Biological Opinion

Bridge 25 Replacement on SR 2033 (Oak Grove Road) over Buffalo Creek, Cleveland County, North Carolina

TIP B-5845
WBS Element 45798.1.1
Service Log #21-231

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INTRODUCTION

A Biological Opinion (Opinion) is the document that states the opinion of the U.S. Fish and Wildlife Service (Service) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (ESA), as to whether a federal action is likely to jeopardize the continued existence of species listed as endangered or threatened; or result in the destruction or adverse modification of designated critical habitat.

The North Carolina Department of Transportation (NCDOT), Division 12, proposes to replace Bridge 25 on SR 2033 (Oak Grove Road) over Buffalo Creek in Cleveland County. The U.S. Army Corps of Engineers (USACE) is the lead federal action agency for this project, as the proposed action will impact Waters of the United States.

This document transmits the Service's Opinion of the proposed action and its effects on federally threatened dwarf-flowered heartleaf (*Hexastylis naniflora,* DFHL). This Opinion is based on information provided in a Biological Assessment (BA) submitted to the Service by the USACE on August 19, 2022, email communications between NCDOT and the Service, virtual meetings, communications with experts on the affected species, and other sources of information. The proposed work will directly affect 705 DFHL plants and indirectly affect 911 DFHL plants, necessitating formal consultation.

On July 5, 2022, the U.S. District Court of the Northern District Court of California vacated the 2019 regulations implementing section 7 of the ESA. On September 21, 2022, the Ninth Circuit Court of Appeals granted a request to stay the U.S. District Court of Northern California's July 5, 2022, order that vacated the 2019 ESA regulations. As a result, the 2019 regulations are again in effect, and the Service has relied upon the 2019 regulations in rendering this Opinion. However, because the outcome of the legal challenges to 2019 ESA Regulations is still unknown, we considered whether our substantive analyses and conclusions in this consultation would have been different if the pre-2019 regulations were applied. Our analysis included the prior definition of "effects of the action," among other prior terms and provisions. We considered all the "direct and indirect effects" and the "interrelated and interdependent activities" when determining the "effects of the action." As a result, we determined the substantive analysis and conclusions would have been the same, irrespective of which regulations applied.

CONSULTATION HISTORY

A complete administrative record of this consultation is on file at the Service's Asheville Ecological Services Field Office. A summary of correspondences concerning the project includes the following:

- August 12, 2016 – Email: NCDOT provided the Service with a list of upcoming projects and associated northern long-eared bat (*Myotis septentrionalis*) programmatic biological opinion 4d rule memos for review.
- August 15, 2016 – Email: The Service confirmed northern long-eared bat 4d rule compliance.
- April 28, 2021 – Email: NCDOT requested scoping comments from the Service.
- May 19, 2021 – Email: The Service provided a scoping letter with comments for the project.
- January 13, 2022 – Email: USACE issued a public notice for the project.
- March 1, 2022 – Email: Due to anticipated adverse impacts, NCDOT requested review and comment from the Service on draft figures and potential conservation measures for DFHL.
- March 11, 2022 – Email: The Service provided a response to NCDOT with questions regarding DFHL and project details.
- March 25, 2022 – Phone Call: USACE called the Service to discuss project details and potential conservation measures for DFHL.
- March 31, 2022 – Phone Call: The Service called NCDOT and left a voicemail to discuss the draft BA and potential conservation measures.
- April 4, 2022 – Remote Meeting: Several members from the Service, NCDOT, USACE and Three Oaks Engineering met to discuss project background, timeline, and potential conservation measures for DFHL.
- April 18, 2022 – Email: USACE sent a draft BA to the Service.
- April 26, 2022 – Email: NCDOT sent DFHL survey reports to the Service.
- May 19, 2022 – Email: The Service provided comments to USACE and NCDOT on the draft BA.
- June 15, 2022 – Email: USACE provided comments to the Service on conservation funding.
- June 27, 2022 – Email: The Service responded to USACE's comments on conservation funding.
- August 4, 2022 – Remote Meeting: The Service and NCDOT discussed DFHL conservation funding.
- August 19, 2022 – Email: USACE provided the final BA to the Service.

1. DESCRIPTION OF THE PROPOSED ACTION AND ACTION AREA

As defined in the Service's section 7 regulations (50 CFR 402.02), "action" means "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." The action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The direct and indirect effects of the actions and activities must be considered in conjunction with the effects of other past and present Federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

1.1 PROJECT DESCRIPTION

The NCDOT proposes to replace Bridge 25 on Oak Grove Road over Buffalo Creek in Cleveland County, North Carolina (Appendix A, Figure 1). The scope of B-5845 is to replace the deteriorated bridge with minimal effects to the roadway approaches, environment, and surrounding properties. The bridge will be replaced to the south of the existing structure to avoid buildings associated with the T.J. Ellison Water Treatment Plant, including a pump control building immediately north of Oak Grove Road. The total length of the project is approximately 0.37 miles. There will be no off-site detour and the existing bridge will remain open during construction until the replacement bridge is ready to open.

One driveway and one tributary to Buffalo Creek, both on the south side of Oak Grove Road, will require relocation as a result of the bridge replacement. Utilities on the south side of the road will have to be relocated further south and may require additional land disturbance to avoid wetland and stream impacts.

The typical section for Oak Grove Road will include 12-foot lanes, 5-foot paved shoulders, and 8-foot total shoulder width. Based on preliminary design information, the replacement bridge will have two spans, a length of 230 feet, and out-to-out width of 36 feet and 7 inches. The project will help to reduce automobile accidents with the introduction of a wider bridge and 5-foot paved shoulders for the entire project limit. The proposed design provides modifications to the bridge approaches (paved shoulders and installation of longer guardrail sections) which will improve the overall safety of the facility. The realigned driveway will be 10-16 feet wide with 2-foot shoulders.

The replacement of Bridge 25 on Oak Grove Road over Buffalo Creek will include:

- Approximately 890 feet of approach work (realignment, grading, paving, drainage) to the west of the bridge.
- Approximately 830 feet of approach work (realignment, grading, paving, drainage) to the east of the bridge.
- Approximately 230 feet of driveway work (relocation, grading, paving, drainage) just west of the bridge and parallel to Buffalo Creek. The driveway easement belongs to the City of Shelby.
- Approximately 874 linear feet of jurisdictional stream impacts.

This existing section of Oak Grove Road is a two-lane facility that varies from 22 – 24 feet in width along both approaches to the bridge. The existing bridge is a 225-foot long by 28-foot wide, reinforced concrete deck on I-beams, five-span structure. The approaches have grass shoulders of variable width and guardrail sections on the western approach. There is currently no access control in the project area, and none is proposed.

Existing culverts in the project footprint include:

- One 62-foot long by 36-inch diameter reinforced concrete pipe (RCP) (Appendix B, Plan Sheet -L- station 17+34) will be retained and extended upstream with 61 feet of RCP. On the upstream end of the existing 36-inch pipe, there is an additional 6 feet of 30-inch diameter corrugated metal pipe (CMP) which will be replaced with the proposed pipe extension.
- One 78-foot long by 36-inch diameter RCP (Appendix B, Plan Sheet -L- station 19+60) will be retained and extended downstream with 106 feet of 36-inch RCP.
- The remaining culverts in the project footprint are all less than 36 inches in diameter.

A detailed description of the construction activities, as provided by NCDOT, is included as Appendix D.

1.2 CONSERVATION MEASURES

Conservation measures represent actions, pledged in the project description, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. We consider the beneficial effects of conservation measures in making our determination of whether the project will jeopardize the species.

NCDOT made the following design modifications to avoid and minimize impacts to DFHL from the proposed action:

- NCDOT designed the bridge and roadway approaches to sit as close to existing approaches as possible to still allow for construction while maintaining traffic on the existing crossing. NCDOT typically recommends an 8-foot shoulder width on a bridge carrying this type of facility; however, to reduce adverse effects, the shoulder on the bridge design was reduced to 5 feet. This design specification served to avoid the loss of 70 DFHL plants and 0.08 acres of occupied habitat.
- NCDOT designed the grade to be kept as close to existing as practical by reducing vertical curvature down to 35 mph, requiring a design exception. Without this design specification, the project footprint would have extended roughly 25 feet further south to maintain traffic on the existing alignment during construction. This design change along with the modifications to the horizontal curvature avoided the loss of approximately 145 DFHL plants and 0.17 acres of occupied habitat.
- NCDOT designed drainage features to direct stormwater runoff within the southeast quadrant of the project away from DFHL Site D (Appendix A, Figure 2) into the stream relocation area, where it will discharge into Buffalo Creek, avoiding impacts to DFHL.
- NCDOT designed the stream relocation to be as close as possible to Oak Grove Road, minimizing effects to Site D.

NCDOT proposed the following conservation measures to avoid and/or minimize potential impacts to DFHL from project-mediated activities:

1. Fencing. High-visibility fencing will be placed around DFHL sites within 25 feet of slope stakes or at the edge of construction (in areas where drainage, driveway or utility work is taking place) to ensure no accidental encroachment.

2. Restricted Staging Areas. No access or staging area will be permitted within DFHL sites. These sites will be clearly demarcated via the high-visibility fencing.

3. Pre-construction site meeting. NCDOT environmental staff will conduct on-site meetings with utilities and construction contractors to review DFHL areas and the commitments outlined in this document.

4. Contribution to Conservation Fund. By December 31, 2022, NCDOT commits to provide $67,746 to the NCDOT/North Carolina Plant Conservation Program (NCPCP) fund for DFHL conservation.

1.3 ACTION AREA

The project action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR §402.02).

The project study area consists of five delineated DFHL sites (A, BA, BB, C, and D) (Appendix A, Figure 2). The project action area contains two of the five DFHL sites (C and D). Biologists from Three Oaks Engineering conducted initial surveys on April 22, 2021 and follow-up surveys on August 24, 2021. Site A occurs north of the existing bridge and consists of 43 DFHL plants. Site BA occurs north of the highway, west of Buffalo Creek, and contains 5 DFHL plants. Site BB is north of the highway, west of Buffalo Creek, and contains 1 DFHL plant. Site C is south of the highway and west of Buffalo Creek and contains 1,711 DFHL plants. Site D is south of the highway and east of the creek and contains 679 DFHL plants.

To determine the action area, NCDOT reviewed the activities associated with the project and the effects those activities will have on the environment. Construction activities and effect pathways used to create the action area include excavation, grading, mechanized clearing, utility and driveway relocation, bridge construction and demolition, hydrological effects, and biological pollution from non-native invasive plant species (NNIS). The action area was established using the described actions and the associated potential consequences, which include:

- Areas within the project cut/fill lines (slope stakes [SS]) plus a 25-foot buffer to account for mechanized clearing, access, erosion control maintenance, etc.
- Easements for drainage and utility relocations.
- A 150-foot effect buffer was added from SS/drainage easements adjacent to DFHL Site C (Appendix A, Figure 2) where there is potential for biological pollution (via NNIS) to affect DFHL occupied habitat.

The action area does not include the following:

- A buffer for Site D because it has a low threat from NNIS (NCDOT 2021a).
- DFHL sites on the north side of Oak Grove Road (A, BA, and BB), as they will not be affected by any ground-disturbing activity associated with B-5845. Although there are a wide range of threats from existing NNIS occurring north of the project's action area at Site A (existing low threat), Site BA (existing medium threat), and Site BB (existing high threat), road construction activities will not break any ground in occupied DFHL habitat at any of these sites. The lack of ground disturbance at the road construction/occupied habitat interface will not create bare soil conditions that could provide opportunities for additional NNIS to encroach upon and/or outcompete the DFHL plants or the occupied DFHL habitat within the sites. Consequently, no adverse effects from biological pollution – or any other consequences of the action - are anticipated to occur at Sites A, BA, and BB. These sites are excluded from the project's action area.

2. STATUS OF THE SPECIES

Species: Dwarf-flowered heartleaf (*Hexastylis naniflora*)
Family: Aristolochiascaea
Status: Threatened (proposed for delisting)
Date Listed: April 14, 1989 (FR 54 14964-14967)

2.1 OVERVIEW

DFHL was listed as a threatened species in 1989 under the authority of the ESA. The herbaceous evergreen is endemic to the western Piedmont and foothills regions of North and South Carolina. DFHL occurs in sandy-loam soils, and is generally found in mesic to dry bluffs, slopes or ravines in deciduous forests; or in moist soils adjacent to creeks, streamheads, lakes, and rivers (Robinson 2016). The primary threats to the species include habitat loss due to the conversion of land to residential, commercial, and industrial use (Service 1989) and habitat loss from land conversion to agricultural use, timber harvest, hydrological alterations from the damming of ponds, impacts from grazing cattle, off-road vehicle damage, trampling from foot traffic, invasive species, highway or road improvements, and erosion or siltation (NCNHP 2016, Robinson and Padgett 2016). DFHL occupies rapidly developing urban areas surrounding the municipalities of Charlotte, Greenville, Spartanburg, and Hickory. The 2019 Species Status Assessment (SSA) lists the following threats to the viability of this plant: human population change, development, invasive species, woody encroachment, and climate change (Service 2019).

The initial listing rule recognized 24 populations of DFHL distributed across eight counties in North and South Carolina. The SSA recognizes 119 known populations occurring in 10 counties in North Carolina and three counties in South Carolina. Of the known populations, 28 are composed of >1,000 plants and are considered to have very high viability (Service 2019). At least 40 known populations currently occur on lands either protected in perpetuity, or protected, but not in perpetuity (Service 2019). Conservative population estimates include a collective total of more than 300,000 rosettes (NCNHP 2016, SC Department of Natural Resources (SCDNR) 2016). However, the NCNHP estimates that the short-term trend over approximately 30 years is declining 10-30%. This estimation reflects documented declines of some populations, while many others appear stable, and some have increased (Service 2019).

Following a review of the best-available science, the Service proposed to delist DFH due to recovery on April 26, 2021 (Service 2021). The Service is currently evaluating comments received on the proposed delisting (60-day public comment period now closed). The Service will make a final listing determination once comments have been addressed.

2.2 ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the ESA, when considering the effects of an action on federally listed species, we are required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and past and present impacts from all Federal, state, or private actions and other activities in the action area (50 CFR 402.02), including Federal actions in the area that have already undergone section 7 consultation and the impacts from state or private actions that are contemporaneous with the consultation in progress. The environmental baseline for this Opinion considers all projects approved prior to the initiation of formal consultation.

The action area contains elevations ranging from 640 to 740 feet above mean sea level. Land use in the project vicinity consists primarily of a water treatment facility, roadway and bridge infrastructure, and forested habitat. The project is located within the Broad River Basin and the topography in the project study area is characterized as rural ridge and valley. The Moss Lake Dam is approximately 800 feet north

of the existing bridge. Natural communities within the action area consist primarily of Dry-Mesic Oak-Hickory Forest, Mesic Mixed Hardwood Forest, and Pine Plantation. Soil types consist of Grover, Grover/Madison-Bethlehem, and Hulett. NNIS growth is most extensive on the north side of Oak Grove Road, where more disturbed habitat is present. Invasive plants include Japanese honeysuckle (*Lonicera japonica*), Nepalese stiltgrass (*Microstegium vimineum*), tree-of-heaven (*Ailanthus altissima*), and Oriental false hawksbeard (*Youngia japonica*).

The B-5845 project footprint consists of maintained/disturbed habitat along Oak Grove Road, near the T.J. Ellison Water Treatment Plant (east side of project), at the entrance to the John H. Moss Lake Recreation Park (west side of project), and at a couple of home sites (far west end of project). A gravel driveway runs south from Oak Grove Road, running parallel to the creek. Remaining areas of the project footprint are forested. It is likely that the construction of Oak Grove Road, the utility lines that run parallel to it, and the driveway running south from the road historically altered the DFHL population in the area by fragmenting it and reducing available habitat. The construction of the water treatment plant, the recreation area, and nearby residential area also may have affected DFHL habitat.

DFHL surveys occurred on April 22, 2021 and follow-up surveys occurred on August 24, 2021. Results of those surveys within the action area are shown in Table 1.

Table 1. B-5845 DFHL Populations within Action Area

DFHL Site	Plant Count	Area (ac)	*NNIS Threat Level
C	1,422	1.28	Medium
D	194	0.51	Low
Total	1,616	1.79	

*Based on North Carolina Natural Heritage Program rare plant survey form data field.

3. EFFECTS OF THE ACTION

Under section 7(a)(2) of the ESA, "effects of the action" refers to the consequences, both direct and indirect, of an action on the species or critical habitat. The effects of the proposed action are added to the environmental baseline to determine the future baseline, which serves as the basis for the determination in this Opinion. Should the effects of the federal action result in a situation that would jeopardize the continued existence of the species, we may propose reasonable and prudent alternatives the federal agency can take to avoid a violation of section 7(a)(2). The direct and indirect effects of the actions and activities must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

3.1 DIRECT EFFECTS

According to the information provided, approximately 1,616 DFHL plants occur within the action area, distributed over 1.79 acres. The combination of construction, utility, stream, and driveway relocation activities will directly affect 705 DFHL plants (Table 2). Directly affected plants are expected to be crushed or buried resulting in the death of the plant.

Effects from construction, and utility, stream, and driveway relocation activities (Appendix B, Plan Sheets) are expected as follows:

- Mechanized vegetation clearing for utility alignment, construction areas, and stream/driveway relocation areas.
- Land disturbance for construction of the bridge, roadway approaches, and stream/driveway relocation areas.
- Hydrologic alterations resulting from stream relocation, collection and discharge of stormwater from roadway realignment, and temporary alterations during bridge construction from stormwater pipe installations, dewatering, erosion control, and temporary work pads.

3.2 INDIRECT EFFECTS

Indirect effects are those impacts that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur.

Adverse indirect effects from biological pollution could include species composition change in the understory, increased light penetration from clearing, and potential for NNIS to encroach on the habitat. Based on post-construction monitoring at multiple NCDOT projects where DFHL occur, along with surveys conducted within the project action area, healthy viable clusters of DFHL are often found right up to the clearing/construction limits, as well as disturbed habitats such as logged areas, commercial developments, and surface mine remnants. DFHL has also been found to grow in disturbed, early successional and maintained powerline easements where light penetration reaches the population (NCDOT 2009, 2012). Similar results have been documented (or observed) with understory density changes along roadway projects, where DFHL persist despite increased shading. Therefore, adverse effects of the action from biological pollution due to changes in light regime from clearing and higher understory density are not anticipated.

Biological pollution through the encroachment of NNIS is another possible indirect adverse effect of the action. Clearing and ground disturbing activities, especially those close to occupied habitat, will create conditions for the establishment of NNIS. If or once NNIS establish in these areas, they can more easily move into habitat occupied by DFHL. The estimated distance a planted roadside species could invade into the woods is 33 to 400 feet (Forman and Deblinger 1998). A 150-foot buffer to estimate potential NNIS encroachment into Sites C is based on a median distance and on the "medium" NNIS threat level designation. The primary NNIS of concern in this location is Japanese honeysuckle. Based on these considerations, it is anticipated that a total of 911 plants within 0.82 acres of occupied DFHL habitat could incur adverse indirect effects from NNIS encroachment (Table 2).

Because Site D has a "low" designated threat level from NNIS, it is not anticipated that adjacent clearing and construction disturbance will result in indirect adverse effects from NNIS encroachment. This is based on the minimal existing NNIS biomass and NNIS seed sources that could encroach on this area.

Table 2. DFHL Direct and Indirect Effects

Site	Direct Adverse Effects									Indirect Adverse Effects		Total Adverse Effects	
	Construction		Stream Relocation		Utilities		Driveway		Total	Bio Pollution			
Site	Acres	Plant #s	Acres	Plant #s	Acres	Plant #s	Acres	Plant #s	Plant #s	Acres	Plant #s	Acres	Plant #s
C	0.44	489	0.00	0	0.01	11	0.01	11	511	0.82	911	**1.28**	**1,422**
D	0.39	149	0.12	45	0.00	0	0.00	0	194	0	0	**0.51**	**194**
TOTAL	**0.83**	**638**	**0.12**	**45**	**0.01**	**11**	**0.01**	**11**	**705**	**0.82**	**911**	**1.79**	**1,616**

3.3 CUMULATIVE EFFECTS

Cumulative effects are defined as "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 CFR 402.02). Future federal actions unrelated to the proposed action are not considered because they require separate consultation pursuant to Section 7 of the Endangered Species Act.

The B-5845 bridge replacement will not increase traffic capacity and will not provide access to previously inaccessible land. Also, increased development is unlikely along Oak Grove Road as a result of B-5845. Residential, commercial, industrial, and mixed-use development is expected to continue in the area with or without the project. Websites and planning documents from local and regional economic development and planning agencies were searched for development plans along the Oak Grove Road corridor, including county economic development websites and the Gaston-Cleveland-Lincoln Metropolitan Planning Organization. These sites did not list industrial focus areas or economic development focus areas in the vicinity of the B-5845 project (Centralina Council of Governments 2005). Therefore, there are no anticipated cumulative effects associated with the action.

3.4 CONCLUSION

After reviewing the current status of DFHL, the environmental baseline for the action area; and the effects of the action, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of DFHL. This opinion is supported by the fact that plants (directly and indirectly) affected by the proposed project (a total of 1,616) represent approximately 0.53% of the total range-wide abundance (approximately 300,000 individuals). No critical habitat has been designated for this species; therefore, none will be affected.

4. INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the taking of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation resulting in death or injury to listed species by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), incidental take is not prohibited under the ESA, provided it is in compliance with the terms and conditions of this incidental take statement.

Sections 7(b)(4) and 7(o)(2) of the ESA generally do not apply to listed plant species. However, section 9(a)(2)(B) provides limited protection to listed plants from take; the ESA prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage to such plants on areas under federal jurisdiction or the destruction of endangered plants on nonfederal areas in violation of state law or regulation or in the course of any violation of a state criminal trespass law. Therefore, for this Opinion, incidental take does not apply, and an incidental take statement is not necessary.

4.1 CONSERVATION RECOMMENDATIONS

Section 7(a)(l) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. The following conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- Conduct visual monitoring of indirectly impacted DFHL plants within the action area. Integrate observational accounts of indirectly impacted plants and spread of NNIS within Sites C and D into the environmental oversight of the construction and post-construction phases. This could provide valuable information on how the described indirect actions impact the species during and after project actions. A write-up of the results provided to the Service would be useful for future section 7 consultations.

In order for us to be kept informed about actions that minimize or avoid adverse effects or that benefit listed species or their habitats, we request notification of the implementation of any conservation recommendations.

4.2 REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the actions outlined in your project description dated September 9, 2021. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion, or (3) a new species is listed or critical habitat is designated that may be affected by the action.

5. LITERATURE CITED

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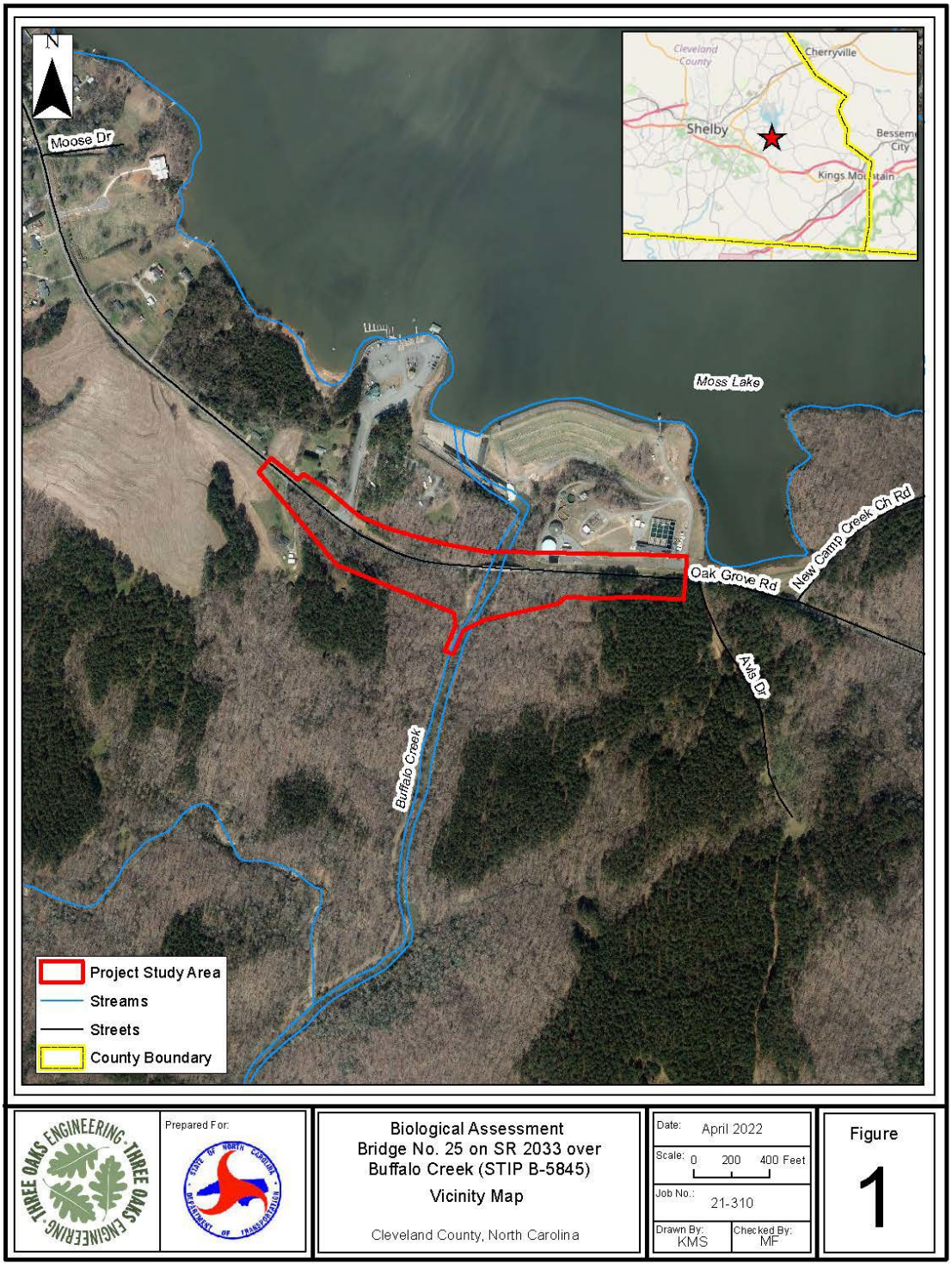
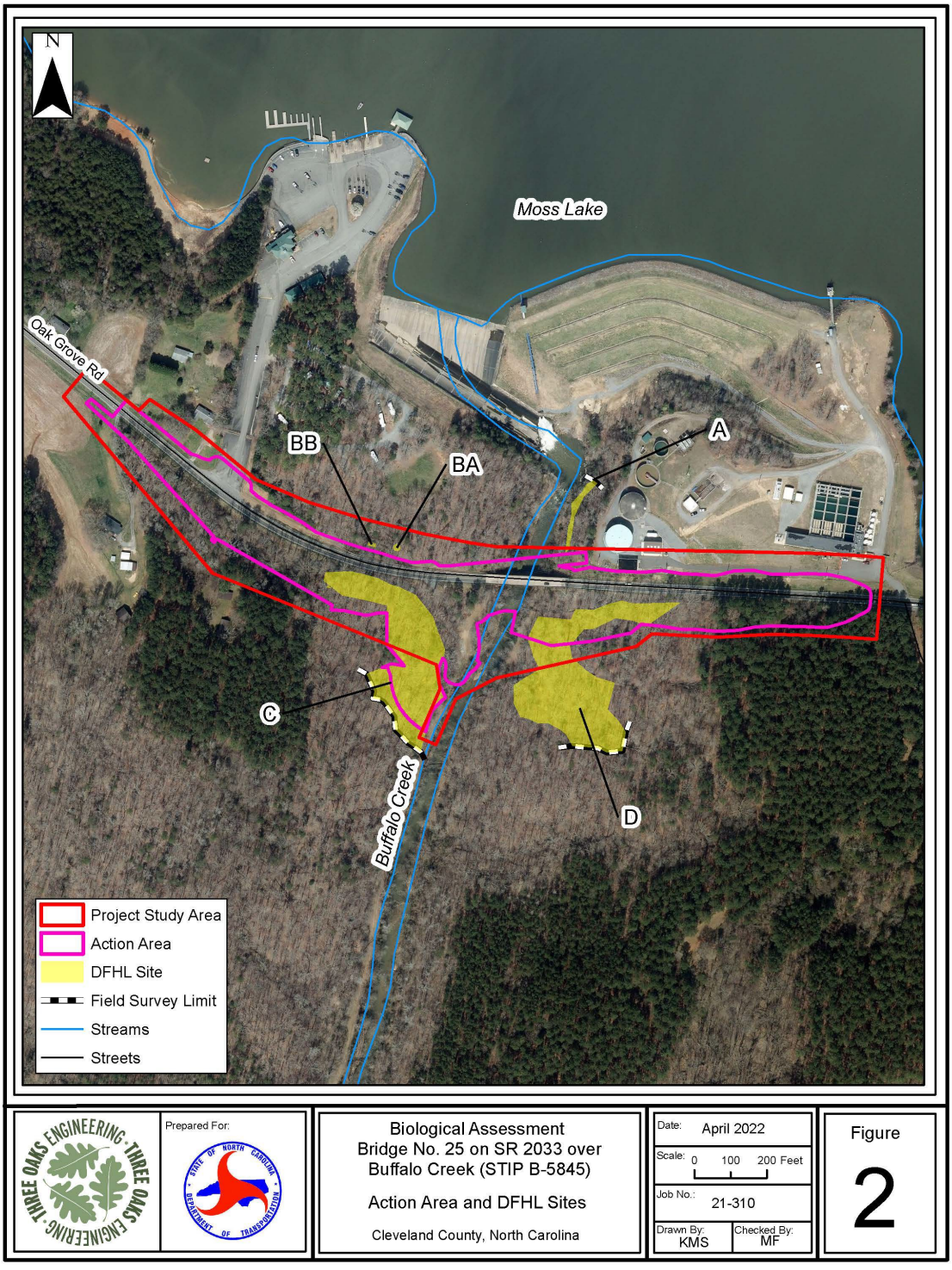
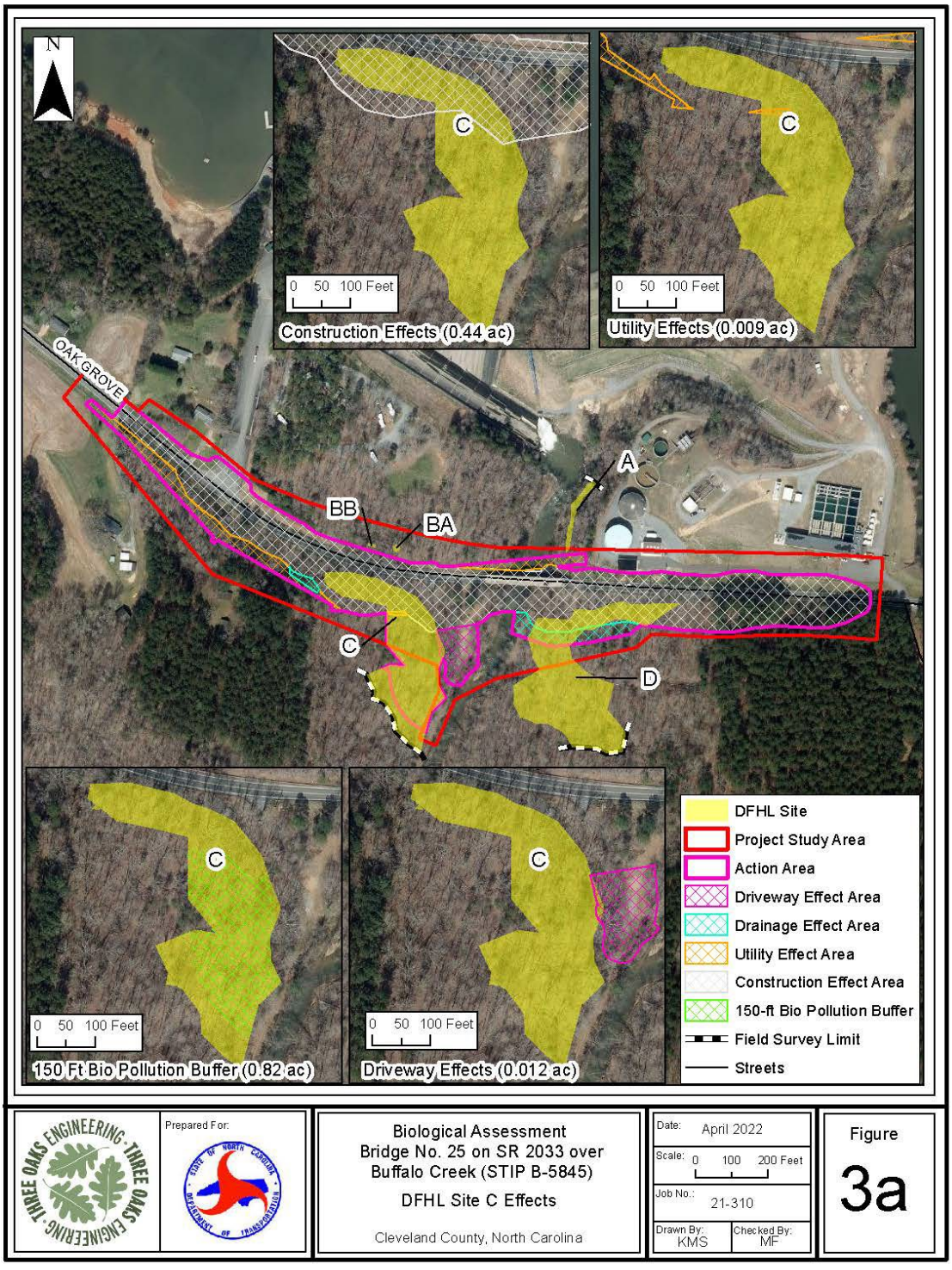
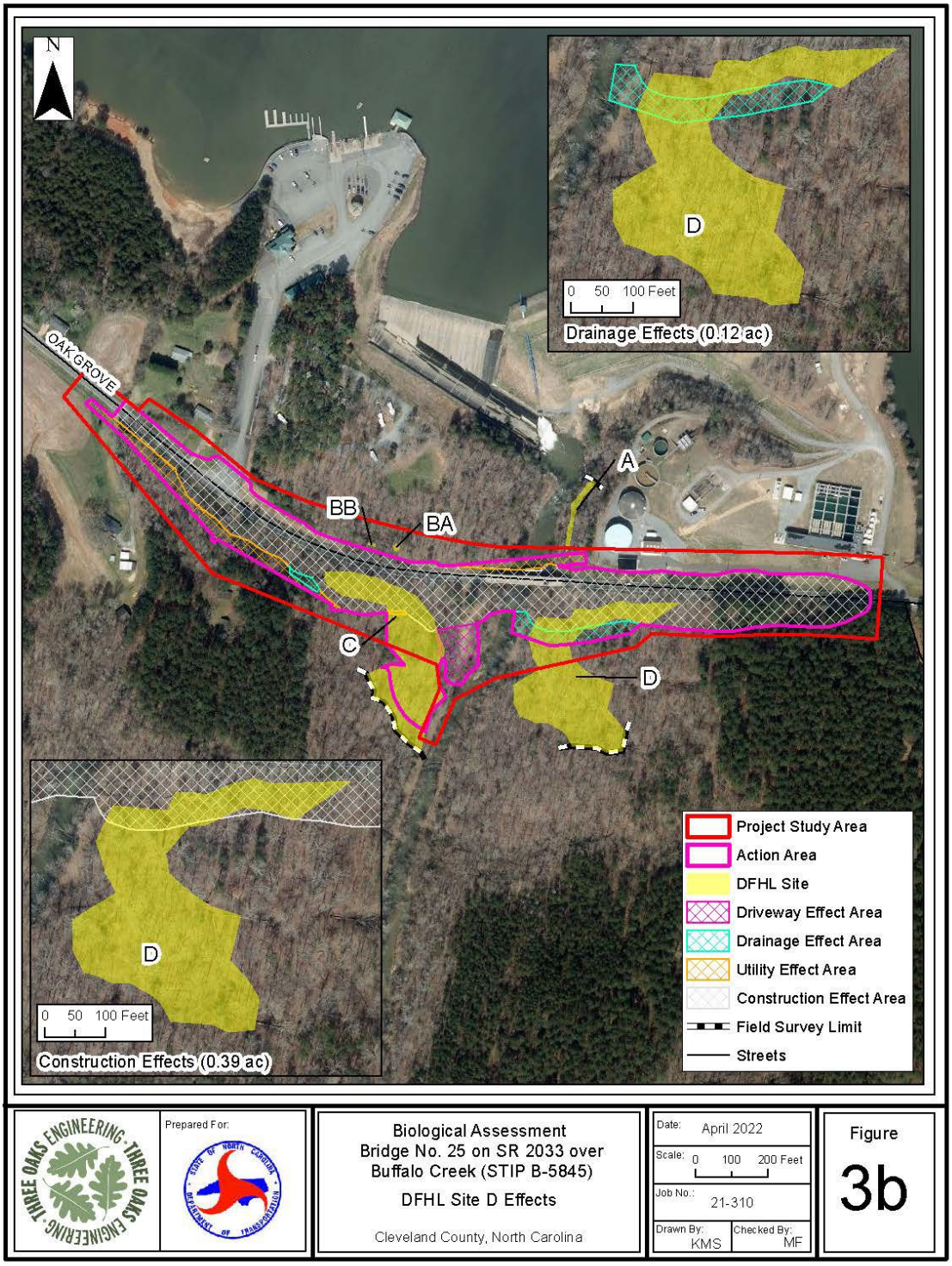
Service and National Marine Fisheries Service. 1998. Endangered Species Consultation Handbook. Print date March 1998.

APPENDIX A - FIGURES

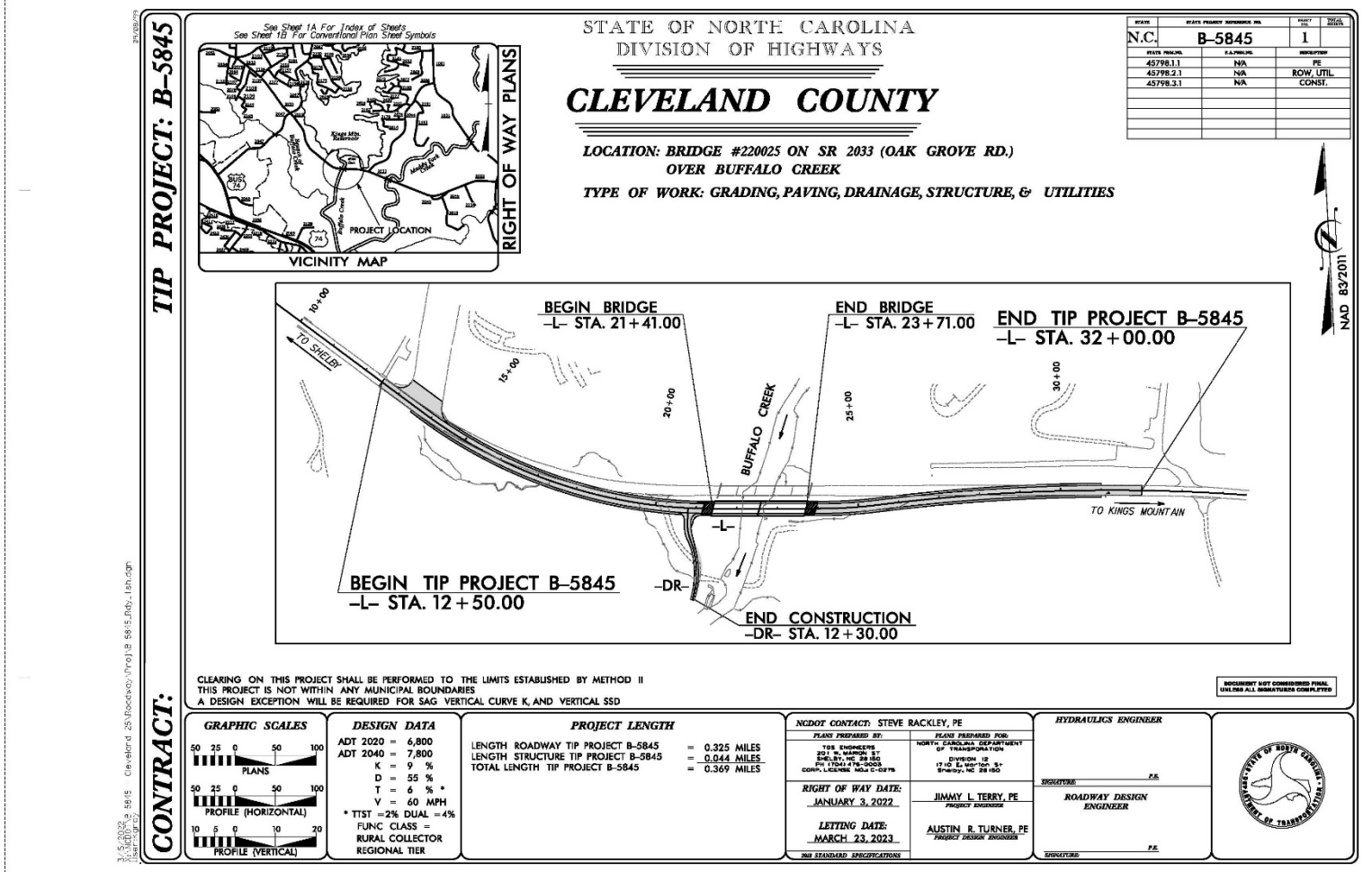


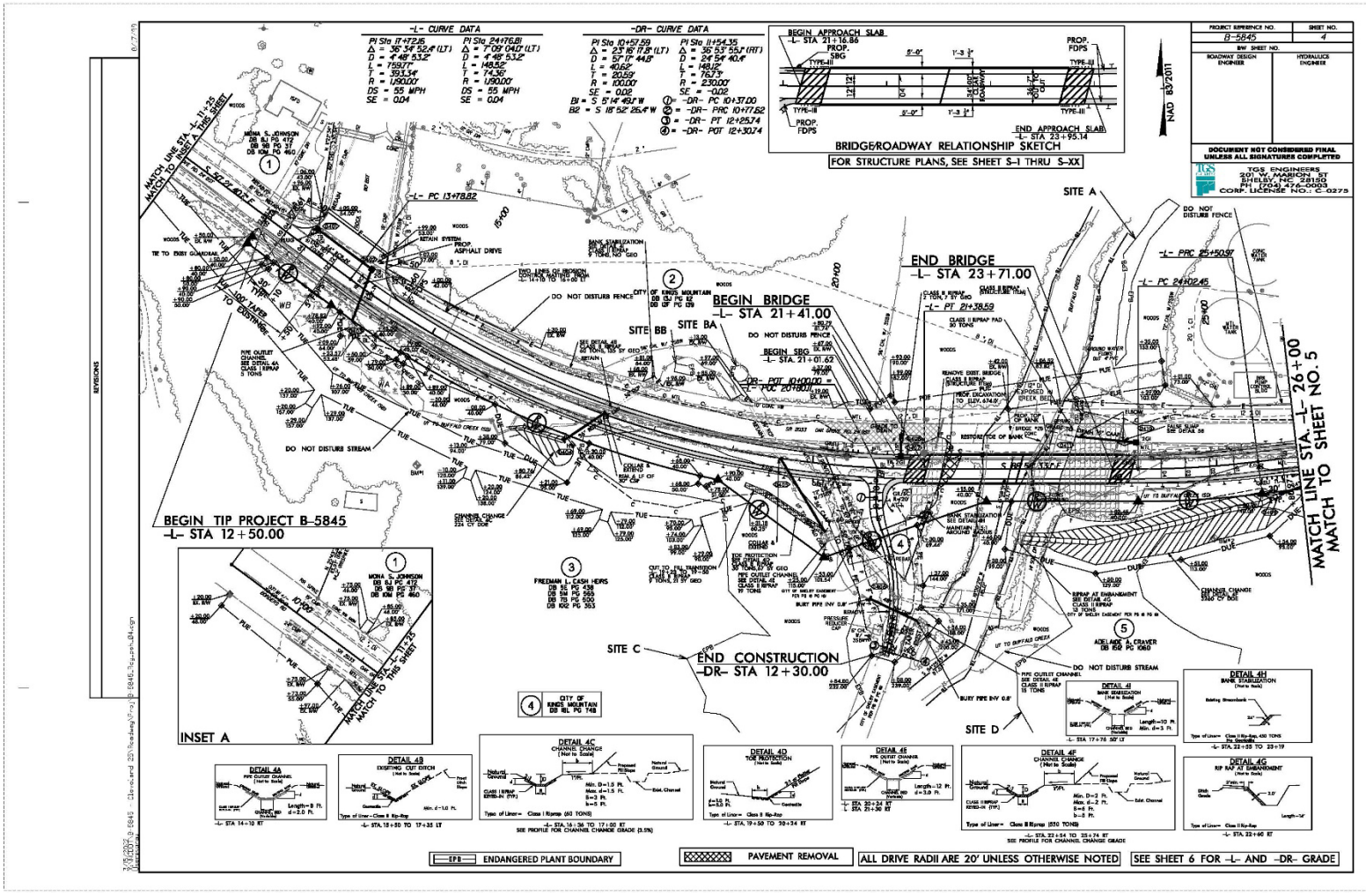

N
Moss Lake
Oak Grove Rd
BB
BA
A
C
D
Buffalo Creek
Project Study Area
Action Area
DFHL Site
Field Survey Limit
Streams
Streets
THREE OAKS ENGINEERING · THREE OAKS ENGINEERING ·
Prepared For:
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Biological Assessment
Bridge No. 25 on SR 2033 over
Buffalo Creek (STIP B-5845)
Action Area and DFHL Sites
Cleveland County, North Carolina
Date: April 2022
Scale: 0 100 200 Feet
Job No.: 21-310
Drawn By: KMS
Checked By: MF
Figure
2

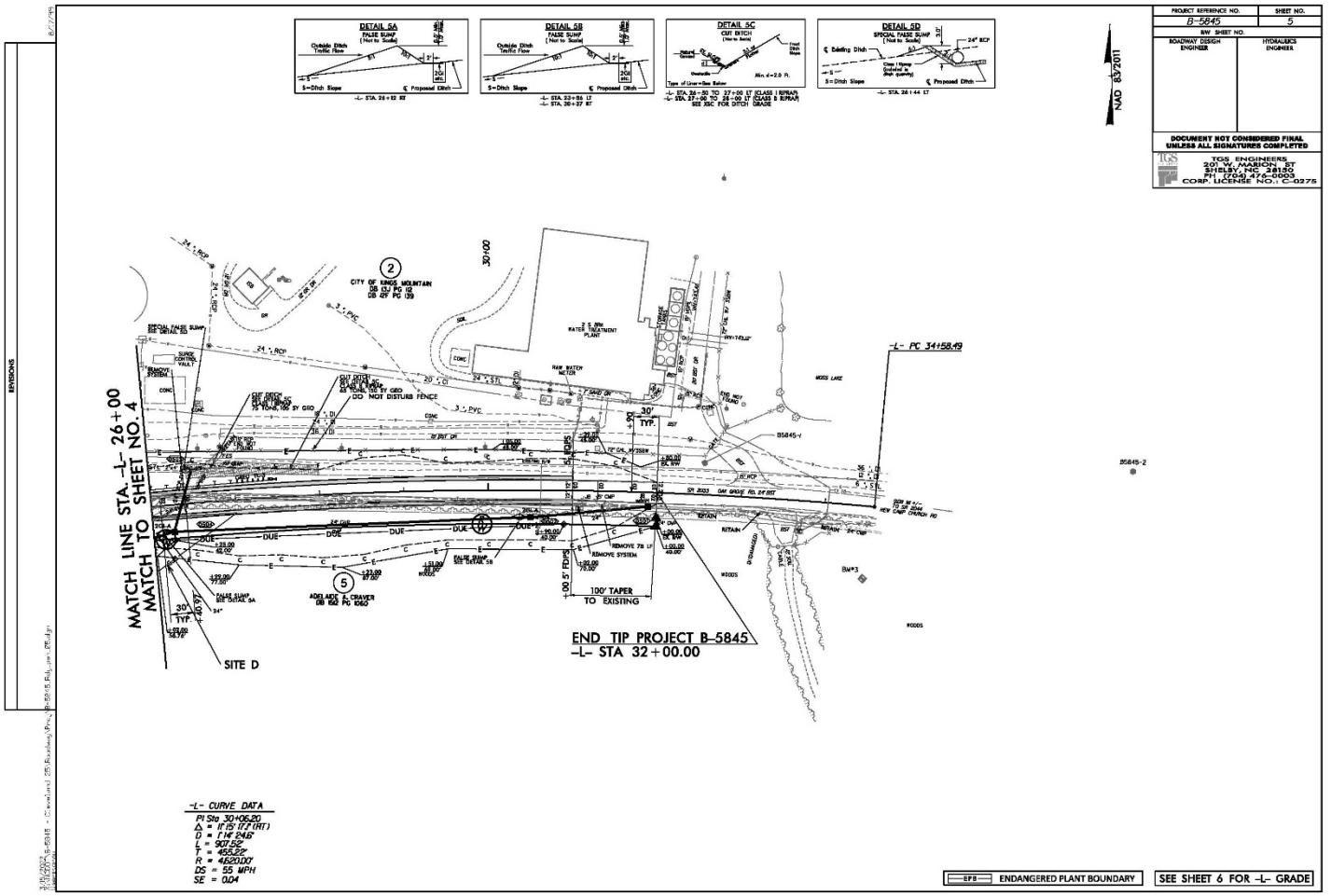

N
C
0 50 100 Feet
Construction Effects (0.44 ac)
C
0 50 100 Feet
Utility Effects (0.009 ac)
OAK GROVE
A
BB
BA
C
D
C
0 50 100 Feet
150 Ft Bio Pollution Buffer (0.82 ac)
C
0 50 100 Feet
Driveway Effects (0.012 ac)
DFHL Site
Project Study Area
Action Area
Driveway Effect Area
Drainage Effect Area
Utility Effect Area
Construction Effect Area
150-ft Bio Pollution Buffer
Field Survey Limit
Streets
THREE OAKS ENGINEERING
Prepared For:
Biological Assessment
Bridge No. 25 on SR 2033 over
Buffalo Creek (STIP B-5845)
DFHL Site C Effects
Cleveland County, North Carolina
Date: April 2022
Scale: 0 100 200 Feet
Job No.: 21-310
Drawn By: KMS
Checked By: MF
Figure
3a


N
OAK GROVE
A
BB
BA
C
D
D
0 50 100 Feet
Drainage Effects (0.12 ac)
D
0 50 100 Feet
Construction Effects (0.39 ac)
Project Study Area
Action Area
DFHL Site
Driveway Effect Area
Drainage Effect Area
Utility Effect Area
Construction Effect Area
Field Survey Limit
Streets
THREE OAKS ENGINEERING
Prepared For:
Biological Assessment
Bridge No. 25 on SR 2033 over
Buffalo Creek (STIP B-5845)
DFHL Site D Effects
Cleveland County, North Carolina
Date: April 2022
Scale: 0 100 200 Feet
Job No.: 21-310
Drawn By: KMS
Checked By: MF
Figure
3b

APPENDIX B – DESIGN PLANS




-L- CURVE DATA
-DR- CURVE DATA
BRIDGE/ROADWAY RELATIONSHIP SKETCH
FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-XX
BEGIN TIP PROJECT B-5845
-L- STA 12+50.00
BEGIN BRIDGE
-L- STA 21+41.00
END BRIDGE
-L- STA 23+71.00
END CONSTRUCTION
-DR- STA 12+30.00
MATCH LINE STA. -L- 26+00
MATCH TO SHEET NO. 5
SITE A
SITE BA
SITE BB
SITE C
SITE D
INSET A
DO NOT DISTURB STREAM
DO NOT DISTURB FENCE
ENDANGERED PLANT BOUNDARY
PAVEMENT REMOVAL
ALL DRIVE RADII ARE 20' UNLESS OTHERWISE NOTED
SEE SHEET 6 FOR -L- AND -DR- GRADE
TGS ENGINEERS
201 W. MARION ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0279
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
NAD 83/2011


DETAIL 5A
FALSE SUMP
DETAIL 5B
FALSE SUMP
DETAIL 5C
CUT DITCH
DETAIL 5D
SPECIAL FALSE SUMP
NAD 83/2011
PROJECT REFERENCE NO.
B-5845
SHEET NO.
5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
TGS ENGINEERING
201 W. MARION ST
SHELBY, NC 28150
PH: (704) 476-0003
CORP. LICENSE NO.: C-0275
REVISIONS
MATCH LINE STA. -L- 26+00
MATCH TO SHEET NO. 4
SITE D
CITY OF KINGS MOUNTAIN
DB 137 PG 18
DB 697 PG 139
ADELAIDE E. CRAVER
DB 652 PG 1060
30+00
-L- PC 34+58.49
B5845-1
B5845-2
B5845-3
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-L- CURVE DATA
PI Sta 30+06.20
Δ = 11° 15' 17.7" (RT)
D = 1°4' 29.6"
L = 907.52'
T = 455.52'
R = 4520.00'
DS = 55 MPH
SE = 0.04
END TIP PROJECT B-5845
-L- STA 32+00.00
ENDANGERED PLANT BOUNDARY
SEE SHEET 6 FOR -L- GRADE

APPENDIX D – CONSTRUCTION DETAILS

Project Timeline and Sequencing

- The public comment deadline for the individual permit application under Section 404 of the Clean Water Act (33 U.S.C. 1344) was February 14, 2022. The permit cannot be issued until a Biological Opinion is issued by the USFWS under Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 - 1543).
- The B-5845 Let date is scheduled for February 2024; utility relocation is scheduled to begin prior to Let, in January 2023; however, no relocations will occur within DFHL occupied habitat until the BO is issued.

Site Preparation

- Site preparation involves land clearing, grubbing, and earthwork. Clearing of trees and other vegetation will be performed to prepare the project area for construction activities. Clearing will likely consist of cutting and removing above-ground vegetation such as brush and trees, removing downed timber and other vegetative debris, and salvaging marketable timber. Grubbing will follow clearing operations to remove any remaining surface vegetation, roots, and buried debris. Trees, stumps, and large roots will be removed from excavation areas to a depth sufficient to prevent such undesirable material from becoming mixed with the material being incorporated in the embankment. All extraneous matter will be disposed of in designated waste areas by chipping, burying, or other methods of disposal, including burning. Various methods and equipment will be used for this work.
- Clearing and grubbing will take place within right-of-way (ROW) limits but may also occur in utility easements and temporary construction easements used to store construction vehicles that are too large to travel on the highway in one piece (e.g., haul trucks, earthmovers, large dozers, large excavators, cranes, etc.). These areas are also used to store supplies (erosion control materials, steel rebar and mesh, traffic signs and posts, office trailer, etc.).
- Earthwork includes all earth moving activities for road construction, including associated activities such as preparation of staging areas, bridge approaches, alignments, embankments, fills, backfills, foundations, waste areas, borrow areas, utility relocation, stormwater treatment, ditch construction and stabilization, and streambank stabilization. Specific earthwork practices can include excavating (cutting), filling, ditching, backfilling, grading, embankment construction, augering, disking, ripping, grading, leveling, and borrowing and wasting of materials. Typical earthmoving equipment used includes haul trucks, dozers, excavators, scrapers, backhoes, and tractors.

Construction access and Staging

- Construction access and staging areas will be ultimately determined by the selected contractor after letting. Project specifications and contracts will require that access and staging areas be located in upland areas, and an environmental review of any areas outside the proposed project footprint will be performed. This review would include wetland and stream delineations as well as evaluation of the area for potential habitat and presence of any listed species, including DFHL. No access or staging area will be permitted within DFHL sites. The contractor may use locations outside the action area for borrow pits or spoil areas in order to dispose of, or obtain, materials for earthwork. Most borrow and waste areas are sited in upland areas of previously disturbed habitat where vegetation removal is minimal. Construction contractors are responsible for addressing federally listed threatened and endangered species issues per NCDOT standard specifications. Contractors must submit plans for borrow pits/staging sites to NCDOT's Resident Engineer. The plans are reviewed by the Roadside Environmental Field Operations Engineer and Division Environmental Officer prior to approval. Details can be found at: https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/Contract%20Reclamation%20Procedures.pdf.

- In addition, this standard special condition will be in the 404 Clean Water Act permit issued by the U.S. Army Corps of Engineers for the project:

  Borrow and Waste: To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the Permittee (NCDOT) shall require its contractors and/or agents to identify all areas to be used as borrow and/or waste sites associated with this project. The Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating the locations of proposed borrow and/or waste sites as soon as such information is available. The Permittee shall submit to the Corps site-specific information needed to ensure that borrow and/or waste sites comply with all applicable Federal requirements, to include compliance with the ESA and the National Historic Preservation Act, such as surveys or correspondence with agencies (e.g., the USFWS, the NC-Historic Preservation Office, etc.). The required information shall also include the location of all aquatic features, if any, out to a distance of 400 feet beyond the nearest boundary of the site. The Permittee shall not approve any borrow and/or waste sites before receiving written confirmation from the Corps that the proposed site meets all Federal requirements, whether or not waters of the U.S., including wetlands, are located in the proposed borrow and/or waste site. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the U.S. Army Corps of Engineers and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with Special Condition ## of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. This documentation will include data regarding soils, vegetation, hydrology, any delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with Special Condition ##. All information will be available to the U.S. Army Corps of Engineers upon request. The Permittee shall require its contractors to complete and execute reclamation plans for each borrow and/or waste site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the U.S. Army Corps of Engineers within 30 days of the completion of the reclamation work.

<u>Bridge Construction/Demolition</u>

- The new bridge will be parallel to the existing bridge with an offset to the south. Bridge construction will include substructure pile-driving and drilling for bents, concrete and girder delivery, girder placement, concrete pours, and guardrail installation. Pile-driving will be conducted at the bridge end bents; it is estimated to take up to two weeks, with no night work. The number of bents in the creek is being reduced from two bents (existing) to one (proposed). These will be five-foot diameter drilled concrete piers. Temporary work pads will be placed in Buffalo Creek to facilitate bridge construction and the removal of the existing bridge.
- Once traffic flow has been moved to the new bridge, the old one will be demolished using a tractor trailer truck, cranes, and excavators. An excavator-mounted jackhammer will be used to remove the concrete bridge deck and concrete piers; this work is estimated to take 10 weeks. The deck will be removed first, followed by the girders then bridge supports. Bridge No. 25 is constructed of concrete and steel and should be possible to remove with no resulting debris in Buffalo Creek.

<u>Surface Waters & Wetlands</u>

- B-5845 construction will impact 874 linear feet of jurisdictional streams and 0.03 acres of jurisdictional riparian wetlands. As mentioned above, a jurisdictional tributary (SD) to Buffalo Creek will have to be re-aligned as a result of the bridge replacement. Proposed stream relocation work will occur at -L- 16+36 to 17+00 Right and -L- 22+60 to 25+74 Right (Appendix B, Plan Sheet No. 4). There will be permanent jurisdictional stream and wetland impacts due to roadway construction, stormwater pipe extensions, and stream bank stabilization. Temporary jurisdictional

impacts will result from roadway and bridge construction, stormwater pipe installations, dewatering, erosion control, and temporary work pads for bridge construction/removal. Work pad fill will cover 0.07 acre in Buffalo Creek.

- The NCDOT proposes a mitigation ratio of 2:1 for all mitigable impacts to Waters of the US on this project. Compensatory wetland and stream mitigation credits will be provided by the North Carolina Department of Environmental Quality – Division of Mitigation Services.

Post-Project Site Restoration

- Upon conclusion of the construction of the new bridge and roadway, disturbed areas will be re-vegetated. Typically, this will involve reseeding with grasses suitable for stabilization and maintenance of roadway side slopes. Borrow areas will be graded to drain and re-seeded. Temporary Best Management Practices (BMPs) such as silt fencing, check dams, and sediment basins will be removed.