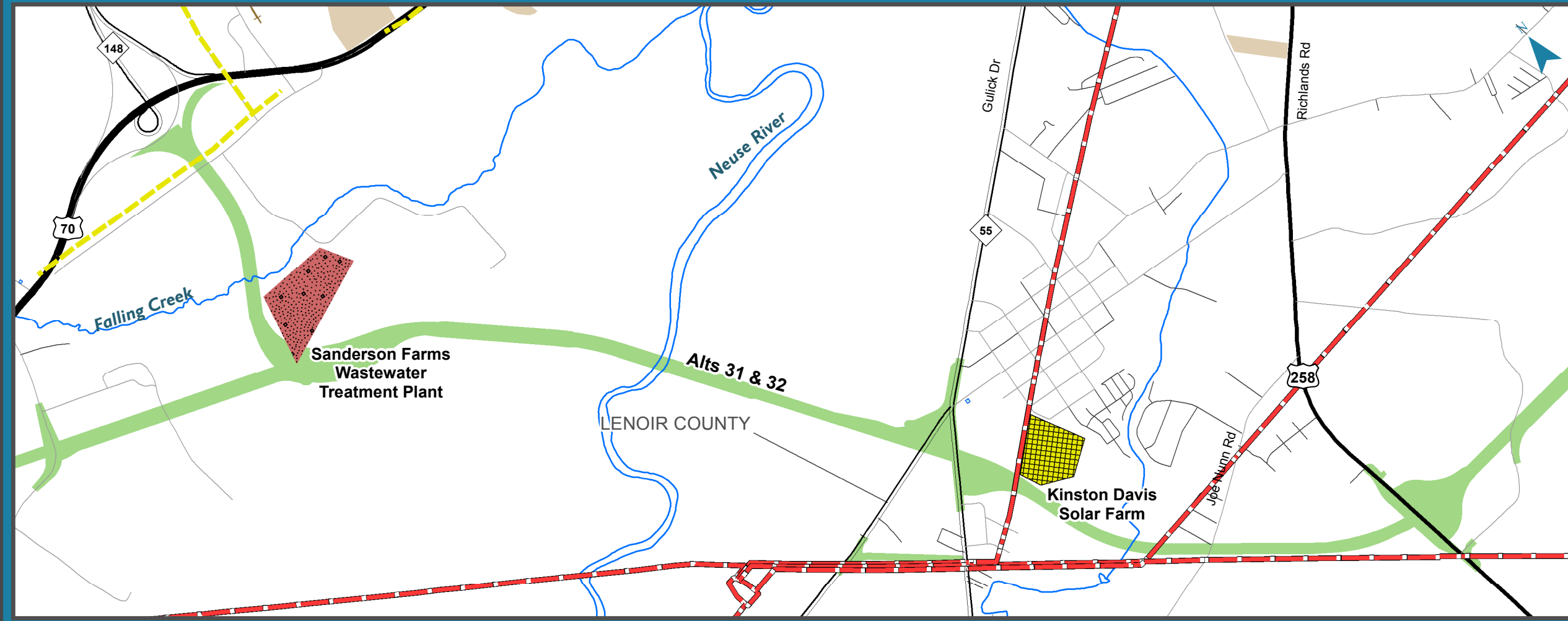
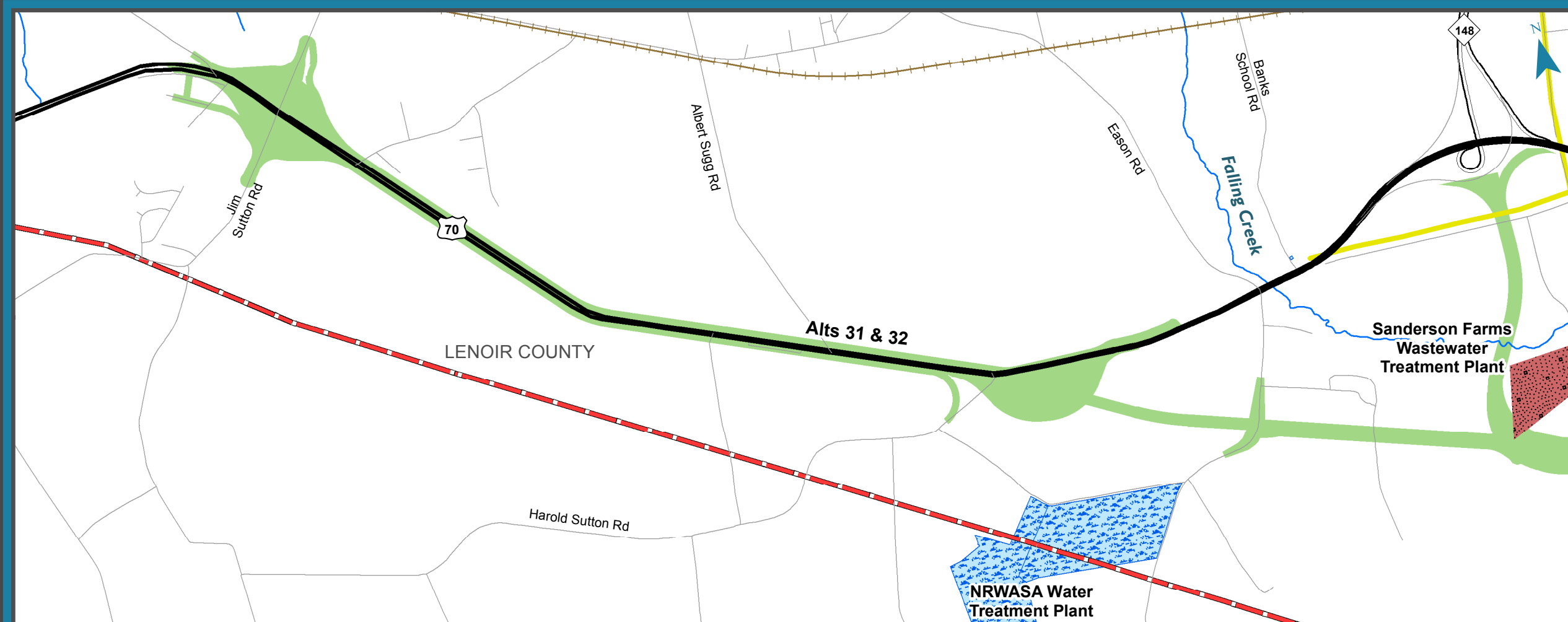
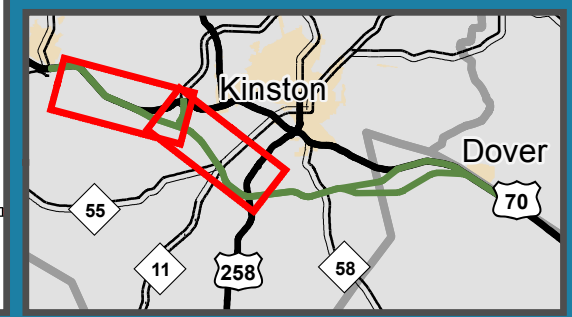




Figure 4-112:  
Utility impacts -  
Alternatives 31 and 32 - B

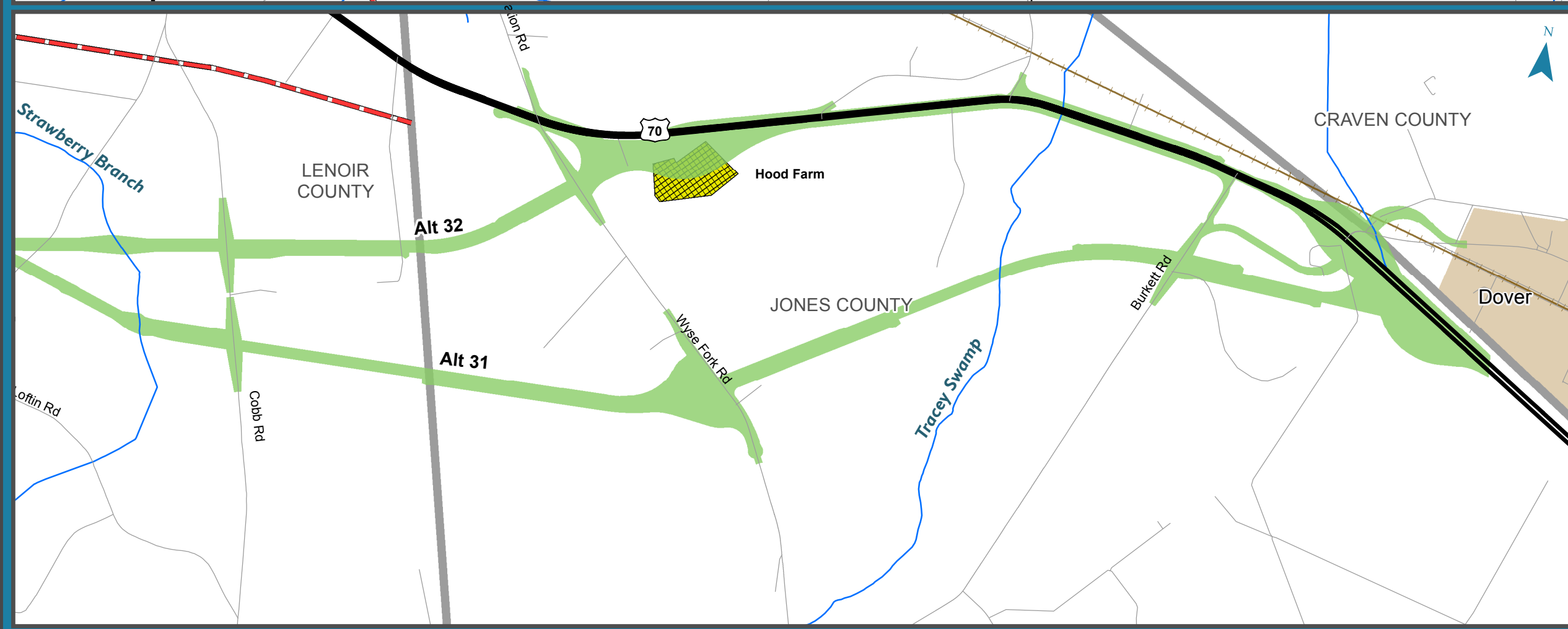
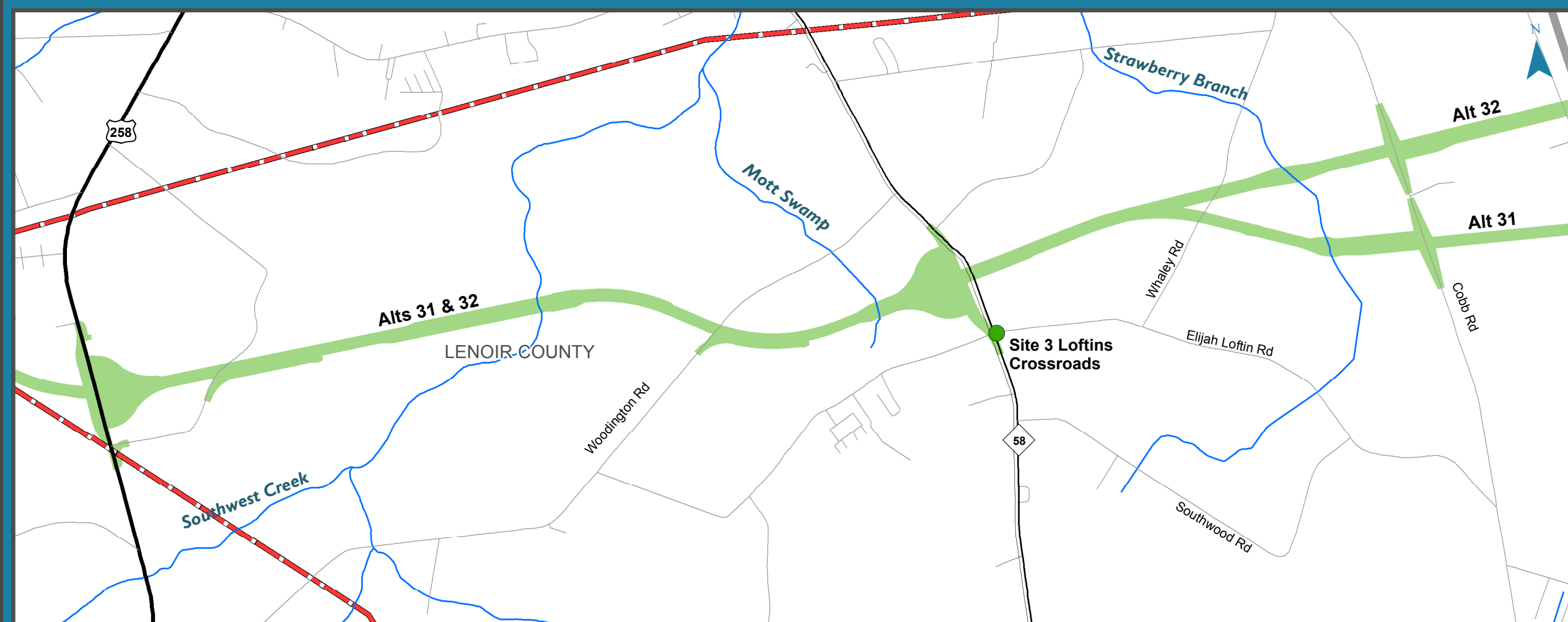
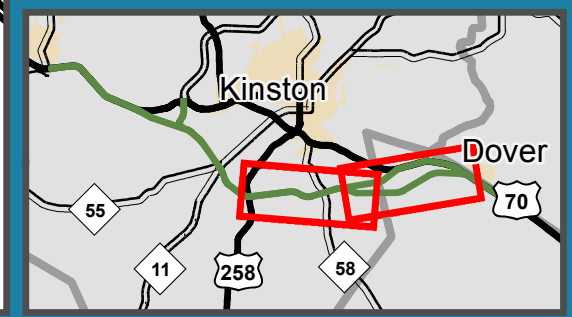
**Legend**

- Alts. 31 and 32 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant

0 0.25 0.5  
Miles



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Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDOT, NCDEQ, NCEM,  
NCONemap, NRCS, USFWS



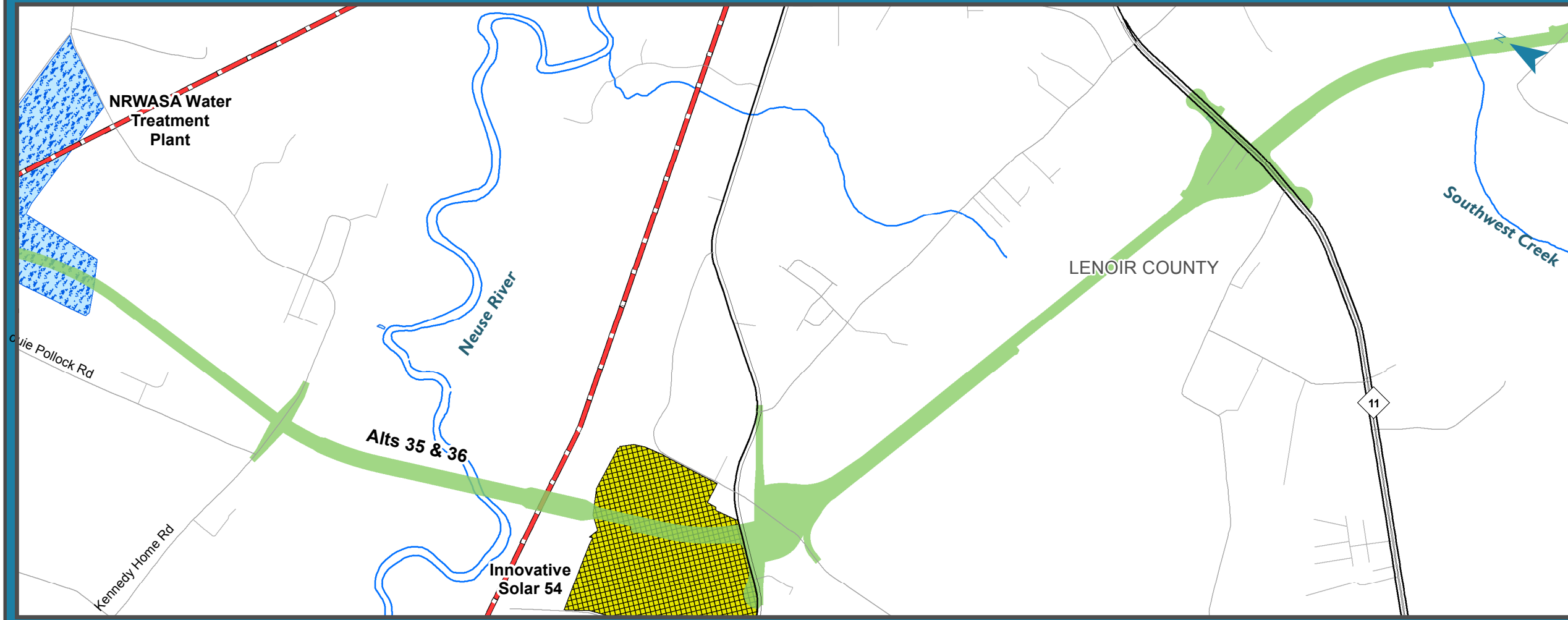
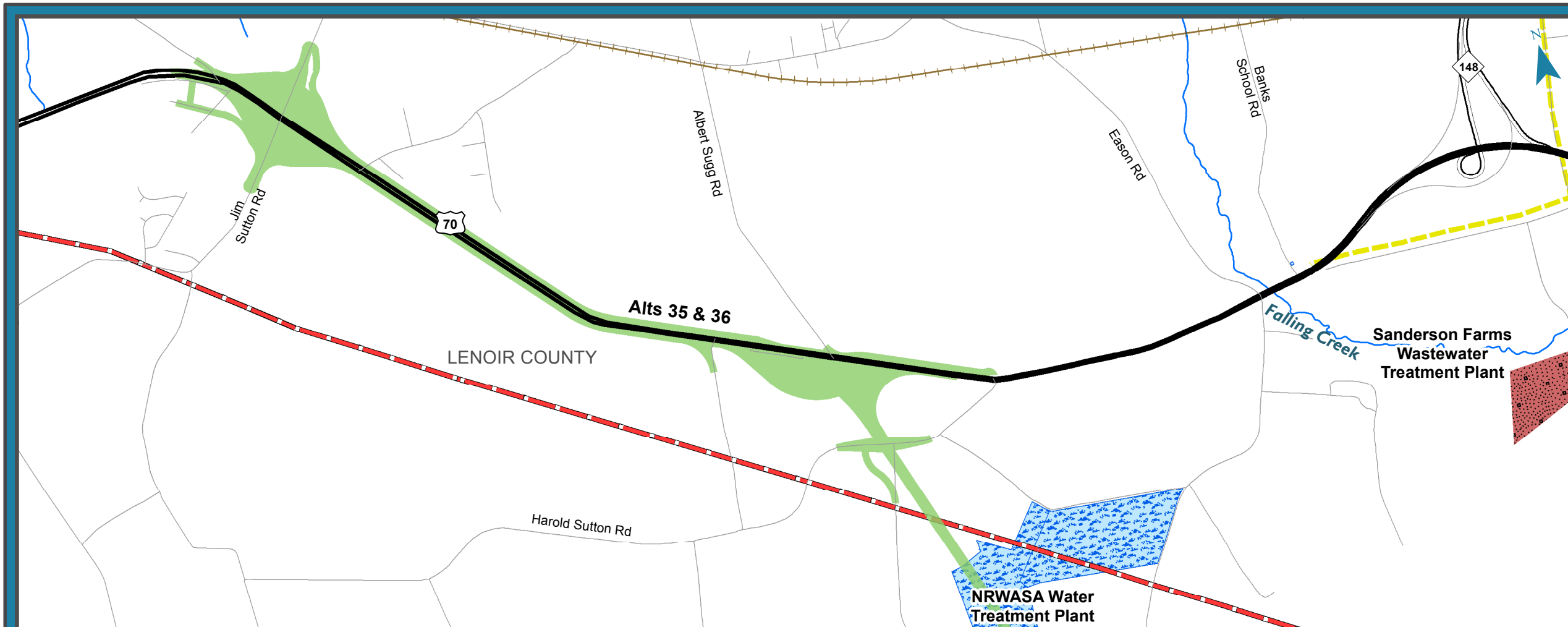



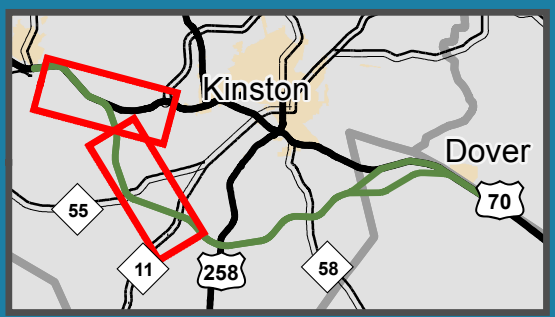
Figure 4-113:  
Utility iimpacts -  
Alternatives 35 and 36 - A

**Legend**

- Alts. 35 and 36 ROW
- Railroad
- US Highway
- NC Highway
- State Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant

0 0.25 0.5  
Miles

  
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Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS





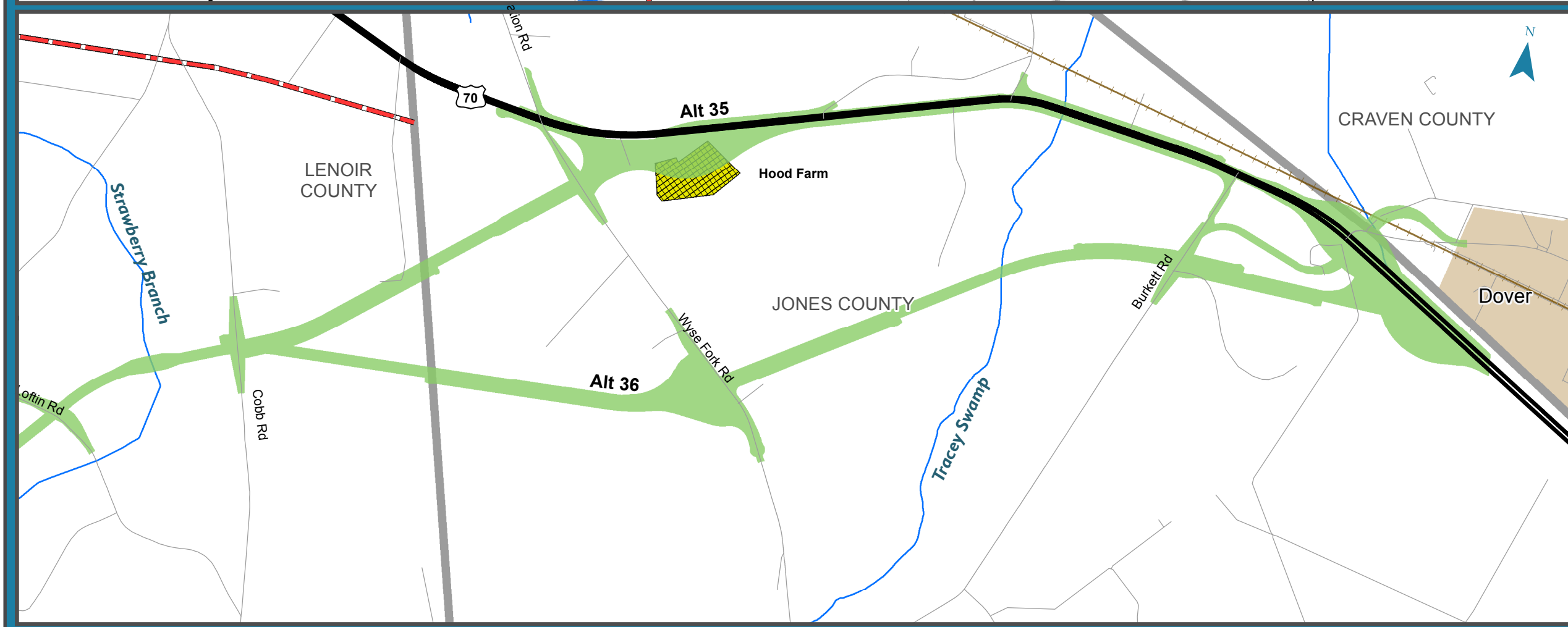
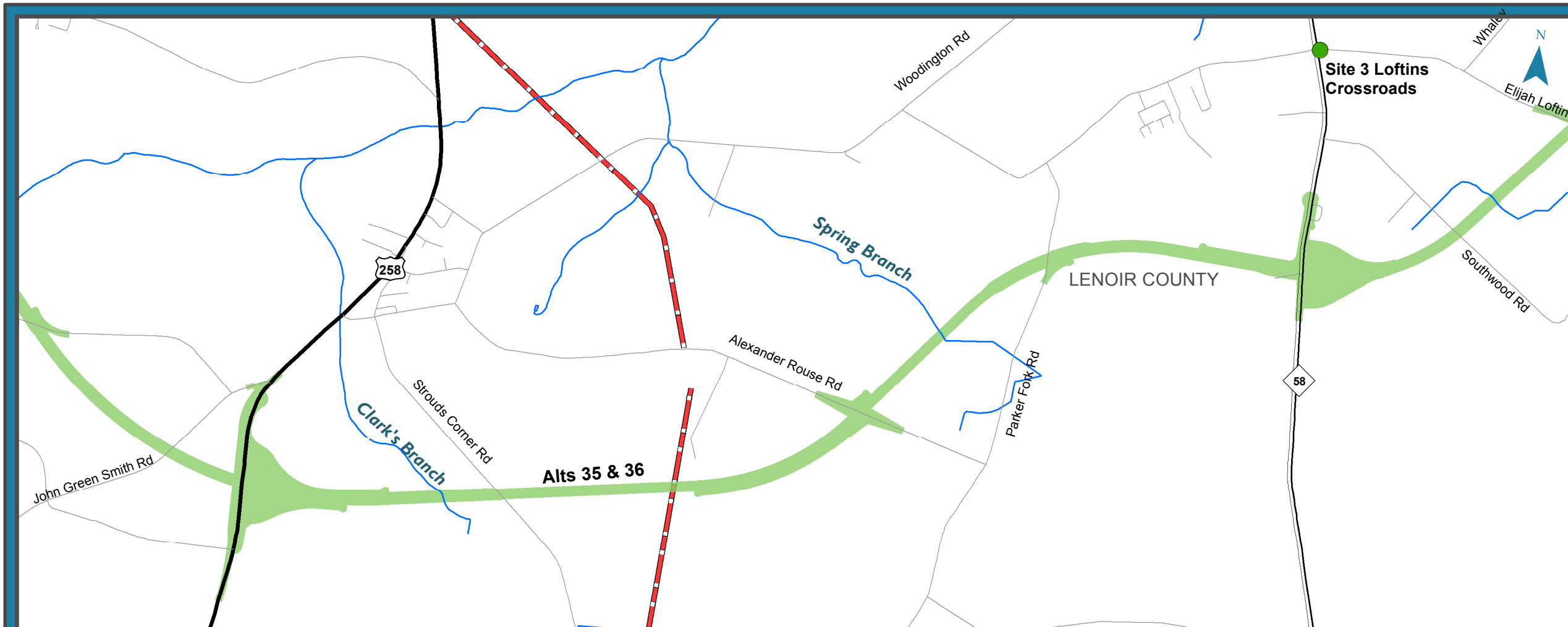



Figure 4-114:  
Utility impacts -  
Alternatives 35 and 36 - B

**Legend**

- Alts. 35 and 36 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant

0 0.25 0.5 Miles

  
This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

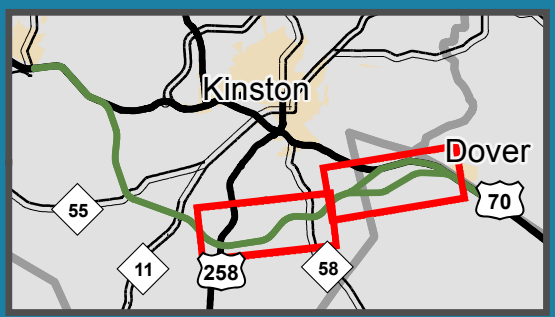


Figure 4-115:  
Utility impacts -  
Alternatives 51 and 52 - A

**Legend**

- Alts. 51 and 52 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant



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Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NConemap, NRCS, USFWS

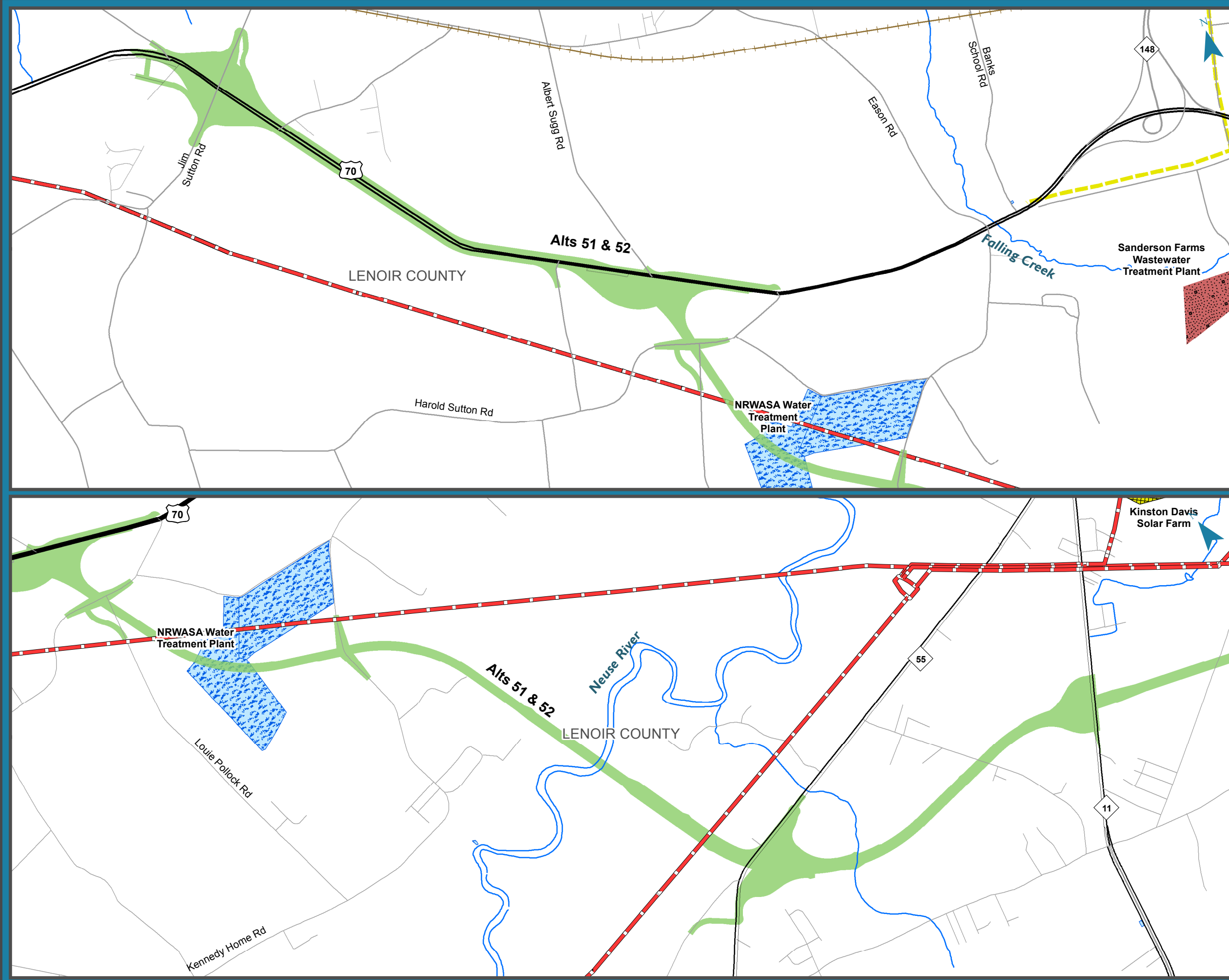
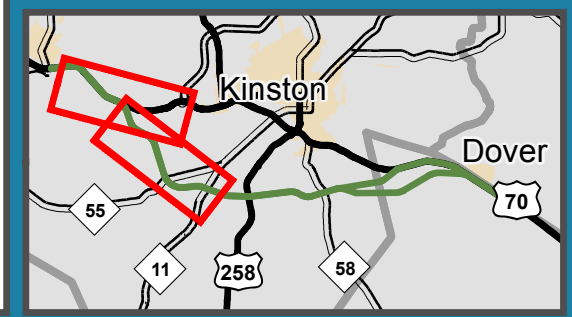




Figure 4-116:

Utility impacts -

Alternatives 51 and 52 - B

Legend

- Alts. 51 and 52 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant



This map is for reference only.

Sources: AECOM, CGIA, City of Kinston, Craven County, ESRI, HPO, Jones County Lenoir County, NCDOT, NCDEQ, NCEM, NCONemap, NRCS, USFWS

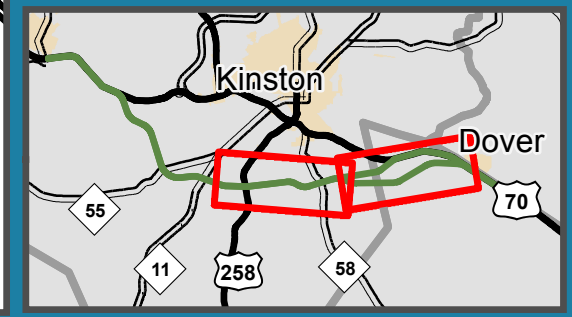
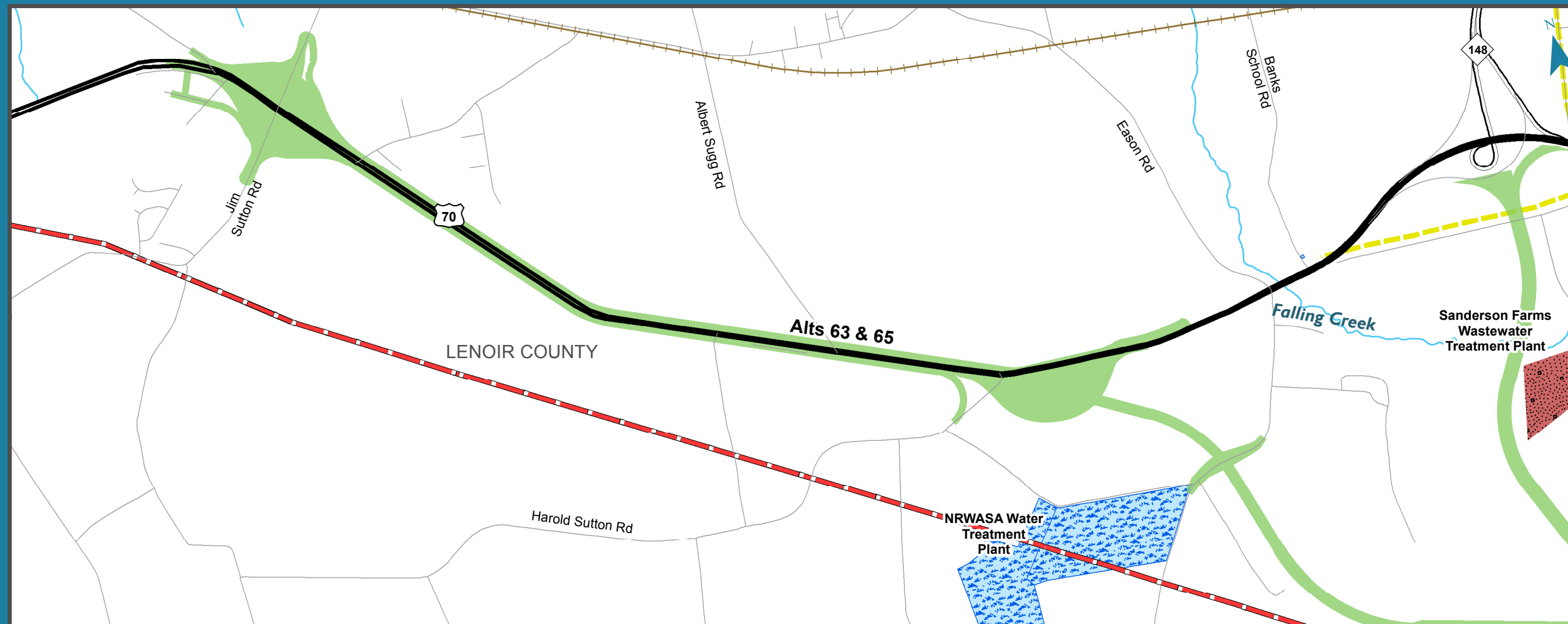


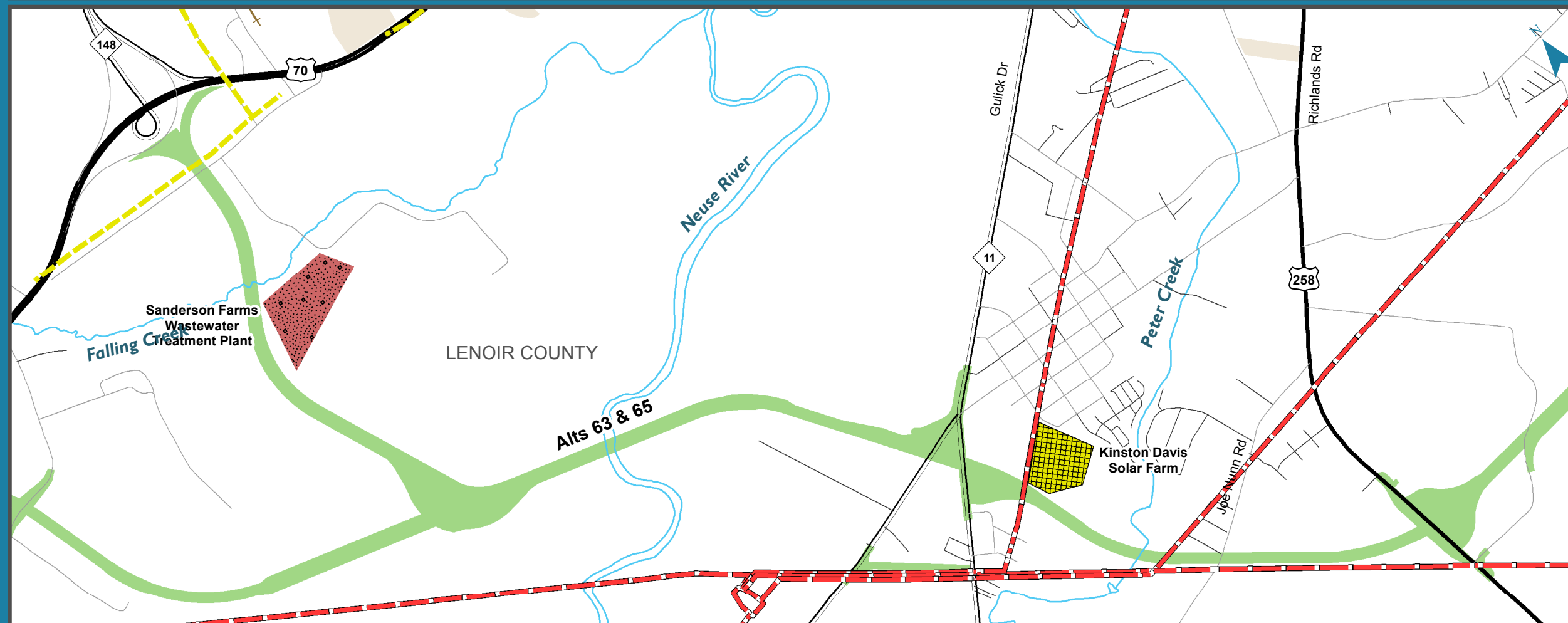
Figure 4-117:  
Utility impacts -  
Alternatives 63 and 65 - A



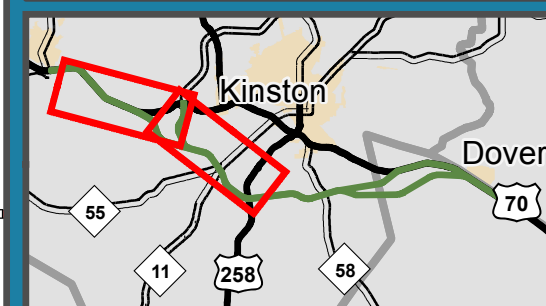
**Legend**

- Alts. 63 and 65 ROW
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary
- Recycling Site
- Power Transmission Lines
- Natural Gas Lines
- Landfill
- Solar Farm
- Wastewater Treatment Plant
- Water Treatment Plant

0 0.25 0.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS





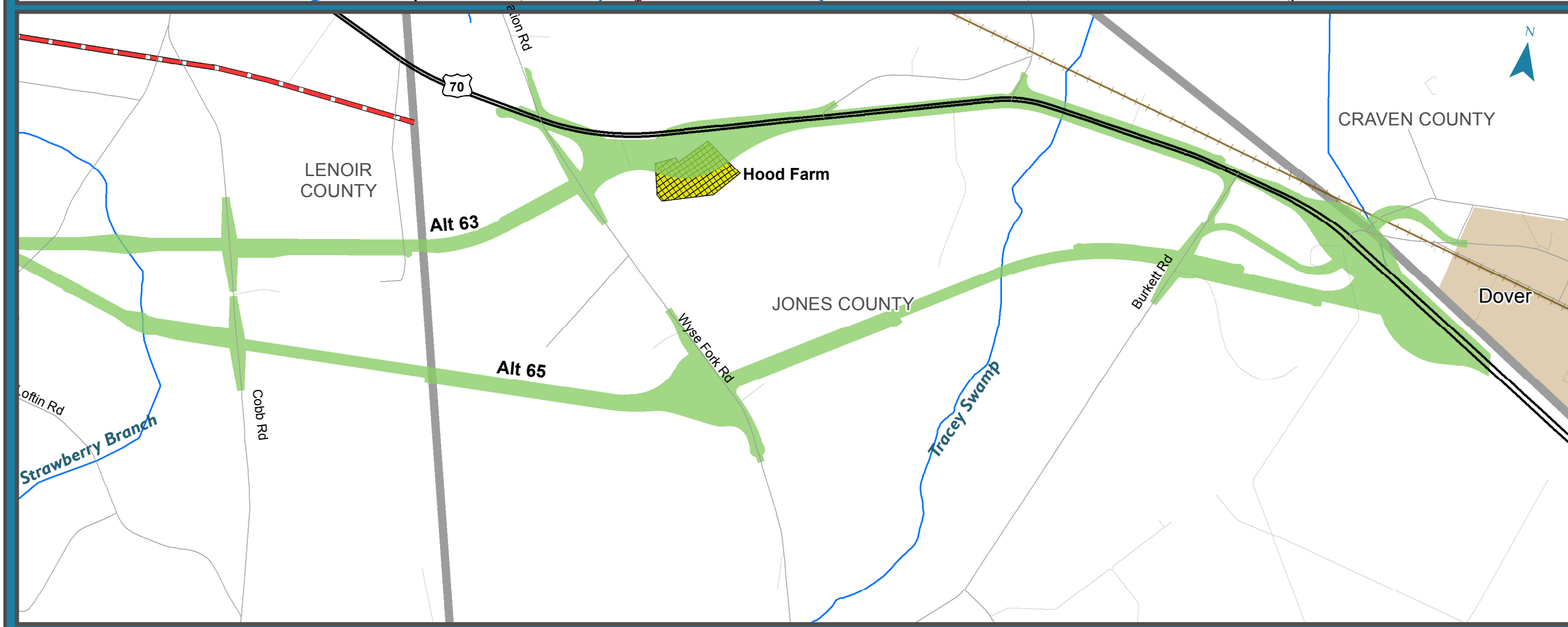


Figure 4-118:

Utility impacts -

Alternatives 63 and 65 - B

Legend

Alts. 63 and 65 ROW

Railroad

US Highway

NC Highway

Secondary Road

Municipal Boundary

County Boundary

Recycling Site

Power Transmission Lines

Natural Gas Lines

Landfill

Solar Farm

Wastewater Treatment Plant

Water Treatment Plant

0

0.25

0.5

Miles

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

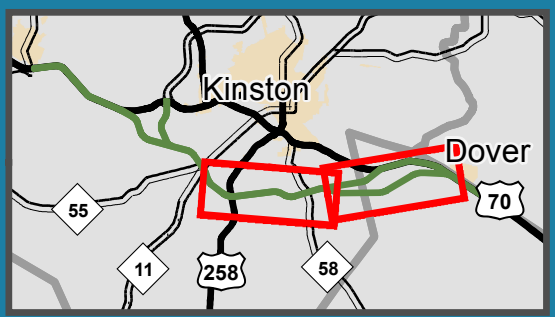
This map is for reference only.

Sources: AECOM, CGIA, City of Kinston,

Craven County, ESRI, HPO, Jones County

Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,

NCONemap, NRCS, USFWS



### 4.13 HAZARDOUS MATERIAL SITES

The Preliminary GeoEnvironmental Alternatives Analysis identified 42 potentially hazardous sites within 500 feet of the project corridor (Box 2013). The report describes these sites as typical of those “found along preexisting roadways and characteristically present a low to moderate risk of additional expense” to a given project.

Twenty-one hazardous sites are located within the right-of-way of the DSAs. Table 4-20 summarizes the hazardous sites located within each DSA right-of-way. Additional testing will be completed after the applicant’s preferred alternative is selected, and a work plan will be developed based on the final design to address any contaminated material that may be encountered during construction.

**Table 4-20: Hazardous materials sites**

Site Number	Type	Location	Property Name	DSA	Anticipated Impacts	Anticipated Risk
3	UST	7851 Highway 70 West	Hasty Mart 31	All alternatives	Low	Low
4	Auto Salvage	7514 Highway 70 West	Vacant site with billboard	All alternatives	Low	Low
5	Auto Salvage	7135 Highway 70 West	Foss Enterprises Inc.	All alternatives	Low	Low
7	UST	6844 Highway 70 West	Singleton’s Grocery	All alternatives	Low	Low
8	UST	Highway 70 West	Farm Stand	1UE, 1SB, 11, 12, 31, 32, 63, 65	Low	Low
9	UST	6130 Highway 70 West	Mallard Food Shop No. 19	1UE, 1SB, 11, 12	Low	Low
10	UST	5744 Highway 70 West	Falling Creek Service Center	1UE, 1SB, 11, 12	Low	Low
12	UST	Vernon Avenue	Coca Cola Warehouse	1UE	Low	Low
13	UST	4050 West Vernon Avenue	Kinston Suzuki	1UE	Low	Low





Site Number	Type	Location	Property Name	DSA	Anticipated Impacts	Anticipated Risk
14	UST	3800 West Vernon Avenue	66 Mini-Mart/ Speedway 8229	1UE	Low	Low
16	UST	3601 West Vernon Avenue	C-Mart 9 Pure	1UE	Low	Low
17	UST	2697 Highway 258 North	Carolina Ice Company	1UE	Low	Low
18	Auto Salvage	Highway 70	Auto Salvage	1UE	Low	Low
20	UST	1100 West New Bern Road	Stroud's Exxon	1UE	Low	Low
22	UST	1020 East New Bern Road	Circle B 9	1UE	Low	Low
23	UST	1005 South New Bern Road	Kinston Quick Stop/ Scotchman #78	1UE	Low	Low
32	UST	700 East New Bern Road	The Pantry #3076	1UE	Low	Low
37	Auto Salvage	5763 Highway 70 East	Auto Salvage	12, 32, 35, 52, 63	Low	Low
38	UST	136 Dover Road	Auto Service Center	All alternatives	Low	Low
39	UST	2777 Highway 55 West	Lighthouse Food Mart #110	11, 12, 31, 32, 63, 65	Low	Low
42	UST	1559 Highway 11/55	Vacant lot	1SB	Low	Low



#### **4.14 MINERAL RESOURCES**

The Davis Pit and Clay Pit would not be impacted by any of the DSAs. Construction of the project may temporarily increase the demand for locally crushed stone and sand. However, such an increase in demand would not adversely impact natural resources.

#### **4.15 ALTERNATIVE COMPARISON MATRIX**

Estimated environmental impacts associated with the DSAs are provided in Table 4-21. Natural resource impact calculations for the DSAs and corresponding service roads were calculated using the construction slope stake limits plus a 40-foot buffer of the functional designs. All other impact calculations were calculated using the alternative right-of-way limits.



Table 4-21: DSA comparison matrix

	Alternative 1UE	Alternative 1SB	Alternative 11	Alternative 12	Alternative 31	Alternative 32	Alternative 35	Alternative 36	Alternative 51	Alternative 52	Alternative 63	Alternative 65
<b>General</b>												
Length (miles)	24.5	24.5	26.5	26.7	25.3	25.5	28.6	28.3	25.9	26.1	25.6	25.4
Intelligent transportation system cost (\$)	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000	\$450,000
Utility cost (\$)	\$12,830,000	\$10,800,000	\$9,130,000	\$9,430,000	\$7,840,000	\$8,080,000	\$8,620,000	\$7,980,000	\$7,930,000	\$9,880,000	\$7,880,000	\$7,630,000
Right-of-way cost (\$)	\$183,070,000	\$123,710,000	\$78,330,000	\$85,050,000	\$63,340,000	\$66,990,000	\$65,490,000	\$64,200,000	\$54,560,000	\$57,380,000	\$64,010,000	\$61,180,000
Construction cost (\$)	\$245,900,000	\$292,800,000	\$284,100,000	\$299,000,000	\$284,200,000	\$288,900,000	\$290,400,000	\$297,800,000	\$296,200,000	\$275,800,000	\$355,900,000	\$358,900,000
Mitigation cost (\$)	\$12,940,000	\$12,250,000	\$12,130,000	\$13,390,000	\$12,290,000	\$13,550,000	\$13,940,000	\$12,810,000	\$11,720,000	\$12,980,000	\$13,440,000	\$12,180,000
Total cost (\$)	\$455,190,000	\$440,010,000	\$384,140,000	\$407,320,000	\$368,120,000	\$377,970,000	\$378,900,000	\$383,240,000	\$370,860,000	\$356,490,000	\$441,680,000	\$440,340,000
<b>Socioeconomic Resources</b>												
Residential (#)	125	162	95	101	76	92	130	113	97	113	98	80
Business (#)	137	67	35	40	30	37	32	27	26	32	36	30
Non-Profit (#)	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total (#)</b>	<b>262</b>	<b>229</b>	<b>130</b>	<b>141</b>	<b>106</b>	<b>129</b>	<b>162</b>	<b>140</b>	<b>123</b>	<b>145</b>	<b>134</b>	<b>110</b>
Communities (#)	3	3	2	3	3	3	5	5	3	3	3	3
Environmental Justice residential areas (#)	4	6	2	3	2	3	5	4	4	5	4	3
Minority block groups (#)	2	0	0	0	0	0	0	0	0	0	0	0
Low Income block groups (#)	6	3	3	3	3	3	3	3	3	3	3	3
Schools (#)	1	1	0	0	0	0	0	0	0	0	0	0
Hospitals (#)	0	0	0	0	0	0	0	0	0	0	0	0
Churches (#)	9	6	1	1	1	1	1	1	0	0	1	1
Fire departments (#)	1	1	1	2	1	2	1	0	1	2	2	1
Emergency Medical Services stations (#)	0	0	0	0	0	0	0	0	0	0	0	0
Airports (#)	0	0	0	0	0	0	0	0	0	0	0	0
Parks and recreational areas (#)	1	0	0	0	0	0	0	0	0	0	0	0
Cemeteries (#)	2	1	1	0	1	0	2	2	1	0	0	1
VADs (#)	0	0	0	0	0	0	1	1	0	0	0	0
VADs (ac)	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6	0.0	0.0	0.0	0.0
NCNHP managed areas (ac)	6.0	2.3	0.0	0.0	6.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0
Prime farmland (ac)	282.2	302.3	392.5	422.4	404.3	434.0	432.4	415.2	410.3	440.1	420.5	390.6
Farmland of statewide importance (ac)	172.2	222.5	236.8	210.2	263.7	236.6	203.4	225.6	224.4	198.3	218.2	243.7
Farmland of unique importance (ac)	53.3	53.3	56.8	56.8	51.7	51.7	47.3	47.3	48.8	48.8	51.7	51.7
<b>Economic Resources</b>												
Annual total net benefits (quantified 2040)	\$22.5 million	\$23.4 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million	\$4.9 million
<b>Physical Resources</b>												
Noise receptors impacted	38	56	34	37	41	44	23	21	24	27	41	38
Hazardous materials sites (#)	18	9	9	10	7	8	6	5	5	6	8	7
<b>Cultural Resources</b>												
Section 106 adverse effects	2	2	3	4	6	7	2	1	1	2	6	5
Archaeological sites - high probability (ac)	649.8	829.3	628.9	753.6	590.3	714.3	626.1	526.3	516.8	641.8	668.4	542.8
Archaeological sites - low probability (ac)	570.6	480.1	684.4	583.9	688.0	588.4	816.9	883.1	756.4	657.2	664.7	763.9
<b>Natural Resources</b>												

	Alternative 1UE	Alternative 1SB	Alternative 11	Alternative 12	Alternative 31	Alternative 32	Alternative 35	Alternative 36	Alternative 51	Alternative 52	Alternative 63	Alternative 65
Maintained/Disturbed (ac)	706.2	516.6	264.2	346.3	242.3	324.3	312.7	230.1	214.9	297.6	315.5	232.8
Agriculture (ac)	317.9	507.9	672.2	689.6	664.6	682.3	714.1	699.9	637.3	655.6	667.8	648.9
Pine Plantation (ac)	73	148.5	246.7	193	242.6	188.7	265.3	305.1	266.1	212.4	211.3	265.1
Forested Upland (ac)	21.5	25.3	28	19.9	27.9	19.7	29.7	38	34.2	26	19.4	27.6
Palustrine Wetland (ac)	98.3	97.4	98.2	86.6	97	85.4	117.3	130.7	115.1	103.5	114.8	126.3
Open Water (ac)	3.5	13.7	3.9	2.3	3.9	2.3	4	5.6	5.6	4	4.3	5.9
<b>Total biotic resources (ac)</b>	1220.4	1309.4	1313.2	1337.7	1278.3	1302.7	1443.1	1409.4	1273.2	1299.1	1333.1	1306.6
Stream crossings (#)	43	44	45	50	41	45	42	40	38	42	45	41
Stream length (ft)	32,057	33,112	26,771	33,864	26,620	33,699	31,295	24,888	23,638	30,717	31,368	24,289
100-year floodplain (ac)	358.6	147.7	95.2	83.9	109	97.7	52.1	62.3	73.4	62.1	139.1	150.4
500-year floodplain (ac)	75	130.8	23.9	23.9	21.7	21.7	40.2	40.2	46.2	46.2	29.2	29.2
<b>Total floodplains (ac)</b>	433.6	278.5	119.1	107.8	130.7	119.4	92.3	102.5	119.6	108.3	168.3	179.6
Floodway (ac)	35.6	0.6	1.8	1.9	1.1	1.1	0.1	0.1	1.1	1.1	1.2	1.2
Riparian wetland	74.1	41.2	68.5	55.1	66.5	53.2	41.6	55.4	60.4	47.1	74.5	87.9
Non-riparian wetland	11.8	24.2	49.4	37.4	60.1	48.1	107.4	116.4	81.8	69.8	37.7	49.7
<b>Total wetland impacts (ac)</b>	85.9	65.4	117.9	92.5	126.6	101.3	149	171.8	142.2	116.9	112.2	137.6



## 4.16 INDIRECT AND CUMULATIVE EFFECTS

The indirect and cumulative effects associated with the proposed action have been identified and assessed in several technical reports available under separate covers. These reports include the LUSA (NCDOT 2018g), CIA (NCDOT 2018d), and EIA (NCDOT 2018f), which are all available on the project website.

Indirect and cumulative effects were assessed within the Future Land Use Study Area (FLUSA) by predicting changes in development types within defined probable development areas (PDA) as a result of the No-Build Alternative and DSAs. The development pressures and regulations, proposed future land use, infrastructure, and proximity to proposed economic centers were considered to determine the degree of impacts to notable features and waterways within each PDA with and without the proposed action. The locations of the PDAs are shown on Figure 4-119 and Figure 4-120.

The proposed action is included in local transportation planning documents; therefore, conflicts are not anticipated. Examination of the PDAs shows that the proposed action is expected to encourage growth targeted to highway users in certain areas; however, pressure for development is expected to be limited. The project is specifically aligned with the mobility goal of the North Carolina STC policy (previously the Strategic Highway Corridors policy) (NCDOT 2015c). Federal, state, and local policies and regulations that include zoning ordinances and land use plans provide protections from development for human and natural environmental features in the FLUSA that include historic and cultural resources, protected populations, wetlands, natural resources, farmland, and other important features.

In the LUSA, three land use scenarios were evaluated; one that applied to Alternative 1UE, one that applied to Alternative 1SB, and one that applied to the remaining 10 alternatives. The remaining 10 alternatives were grouped together because the indirect and cumulative effects from Alternatives 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 would be similar, as they would be located along paths with similar land use and population and availability of public utilities.

### Technical Studies

The LUSA, CIA, and EIA for the Kinston Bypass can be found on the project website.

<https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx>

### Direct Effects

Direct effects are caused by the action and occur at the same time and place. (40 CFR 1508.8)

### Indirect Effects

Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. (40 CFR 1508.8)

### Cumulative Impact

Cumulative impact is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)

Categories were used to help determine the potential for land use change induced by the proposed action, and have been shown to have a direct relationship to future quality of life and resource impacts. These include the following:

- Pressure/demand for typically higher impact development
- Future shift of regional population growth to the project area
- Pressure for land development outside regulated areas
- Pressure for land development outside of planned areas
- Development patterns
- Planned/managed land use and impacts

The relative rating of potential indirect and cumulative effects for the three different land use scenarios are shown in Table 4-22 through Table 4-24. Potential impacts are also discussed in the following sections.

### **Safety**

Potential positive impacts to community safety are expected to be moderate and are likely for each DSA, depending upon how accessibility is altered for each PDA. In comparison to the No-Build Alternative, response times of emergency response vehicles that utilize or pass through the existing US 70 corridor would likely be improved for all the DSAs. The changes or benefits among the individual DSAs would vary depending on the service area for emergency response providers and how accessibility is affected by change of access and/or potential road closures. The DSAs that are not Alternative 1UE would have the benefit of providing an alternative route for US 70 through much of the study area, which would be beneficial if either the existing US 70 or the new route were closed or blocked due to an incident.

### **Mobility**

All the DSAs would provide a freeway with full control of access, which would result in travel time savings that will exceed 10 minutes for an individual highway user.

### **Property Access**

The proposed action would alter property access for those properties that abut or are adjacent to the project. Properties bisected by or near the project would have a new barrier that may alter and/or limit access. Other properties may experience improved access to the highway system if they are located near interchanges.

### **Noise**

The design year traffic projections through 2040 used for the *Traffic Noise Report* include the effects of planned and programmed projects. As a result, the reported noise impacts in section 4.10 include this growth and represent both direct and cumulative noise impacts.



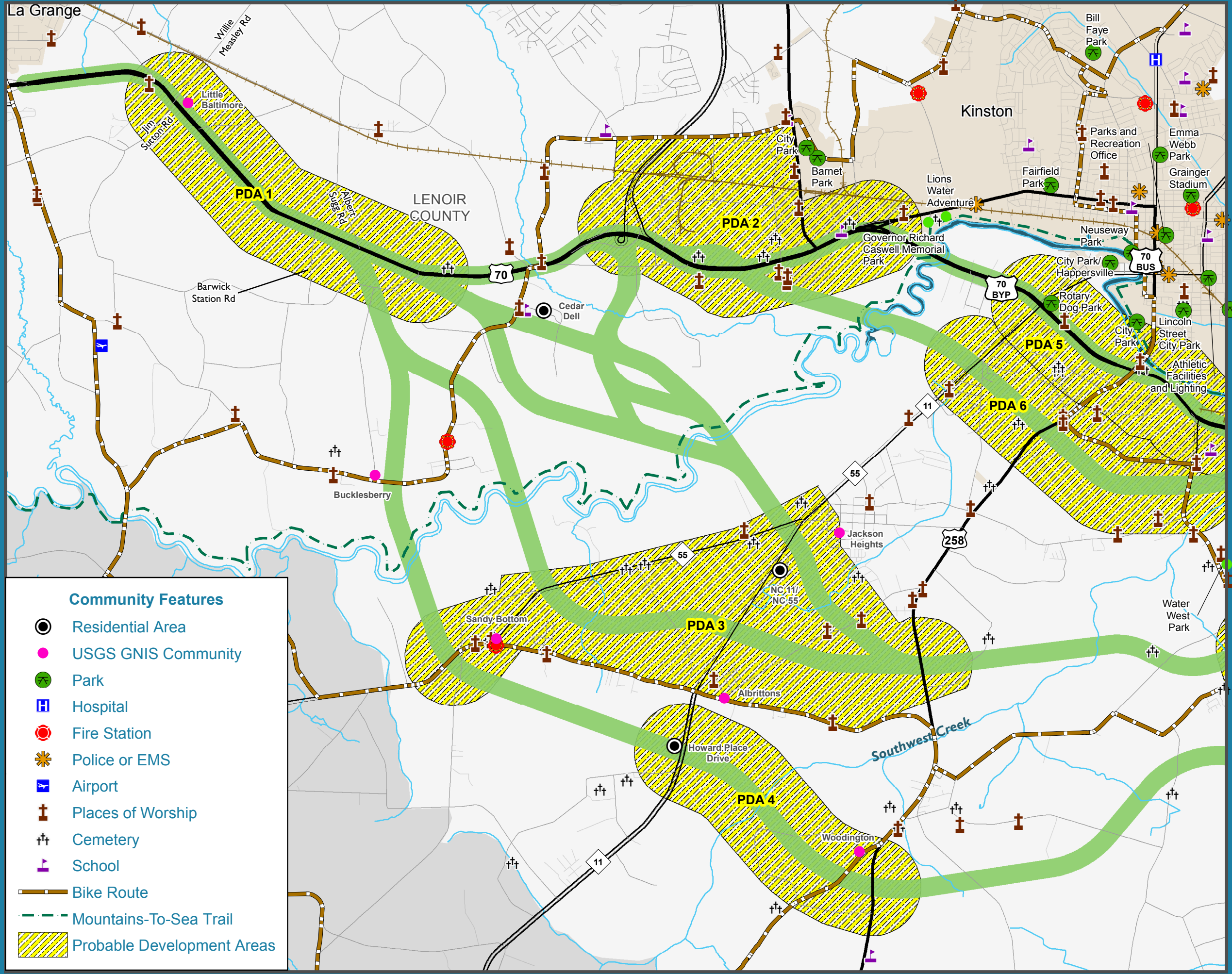


Figure 4-119:  
Probable Development Areas  
(PDAs) - A

**Legend**

- Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

0 0.75 1.5  
Miles

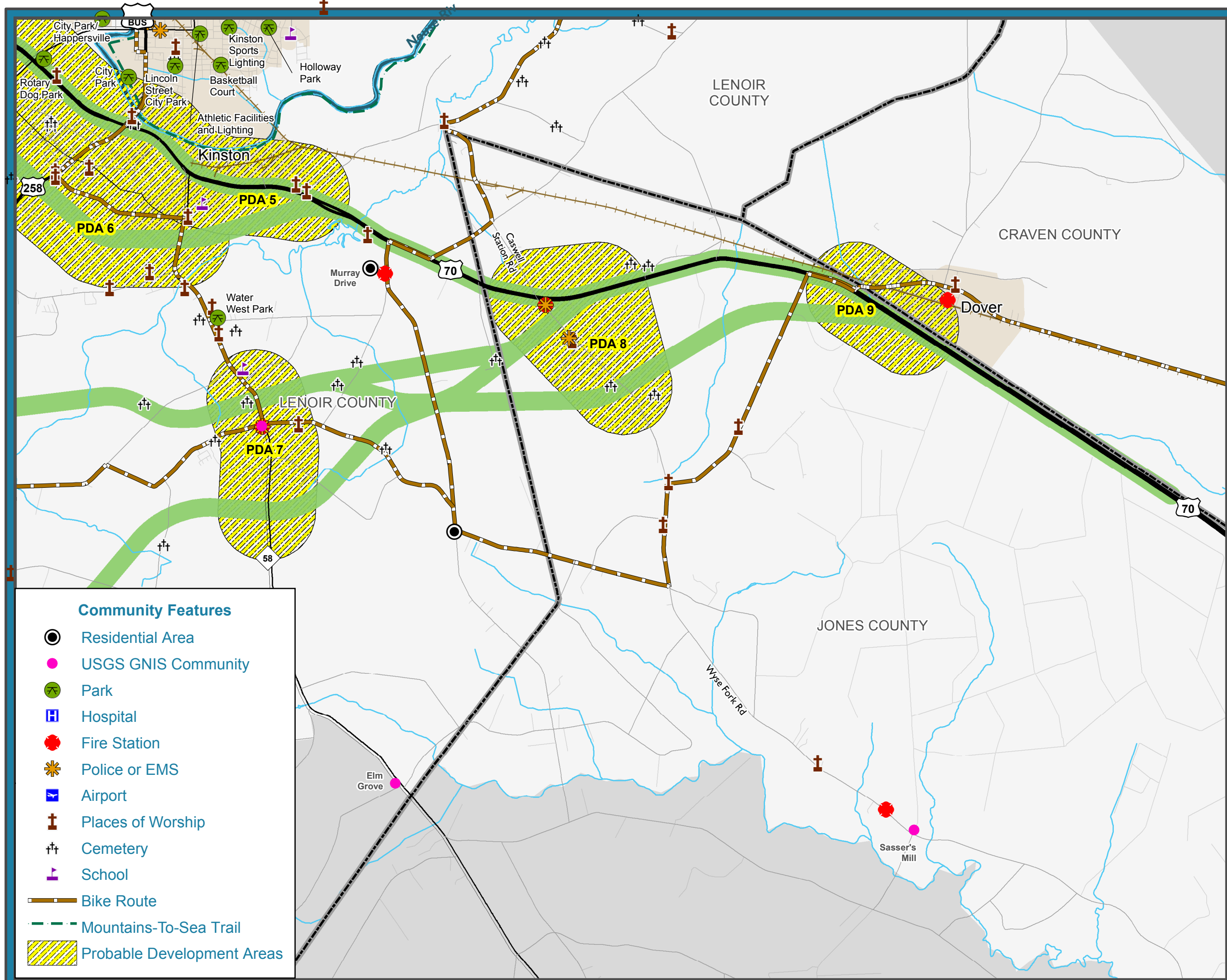


This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCs, USFWS



- Community Features**
- Residential Area
  - USGS GNIS Community
  - Park
  - Hospital
  - Fire Station
  - Police or EMS
  - Airport
  - Places of Worship
  - Cemetery
  - School
  - Bike Route
  - Mountains-To-Sea Trail
  - Probable Development Areas





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Figure 4-120:  
Probable Development Areas  
(PDAs) - B

Legend

- Detailed Study Alternative
- Railroad
- US Highway
- NC Highway
- Secondary Road
- Municipal Boundary
- County Boundary

0 0.75 1.5  
Miles



This map is for reference only.  
Sources: AECOM, CGIA, City of Kinston,  
Craven County, ESRI, HPO, Jones County  
Lenoir County, NCDCM, NCDEQ, NCDOT, NCEM,  
NCONemap, NRCS, USFWS



Community Features

- Residential Area
- USGS GNIS Community
- Park
- Hospital
- Fire Station
- Police or EMS
- Airport
- Places of Worship
- Cemetery
- School
- Bike Route
- Mountains-To-Sea Trail
- Probable Development Areas



**Table 4-22: LUSA matrix – Alternative IUE**

Rating	Pressure / Demand for Typically Higher Impact Development	Future Shift of Regional Population Growth to the Growth Area	Pressure for Land Development Outside Regulated Areas	Pressure for Land Development Outside Planned Areas	Development Pattern	Planned / Managed Land Use Impact
	Commercial/ industrial development with large parking lots likely	Strong attraction of development in this area	Many acres in the probable development areas are outside a regulated area	Many acres in the probable development areas are outside a planned area	Strip or sprawling development likely	Land development and stormwater management goals not set
High Concern						
Medium-High Concern	Build Scenario				Build Scenario No-Build Scenario	
Medium Concern	No-Build Scenario					
Medium-Low Concern		Build Scenario No-Build Scenario				Build Scenario No-Build Scenario
Low Concern			Build Scenario No-Build Scenario	Build Scenario No-Build Scenario		
	Commercial development and / or large residential developments not likely	No population shift likely	All probable development areas in a regulated area	All probable development areas in planned area	Likely to support clustered development	Probable development areas are consistent with land development and stormwater management goals

**Table 4-23: LUSA matrix – Alternative ISB**

Rating	Pressure / Demand for Typically Higher Impact Development	Future Shift of Regional Population Growth to the Growth Area	Pressure for Land Development Outside Regulated Areas	Pressure for Land Development Outside Planned Areas	Development Pattern	Planned / Managed Land Use Impact
	Commercial/ industrial development with large parking lots likely	Strong attraction of development in this area	Many acres in the probable development areas are outside a regulated area	Many acres in the probable development areas are outside a planned area	Strip or sprawling development likely	Land development and stormwater management goals not set
High Concern						
Medium-High Concern	Build Scenario				Build Scenario No-Build Scenario	
Medium Concern	No-Build Scenario	Build Scenario				
Medium-Low Concern		No-Build Scenario				Build Scenario No-Build Scenario
Low Concern			Build Scenario No-Build Scenario	Build Scenario No-Build Scenario		
	Commercial development and / or large residential developments not likely	No population shift likely	All probable development areas in a regulated area	All probable development areas in planned area	Likely to support clustered development	Probable development areas are consistent with land development and stormwater management goals



**Table 4-24: LUSA matrix – representative southern bypass scenario**

Rating	Pressure / Demand for Typically Higher Impact Development	Future Shift of Regional Population Growth to the Growth Area	Pressure for Land Development Outside Regulated Areas	Pressure for Land Development Outside Planned Areas	Development Pattern	Planned / Managed Land Use Impact
	Commercial/ industrial development with large parking lots likely	Strong attraction of development in this area	Many acres in the probable development areas are outside a regulated area	Many acres in the probable development areas are outside a planned area	Strip or sprawling development likely	Land development and stormwater management goals not set
High Concern						
Medium-High Concern	Build Scenario	Build Scenario			Build Scenario No-Build Scenario	
Medium Concern	No-Build Scenario					
Medium-Low Concern		No-Build Scenario		Build Scenario		Build Scenario No-Build Scenario
Low Concern			Build Scenario No-Build Scenario	No-Build Scenario		
	Commercial development and / or large residential developments not likely	No population shift likely	All probable development areas in a regulated area	All probable development areas in planned area	Likely to support clustered development	Probable development areas are consistent with land development and storm water management goals

### **Induced Growth**

- The project would result in a travel time savings in excess of 10 minutes for an individual highway user traveling on a new location alternative, which would be expected to increase the likelihood and/or density of development. Industrial development would be expected, especially in PDAs that include existing industrial land uses and development along existing US 70 and the C.F. Harvey Parkway interchange.
- In comparison to the No-Build Alternative, all the DSAs would create more pressure/demand for higher density and/or industrial development. While the overall growth projections for the FLUSA are relatively low, the construction of a new freeway and/or major improvements to the existing highway would likely encourage new commercial and industrial development.
- Alternative 1SB, 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 are more likely to shift future population growth areas than the No-Build Alternative and Alternative 1UE.
- Alternatives 11, 12, 31, 32, 35, 36, 51, 52, 63, and 65 would provide new access to land in Jones County, which does not implement zoning controls. However, these areas are not served by sewer service and are designated rural and agricultural, and low-density residential served by on-site septic systems and agricultural uses are planned.
- Alternatives 1UE and 1SB would be more likely to support some clustered development than the No-Build Alternative and the other DSAs, especially around proposed interchange areas where new access is provided.
- The areas that are projected for probable development are consistent with land development and stormwater management goals set in these respective areas; thus, there were no discernable differences between the No-Build Alternative and any of the DSAs.
- The potential for substantial project-induced, or project-focused, growth that would have visual impacts on the community would be limited to new interchange catchment areas. In these areas, rural viewsheds would likely be replaced by buildings and other structures. In urban settings, visual impacts are still possible, but the project context is more consistent with the existing urban land uses and would likely be in context to the surrounding areas.

### **Natural Habitat**

- No induced growth is projected in areas adjacent or near the NCNHP natural areas as they are outside of the PDAs. Induced growth could create development pressure to develop NCNHP natural areas for active land uses and/or habitat fragmentation could take place, which would limit the integrity of the NCNHP natural areas.
- No indirect impacts to terrestrial communities related to fragmentation of forested landscapes and plant communities are anticipated. The landscape within the project study area is already fragmented due to the large amount of maintained/disturbed and agricultural community types.

### **Energy**

- Increased energy efficiency on the new highway would be attributed to its controlled access features and would result in decreased vehicle delays, more efficient vehicle operating speeds, and diversion of traffic away from less convenient and less efficient roadways.



- Improved travel conditions would reduce vehicle fuel use, resulting in direct travel cost savings for highway users.

### **Water Quality Statement**

Qualitative analyses of the probable development patterns in the FLUSA suggest that change in land use resulting from the project and subsequent private and public development actions could lead to an increase in impervious surface and could potentially have a negative effect on future stormwater runoff and water quality in the watersheds encompassed by the project.

However, there are adopted ordinances and regulations to help reduce potential water quality effects due to increased impervious surface coverage and increased water runoff. The Lenoir County *Watershed Protection Ordinance* applies to the southwestern portion of the FLUSA and establishes density and intensity standards for development in the Neuse River Water Supply Watershed WS-IV Critical and Protected areas (Lenoir County 2003b). In addition, the Neuse River buffer rules apply to the entire FLUSA and require a 50-foot riparian buffer area to be protected and maintained along waterways in the river basin. Other stormwater permitting programs exist in the FLUSA, including the City of Kinston under the Neuse River Stormwater Program; Craven County, the Town of Dover, and Cove City under the Coastal State Permitting Program; and Pitt County and the Town of Grifton under the NPDES Phase II Stormwater Permits.

Direct water quality impacts will be avoided and/or mitigated through compliance with regulations covering watershed protection, floodplain protection, stream and river buffers, and stormwater management.

Direct water quality impacts will be addressed by avoidance, minimization, and mitigation, consistent with programmatic agreements with environmental resource and regulatory agencies during the permitting processes (USACE 2018). Future development will be required to follow federal, state, and local regulations for the protection of water quality.

Table 4-25 provides a summary of notable environmental features that are within the FLUSA and highlights likely foreseeable cumulative impacts from the proposed action.

Direct environmental impacts by NCDOT projects are addressed by avoidance, minimization, or mitigation consistent with programmatic agreements with the natural resource agencies during the permitting processes (USACE 2018). All development will be required to follow local, state, and federal guidelines and permitting requirements.

**Table 4-25: Summary of notable water quality, habitat, and community features and foreseeable impacts**

Notable Feature	Description	Foreseeable Impacts
FEMA's HMGP buyout program	Contains over 700 acres that were purchased under the FEMA HMGP, which is a federal buyout grant program used to relocate businesses and residences from the floodplain. Restrictive covenants that prohibit construction of any permanent structures or impervious surfaces are in place. This program intends to mitigate future flood damage and property loss. Any impacts to HMGP properties from the project would require review and approval from FEMA.	<b>PDA 5 and PDA 6:</b> contain properties that were purchased under the FEMA HMGP. In PDA 5, Alternative 1UE would directly impact some of these parcels, totaling 21.4 acres. In PDA 6, Alternative 1SB would impact 20.2 acres. Otherwise no impacts are expected as regulations in place will continue to prohibit development or alterations to the HMGP properties. Overall beneficial effects include keeping floodplains and associated wetlands intact, helping innate functions for stormwater treatment, and preventing and mitigating flood damage.



Notable Feature	Description	Foreseeable Impacts
EJ populations	<p>The CIA identified eleven EJ residential areas.</p> <p><b>Norbert Hill Road:</b> located between US 70 and Gregg Drive; contains low-income populations.</p> <p><b>Foss Farm Road:</b> located on US 70 between Barwick Station Road and Albert Sugg Road; contains concentrations of minority and low-income populations.</p> <p><b>Crooms Drive:</b> located off NC 55; contains low-income populations</p> <p><b>Jesse T. Bryan Road:</b> located near Barwick Road; contains low-income populations.</p> <p><b>Carrie Hill Drive and Howard Place Drive:</b> located off of NC 11; contains low-income populations.</p> <p><b>Lonesome Pine Drive:</b> located between Joe Nunn Road and Randy Road; contains low-income populations.</p> <p><b>Albert Baker Road:</b> located off of NC 58; contains minority and low-income populations.</p> <p><b>Fordham Lane:</b> located near US 258; contains a minority and low-income population.</p> <p><b>Johnson Road/NC 58:</b> This residential area contains a minority population.</p> <p><b>British Road and Caswell Station Road:</b> located on the north side of US 70; contains a minority population.</p> <p><b>US 70/Tilghman Road:</b> located on the southern side of US 70 just west of Tilghman Road; contains minority and low-income populations.</p>	<p><b>PDA 1:</b> The Norbert Hill Road residential area would be affected by all DSAs. The DSAs may displace some of these residences closest to US 70 and those that remain would experience a change in access to US 70.</p> <p>The Foss Farm Road residential area would be displaced by Alternatives 1UE, 1SB, 11, 12, 35, 36, 51, and 52. Access to this residential area would be affected by Alternatives 31, 32, 63, and 65 (from Willie Measley/Little Baltimore interchange), as these alternatives would provide a service road to this community.</p> <p><b>PDA 3:</b> The Crooms Drive residential area would be impacted by Alternatives 51 and 52. Some of the residences would be displaced by the proposed interchange with NC 55 and those that remained would experience a change of access to NC 55.</p> <p>The Jesse T. Bryan Road residential area would experience change in access to the local road network from Alternatives 51 and 52.</p> <p><b>PDA 4:</b> the Carrie Hill Drive and Howard Place Drive residential area would have approximately 35 homes displaced by Alternatives 35 and 36.</p> <p>The Lonesome Pine Drive residential area would experience several displacements from Alternatives 63 and 65.</p> <p><b>PDA 5:</b> the Albert Baker Road residential area would be displaced by Alternatives 35 and 36.</p>



Notable Feature	Description	Foreseeable Impacts
EJ populations (continued)		<p><b>PDA 7:</b> the Fordham Lane residential area and the Johnson Road/NC 58 residential area would be displaced by Alternative 1SB.</p> <p>The Johnson Road/NC 58 residential area would be displaced by Alternative 1SB due to the proposed interchange with NC 58.</p> <p><b>PDA 6:</b> the British Road and Caswell Station Road residential area would be impacted by Alternatives 1UE and 1SB. A new service road would be required in this area, which would directly impact several homes along existing US 70 in this area due to the need for additional ROW. Homes that would not be directly impacted would experience change in access to the US 70 corridor.</p> <p><b>Other:</b> The US 70/Tilghman Road residential area is also an EJ residential area but is located outside of all PDAs.</p>
Wyse Fork Battlefield	Contains approximately 4,000 acres southeast of Kinston along US 70 and is listed on the NRHP.	Wyse Fork Battlefield would be crossed by Alternatives 1UE, 1SB, 12, 32, 35, 52, and 63; however, little development pressure was projected as almost all of the area is classified as flood hazard, and many properties are already included in the FEMA buyout program.



Notable Feature	Description	Foreseeable Impacts
VAD	All three counties in the FLUSA have VAD ordinances in place. Several farms in Lenoir County and Jones County that are in the FLUSA are protected as VADs. These properties have a conservation agreement between the landowner and the county that prohibits non-farm use or development for a period of at least 10 years.	There are two VAD properties within PDA 4. Parcel Identification Numbers 450200425447 and 450200523932 are located near Alternatives 35 and 36 along Black Harper Road. This VAD may be impacted by right-of-way acquisition, and land in the VAD may be temporarily converted to non-agricultural use as part of a temporary construction easement. Changes in access to agricultural fields could result in indirect effects.
Neuse River – NSW	The portion of the Neuse River in the FLUSA is classified as a NSW. The Neuse River Compliance Association has a watershed based permit from the NCDEQ and represents local governmental units to monitor water quality in the watershed.	While PDA 5 is the only PDA that contains portions of the Neuse River, the entire FLUSA is within the Neuse River Basin. Increased water runoff from induced growth could impact the water quality of the Neuse River.
Neuse River – AFSA	The portion of the Neuse River in the FLUSA is designated as an AFSA. Designated AFSAs have in-water work construction moratorium dates when construction cannot occur during spawning periods. In-water work is prohibited between February 15 and June 30.	New culverts built over small streams could interrupt migration patterns of anadromous fish, which can lead to a decline in anadromous fish population and impact the number of fish in salt water environments.

Notable Feature	Description	Foreseeable Impacts
Prime and unique farmland	Prime and unique farmland soils are present throughout the FLUSA and in all the DSA corridors.	All PDAs contain some prime and unique farmlands. Impacts to prime farmland are the lowest for Alternative 1UE (282 acres) and the highest for Alternative 32 (434 acres). Alternative 1SB had 302 acres of prime farmland. Unique farmland impacts were similar among all DSAs, ranging from 47 acres (Alternatives 35 and 36) to 57 acres (Alternatives 11 and 12). Potential induced development could impact prime and unique farmland and changes in access to farm fields could result in indirect effects.
Public parks and open space	The Governor Caswell Memorial Park, First Battle of Kinston Memorial Site, and the Rotary Dog Park are located within the FLUSA.	PDA 2 contains the Governor Caswell Memorial site. No direct impacts are expected, but Alternative 1UE may involve changes in access (temporary or permanent). PDA 5 contains the First Battle of Kinston Memorial site and the Rotary Dog Park. No direct impacts to the First Battle of Kinston Memorial site are anticipated. Direct impacts, as well as changes in access (temporary or permanent), are expected from Alternative 1SB to the Rotary Dog Park. No impacts from induced growth are anticipated to the First Battle of Kinston Memorial site or the Rotary Dog Park.



Notable Feature	Description	Foreseeable Impacts
Conservation easements	Several areas of land have been purchased as conservation easements in the FLUSA, which includes wetlands and croplands. These lands carry deed restrictions, which prohibit development activity.	No direct impacts are expected, as deed restrictions are in place that will prohibit changes in land use. Conservation easements limit or prohibit development, so little to no impacts from induced development or other reasonable foreseeable future projects are anticipated.
NCNHP natural areas	Two NCNHP natural areas exist in the FLUSA. NCNHP natural areas contain one or more high-quality or rare natural communities, rare species, and/or special animal habitats.	No induced growth is projected in areas adjacent or near the NCNHP natural areas as they are outside of the PDAs. Induced growth could create development pressure to develop NCNHP natural areas for active land uses and/or habitat fragmentation could take place, which would limit the integrity of the NCNHP.
Section 303(d) Streams	Three streams/rivers in the FLUSA are listed as impaired for severe or fair bio-classification.	The Section 303(d) streams in the FLUSA are outside of the PDAs. Increased surface water runoff from induced growth and reasonably foreseeable future projects could further contribute to the stream bio-classification.
Surface waters	A portion of the FLUSA includes a portion of a WS-IV water supply watershed, which has portions designated both as a protected area and a critical area. Residential and commercial densities are regulated in these areas.	The WS-IV portion of the water supply watershed is outside of the PDAs. Induced development and reasonably foreseeable future projects can affect water quality in the water supply watershed, but growth would be constrained by the density requirements of the watersheds.
Wetlands	Wetlands are located throughout the FLUSA and are protected under Section 404 of the Clean Water Act.	Wetlands exist in all PDAs. Induced development and reasonably foreseeable future projects, specifically around interchange areas, would be likely to eliminate small wetlands, which could lead to a cumulative aggregate loss of wetlands.

## 4.17 CONSTRUCTION IMPACTS

Impacts are to be expected during the construction phase of the proposed action. Most of the impacts during construction are expected to be temporary in nature and may include the following:

- Minor short-term business impacts as a result of changes in access during construction.
- Minor short-term community impacts as a result of changes in access during construction.
- Temporary impacts to soils during construction (erosion, compaction, and discharges).
- Temporary impacts to water quality during construction (erosion, runoff, discharges to surface waters).
- Temporary impacts to aquatic resources and water quality during bridge construction (pier placement, mobility of equipment) that could result in a temporary increase in turbidity and a potential decrease in dissolved oxygen levels associated with the re-suspension of sediment particles into the water column.
- Temporary impacts to floodplains and floodways during bridge construction over the Neuse River, Southwest Creek, Falling Creek, and Strawberry Branch.
- Temporary impacts during construction to HMGP properties along Alternatives 1UE and 1SB if either alternative is chosen as the applicant's preferred alternative.
- Temporary impacts during construction to NCNHP managed areas along Alternatives 1UE, 31, 32, 63, or 65 if chosen as the applicant's preferred alternative. Temporary impacts would also be possible to the Goodman Property Stream Restoration project if Alternative 11 or 12 was chosen as the applicant's preferred alternative.
- Alternatives 11 and 12 would have temporary impacts during construction to the Banks School Road Stream Restoration that is an NCDOT on-site mitigation project.
- Temporary impacts to terrestrial communities during project construction (erosion, minor clearing, discharges).
- Temporary impacts to wildlife species during project construction in the form of dislocation of species occupying adjacent habitats during construction due to noise and activity in the vicinity of their usual habitat. It is likely that species dislocated during construction activities would return once construction is complete.
- Temporary impacts to jurisdictional waters of the US and protected stream buffers during construction to include erosion, runoff, and discharges to floodplains, wetlands, and surface waters within and in the vicinity of the construction area. Construction of bridges along the Neuse River, Southwest Creek, Falling Creek, and Strawberry Branch could cause temporary impacts to their associated floodplains from general construction activity and pile placement.
- Temporary impacts to air quality during project construction (vehicle and equipment exhaust, dust, off-gassing of construction materials).
- Construction noise.

Detailed temporary impacts to all resources will be assessed and calculated once the applicant's preferred alternative is selected.



#### **4.18 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

An irreversible or irretrievable commitment of resources refers to losses or impacts that cannot be reversed or recovered (i.e., the losses are permanent). Examples include permanent conversion of wetlands and streams, or loss of cultural resources, soils, wildlife, agricultural, and socioeconomic conditions.

A commitment of resources is considered irreversible if impacts to a resource, either directly or indirectly, limit the future option for the resource. A commitment of irreversible impacts to resources typically applies primarily to the effects of use of nonrenewable resources such as minerals and cultural resources. Irretrievable impacts or commitment of resources refer to loss of production, harvest, or use of natural resources.

The consumption of resources is evaluated to ensure that it is justified as a result of the proposed action. The proposed action would require the irretrievable commitment of natural resources through direct consumption of construction materials such as wood, aggregate, and cement to construct roadways and bridges, and to fossil fuels such as gasoline and diesel to power construction equipment.

#### **4.19 RELATIONSHIP BETWEEN LONG-TERM AND SHORT-TERM USES OF THE ENVIRONMENT AND ANTICIPATED BENEFITS**

This section defines the balance, or trade-off, between short-term uses and long-term productivity needs in relation to the proposed action. The short-term effects on and uses of the environment in the vicinity of the DSAs are related to the long-term effects and maintenance and enhancement of long-term productivity. Short-term relates to the total duration of construction of the proposed action. Long-term refers to an indefinite period after construction of the project and includes the longer term mitigation measures that may be implemented, as well as the ongoing operation and maintenance of the newly constructed highway.

The most disruptive short-term impacts associated with the proposed action would occur during land acquisition and project construction, such as construction hauling, noise, lighting, and/or dust. However, these short-term uses of human, physical, economic, cultural, and natural resources would contribute to the long-term productivity of the study area.

Existing homes and businesses within the applicant's preferred alternative's right-of-way will be displaced. However, adequate replacement housing, land, and space are available for homeowners and business owners to relocate within the study area.

The project is consistent with the objectives of state and local transportation plans. It is anticipated that the proposed action will enhance long-term access and connectivity opportunities in Craven, Jones, and Lenoir counties and will support local, regional, and statewide commitments to transportation improvement and economic viability.

## 4.20 MITIGATION MEASURES

As discussed in chapter 2, during the development of the DSAs, efforts were made to avoid and minimize impacts to resources wherever practicable while meeting the purpose of and need for the project. The DSA selection process incorporated recommendations made by federal and state environmental regulatory and resource agencies and comments received from the public.

Once the applicant's preferred alternative is selected, project-specific avoidance, minimization, and mitigation measures will be determined as necessary. General mitigation measures that will be employed include the following:

- Relocation benefits under the Uniform Relocation Act will be available to anyone displaced from the project (NCDOT 2017f).
- Context sensitive designs will be used in areas along the applicant's preferred alternative where visual/aesthetic impacts or EJ impacts are likely.
- Best management practices and sediment and erosion control plans will be implemented to minimize soil compaction and erosion outside of the construction area as required and to the maximum extent practicable.
- During bridge construction, construction methods such as top-down construction will be implemented to reduce the amount of in-water work and disturbance. Any in-water work will be done in phases to reduce the amount of turbidity-causing activities occurring at one time.
- Impacts to HMGP properties will be avoided and minimized to the extent practicable during final project design. NCDOT's coordination with FHWA, FEMA, and NCDWM will ensure that any impacts are mitigated to the fullest extent.
- Best management practices will be used to minimize transport and distribution of non-native vegetation cuttings and seeds. Newly disturbed areas will be re-planted with desired species as required and as soon as practicable.
- Bridge construction could involve barges and other watercraft originating from other-than-local harbor waters. To ensure that watercraft do not introduce exotic or invasive species, NCDOT will require its contractors to pre-inspect and certify that all vessels are clean and devoid of exotic or invasive species.
- Jurisdictional streams in the project study area will be designated as warm water streams for the purposes of stream mitigation. Mitigation requirements will be coordinated with NCDWR and USACE.
- Avoidance, minimization, and mitigations measures will be taken in compliance with Section 106 for all cultural resources within the applicant's preferred alternative.
- Once the applicant's preferred alternative is selected, a design noise report will determine more specific details regarding the noise abatement measures.
- Access to farms will be maintained.





# CHAPTER 5

## AGENCY COORDINATION AND PUBLIC INVOLVEMENT

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## 5. AGENCY COORDINATION AND PUBLIC INVOLVEMENT

This chapter summarizes regulatory agency coordination, public involvement activities, and environmental resource coordination required under regulatory programs administered by the federal lead agency (USACE) for the project development and the decision-making process. Detailed information on agency coordination and public involvement for the project can be found in the *Agency Coordination Plan* (NCDOT 2018b) and the *Public Involvement Plan* (NCDOT 2018h).

### 5.1 AGENCY COORDINATION

This project followed the NCDOT Clean Water Act Section 404/NEPA Interagency Merger Process (Merger Process) in order to integrate and streamline these two processes. NCDOT has assisted USACE with the administration of the merged process.

The Merger Process provides a forum for appropriate federal, state, and local agency representatives to discuss and reach consensus on major project milestones through a shared decision-making process, which results in agency representatives reaching compromised-based decisions throughout the development of the project.

Federal and state agencies with jurisdiction over the project were brought together through the Merger Process as the Interagency Merger Team. The Merger Process defines specific steps, or CPs, when the Interagency Merger Team meets to reach consensus on major project milestones through the life of a project.

The members of the Interagency Merger Team include the following:

- USACE
- NCDOT
- USCG
- USEPA
- USFWS
- NOAA – Fisheries Service
- National Marine Fisheries Service
- North Carolina Department of Natural and Cultural Resources
- NCWRC
- NCDEQ, DWR
- NCDCM
- Eastern Carolina Rural Planning Organization
- Down East Rural Planning Organization



### 5.1.1 Agency Coordination: Merger Process Team Meetings

The Interagency Merger Team reached concurrence on the following three predetermined CPs through a series of informational meetings held at various points during the project process:

- CP1: Project Purpose and Need
- CP2: Alternatives to be Carried Forward
- CP2A: Review of Bridges and Crossings

Since the initiation of the project, 17 Interagency Merger Team meetings have been held. Information on the study area and project were presented and key issues were discussed at these meetings. The meetings provided a forum for the agencies to provide feedback on the process and characteristics of the project, as well as note concerns related to the resources in the study area. In addition, seven local officials meetings have been held for the benefit of local elected bodies.

A summary of the Interagency Merger Team meetings and local official meetings is included in the *Agency Coordination Plan* (NCDOT 2018b).

### 5.1.2 Agency Coordination: Scoping Process

In addition to the Merger Team's input, the project staff maintained a record of input and correspondence from a full range of public agencies that was specifically obtained during the formal scoping process. The comments received during the scoping process related to the identification of resources under each agency's purview that were located in the study area.

Comments were received from 23 agencies. Some of the notable comments came from the USEPA and NCWRC regarding the wetlands and streams in the area, the NCDA&CS regarding permanent loss of productive farmland, and the North Carolina Department of Cultural Resources regarding the list of archaeological and historic resources in the area. A summary of the scoping input is included in the *Agency Coordination Plan* (NCDOT 2018b).

## 5.2 PUBLIC INVOLVEMENT

The public involvement program included public notices, project postcards and newsletters, public meetings, and information distribution in various formats.

The Notice of Intent for the project was published in the Federal Register by the USACE on September 11, 2014. A copy of the Notice of Intent is in Appendix H.

Four public meetings were held, each of which included two separate meetings covering the same materials, resulting in eight public meetings in total. In addition, four small group meetings was also held; two of the meetings focused on community impacts while the other two focused on business impacts.

The public involvement program has included multiple opportunities for stakeholders to learn about the purpose of and need for the project, project alternatives, and potential project issues and impacts. Stakeholders participated in various forums, submitted comments, asked questions, and stayed informed. The project's *Public Involvement Plan* outlines strategies, dates, and efforts

undertaken to reach the general public and traditionally underrepresented populations (minorities, low income community members, and people with LEP) (NCDOT 2018h).

### 5.2.1 Public Meetings

Eight public meetings, which were formerly called “Citizens Informational Workshops,” were offered in two locations in Kinston (two each in 2010, 2011, 2012, and 2014). Citizens were notified about the workshops by direct mail, flyers, and local media announcements. The purposes of the workshops were to review and receive comments on the project’s purpose and need, the project alternatives, and the project study process. Dates, quantities, and the content of the postcards, newsletters, and flyers, as well as participation rates for the workshops, are presented in the project’s *Public Involvement Plan* (NCDOT 2018h).

A total of 879 attendees signed in at the eight workshops between 2010 and 2014. On average, each workshop was attended by 110 people. Citizens frequently pointed out congestion at key US 70 intersections (US 258, NC 11, and the existing US 70 bypass connections). Citizens were evenly split on whether the existing US 70 and existing US 70 bypass could accommodate future regional and local demand. Many citizens attributed the congestion on US 70 to travelers from North Carolina’s Piedmont and Mountain regions traveling to the beaches and to holiday and weekend traffic. Concerns about a “build” solution revolved around impacts to personal property, farmland, and neighborhoods, followed by impacts to businesses along existing US 70.

### 5.2.2 Small Group Meetings

As part of the CIA, the project team offered four small group meetings in 2013 to meet with representatives of organizations, civic groups, churches, and community services (e.g., fire protection). Following a formal presentation of the project status, attendees were split into groups no larger than 10 people to discuss travel patterns, impacts of alternatives on personal property and community services, and understanding of the project. When the project was restarted, the project team held two additional small group meetings in 2017. The purpose of these later meetings was to update and verify information previously collected on the project in relation to impacts to personal property and community services. All the individuals who participated in previous small group meetings, as well as potentially impacted property owners and tenants living within the project area, were invited to attend. The small group meeting details, including summarized comments, are presented in the appendix of the *Public Involvement Plan* (NCDOT 2018h).

As part of the EIA, the project team offered two small group meetings in 2014. The two meetings targeted the major employers and the small business community to identify their concerns and interests in the project, as well as to gage their perspective on how the different alternatives may impact their businesses and the larger regional economy. When the project was restarted in 2017, the project team held two additional small group meetings that focused on potential impacts to businesses on existing US 70. The purpose of these meetings was to update information previously collected on the project in relation to impacts to businesses, as well as to reach new business owners. Invitations were sent to participants in the previous small group meetings, and all potentially impacted property owners and tenants with businesses along US 70. The small group meeting details, including summarized comments, are presented in the appendix of the *Public Involvement Plan* (NCDOT 2018h).



### 5.2.3 Other Public Outreach

A project website and a toll-free bilingual hotline were established in 2010 to give the public consistent means to learn more about the project and to contact project staff. Direct mail was sent to the public near the project describing current events and upcoming public involvement opportunities such as workshops, meetings, and community event appearances. The mailing list included landowners not residing in the study area and all those who have requested to be added to the mailing list.

Additional methods to disseminate project information included the following:

- Direct mail postcards
- Direct mail newsletters
- Flyers
- Press releases
- Factsheets

Each item was clearly labeled and branded in relation to the project. The outreach materials are presented in the *Public Involvement Plan* (NCDOT 2018h). Many of the materials were offered in both English and Spanish. Project staff used a variety of outreach methods to target potentially affected citizens at different project planning phases.

The interactive nature of the following tools has also helped inform, engage, and capture public sentiment about the project:

- Surveys (MetroQuest)
- Videos

The videos provided a project introduction and details about the project alternatives and potential impacts.

### 5.2.4 Limited English Proficiency and Environmental Justice Outreach

Specific outreach efforts have been taken to include and encourage participation from LEP and EJ (minority and/or low income) populations. Flyers regarding small group meetings were hand delivered to several manufactured home neighborhoods in the project area, many of which include LEP and EJ populations. Postcards were also hand delivered to public service centers in the study area such as the La Grange and Kinston public libraries, the Kinston Community Health Center, and Lenoir County Social Services. Other LEP and EJ outreach is planned and outlined further in a supplemental document to the *Public Involvement Plan* (NCDOT 2018h).

## 5.3 USACE PUBLIC INTEREST REVIEW

The proposed action will be reviewed in accordance with 33 CFR 320-332, the Regulatory Programs of the USACE, and other pertinent laws, regulations, and Executive Orders. The decision whether to authorize this proposed action will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed action on the public interest. That decision will reflect the national concern for both protection and utilization of important

resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors that may be relevant to the proposed action will be considered. Among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, and in general, the needs and welfare of the people.

All public interest factors have been reviewed. The following public interest factors are considered relevant to this proposed action. Both indirect and cumulative impacts on the public were considered.

- **Conservation:** Conservation areas are discussed in section 3.6.5. Section 4.3 provides information on compatibility with local land use plans. Indirect and cumulative effects related to development can be found in section 4.16.
- **Economics:** In accordance with 33 CFR 320.4(q), section 4.1.3 describes the economic effect of the proposed action. Indirect and cumulative effects are described in section 4.16.
- **Aesthetics:** Section 3.5 describes the visual quality and aesthetics of the proposed action and section 4.5 describes the impacts.
- **Environmental Benefits:** In accordance with 33 CFR 320.4(p), beneficial effects to the quality of the environment resulting from the project are discussed throughout Chapter 4, where applicable.
- **Wetlands:** Wetland impacts have been evaluated in accordance with 33 CFR 320.4(b). Sections 3.6.7, 4.6.7.1, and 4.16 provide additional specific information, including indirect and cumulative effects, regarding wetland impacts in the project study area.
- **Historic and Cultural Resources:** In accordance with 33 CFR 320.4(e), potential impacts to historic and cultural resources have been coordinated with the North Carolina HPO as a part of the project. Sections 3.4 and 4.4 provide information on the resources and potential impacts. Impacts to cultural resources and measures to minimize impacts to cultural resource will be discussed in greater detail in the FEIS.
- **Fish and Wildlife Values:** In accordance with 33 CFR 320.4(c), NCDOT has coordinated with the USFWS and the NCWRD, as detailed in section 5.1. Fish and wildlife resources are detailed in sections 3.6.3, 3.6.4, and 3.6.6. Potential impacts to fish and wildlife resources are identified in sections 4.6.3, 4.6.4, and 4.6.6.
- **Flood Hazards:** Sections 3.7 and 4.7 address flood hazards and potential impacts. In addition, NCDOT has coordinated with local planners to ensure the proposed action is compatible with local plans, including hazard mitigation.
- **Floodplain Values:** Information regarding floodplains is located in section 3.7, and potential impacts are addressed in section 4.7.
- **Land Use:** Land use information and impacts are detailed in sections 3.3 and 4.3, respectively.
- **Navigation:** In accordance with 33 CFR 322.2, information regarding navigable waters is addressed in sections 3.6.7.4 and 4.6.7.5.



- **Recreation:** In accordance with 33 CFR 320.4(e), impacts to recreation have been evaluated as part of this project. Sections 3.2 and 4.2 discuss recreation in the project area and the potential impacts of the project.
- **Water Supply and Conservation:** In accordance with 33 CFR 320.4(m), impacts to the project area water supply are detailed in sections 3.6.2 and 4.6.2.
- **Water Quality:** In accordance with 33 CFR 320.4(d), impacts to water quality have been evaluated. Detailed information related to water quality compliance and coordination can be found in sections 3.6.2, 4.6.2, 4.16, and 4.17.
- **Energy Needs:** In accordance with 33 CFR 320.4(n), section 4.12 describes the impact of the project on energy needs.
- **Safety:** Safety benefits from the project are discussed in sections 4.1.5 and 4.16.
- **Food and Fiber Production:** Farmland is described in section 0. Section 4.7.2 describes impacts to prime farmland and section 4.1.3 identifies impacts to active farms in the project study area.
- **Mineral Needs:** Mineral resources are addressed in sections 3.13 and 4.14.
- **Consideration of Landowners:** Considerations of property ownership have been made during evaluation of the proposed action. Information related to considerations of property ownership can be found in sections 3.1 and 4.1.
- **Needs and Welfare of the People:** The needs and welfare of the people are addressed in sections 3.1 and 4.1.



# CHAPTER 6

## LIST OF PREPARERS AND DEIS DISTRIBUTION

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## 6. LIST OF PREPARERS AND DEIS DISTRIBUTION

### 6.1 PREPARERS

This DEIS was prepared by AECOM Technical Services of North Carolina, in cooperation with the USACE, and NCDOT. The following personnel were instrumental in the preparation of this document.

#### 6.1.1 US Army Corps of Engineers

Name	Position	Qualifications
Tom Steffens	Division 2 & 4, Washington Regulatory Field Office	BS, Biology; 19 years of experience with environmental regulations and compliance

#### 6.1.2 NCDOT

Name	Position	Qualifications
Preston Hunter, PE	NCDOT Division Engineer, Highway Division 2	BS, Civil Engineering; 27 years of experience in transportation engineering
Bill Kincannon, PE	NCDOT Division Project Development Engineer, Division 2	BS, Civil Engineering; 15 years of experience in transportation engineering and construction management
Morgan Weatherford	NCDOT Environmental Program Supervisor II, Natural Environment Section; preparer of wetland predictive model	Master of Forestry, BS, Forest Management; 15 years of experience in environmental programming and GIS
Leilani Paugh	NCDOT On-Site Mitigation Group Leader, Natural Environment Section; reviewer of wetland predictive model	Master of Natural Resource Management; 19 years of experience in natural resource management
Heather Lane, PE	NCDOT Assistant Division Construction Engineer, Division 2	BS, Civil Engineering; 8 years of experience in engineering and program management
Maria Rogerson, PE (Former NCDOT Division 2)	NCDOT Project Engineer, Division 2	Master in Public Administration, BS, Biological and Agricultural Engineering; 20 years of experience in engineering and program management



Name	Position	Qualifications
Dean Hatfield, PE, E.L. Robinson	Representative for NCDOT Division 2; independent technical reviewer	MS, Civil Engineering; BS, Civil Engineering; 32 years of professional experience in the transportation industry
Douglas Parker, E.L. Robinson	Representative for NCDOT Division 2; document review support	MS, Forestry, BS, Botany, Horticultural Science; 19 years of experience in environmental site development and remediation
Ginny Snead (former Louis Berger)	Representative for NCDOT Division 2; document review support	MS, Environmental Engineering and Policy, BA, Environmental Science; 18 years of experience in storm water management and environmental quality
Kerri Snyder, AICP, Louis Berger	Principal Planner, Independent Technical Reviewer	MS, Zoology, BS, Science Education; 14 years professional experience
Leigh Lane, E.L. Robinson	Representative for NCDOT Division 2; lead reviewer for the DEIS document	BS, Civil Engineering; 30 years of experience in transportation and environmental planning and engineering
Paul Graham, Louis Berger	Representative for NCDOT Division 2; Senior Program Manager, Heritage Resource Management	BA, Anthropology/Archaeology; Non-degree graduate program Public Service Archaeology; 39 years of experience
Robin Maycock, LSS, CPM (former Louis Berger)	Representative for NCDOT Division 2; document review support	BS, Soil Science and Agronomy; 27 years of experience in environmental compliance and problem solving
Roland Robinson, E.L. Robinson	Representative for NCDOT Division 2; reviewer of ROW, construction costs	AS, Civil Engineering; 49 years of experience in transportation design and engineering
Roger Worthington, Louis Berger	Representative for NCDOT Division 2; reviewer of utilities estimations	BS, Mechanical Engineering; 34 years of experience in utility engineering
R.D. Odell, Louis Berger	Representative for NCDOT Division 2; roadway design approver	BS, Civil Engineering; 37 years of experience in design engineering



### 6.1.3 AECOM/Subconsultants

Name	Position	Qualifications
Taylor Alligood	Entry-level Transportation Planner; document content preparer	BA, Public Policy; 1 year of experience in transportation planning
Andrew Bell, PE, PTOE (former AECOM)	Transportation Engineer/Traffic Noise and Air Quality Analyst; technical reviewer for traffic, air, and noise documents	BS, Civil and Environmental Engineering; 11 years of experience in traffic analysis and noise analysis, certified PE and PTOE
Marvin Brown	Senior Architectural Historian; technical reviewer for historic architecture documents	MA, American Civilization, JD Stanford Law; 33 years of historic and architectural studies experience
Paul Burge, INCE Bd. Certified	Principal Noise Control Engineer; independent technical reviewer	MS, Mechanical Engineering; BS, Mechanical Engineering; 30 years of professional experience
Meme Buscemi, PE	Water Resources Engineer; document preparer and technical reviewer for hydraulics	MCE, Civil Engineering; 12 years of experience in drainage design and flood modeling, certified PE
Ashley Bush	Transportation Planner; document preparer	Master of City and Regional Planning, BS, Building Construction; 2 years of experience in transportation planning
Cindy Camacho, AICP	Senior Project Manager; CIA preparer and technical reviewer for community studies	MA, Planning; 29 years of land use and environmental planning experience
Nik Carlson	Senior Economist; EIA document preparer	Master of Public Policy; MA, Hon. Philosophy, Politics, and Economics; 27 years in economic analysis
Daniel Cassedy, PhD	Principal Archaeologist; technical reviewer	PhD, Anthropology, BA, Anthropology; 38 years of supervisory archaeology and cultural resource management
Ed Edens, PE	Civil Engineer; technical reviewer for roadway design	BS, Civil Engineering, PE; 30 years of experience in civil engineering
Celia Miars	Environmental Planner; DEIS document preparer	MA, Environmental Studies; 6 years of experience in environmental assessments

Name	Position	Qualifications
Paul Gerlach	Environmental Scientist, GIS Specialist; NRTR document preparer, impact calculations preparer	Masters of Environment Management, BS, Biology; 3 years of experience in NEPA documentation, GIS Analysis
Dennis Hoyle, PE	Vice President – Manager, Civil Engineer; technical reviewer	BS, Civil Engineering, PE; 39 years of experience as a project manager and project engineer
JD Hutchinson, GISP	Senior GIS Analyst; right-of-way impacts preparer	Masters of Urban and Regional Planning, BA, History, GISP; 14 years of experience in GIS Analysis and Cartography
Ron Johnson	Senior Biologist; technical reviewer	MS, Biological Sciences; 31 years of experience in biology, wetland/stream restoration, and NEPA
Matt Jorgenson	Archaeologist; technical reviewer	MA, Anthropology; 17 years of experience in all levels of archaeological background/studies
Drew Joyner, PE	Transportation Planner Department Manager; technical reviewer	BS, Civil Engineering, PE; 23 years of experience in NEPA studies
Brian Kennedy, AICP	Planner, Transportation Planning; technical reviewer of community studies	BA, Environmental Planning and Design; 35 years of interdisciplinary environmental impact documentation, public involvement
Kevin Lapp	Biologist; GIS Specialist, GIS figure preparer	MS, Biology, BS, Science, Conservation; 19 years of experience in natural resource investigations and GIS mapping/analysis
Robin Marshall	Senior Technical Editor/Writer	BA, English; 28 years of experience
Todd McAulliffe, AICP	Planner/GIS; lead GIS reviewer	MA, Geography, AICP; 15 years of experience in GIS analysis, transportation and urban planning
Adam Migliore Meyer, AICP	Transportation Planner; document preparer	BS, Environmental Science; 7 years of experience in transit development and comprehensive pedestrian planning



Name	Position	Qualifications
Suraiya Motsinger	Transportation Planner Project Manager; document preparer and technical reviewer	BA, Urban and Regional Planning; 10 years of experience in transportation planning
Paul Peninger	Director of Economics; technical reviewer for Economic Impact Assessment	Masters of City/Urban, Community and Regional Planning; 22 years of experience in economic analysis and policy
Joanna Rocco, AICP	Environmental Planner; document preparer and technical reviewer	MS, Environmental Studies; 16 years of experience
Christy Shumate, AICP	Transportation Planner Project Manager; technical reviewer	Masters of Environmental Management, BS, Natural Sciences, AICP; 16 years of experience in NEPA documentation
Eric Spalding, PE	Transportation Engineer; roadway designer	BS, Civil Engineering, PE; 5 years of experience in roadway design
Karen Taylor, PE (former AECOM)	Senior Transportation Planner/Engineer; document preparer and technical reviewer	BS, Civil Engineering, BS, Environmental Engineering; PE; 19 years of experience in project planning and management, NEPA analysis/documentation
Liz Twiss	Senior Editor/Writer	BS, Business Administration; 30 years of experience in editing, developing, and producing documentation materials
Jeff Weisner, AICP (former AECOM)	Senior Environmental Planner/Planning Department Manager; technical reviewer	BS, Biology; 24 years of experience as Environmental Planner and Project Manager for transportation and facilities projects
Chris Werner, PE (former AECOM)	Former Project Manager/Transportation Engineer; document preparer and technical reviewer	BS, Civil Engineering, PE; 12 years of experience in planning projects, transportation design, environmental impact assessments
Susan Westberry, AICP	Senior Environmental Scientist; document preparer and technical reviewer	MS, Botany, PWS, AICP, CPESC; 19 years of experience in stream and wetland assessments and NEPA documentation



Name	Position	Qualifications
Kory Wilmot, AICP	Project Manager/Urban Planner; document reviewer	Masters of Public Administration, BA, Urban and Regional Planning, AICP; 16 years of experience in NEPA documentation
Cyndy Yu-Robinson	Public Involvement Specialist; document preparer	Master of Pacific International Affairs; 24 years of experience in corporate communication and public affairs

## 6.2 DEIS DISTRIBUTION

In order to facilitate review and comment, the following agencies, local officials, and public libraries were provided copies of this document.

### 6.2.1 Federal Agencies

- Advisory Council on Historic Preservation
- FEMA
- FHWA
- USACE
- USCG
- USDA NRCS
- US Department of Commerce – NOAA – National Marine Fisheries Service
- US Department of Health and Human Services
- US Department of Housing and Urban Development
- US Department of the Interior
  - Office of the Secretary
  - Fish and Wildlife Service: Raleigh Field Office
  - National Park Service
  - USGS
- US Department of Transportation
- USEPA Region IV (Environmental Review Branch)

### 6.2.2 State Agencies

- North Carolina Department of Administration, State Clearinghouse
- North Carolina Department of Cultural and Natural Resources
- NCDEQ





- Division of Air Quality
- Division of Coastal Management
- Division of Energy, Mineral, and Land Resources
- Division of Environmental Assistance and Customer Service
- Division of Environmental Education and Public Affairs
- Division of Marine Fisheries
- Division of Mitigation Services
- Division of Waste Management
- Division of Water Infrastructure
- Division of Water Resources
- NCNHP
- NCWRC
- NCDOT Division 2

### **6.2.3 Local Government and Agencies**

- Lenoir County
  - Chair, Lenoir County Commissioners
  - County Manager
  - Emergency Management Agency
- Craven County
  - Chair, Craven County Commissioners
  - County Manager
  - Emergency Management Agency
- Jones County
  - Chair, Jones County Commissioners
  - County Manager
  - Emergency Management Agency
- Eastern Carolina Rural Planning Organization
- Mayor of Kinston
- Mayor of La Grange
- Mayor of Dover
- Lenoir County Civil War Battlefields Commission



- Neuse Regional Library
- Cove City-Craven Library
- La Grange Public Library

#### **6.2.4 Interest Groups**

Historical Preservation Group, Inc.

American Battlefield Trust, <https://www.civilwar.org/>





# CHAPTER 7

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## 7. REFERENCES

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