

# **NATURAL RESOURCES TECHNICAL REPORT**

**Improvements to U.S. 70 from east of the SR 1116 (E. Thurman Road) intersection  
to the Proposed Havelock Bypass  
Craven County, North Carolina**

**STIP No. R-5777C  
WBS Element No. 44648.1.4**



**THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
Division of Highways – Division 2**

**July 2020**

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## 1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) proposes improvements to U.S. 70 from east of the SR 1116 (E. Thurman Road) intersection to the proposed Havelock Bypass (STIP No. R-1015) in Craven County, North Carolina (STIP No. R-5777C; Figures 1-2). The following Natural Resources Technical Report (NRTR) has been prepared to assist in the preparation of a federally funded Categorical Exclusion (CE), which will be prepared in accordance with the National Environmental Policy Act (NEPA).

## 2.0 METHODOLOGY

All work was conducted in accordance with the NCDOT Environmental Coordination and Permitting's (ECAP) Preparing Natural Resources Technical Reports Procedure and the latest NRTR Template (November 2017). Field work was conducted on the following 2019 dates: June 5-6 and 24-25 | July 24-25 | September 17-18 | November 6-7, 20-21, and 25-26 | December 11-12. Field work was also conducted on the following 2020 dates: January 27-31 | February 25-27 | April 8 and 16. The majority of potential jurisdictional areas in the study area were reviewed and field verified by United States Army Corps of Engineers (USACE) Regulatory Specialist Tom Steffens and North Carolina Division of Water Resources (NCDWR) Regulatory Specialist Garcy Ward during a Preliminary Jurisdictional Determination (PJD) field verification meeting held on December 11-12, 2019. However, in January of 2020, the study area was expanded, resulting in the identification of two additional wetlands. In email correspondence dated March 2, 2020, Tom Steffens confirmed that he had reviewed and accepted the revised PJD package, which included these two additional wetlands. Therefore, a site review of the wetlands was not requested. The principal personnel contributing to the field work and document are provided in Appendix B.

## 3.0 TERRESTRIAL COMMUNITIES

Six terrestrial communities were identified in the study area. Figure 4 shows the location and extent of these terrestrial communities. Terrestrial community data are presented in the context of total coverage of each type within the study area (Table 1). A large amount of open water was also located within the study area and its acreage is included in the table below.

**Table 1. Coverage of terrestrial communities in the study area**

Community	Dominant Species ( <i>Scientific name</i> )	Coverage (ac.)
Maintained/Disturbed	Broomsedge ( <i>Andropogon virginicus</i> ) Sericea lespedeza ( <i>Lespedeza cuneata</i> ) Japanese honeysuckle ( <i>Lonicera japonica</i> )	616.1

**Table 1. Coverage of terrestrial communities in the study area (continued)**

Community	Dominant Species ( <i>Scientific name</i> )	Coverage (ac.)
Coastal Plain Small Stream Swamp	Swamp tupelo ( <i>Nyssa biflora</i> ) Royal fern ( <i>Osmunda regalis</i> ) Swamp ti-ti ( <i>Cyrilla racemiflora</i> )	9.2
Cypress-Gum Swamp (Blackwater Subtype)	Bald cypress ( <i>Taxodium distichum</i> ) Titi ( <i>Cyrilla racemiflora</i> ) Lizard tail ( <i>Saururus cernuus</i> )	11.5
Dry-Mesic Oak-Hickory Forest (Coastal Plain Subtype)	White oak ( <i>Quercus alba</i> ) Sourwood ( <i>Oxydendrum arboreum</i> ) Striped wintergreen ( <i>Chimaphila maculata</i> )	68.9
Mesic Mixed Hardwood Forest (Coastal Plain Subtype)	White oak ( <i>Quercus alba</i> ) Beautyberry ( <i>Callicarpa americana</i> ) Little brown jug ( <i>Hexastylis arifolia</i> )	45.1
Open Water	N/A	4.3
Pine Forest	Loblolly pine ( <i>Pinus taeda</i> ) Sweetgum ( <i>Liquidambar styraciflua</i> ) False jessamine ( <i>Gelsemium sempervirens</i> )	613.4
	<b>Total</b>	<b>1,368.5</b>

## 4.0 PROTECTED SPECIES

### 4.1 Endangered Species Act Protected Species

As of April 25, 2018, the United States Fish and Wildlife (USFWS) lists nine federally protected species, under the Endangered Species Act (ESA), for Craven County. Two additional species are listed by USFWS as Proposed for Listing. Additionally, the National Oceanic and Atmospheric Administration (NOAA) – National Marine Fisheries Service (NMFS) also lists Atlantic sturgeon and shortnose sturgeon as potentially occurring in the Neuse River Basin in Craven County (Table 2). For each species, a discussion of the presence or absence of habitat is included below along with the Biological Conclusion rendered based on survey results in the study area.

**Table 2. ESA federally protected species listed for Craven County**

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	Yes	Not Required
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon	E	No	No Effect
<i>Noturus furiosus</i>	Carolina madtom	PE	No	No Effect

**Table 2. ESA federally protected species listed for Craven County (continued)**

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	E	No	No Effect
<i>Chelonia mydas</i>	Green sea turtle	T	No	No Effect
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	No	No Effect
<i>Necturus lewisii</i>	Neuse River waterdog	PT	No	MANLAA
<i>Myotis septentrionalis</i>	Northern long-eared bat	T	Yes	MALAA
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	Yes	No Effect
<i>Calidris canutus rufa</i>	Rufa Red knot	T	Yes	No Effect
<i>Trichechus manatus</i>	West Indian manatee	E	No	No Effect
<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E	Yes	No Effect
<i>Aeschynomene virginica</i>	Sensitive joint-vetch	T	No	No Effect

E – Endangered; PE – Proposed Endangered; PT – Proposed Threatened; T- Threatened; T(S/A) – Threatened due to similarity of appearance

MALAA – May Affect, Likely to Adversely Affect; MANLAA – May Affect, Not Likely to Adversely Affect

### **American alligator**

USFWS Optimal Survey Window: year-round (only warm days in winter)

Biological Conclusion: Not Required

Habitat for the American alligator is present within the project study area; however, no individuals were identified during any site visits. A review of the April 2020 North Carolina Natural Heritage Program (NCNHP) dataset identified no known occurrences of American alligator within the study area or within 1.0 mile of the study area. Additionally, this species is listed as Threatened due to Similarity of Appearance and a Biological Conclusion is not required.

### **Atlantic sturgeon**

USFWS/ NMFS Recommended Survey Window: surveys not required; assume presence in appropriate waters

Biological Conclusion: No Effect

In January 15, 2020 emails from Fritz Rohde (NOAA – NMFS) and Travis Wilson (North Carolina Wildlife Resources Commission; NCWRC), it was indicated that there are no Atlantic sturgeon concerns for this project due to habitat constraints (Appendix C). The study area currently extends 30-60 feet, perpendicularly, from the shoreline into the Neuse River at Fisher's Landing Campground. As a result, the river within the study area is limited to a shallow (less than 6 feet) littoral zone aquatic community, which is not suitable for Atlantic sturgeon. Additionally, no streams within the study area are large

enough to support this species. A review of the April 2020 NCNHP dataset identified one known occurrence of Atlantic sturgeon (Element Occurrence [EO] ID No. 38942) within 1.0 mile of the study area. This EO was last observed on April 17, 2018.

**Carolina madtom**

USFWS optimal survey window: year-round

**Biological Conclusion: No Effect**

This species is listed by the USFWS as a “range by basin” species. This project does not occur within this species’ range; moreover, there are no jurisdictional streams within the study area that possess the necessary habitat requirements of this species. Therefore, no habitat is present. Additionally, a review of the April 2020 NCNHP dataset identified no known occurrences of this species within 1.0 mile of the project study area.

**Shortnose sturgeon**

USFWS/ NMFS Recommended Survey Window: surveys not required; assume presence in appropriate waters

**Biological Conclusion: No Effect**

In January 15, 2020 emails from Fritz Rohde (NOAA – NMFS) and Travis Wilson (NCWRC), it was indicated that there are no shortnose sturgeon concerns for this project due to habitat constraints (Appendix C). The study area currently extends 30-60 feet, perpendicularly, from the shoreline into the Neuse River at Fisher’s Landing Campground. As a result, the river within the study area is limited to a shallow (less than 6 feet) littoral zone aquatic community, which is not suitable for shortnose sturgeon. Additionally, no streams within the study area large enough to support this species. A review of the April 2020 NCNHP dataset identified one known historical occurrence of shortnose sturgeon (Element Occurrence [EO] ID No. 24083) within 1.0 mile of the study area. This EO was last observed prior to 1980.

**Green sea turtle**

USFWS/NMFS Recommended Survey Window: April – August

**Biological Conclusion: No Effect**

Suitable marine and estuarine habitat for the green sea turtle does not exist in the study area. Therefore, surveys for this species are not needed. While a small portion of the study area extends from United States Forest Service (USFS) lands to the banks of the tidal and estuarine Neuse River, this area of brackish shoreline does not possess the necessary habitat elements required of the green sea turtle for nesting or prolonged usage. Moreover, a review of the April 2020 NCNHP dataset indicates no known green sea turtle occurrences within 1.0 mile of the study area.

**Leatherback sea turtle**

USFWS/NMFS Recommended Survey Window: April – August

Biological Conclusion: No Effect

Suitable marine and estuarine habitat for the leatherback sea turtle does not exist in the study area. Therefore, surveys for this species are not needed. While a small portion of the study area extends from USFS lands to the banks of the tidal and estuarine Neuse River, this area of brackish shoreline does not possess the necessary habitat elements required of the leatherback sea turtle for nesting or prolonged usage. Moreover, a review of the April 2020 NCNHP dataset indicates no known leatherback sea turtle occurrences within 1.0 mile of the study area.

**Neuse River waterdog**

USFWS optimal survey window: winter months

Biological Conclusion: May Affect, Not Likely to Adversely Affect

This species is listed by the USFWS as a “range by basin” species and this project does occur within this species’ range. Three Oaks staff, contracted by the NCDOT – Biological Surveys Group (BSG) conducted Neuse River waterdog (NRWD) habitat assessments and surveys on the following 2020 dates: January 27-31 and February 25-27. The results of this assessment are provided in a separate aquatic species report along with the biological conclusion (Appendix C).

**Northern long-eared bat (NLEB)**

USFWS Recommended Survey Window: June 1 – August 15

Biological Conclusion: May Affect, Likely to Adversely Affect

The USFWS has developed a Programmatic Biological Opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), USACE, and NCDOT for the NLEB in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is May Affect, Likely to Adversely Affect. The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Craven County, where this project is located. This level of incidental take is authorized from the effective date of a final listing determination through December 31, 2020 (the USFWS, FHWA, USACE, and NCDOT are coordinating to reinstate Section 7 to extend the PBO beyond this date).

**Red-cockaded woodpecker**

USFWS optimal survey window: year-round; November – early March (optimal)

Biological Conclusion: No Effect

Suitable nesting (open to semi-open pine stands  $\geq 60$  years of age) and foraging (open to semi-open pine stands  $\geq 30$  years of age) habitat for the red-cockaded

woodpecker (RCW) does exist in the study area. These forests receive prescribed fire treatments every 3-6 years and possess the necessary mid-story and groundcover vegetative structure required by the red-cockaded woodpecker. Due to the presence of suitable habitat within the study area, Three Oaks staff conducted RCW surveys within a half-mile radius of suitable habitat located within the study area. RCW surveys were conducted November 20-21, 2019 and January 29-30 and February 17, 2020. A report documenting the results of these surveys is provided in Appendix C. No RCW's or RCW cavities were found within the study area. One potential RCW start-cavity was found within a half-mile of the study area on USFS property but was later determined by USFS staff to be the product of pileated woodpecker activity as opposed to that of an RCW; however, USFS staff indicated they would monitor the start-cavity to ensure this was indeed pileated woodpecker activity. A review of the April 2020 NCNHP dataset also identified no known occurrences of RCW within 1.0 mile of the study area.

**Rufa red knot**

USFWS Optimal Survey Window: TBD

**Biological Conclusion: No Effect**

Suitable intertidal marine and estuarine shoreline habitat for the rufa red knot is present within the study area. This area is located where USFS property abuts the Neuse River at Fisher's Landing Campground. Sandy, intertidal beaches occur throughout this section of shoreline, making it a suitable migration stopover location. Rufa red knot surveys were conducted on April 8<sup>th</sup> and 16<sup>th</sup> of 2020. No red knots were observed during these two spring migration surveys. A review of the April 2020 NCNHP dataset indicates no known rufa red knot occurrences within 1.0 mile of the study area. Additionally, eBird datasets (<https://ebird.org/home>) also indicate no red knot occurrences within a mile of the study area.

**West Indian manatee**

USFWS Optimal Survey Window: year-round

**Biological Conclusion: No Effect**

Suitable marine and estuarine habitat for the West Indian manatee does not exist in the study area. Therefore, surveys are not required. While a small portion of the revised study area extends from USFS lands to the banks of the tidal and estuarine Neuse River, this area of brackish shoreline does not possess the necessary habitat elements (e.g., water depth) required of the West Indian Manatee. A review of the April 2020 NCNHP dataset indicates one known West Indian manatee occurrence (EO ID No. 5451) within 1.0 mile of the study area. This historical occurrence is restricted to the main stem Neuse River within and east of the study area and was last observed on September 17, 1994.

**Rough-leaved loosestrife**

USFWS Optimal Survey Window: mid-May – June

Biological Conclusion: No Effect

Suitable habitat for rough-leaved loosestrife does exist in the study area along roadside rights-of-way, within utility corridors, and along sufficiently sunlit upland/wetland interfaces. Three Oaks staff conducted plant-by-plant surveys for rough-leaved loosestrife June 5-6, 2019. No plants were observed. A review of the April 2020 NCNHP dataset indicates no known occurrences of this species within 1.0 mile of the study area.

**Sensitive joint-vetch**

USFWS Optimal Survey Window: mid-July – October

Biological Conclusion: No Effect

Suitable mildly brackish intertidal marsh and disturbed wetland habitats required of sensitive joint-vetch do not exist within the study area. Therefore, no surveys are required. A review of the April 2020 NCNHP dataset indicates one known occurrence (EO ID No. 18719) of this species within 1.0 mile of the study area. This occurrence is considered historical and extirpated, with the last observation being in 1949.

**4.2 Bald and Golden Eagle Protection Act**

The bald eagle is protected under the Bald and Golden Eagle Protection Act and enforced by the USFWS. Habitat for the bald eagle primarily consists of mature forests in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the study area, as well as the area within a 1.13-mile radius of the project limits, was performed on August 20, 2019 and using the most currently available orthoimagery. Water bodies large and sufficiently open enough to be considered potential feeding sources were identified. Since foraging habitat was present within the review area, Three Oaks staff conducted surveys of the study area and the area within 660 feet of the project limits on November 20-21, 2019 and April 8<sup>th</sup> and 16<sup>th</sup> of 2020. Several bald eagles were observed at Fisher's Landing Campground, along the Neuse River shoreline; however, no bald eagle nests were found. A review of the April 2020 NCNHP dataset revealed one known nesting occurrence of this species within 1.0 mile of the study area (EO ID No. 10367). This is a historical, extirpated occurrence, with the last observation being in May 1971. Although this occurrence occurs within the study area, due to its extirpated status, the lack of nests, and the minimal impact anticipated, it has been determined that this project will not affect this species.

### 4.3 Essential Fish Habitat

The NOAA – NMFS has identified no Essential Fish Habitat within the project study area.

### 5.0 WATER RESOURCES

The study area is located within the Neuse River Basin (United States Geological Survey [USGS] Hydrologic Unit [HUC] 03020204). Nineteen potential streams/stream channels were identified in the study area (Table 3). The locations of these potential streams are shown on Figures 3 and 4.

**Table 3. Potential streams in the study area**

Stream Name	Map ID	Figure No.	NCDWR Index Number	Best Usage Classification	Bank Height (ft.)	Bankfull width (ft.)	Depth (in.)
Goodwin Creek	Goodwin Creek	3-1; 4-1	27-112-6-2	SC; Sw; NSW	1-10	3-15	0-36
Neuse River	Neuse River	3-4; 4-4	27-(104)	SB; Sw; NSW	4-6	17,500	0-72
Otter Creek	Otter Creek	3-1; 4-1	27-108	SC; Sw; NSW	1-5	2-8	0-8
Unnamed Tributary (UT) to Otter Creek	SA	3-1; 4-1	27-108	SC; Sw; NSW	1-4	3-5	0-4
UT to Otter Creek	SB	3-1; 4-1	27-108	SC; Sw; NSW	3-6	3-5	0-3
UT to Otter Creek	SC	3-2; 4-2	27-108	SC; Sw; NSW	0.5-1	3-4	0-6
UT to Otter Creek	SD	3-2; 4-2	27-108	SC; Sw; NSW	4-8	4-6	0-6
UT to Great Branch	SE	3-5; 4-5	27-101-40-3	SC; Sw; NSW	2-6	3-6	0-6
UT to Brice Creek	SF	3-5; 4-5	27-101-40-3	C; Sw; NSW	2-7	3-10	0-6
UT to Brice Creek	SG	3-5; 4-5	27-101-40-(1)	C; Sw; NSW	1-3	4-6	0-3
UT to Neuse River	SH	3-6; 4-6	27-(104)	SB; Sw; NSW	2-4	3-4	0-4
UT to Neuse River	SI	3-6; 4-6	27-(104)	SB; Sw; NSW	2-3	3-4	0-6
UT to Neuse River	SJ	3-6; 4-6	27-(104)	SB; Sw; NSW	1-4	2-4	0-4
UT to Neuse River	SK	3-4; 4-4	27-(104)	SB; Sw; NSW	1-2	2-3	0-1



**Table 3. Potential streams in the study area (continued)**

Stream Name	Map ID	Figure No.	NCDWR Index Number	Best Usage Classification	Bank Height (ft.)	Bankfull width (ft.)	Depth (in.)
UT to Neuse River	SL	3-4; 4-4	27-(104)	SB; Sw; NSW	0.5-1	1-3	0
UT to Neuse River	SM	3-4; 4-4	27-(104)	SB; Sw; NSW	1	2-3	0-1
UT to Neuse River	SN	3-4; 4-4	27-(104)	SB; Sw; NSW	0.5-1	2-3	0-2
UT to Otter Creek	SO	3-1; 4-1	27-108	SC; Sw; NSW	2-3	3-4	0
UT to Otter Creek	SP	3-3; 4-3	27-108	SC; Sw; NSW	4-6	3-4	0-4

There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), or water supply watersheds (WS-I or WS-II) within the study area or within 1.0 mile downstream of the study area. The North Carolina 2018 Final 303(d) list of impaired waters identifies one impaired water, the Neuse River (Assessment Unit Nos. 27-[104]a1 and a2), within 1.0 mile of the study area as impaired due to Copper.

Four potential surface waters (i.e., ponds, tributaries, or basins) were identified within the study area (Table 4). The location of these waters is shown on Figures 3 and 4.

**Table 4. Potential surface waters in the study area**

Surface Water	Map ID of Connection	Area (ac.)
PA	N/A	0.31
PB	N/A	0.29
BA	N/A	0.17
BB	N/A	0.09
<b>Total</b>		<b>0.86</b>

**Note:** BA and BB are Section 402 stormwater basins that were constructed in uplands for the sole purpose of collecting and filtering stormwater runoff.

## 6.0 REGULATORY CONSIDERATIONS

### 6.1 Clean Water Act Waters of the U.S.

Nineteen potential jurisdictional streams/stream channels were identified in the study area (Table 5). The locations of these streams are shown on Figures 3 and 4. All potential jurisdictional streams in the study area have been designated as warm water streams for the purposes of stream mitigation. North Carolina Stream Assessment Method

(NCSAM) and NCDWR Stream Identification forms are included in a separate PJD Package.

**Table 5. Characteristics of potential jurisdictional streams in the study area**

Map ID	Length (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffer
Goodwin Creek	315	Perennial	2:1	Subject <sup>1</sup>
Otter Creek	2,231	Perennial	2:1	Subject
SA-I	677	Intermittent	1:1	Subject
SA-P	485	Perennial	2:1	Subject
SB	894	Intermittent	1:1	Subject
SC	118	Intermittent	None Required	Subject
SD-I	940	Intermittent	1:1	Subject <sup>2</sup>
SD-P	100	Perennial	2:1	Subject
SE	675	Perennial	None Required	Not Subject
SF-I	423	Intermittent	1:1	Subject
SF-P	613	Perennial	2:1	Subject
SG	427	Intermittent	None Required	Subject
SH	208	Intermittent	1:1	Not Subject
SI-I	16	Intermittent	None Required	Subject
SI-P	139	Perennial	1:1	Subject
SJ	501	Intermittent	None Required	Not Subject
SK-I	223	Intermittent	Undetermined	Subject
SK-P	229	Perennial	Undetermined	Subject
SL	115	Intermittent	Undetermined	Not Subject
SM-I	408	Intermittent	Undetermined	Not Subject
SM-P	243	Perennial	Undetermined	Not Subject
SN	105	Intermittent	Undetermined	Not Subject
SO	203	Intermittent	Undetermined	Subject
SP	118	Intermittent	None Required	Subject
<b>Total</b>	<b>10,406</b>			

**Note 1:** I – Intermittent; P - Perennial

**Note 2:** <sup>1</sup> – Neuse River Basin (NRB) buffers only apply to the downstream reach of Goodwin Creek, east of US 70; <sup>2</sup> – NRB buffers apply to the intermittent reach of Stream SD on the west side of US 70 between the mapped perennial origin and the USGS blue-line stream origination point, which is short of where the intermittent stream origin is located in our mapping (i.e., at the railroad culvert outlet).

Thirty-eight potential jurisdictional wetlands were identified within the study area (Table 6). The locations of these wetlands are shown on Figures 3 and 4. All wetlands are located within the Neuse River Basin (USGS HUC 03020204). USACE wetland determination forms and North Carolina Wetland Assessment Method (NCWAM) forms are included in a separate PJD Package.

**Table 6. Characteristics of potential jurisdictional wetlands in the study area**

Map ID	NCWAM Classification	NCWAM Rating	Hydrologic Classification	Figure No.	Area (ac.)
WA	Headwater Forest	*	Riparian	3-1; 4-1	0.12
WB	Headwater Forest	Low	Riparian	3-1; 4-1	0.21
WC	Headwater Forest	Low	Riparian	3-1; 4-1	0.01
WD	Headwater Forest	*	Riparian	3-1; 4-1	0.37
WE	Riverine Swamp Forest	*	Riparian	3-1; 4-1	6.6
WF	Headwater Forest	*	Riparian	3-1; 4-1	0.48
WG	Headwater Forest	*	Riparian	3-1; 4-1	0.18
WH	Headwater Forest	*	Riparian	3-2; 4-2	17.48
WI	Headwater Forest	*	Riparian	3-2; 4-2	0.03
WJ	Headwater Forest	*	Riparian	3-4; 4-4	6.90
WK	Headwater Forest	*	Riparian	3-5; 4-5	0.60
WL	Headwater Forest	*	Riparian	3-5; 4-5	0.22
WN	Headwater Forest	*	Riparian	3-5; 4-5	1.56
WO	Headwater Forest	*	Riparian	3-5; 4-5	0.05
WP	Pine Flat	*	Non-riparian	3-5; 4-5	0.20
WQ	Basin Wetland	*	Non-riparian	3-5; 4-5	0.02
WR	Basin Wetland	*	Non-riparian	3-5; 4-5	0.09
WS	Basin Wetland	*	Non-riparian	3-5; 4-5	0.05
WT	Basin Wetland	*	Non-riparian	3-5; 4-5	0.04
WV	Headwater Forest	*	Riparian	3-6; 4-6	0.20
WW	Headwater Forest	*	Riparian	3-6; 4-6	0.17
WX	Headwater Forest	*	Riparian	3-6; 4-6	0.09
WY	Headwater Forest	*	Riparian	3-6; 4-6	1.93
WZ	Headwater Forest	*	Riparian	3-6; 4-6	0.96
WAA	Headwater Forest	*	Riparian	3-1; 4-1	0.02
WEE	Pine Flat	*	Non-riparian	3-2; 4-2	0.16
WFF	Pine Flat	*	Non-riparian	3-2; 4-2	0.03
WGG	Pine Flat	*	Non-riparian	3-2; 4-2	0.17
WHH	Riverine Swamp Forest	*	Riparian	3-4; 4-4	4.59
WII	Riverine Swamp Forest	*	Riparian	3-4; 4-4	1.30
WJJ	Headwater Forest	*	Riparian	3-4; 4-4	0.01
WKK	Headwater Forest	*	Riparian	3-4; 4-4	0.17
WLL	Headwater Forest	*	Riparian	3-4; 4-4	0.16
WMM	Headwater Forest	*	Riparian	3-4; 4-4	1.34
WNN	Headwater Forest	*	Riparian	3-4; 4-4	0.03
WOO	Headwater Forest	*	Riparian	3-4; 4-4	0.10
WPP	Headwater Forest	*	Riparian	3-5; 4-5	0.07

**Table 6. Characteristics of potential jurisdictional wetlands in the study area (continued)**

Map ID	NCWAM Classification	NCWAM Rating	Hydrologic Classification	Figure No.	Area (ac.)
WQQ	Headwater Forest	*	Riparian	3-2;4-2	0.01
				<b>Total</b>	<b>46.72</b>

**Note 1:** \* - NCWAM forms were not completed for wetlands possessing qualities conducive to them receiving higher mitigation ratios and functional rating values.

**Note 2:** Wetlands WBB-WDD are located within an overlapping section of the R-5777 A&B and R-5777 C study areas. These three wetlands are being permitted under the A&B project; therefore, they are not included in the R-5777C wetland tables or impact calculations. However, due to their presence within the R-5777C study area, they are shown in the NRTR mapping, albeit with a different symbology. Wetlands WM and WU were omitted during the PJD field verification held December 11-12, 2019.

## 6.2 Construction Moratoria

Based on North Carolina Division of Marine Fisheries (NCDMF) mapping, no designated anadromous fish waters are located within the project study area, although Brice Creek is listed as an inland Anadromous Fish Spawning Area (AFSA) by the North Carolina Wildlife Resources Commission (NCWRC) from the County Line Road crossing of Brice Creek to a point about 6.3 miles downstream. In an email, dated November 19, 2019, NCDMF confirmed that no anadromous fish waters exist within the study area and no moratoria are required. While the current project study area does not affect this site, if plans change in the future and show potential impacts to this site, NCDMF should be contacted and included in any planning discussions. In a letter dated May 10, 2019, the NCWRC did not identify any such waters near the project and did not recommend any moratoria.

## 6.3 N.C. River Basin Buffer Rules

This project is located within the Neuse River Basin (USGS HUC 03020204). Potential jurisdictional features within the study area are therefore subject to streamside riparian zones protected under provisions administered by the North Carolina Department of Environmental Quality (NCDEQ). Table 5 lists which potential features are subject to these rules.

## 6.4 Rivers and Harbors Act Section 10 Navigable Waters

The USACE has designated the Neuse River within the study area as a Navigable Water under Section 10 of the Rivers and Harbors Act.

## 6.5 Coastal Area Management Act Areas of Environmental Concern

CAMA Areas of Environmental Concern (AEC) are located within the expanded project study area along the Neuse River shoreline on USFS property. These include: Estuarine Waters, Public Trust Areas, and Estuarine Shoreline AEC's. Although Goodwin Creek is

designated as a CAMA AEC downstream of the project study area, it does not meet the requirements of a CAMA AEC within the study area. Coastal wetlands were not found within the study area.

## **6.6 Coastal Barrier Resources System**

No Coastal Barrier Resources System (CBRS) units exist within the study area.

## 7.0 REFERENCES

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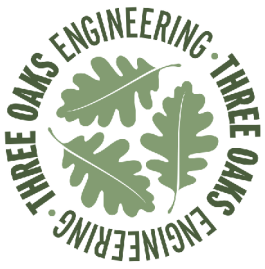
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## **Appendix A**

### **Figures**





Prepared For:



US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

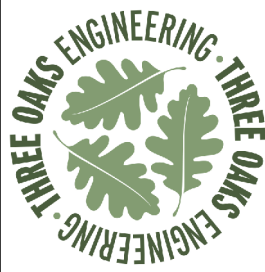
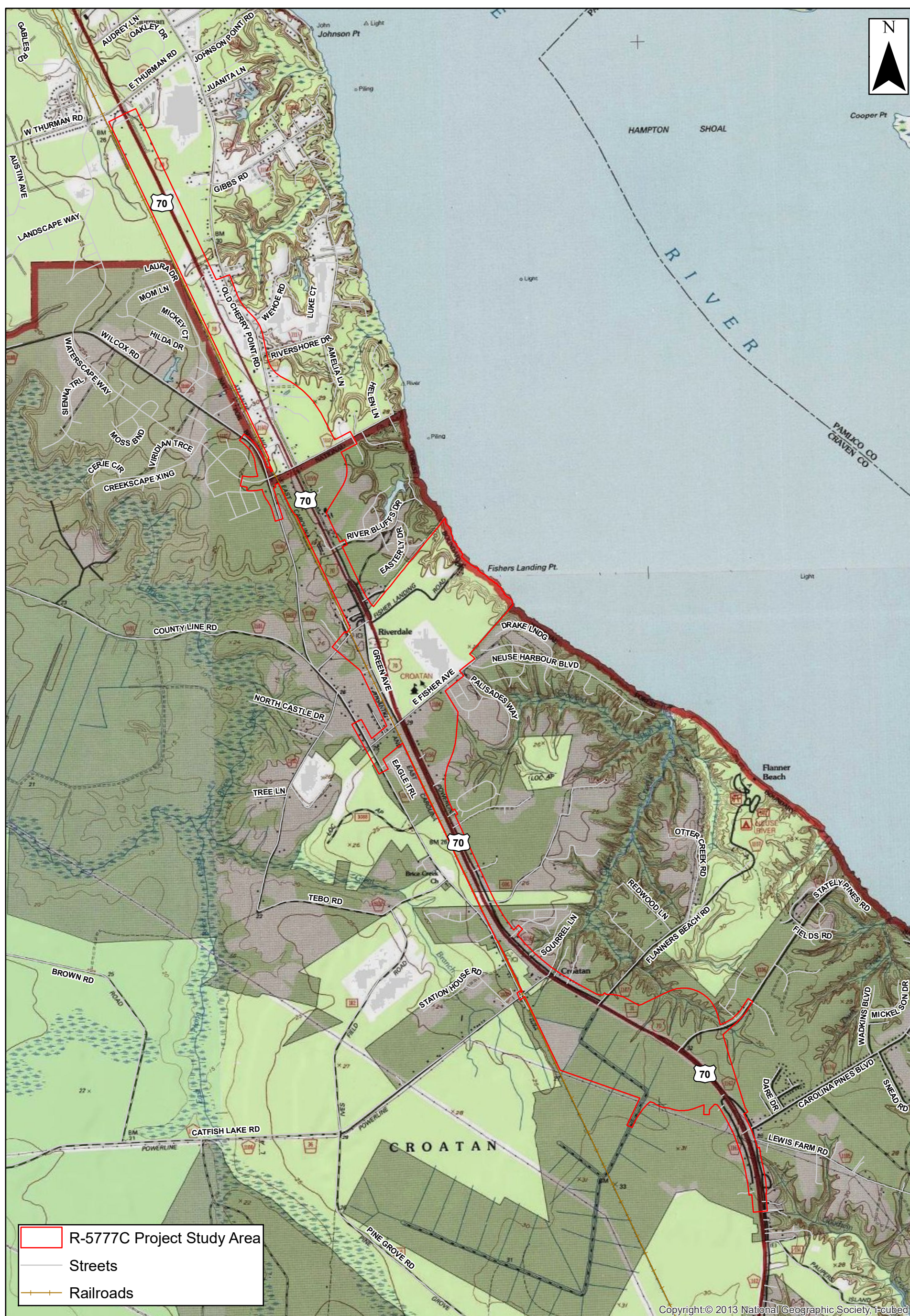
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Craven County, North Carolina

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Job No.:	19-007
Drawn By:	NDH
Checked By:	JM

Figure

1





Prepared For:



US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Topographic Map  
Craven County, North Carolina

Date:

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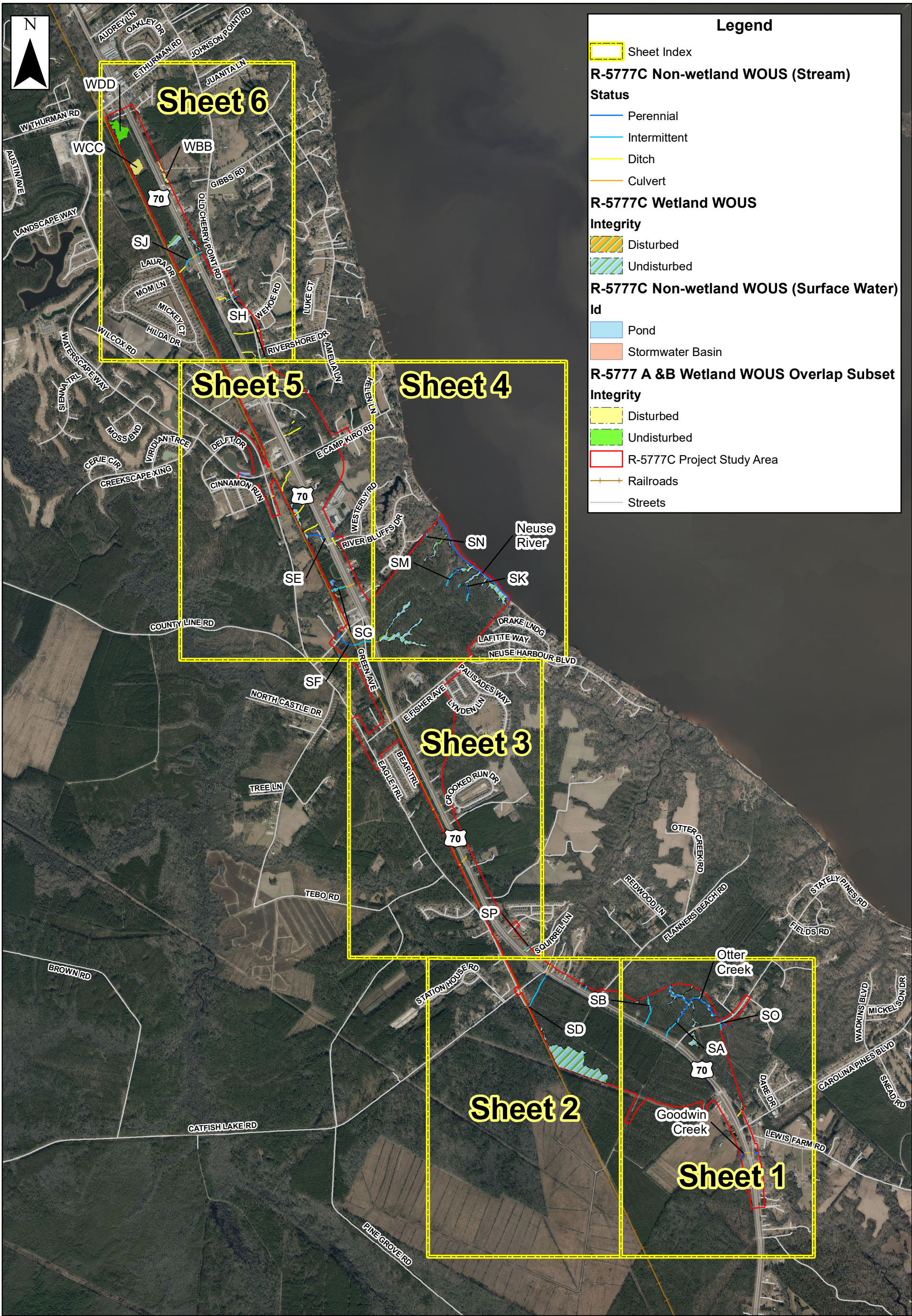
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JM

Figure

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Prepared For:



US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Jurisdictional Features Map  
Craven County, North Carolina

Date:

June 2020

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Job No.:

19-007

Drawn By:

KMS

Checked By:

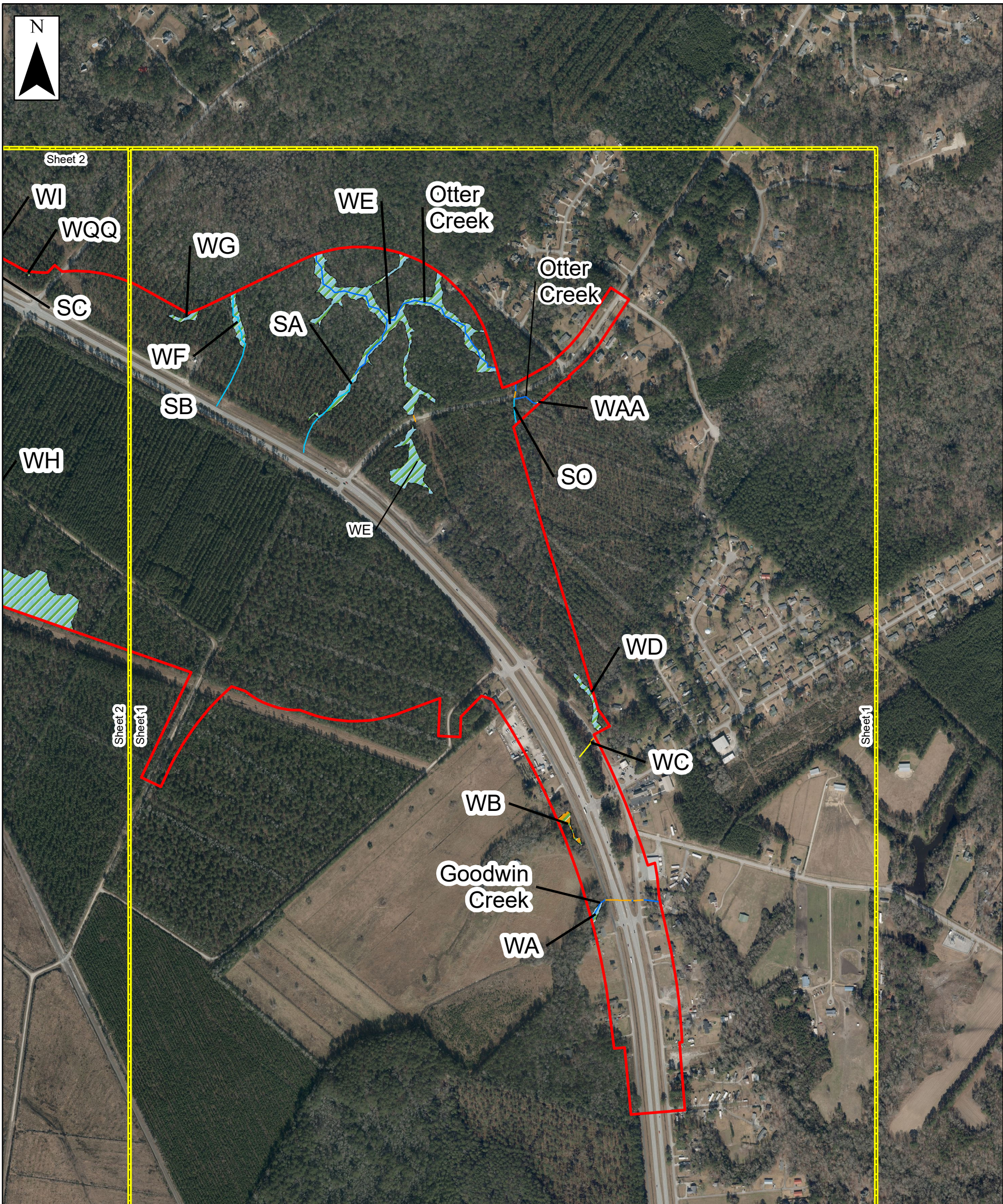
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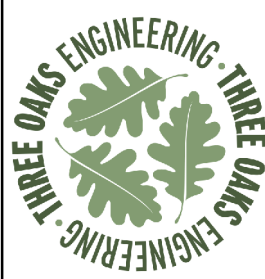
Sheet Index





**Legend**

- |   |  |   |
|---|--|---|
| Sheet Index                                     | <b>R-5777C Non-wetland WOUS (Stream)</b> | <b>R-5777C Wetland WOUS</b>                         |
| R-5777C Project Study Area                      | Perennial                                | Disturbed   |
| <b>R-5777C Non-wetland WOUS (Surface Water)</b> | Intermittent                             | Undisturbed   |
| Pond  | Ditch                                    | <b>R-5777 A &amp; B Wetland WOUS Overlap Subset</b> |
| Stormwater Basin                                | Culvert                                  | Disturbed   |
|   |  | Undisturbed   |



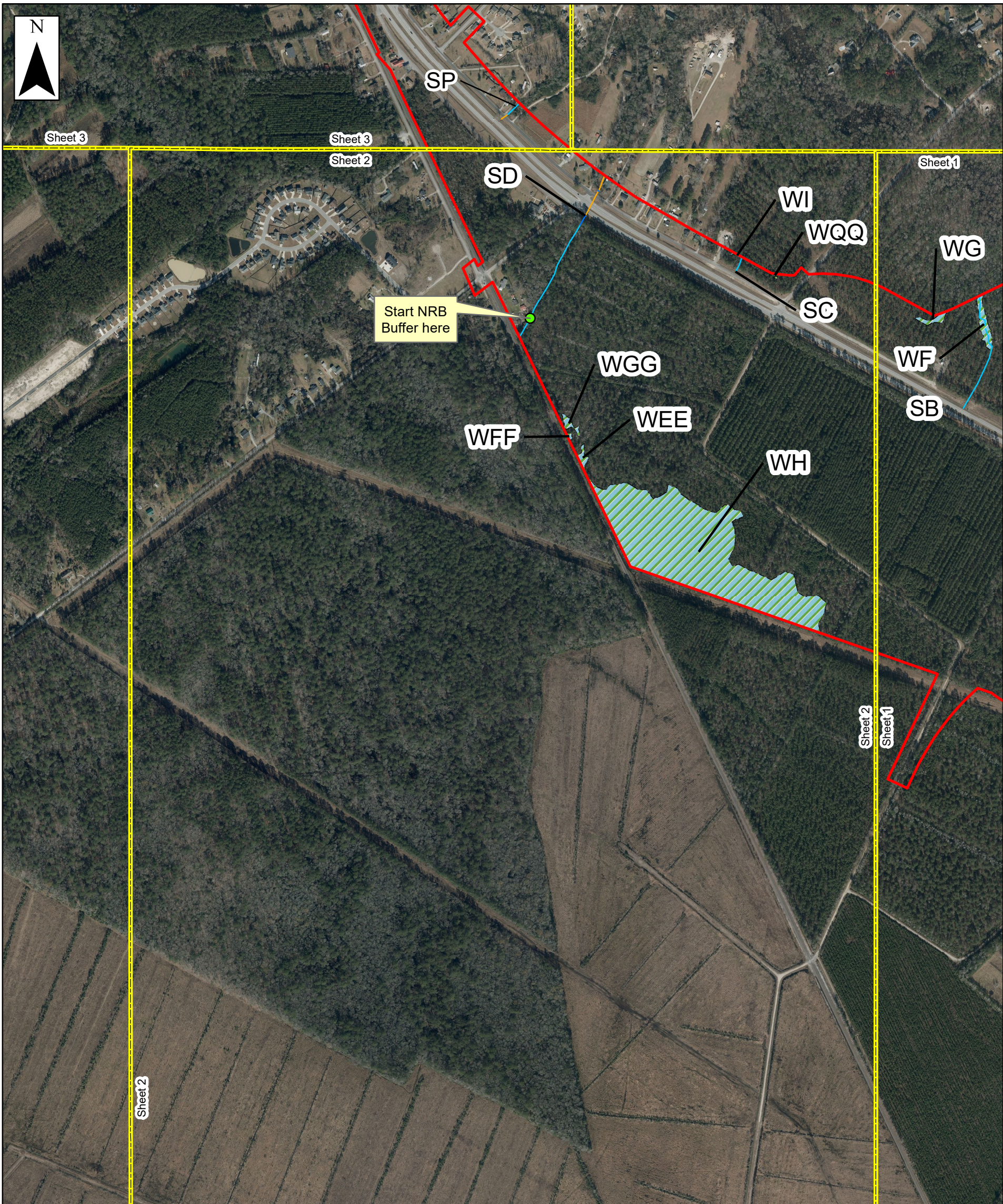
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(TIP R-5777C)

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Figure  
**3**  
Sheet 1 of 6





**Legend**

Sheet Index

R-5777C Project Study Area

**R-5777C Non-wetland WOUS (Surface Water)**

Pond

Stormwater Basin

**R-5777C Non-wetland WOUS (Stream)**

Perennial

Intermittent

Ditch

Culvert

**R-5777C Wetland WOUS**

Disturbed

Undisturbed

**R-5777 A & B Wetland WOUS Overlap Subset**

Disturbed

Undisturbed

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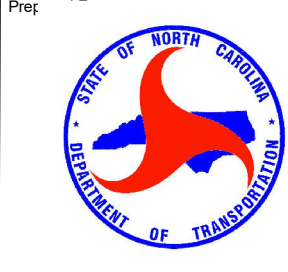
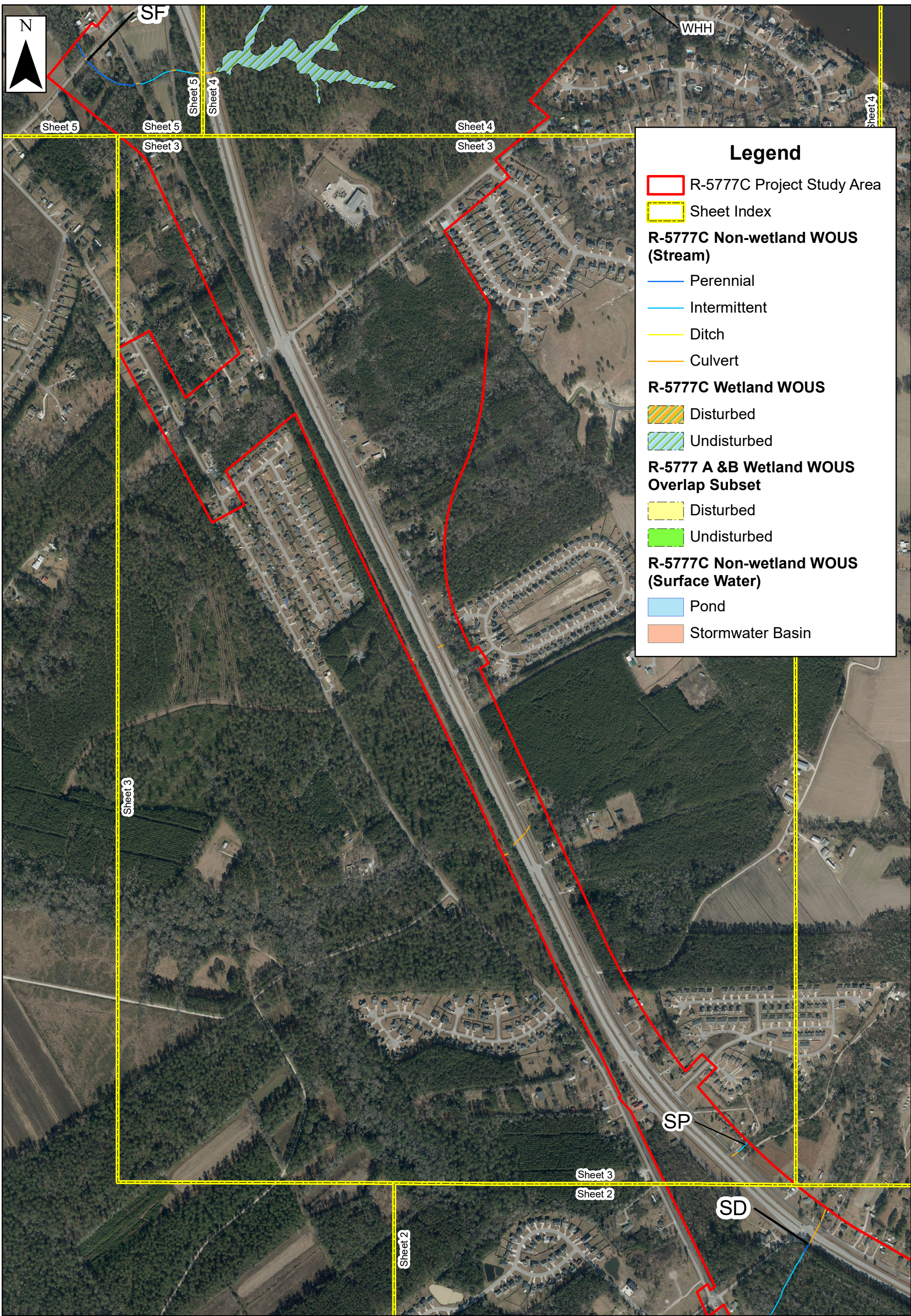
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Figure  
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Sheet 2 of 6





US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Jurisdictional Features Map  
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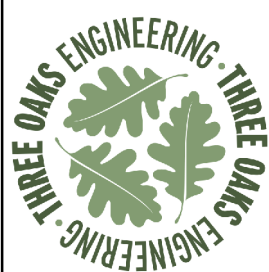
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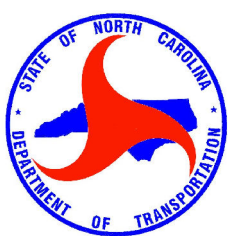
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Sheet 3 of 6





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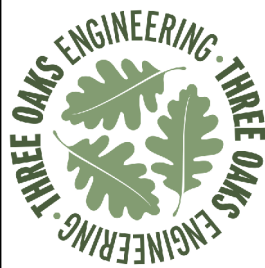
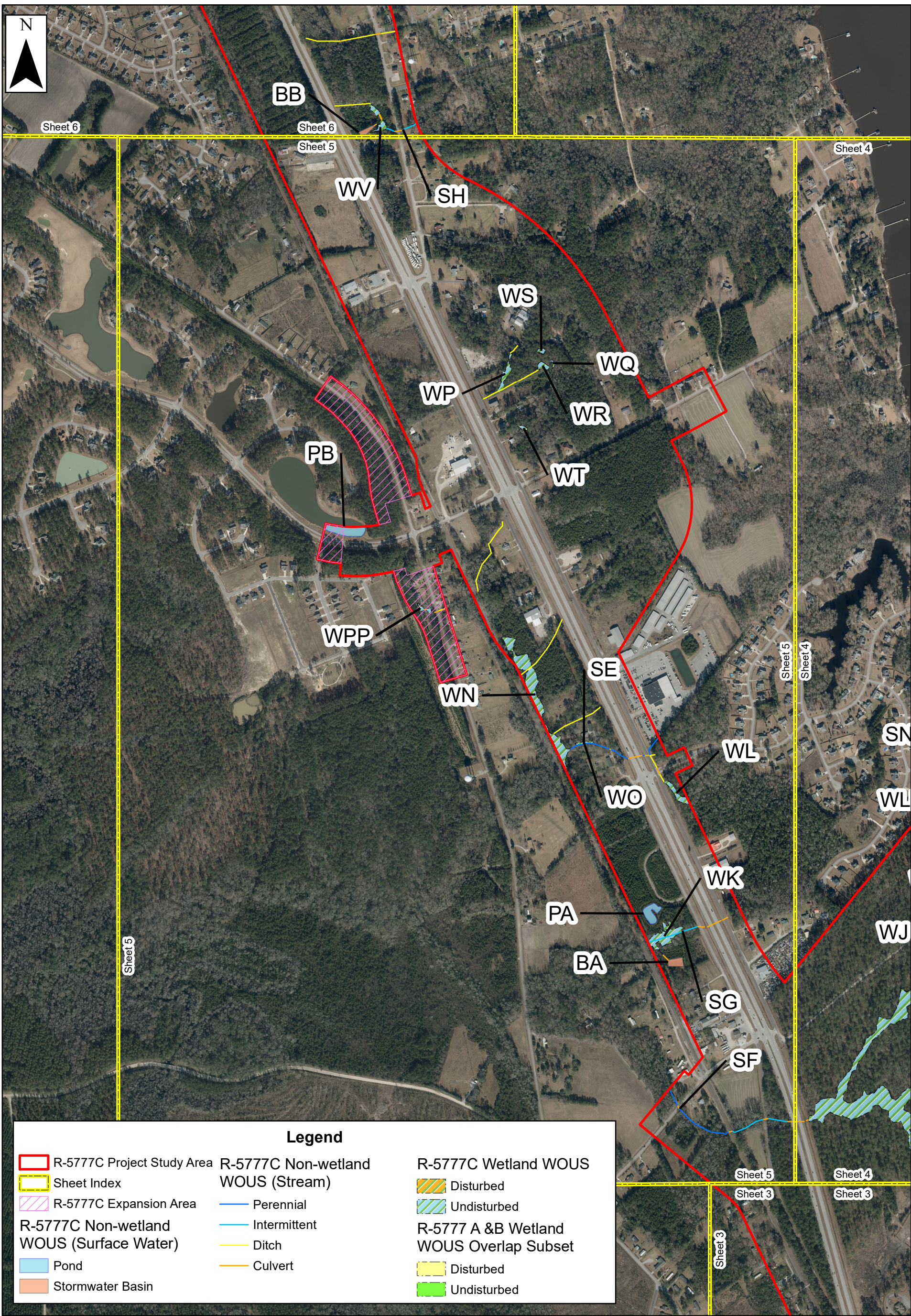
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(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Jurisdictional Features Map  
Craven County, North Carolina

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Checked By:	NH

Figure  
**3**  
Sheet 4 of 6





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# US 70 Improvements from SR 1116 (Thurman Rd) to the Havelock Bypass (TIP R-5777C)

Jurisdictional Features Map  
Craven County, North Carolina

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June 2020

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Job No.:

19-007

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KMS

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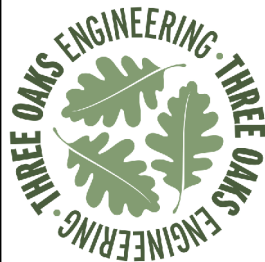
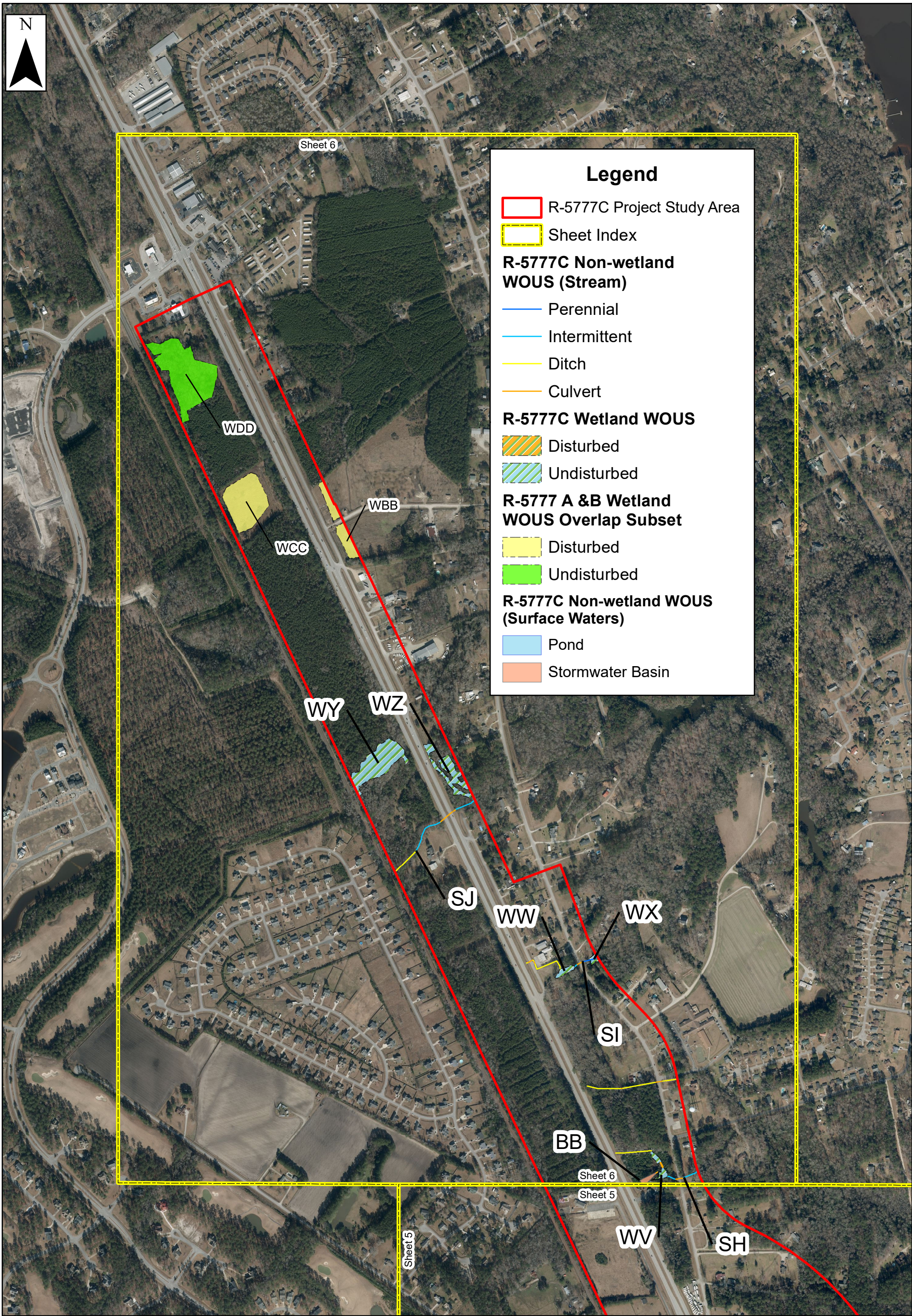
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Figure

3

Sheet 5 of 6





Prepared For:



US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Jurisdictional Features Map  
Craven County, North Carolina

Date:

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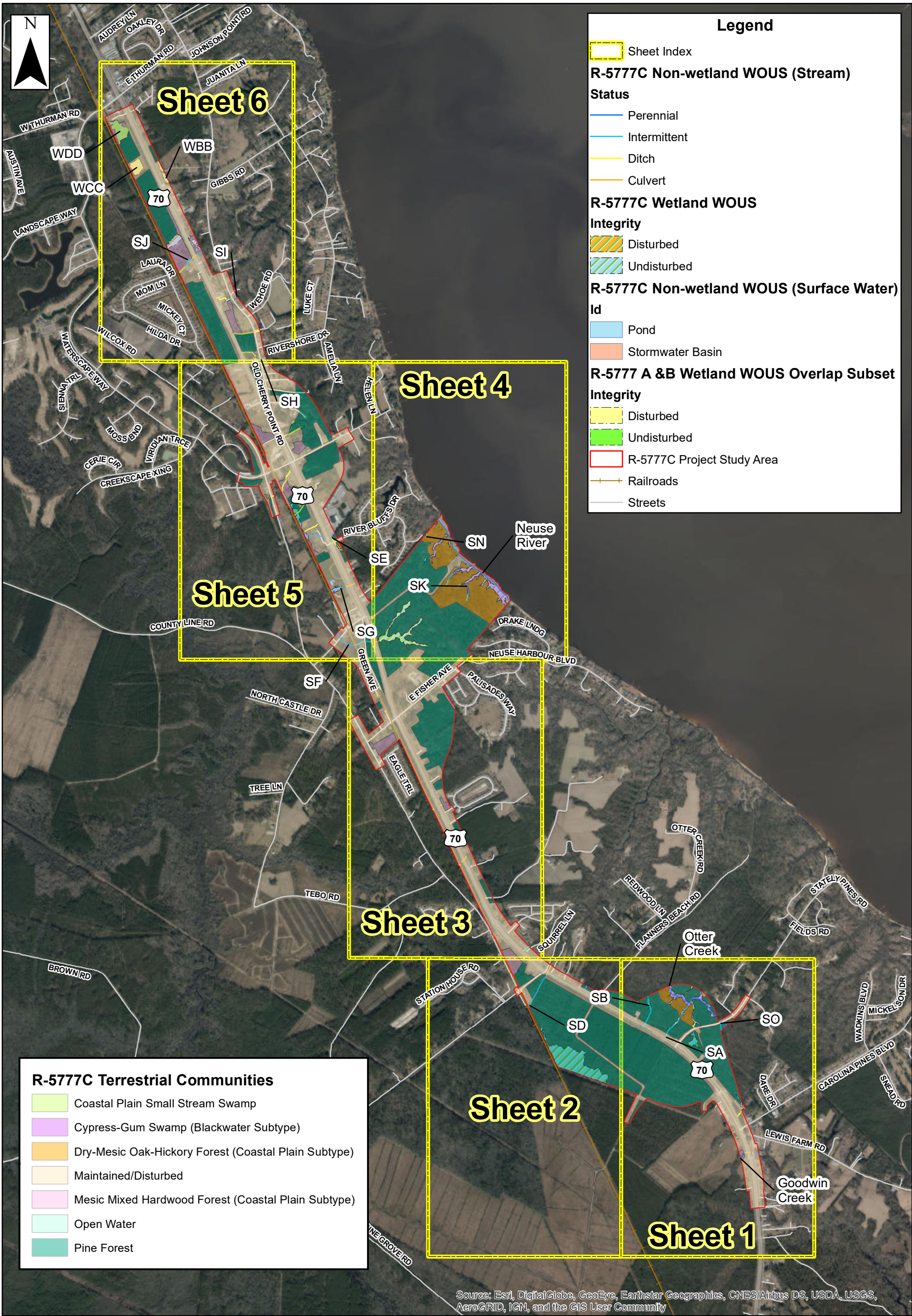
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Figure

3

Sheet 6 of 6





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US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Terrestrial Communities Map  
Craven County, North Carolina

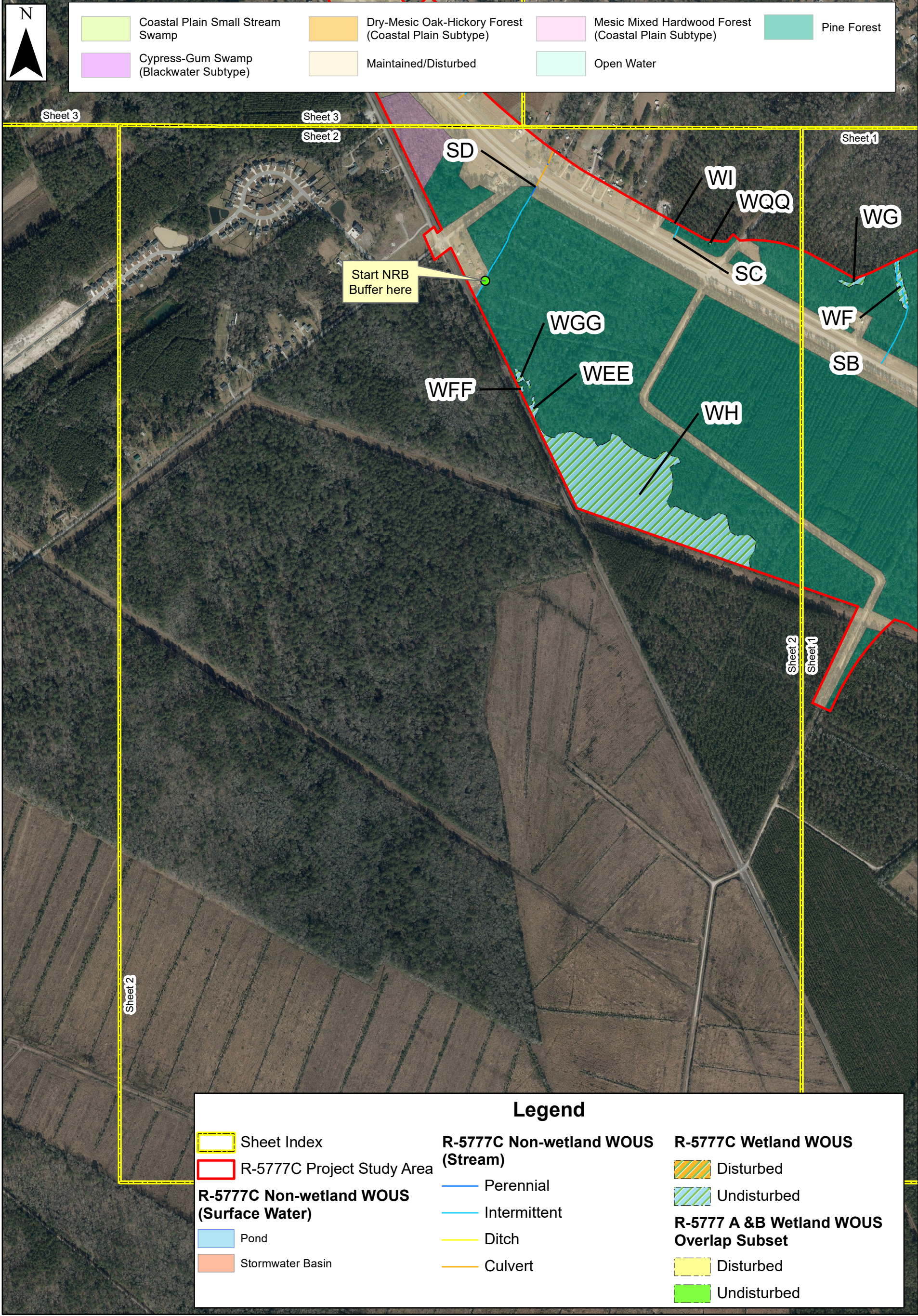
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Figure  
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Sheet Index

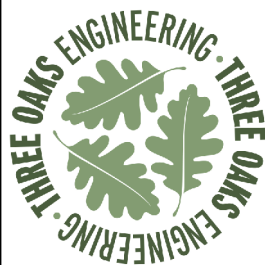
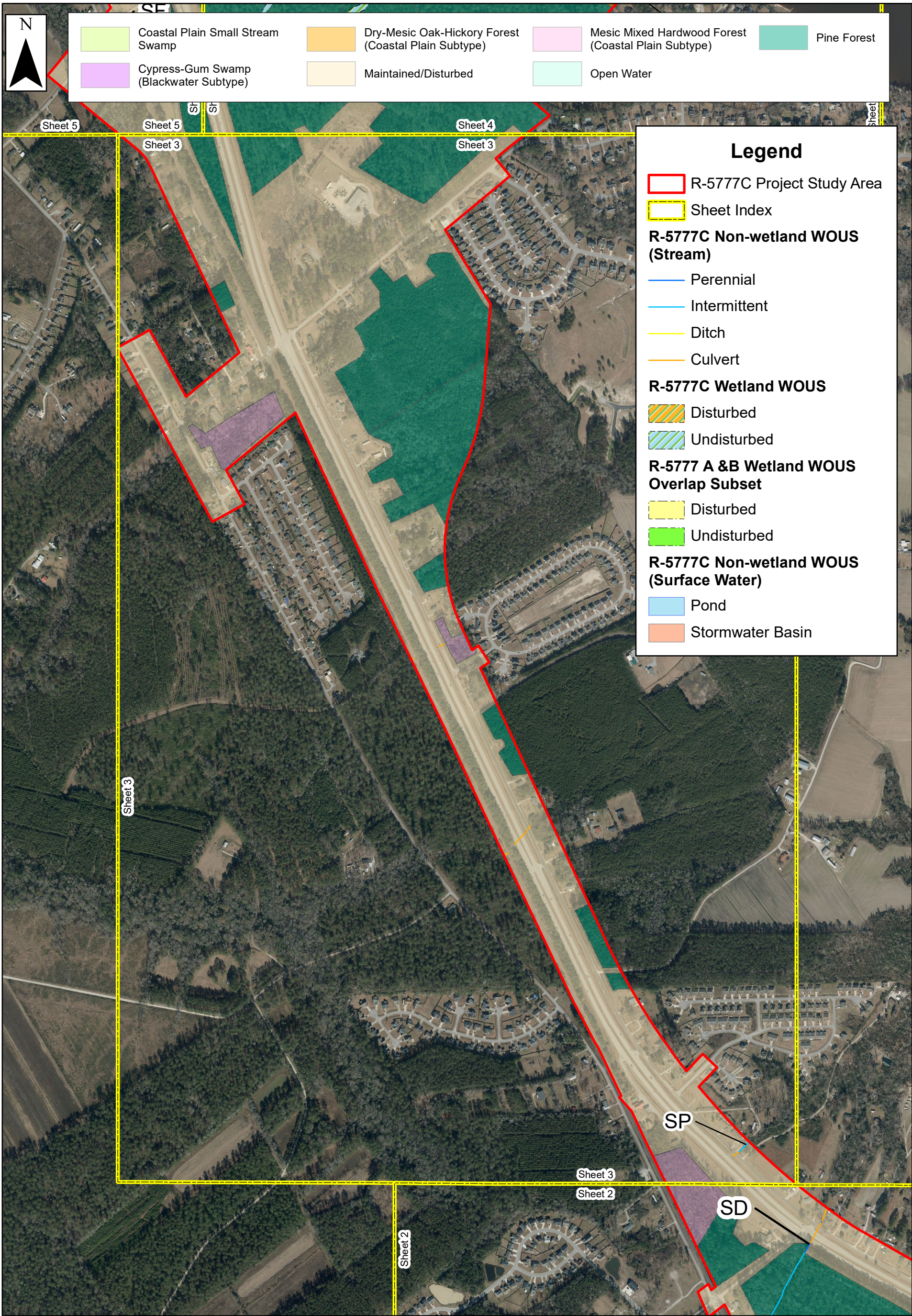












US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Terrestrial Communities Map  
Craven County, North Carolina

Date: June 2020

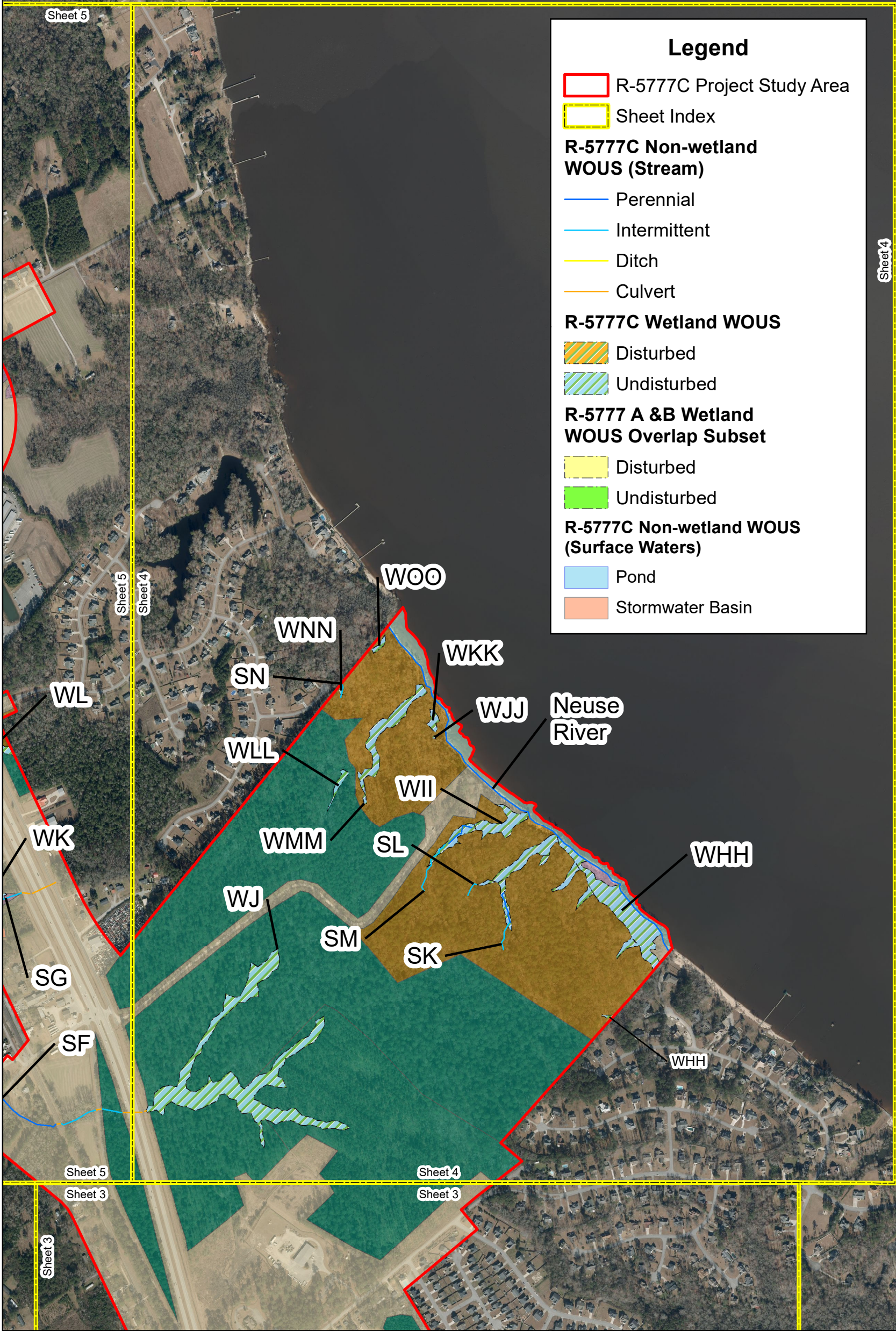
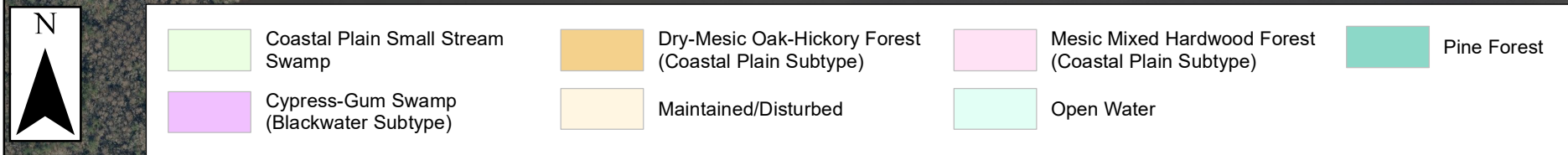
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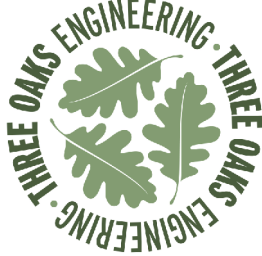
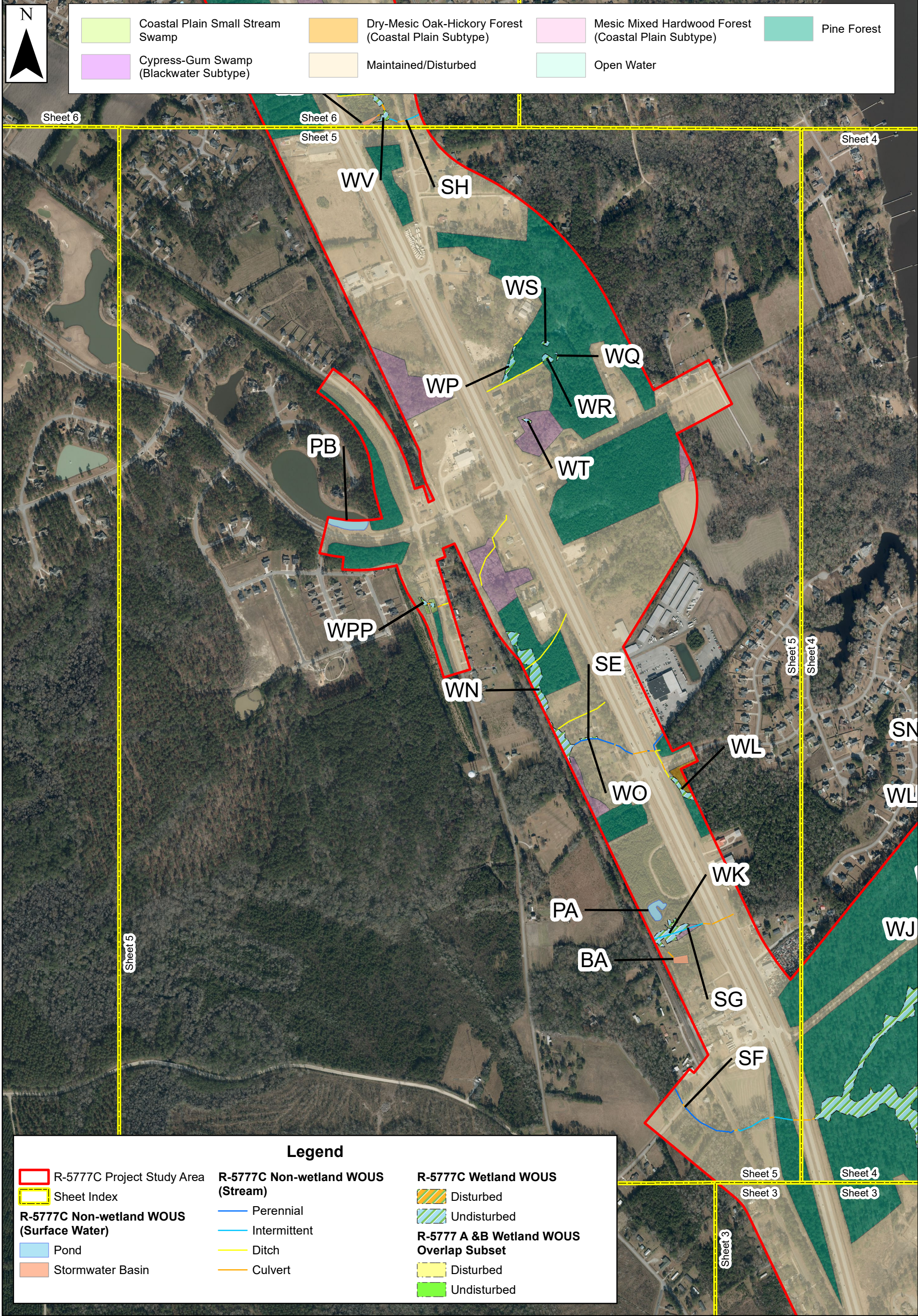
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Figure  
**4**  
Sheet 3 of 6









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US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Terrestrial Communities Map  
Craven County, North Carolina

Date:	June 2020
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Job No.:	19-007
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Checked By:	NH

Figure  
**4**  
Sheet 5 of 6







## **Appendix B**

### **Qualifications of Contributors**

Principal Investigator:	Nathan Howell
Education:	B.S. Fisheries, Wildlife, and Conservation Biology, North Carolina State University, 2013 M.S. Plant and Microbial Biology, North Carolina State University, 2015
Experience:	Environmental Scientist, Three Oaks Engineering, October 2015 – Present
Responsibilities:	Wetland and stream delineations, T&E surveys, document review and preparation, GIS mapping, natural community assessment
Investigator:	James Mason
Education:	B.A. Biology, Colby College, 2000 M.S. Biology/Ecology, UNC-Charlotte, 2004
Experience:	Environmental Senior Scientist, Three Oaks Engineering, April 2018-Present Environmental Program Consultant, NCDOT, 2006-2018
Responsibilities:	Document preparation and review, T&E surveys, wetland and stream delineations, GIS mapping
Investigator:	Mary Frazer
Education:	B.S. Zoology, University of Wisconsin – Madison, 1988 M.E.M. Resource Ecology, Duke University, 1991
Experience:	Biologist/Project Manager, Three Oaks Engineering,
Responsibilities:	T&E surveys
Investigator:	Tim Savidge
Education:	B.S. Biology, Guilford College, 1987 M.S. Marine Biology/Biological Oceanography, University of North Carolina – Wilmington, 1998
Experience:	Environmental Manager & Aquatic Biologist, Three Oaks Engineering, June 2015-present Environmental Specialist, NCDOT, 1992-2002
Responsibilities:	T&E surveys

Investigator:	Tom Dickinson
Education:	B.S. Forestry/Natural Resources, Sewanee: The University of the South, 2001
Experience:	Environmental Supervisor/Aquatic Biologist, Three Oaks Engineering, June 2015-present Environmental Scientist, The Catena Group. June 2003-June 2015
Responsibilities:	T&E surveys
Investigator:	Lillian Lovingood
Education:	B.S. Environmental Studies: Ecology and Environmental Biology, UNC-Asheville, 2016
Experience:	Environmental Scientist, Three Oaks Engineering, December 2018-Present Aquatic Conservation Technician, NCWRC, March 2018-November 2018
Responsibilities:	Wetland and stream delineations, T&E surveys, document review & preparation
Investigator:	Lizzy Stokes-Cawley
Education:	B.S. Conservation Biology, St. Lawrence University, 2011 M.E.M. Water Resources, Duke University, 2016
Experience:	Environmental Scientist, Three Oaks Engineering, April 2017-Present
Responsibilities:	Wetland and stream delineations, document review and preparation
Investigator:	Paige Green
Education:	B.S. Natural Resources, North Carolina State University, 2019
Experience:	Environmental Scientist, Three Oaks Engineering, May 2019-Present
Responsibilities:	Research Assistant, NCSU Tree Improvement Program, 2015-2019 Wetland and stream delineations, T&E surveys, document review & preparation
Investigator:	Cary Rowells
Education:	Coursework, Civil Engineering, Wake Technical Community College Coursework, Geology, University of North Carolina at Wilmington
Experience:	GIS Analyst, Three Oaks Engineering, 2015-Present GIS analyst, Michael Baker Engineering, 2002-2015 Analytical Surveys, Inc., CADD Technician/GIS Technician/GIS Project Coordinator, 1989-2002
Responsibilities:	GIS mapping, Microstation

Investigator: Kate Montieth Sevick  
Education: B.A. Biology, Reed College, 2000  
M.S. Natural Resources Sciences, University of Rhode Island,  
2004  
Experience: Environmental Scientist, Three Oaks Engineering, 2015-Present  
Environmental Specialist and Graphics Coordinator, The Catena  
Group, 2004-2015  
Responsibilities: GIS Mapping

## **Appendix C**

### **Species Survey Reports**

## Jim Mason

---

**From:** Wilson, Travis W. <travis.wilson@ncwildlife.org>  
**Sent:** Wednesday, January 15, 2020 8:49 AM  
**To:** fritz.rohde; Nathan Howell  
**Cc:** Jim Mason; Craig Young; Tom Dickinson  
**Subject:** RE: [External] Re: NCDOT STIP R-5777C (Craven County, NC)

I concur with NOAA's comments below.

---

**From:** Fritz Rohde - NOAA Federal <fritz.rohde@noaa.gov>  
**Sent:** Tuesday, January 14, 2020 9:18 AM  
**To:** Nathan Howell <nathan.howell@threeoaksengineering.com>  
**Cc:** Wilson, Travis W. <travis.wilson@ncwildlife.org>; Jim Mason <james.mason@threeoaksengineering.com>; Craig Young <craig.young@threeoaksengineering.com>; Tom Dickinson <tom.dickinson@threeoaksengineering.com>  
**Subject:** [External] Re: NCDOT STIP R-5777C (Craven County, NC)

**CAUTION:** External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to [report.spam@nc.gov](mailto:report.spam@nc.gov)

Hi Nathan:

Expansion of the study area to include FWS species is not an issue to me knowing that there will be no inwater impacts. Sturgeon typically do not hug the shallow shoreline so no potential impacts to them

Fritz

On Mon, Jan 13, 2020 at 3:48 PM Nathan Howell <[nathan.howell@threeoaksengineering.com](mailto:nathan.howell@threeoaksengineering.com)> wrote:

Fritz and Travis,

I'm reaching out to you about to the subject project's recent study area expansion and subsequent inclusion of estuarine Neuse River shoreline (Sheet 4 on the attached figure). The study area was expanded to include USFS parcel No. 43036 in its entirety. This was done so that biological surveys could be completed within the parcel as part of the Biological Evaluation (BE) process. Currently, NCDOT does not anticipate having impacts anywhere close to this site. Expanding the study area was done strictly to fulfill a request from the USFS.

This stretch of shoreline does contain CAMA AEC's. These include: Estuarine Waters, Public Trust Areas, and Estuarine Shoreline AEC's. Specifically, I would like to get your opinion on whether or not suitable shortnose and Atlantic sturgeon habitat is present along this shoreline and if either of you have any concerns, from a fisheries standpoint, about the projects inclusion of this shoreline area. The study area currently extends anywhere from 30-60 feet out into the river. Depths within this zone do not exceed 6 feet.

Travis, for reference, I've also attached your original SOS response prior to the study area expansion.

Regards,

Nathan



Nathan Howell, Environmental Scientist

Three Oaks Engineering

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## Neuse River Waterdog Survey Report

Upgrade of Existing US 70 to a Freeway from US 17 Bridge over the Neuse River  
to the Proposed Havelock Bypass

STIP No.'s U-5713, R-5777A, R-5777B, R-5777C

WBS No.'s 50111.1.1, 44648.1.2, 44648.1.3, 44648.1.4  
Craven County, North Carolina



*Site 6 Brice Creek at Old Airport Road*

Prepared For:



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March 26, 2020

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Figure 1: Project Vicinity & Survey Reach

Figure 2: NCNHP Element Occurrences

Figure 3: 303(d) Listed Streams and NPDES Discharges

## 1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) proposes the upgrade of existing US 70 to a freeway from the US 17 bridge over the Neuse River to the proposed Havelock Bypass (STIP No. R-1015) in Craven County (STIP Nos. U-5713, R-5777A, R-5777B and R-5777C; Appendix A, Figure 1). The projects, all part of the Neuse River Basin, will cross Unnamed Tributaries (UTs) to the Trent River including the Brice Creek system, UTs to the Neuse River, Scotts Creek, and UTs to Scotts Creek (Figure 1). The Neuse River Waterdog (*Necturus lewisi*) and Carolina Madtom (*Noturus furiosus*) are known to occur in the Neuse River Basin in Craven County. On May 22, 2019, the two species were proposed for listing by the US Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) as a Threatened Species (Neuse River Waterdog) and an Endangered Species (Carolina Madtom) with Critical Habitat Designation proposed for both and a Section 4(d) Rule proposed for the Neuse River Waterdog (USFWS 2019). The USFWS does not consider the project areas in range for Carolina Madtom, therefore, the species is not further addressed in this report. However, the Neuse River Waterdog is considered in range. As such, NCDOT requested surveys targeting Neuse River Waterdog.

Table 1 and 2 list the nearest element occurrence (EO) for targeted species in approximate river miles (RM) from the respective sampled streams in the project study area. Data are from the NC Natural Heritage Program database (NCNHP 2019) most recently updated in January 2020 (Figure 2).

**Table 1. Neuse River Element Occurrences**

Species Name	EO ID	EO Waterbody	Distance from crossing (river miles)	First Observed	Last Observed	EO Status*	Figure Number
Neuse River Waterdog	18289	Neuse River	Brice Creek 1: 19.1	February 1968	January 2014	C	2
Neuse River Waterdog	18289	Neuse River	Brice Creek 2: 14.6	February 1968	January 2014	C	2
Neuse River Waterdog	18289	Neuse River	Brice Creek 3: 22.4	February 1968	January 2014	C	2
Neuse River Waterdog	18289	Neuse River	UT to Brice Creek: 16.6	February 1968	January 2014	C	2
Neuse River Waterdog	18289	Neuse River	Scotts Creek: 7.5	February 1968	January 2014	C	2
Neuse River Waterdog	18289	Neuse River	UT to Scotts: 7.4	February 1968	January 2014	C	2

\*: C-NCNHP Current; H –NCNHP Historic

**Table 2. Trent River Element Occurrences**

<b>Species Name</b>	<b>EO ID</b>	<b>EO Waterbody</b>	<b>Distance from crossing (river miles)</b>	<b>First Observed</b>	<b>Last Observed</b>	<b>EO Status*</b>	<b>Figure Number</b>
Neuse River Waterdog	16565	Trent River	Brice Creek 1: 25.6	September 1978	February 2019	C	2
Neuse River Waterdog	16565	Trent River	Brice Creek 2: 21.1	September 1978	February 2019	C	2
Neuse River Waterdog	16565	Trent River	Brice Creek 3: 24.1	September 1978	February 2019	C	2
Neuse River Waterdog	16565	Trent River	UT to Brice Creek: 23.1	September 1978	February 2019	C	2
Neuse River Waterdog	16565	Trent River	Scotts Creek: 20.2	September 1978	February 2019	C	2
Neuse River Waterdog	16565	Trent River	UT Scotts Creek: 20.1	September 1978	February 2019	C	2

\*: C-NCNHP Current; H –NCNHP Historic

As part of the federal permitting process that requires an evaluation of potential project-related effects to federally protected species, Three Oaks was contracted by NCDOT to update the survey baseline and conduct surveys targeting Neuse River Waterdog.

## **2.0 WATERS IMPACTED**

Brice Creek and Scotts Creek are in the Lower Neuse Subbasin (HUC# 03020204) of the Neuse River Basin. In Scotts Creek, Site 1 flows 0.1 RM to UT to Scotts Creek (Site 2) which flows 0.8 RM to the Neuse River. From the most upstream sampling location (Site 7) Brice Creek flows 3.3 RM to Site 6 which flows 4.5 RM to Site 3 which flows another 6.0 RM to the Trent River. The Trent River flows from the confluence with Brice Creek 2.2 RM to the confluence with the Neuse River.

### **2.1 303(d) Classification**

Brice Creek and Scotts Creek are not on the 2018 303(d) list of impaired streams (NC Division of Water Resources [NCDWR] 2018) in the vicinity of the survey area (Figure 3). The Neuse River is listed as a 303(d) impaired stream due to exceeding criteria for Copper and is located 0.8 RM from Site 2 on UT to Scotts Creek and 0.9 RM from Site 1 on Scotts Creek. There are no listed streams within 5 RM upstream of the two Brice Creek arrays.

### **2.2 NPDES Discharges**

There is one major permitted discharger; New Bern Wastewater Treatment Plant (WWTP) (Permit No. NC0025348) located approximately 5 RM from Site 2 on UT to Scotts Creek, which is contiguous with Scotts Creek. There are no major or minor permitted dischargers within 5 RM of the Brice Creek sites (Figure 3, USEPA 2019).

### **3.0 Target Federally Proposed Species Description**

#### **3.1 *Necturus lewisi* (Neuse River Waterdog)**

##### *3.1.1. Species Characteristics*

The Neuse River Waterdog is a fully aquatic salamander and was first described by C.S. Brimley in 1924 as a subspecies of the Common Mudpuppy (*N. maculosus*); it was elevated to species status in 1937 by Percy Viosca, Jr.

The Neuse River Waterdog's average size ranges from 6-9 inches (15.24 – 22.86 cm) in length, with a record length of 11 inches (27.94 cm). It has a somewhat stocky, cylindrical body with smooth skin, a rather flattened, elongate head with a squared-off nose, and small limbs. The tail is vertically flattened with fins on both the top and bottom. Distinct from most salamanders, the Neuse River Waterdog, and other *Necturus* species, have four toes on each foot. The Neuse River Waterdog is a rusty brown color on the dorsal side and dull brown or slate colored on the ventral side. Both dorsal and ventral sides are strongly spotted but the ventral side tends to have fewer and smaller markings; spots are dark bluish to black. They also have a dark line running through the eye. Adults are neotenuous and retain three bushy, dark red external gills usually seen in larval amphibians. Both male and female are similar in appearance and can be distinguished only through differences in the shape and structure of the cloaca (Beane and Newman 1996; Conant and Collins 1998; EDGE of Existence 2016).

Individuals become sexually mature at approximately 5-6 years of age. Breeding normally occurs in the spring. The male deposits a gelatinous spermatophore that is picked up by the female and used to fertilize between 30-50 eggs. The fertilized eggs are attached to the underside of flat rocks or other submerged objects and guarded by the female until they hatch in June or July (Conant and Collins 1998; EDGE of Existence 2016). The longevity of the Neuse River Waterdog is unknown, however, its close relative, the Common Mudpuppy (*Necturus maculosus*) may live for over 30 years (USFWS 2018).

##### *3.1.2. Distribution and Habitat Requirements*

The Neuse River Waterdog is found only in the Neuse and Tar River basins of North Carolina (AmphibiaWeb 2006; Beane and Newman 1996; Frost 2016).

Neuse River Waterdogs inhabit rivers and larger streams, where they prefer leaf beds in quiet waters. They need high levels of dissolved oxygen and good water quality. The Neuse River Waterdog is generally found in backwaters off the main current, in areas with sandy or muddy substrate. Adults construct retreats on the downstream sides of rocks or in the stream bank where they remain during the day. They are active during the night, leaving these retreats to feed. Neuse River Waterdogs are carnivorous, feeding on invertebrates, small vertebrates, and carrion. Neuse River Waterdogs are most active during winter months even when temperatures are below freezing. During summer months, they will burrow into deep leaf beds and are rarely found. It has been suggested that this inactivity in summer may be an adaptation to avoid fish predators, which are more active at these times. In addition, Neuse River Waterdogs produce a defensive, toxic skin secretion that is assumed to be distasteful to predators (AmphibiaWeb

2006; Beane and Newman 1996; Conant and Collins 1998; EDGE of Existence 2016; NatureServe Explorer 2016).

### *3.1.3. Threats to Species*

Any factors that reduce water quality are threats to the Neuse River Waterdog. These can include changes that result in siltation and pollution reducing habitat quality (e.g. channelization, agricultural runoff, and industrial and urban development). Impoundments are also a threat to the dispersal of the species as it is unable to cross upland habitat; Neuse River Waterdogs do not climb and are unlikely to use fish passages (NatureServe Explorer 2016).

### *3.1.4. Designated Critical Habitat*

As mentioned in Section 1.0, on May 22, 2019, the Neuse River Waterdog is proposed for listing under the ESA as a Threatened Species with Section 4(d) Rule and Critical Habitat Designation. Critical habitat designation provided at that time (CFR Vol. 84 No. 99) consists of the following:

- Unit 1 - 8.6 river miles (13.8 river km) of the Upper Tar River in Granville County
- Unit 2 - 10.5 river miles (16.9 river km) of Upper Fishing Creek in Warren County
- Unit 3 - 63 river miles (101 river km) of Lower Little Fishing Creek in Halifax, Nash, and Edgecombe Counties
- Unit 4 – 68 river miles (110 river km) segment of Sandy Creek and Red Bud Creek in Franklin, Nash, and Edgecombe Counties
- Unit 5 – 100 river miles (161 river km) segment of the Middle Tar River in Franklin, Nash, and Edgecombe Counties
- Unit 6 - 60 river miles (96.6 river km) in the Lower Tar River Subbasin including portions of Town Creek, Otter Creek, and Tyson Creek in Edgecombe and Pitt Counties
- Unit 7 - 41.5 river miles (66.8 river km) of the Eno River in Orange and Durham Counties
- Unit 8 - 17.4 river miles (28 river km) segment of the Flat River in Person and Durham Counties
- Unit 9 - 7.6 river miles (12.2 river km) stretch of Middle Creek in Wake and Johnston Counties
- Unit 10 - 23.35 river miles (37.6 river km) stretch of Swift Creek in Johnston County
- Unit 11 - 89.6 river miles (144.2 river km) segment of the Little River including Buffalo Creek in Franklin, Wake, Johnston, and Wayne Counties
- Unit 12 - 18.7 river miles (30 river km) segment of Mill Creek in Johnston and Wayne Counties
- Unit 13 – 40 river miles of (64.4 river km) of Middle Neuse River in in Wayne and Lenoir Counties
- Unit 14 – 117 river miles (188.3 river km) of Contentnea Creek, Neuse River, Nahunta Swamp, and Pinetree Creek in Wayne, Greene, Wilson, Lenoir, Pitt, and Craven Counties

- Unit 15 – 10 river miles (16 river km) of Swift Creek in Craven County
- Unit 16 – 62 river miles (100 river km) of Trent River including Beaver Creek in Jones County

The proposed Critical Habitat Unit 14, in the Neuse River, is located approximately 19.5 RM upstream of the confluence of the Neuse River and Scotts Creek and approximately 20.2 RM upstream of the confluence of the Trent River and Brice Creek. The proposed Critical Habitat Unit 16, in the Trent River, is located approximately 20.3 RM upstream of the confluence of the Trent River and Brice Creek and 23.5 RM upstream of the confluence of the Neuse River and Scotts Creek.

#### **4.0 SURVEY EFFORTS**

The collective projects cross multiple streams within two sub watersheds (Brice Creek and Scotts Creek). The individual crossings are too small to support the Neuse River Waterdog; however, potentially suitable (marginal) habitat was determined to be present in portions of both streams further downstream. Trapping for Neuse River Waterdog was conducted January 27-31, 2020, by Tim Savidge (Permit # 20-ES00034) and Paige Green and February 25-27, 2020, by Kate Sevick (Permit # 20-ES00485) and Lizzy Stokes-Cawley (Figure 1).

##### **4.1 Stream Conditions: Site 1 - Scotts Creek at Williams Road**

Habitat in this reach of Scotts Creek consisted primarily of sluggish run and pools of varied depth (one to three feet). The channel width ranged between 14 and 20 feet wide, with banks up to three feet high. The substrate consisted primarily of muddy sand and detritus. The channel is bordered by moderately wide forested wetlands on both sides of the channel. This site was surveyed January 27-31, 2020.

##### **4.2 Stream Conditions: Site 2 – Scotts/UT Scotts Creek at Scott Street**

Traps 1-3 were set in UT Scotts Creek below the Scott Street crossing. The channel is straight and approximately 10-14 feet wide, with banks up to two feet high. The stream was bordered by forested swamp wetlands. The substrate consists of muddy sand and detritus. Heavy algal mats covered much of the surface. Flow was very sluggish, and water depth ranged from a few inches to two feet and fluctuated with the tidal cycle.

Traps 4-8 were set in Scotts Creek. The channel ranged from 20 feet wide near the confluence with the UT to approximately 35 feet in the downstream extent. The substrate consisted of mud and detritus. Algal mats and submerged aquatic vegetation covered much of the substrate. Water depth was not determined. This site was surveyed January 27-31, 2020.

##### **4.3 Stream Conditions: Site 3 - Brice Creek at WRC Boat Landing**

The channel in this portion of Brice Creek is greater than 70 feet wide with banks that range from less than one foot to over 10 feet high. Along the right descending banks, the creek is bordered by adjacent floodplain wetlands at both the upstream and downstream limits of the



trapping array. A steep forested slope borders the creek in-between these areas. A mixture of forestland and residential homes with boat docks borders the left descending side of the creek. Water depth was not determined. This site was surveyed January 27-31, 2020.

#### **4.4 Stream Conditions: Site 4 - UT to Brice Creek at US-70**

A habitat evaluation at UT to Brice Creek at US-70 was conducted and determined that survey efforts at this location were not recommended. UT to Brice Creek at this location was between four to six feet wide and had incised banks between two and six feet in height. Water depth was between one and three feet deep and was slightly turbid at the time of the evaluation. The substrate is dominated by clay, silt, and sand. The channel has a moderate forested buffer with commercial areas beyond the buffer. This site was evaluated on February 26, 2020.

#### **4.5 Stream Conditions: Site 5 - UT to Brice Creek at Old Airport Road**

Habitat in this reach of UT to Brice Creek consists primarily of slow-moving runs of varied depth. Habitat above the bridge is characterized by a wide braided channel ranging from 100 to 120 feet in width with depths from six inches to two feet. Below the bridge is a defined channel approximately 15 to 25 feet wide with depths between one and five feet. Bank height both above and below the bridge ranges from one to three feet in height. Substrate consists primarily of clay, silt, and sand with some gravel present in runs. Water was tannic and clear during the survey. The channel is bordered by moderately wide forested wetlands on both sides, with residential areas beyond the buffer. This site was surveyed February 25-27, 2020.

#### **4.6 Stream Conditions: Site 6 - Brice Creek at Old Airport Road**

This portion of Brice Creek is characterized as a slow moving highly meandering blackwater swamp stream with large associated floodplain wetlands. The channel width ranged from 25-35 feet wide, with banks up to four feet high. The substrate consisted primarily of silt, sand, and gravel. Instream habitat consisted of a sequence of runs and pools, with short riffle areas created by sand bars and woody debris. At the time of the surveys, water depth ranged from six inches in the riffles to six feet in the pools. The channel has a moderately wide forested buffer on both sides of the channel. A large wetland is present upstream of the study area on the right descending bank. This portion of Brice Creek was sampled January 27-31 and February 25-27, 2020 with similar habitat conditions on the second sampling effort.

#### **4.7 Stream Conditions: Site 7 - Brice Creek at County Line Road**

This portion of Brice Creek is characterized as a slow moving highly meandering blackwater swamp stream with large associated floodplain wetlands. The channel upstream of the bridge ranges from 50-100 feet wide, with banks from one to four feet high. The substrate consists primarily of clay, sand, and silt. Downstream of the bridge the channel is more defined and ranges from 40 to 50 feet wide with banks up to four feet in height. Instream habitat consisted of a sequence of runs and pools, with short riffle areas created by woody debris. At the time of the surveys, water depth ranged from six inches in the riffles to six feet in the pools. The channel

has an extensive wide forested buffer on both sides of the channel. This site was surveyed February 25-27, 2020.

#### **4.8 Stream Conditions: Site 8 - Great Branch at Tebo Road**

A habitat evaluation at Great Branch was conducted and determined that survey efforts at this location were not recommended. Great Branch at this location is a large swamp with a braided channel between 50 and 80 feet wide with slow flowing water and banks up to one foot high. Water was both tannic and turbid at the time of the evaluation and the substrate is dominated by clay, silt, and sand. The channel has a moderate forested buffer with residential areas beyond. This site was evaluated February 26, 2020.

#### **4.9 Methodology**

A total of six stream reaches, four within the Brice Creek system and two within Scotts Creek system were surveyed for Neuse River Waterdog; two additional reaches were evaluated for habitat and not surveyed.

##### *4.9.1. Neuse River Waterdog Surveys*

Survey methodology was adapted from general methods that had previously been developed by Three Oaks in consultation with the USFWS and NCWRC and were designed to replicate winter trapping efforts conducted as part of the recent species status assessment undertaken by these agencies and collaborators. A variable number of traps were set among sites. The locations of the trapping sites are depicted in Figure 1. The number of traps set at a particular location was based on amount of potentially suitable habitat and stream access. Individual trap locations were selected based on habitat conditions and accessibility. Undercut banks, with some accumulation of leaf pack, as well as back eddy areas within runs were the primary microhabitats selected; however, all of the microhabitats (pool, riffle, run, etc.) occurring at a site were sampled with at least one trap. Traps were baited with a combination of chicken livers and hot dogs and allowed to soak overnight. The traps were checked daily, all species found within the traps were recorded, and the traps were rebaited. In addition, dip net sweeps through leaf packs and underneath submerged rootmats were conducted to supplement the trapping efforts.

During surveys conducted January 27- 31, 2020, Site 1 on Scotts Creek consisted of six traps set for three nights (18 trap nights). Site 2 on Scotts Creek/UT Scotts Creek consisted of eight traps set for four nights (36 trap nights). Site 3 on Brice Creek consisted of 10 traps set for three nights (30 trap nights). Site 6 on Brice Creek initially had 12 traps set for one night, with an additional 3 traps added after the first night for 15 traps for the remaining three nights (57 trap nights).

A second survey period was conducted February 25-27, 2020, Site 6 on Brice Creek was surveyed an additional two nights with 10 traps (20 trap nights). Two additional sites in the Brice Creek system were also surveyed: Site 5 on UT Brice Creek at Old Airport Road set with 10 traps for two nights (20 trap nights) and Site 7 on Brice Creek at County Line Road set with 10 traps for two nights (20 trap nights).

## 5.0 RESULTS

The following details the results for these efforts where appropriate habitat conditions for targeted species were conducted.

### 5.1 Neuse River Waterdog

The Neuse River Waterdog was not captured during the trapping efforts; however, five fish species Yellow Bullhead (*Amerius natalis*), American Eel (*Anguilla rostrata*), Pirate Perch (*Aphredoderus sayanus*), Bluespotted Sunfish (*Ennecanthus gloriatus*) and Warmouth (*Lepomis gulosus*), two Arthropod species, Blue Crab (*Callinectes sapidus*) and an unidentified crayfish (*Procambarus* sp.), and one freshwater snail species Pointed Campeloma (*Campeloma decisum*) were captured collectively during the efforts (Tables 3-8). Additionally, the Atlantic Rangia (*Rangia cuneata*) a surf clam species that occurs in brackish waters was observed at all sampled stream segments except for the Brice Creek-Old Airport Road site and locations upstream. Trapping surveys were conducted at Site 5 on UT to Brice Creek February 25-27, 2020; however, no species were found thus a table is not included

**Table 3. Site 1 - Scotts Creek-Williams Road Trapping Surveys January 27-31, 2020 Species Found**

Trap #	Day 1	Day 2	Day 3	Day 4
1	X	~	~	~
2	X	~	~	~
3	X	~	~	~
4	X	~	~	~
5	X	Yellow Bullhead (1)	~	~
6	X	~	~	~

\*: X-Denotes soak night where trap was not set due to unfavorable conditions

**Table 4. Site 2 - Scotts/UT Scotts Creek-Scott Street Trapping Surveys January 27-31, 2020 Species Found**

Trap #	Day 1	Day 2	Day 3	Day 4
1	Yellow Bullhead (1)	~	~	~
2	~	~	~	~
3	~	~	~	~
4	~	~	~	~
5	~	~	~	~
6	~	~	~	~
7	~	~	~	~
8	~	~	~	~

**Table 5. Site 3 - Brice Creek-WRC Boat Ramp Trapping Surveys January 27-31, 2020 Species Found**

Trap #	Day 1	Day 2	Day 3	Day 4
1	X	~	Tadpole Madtom (1)	~
2	X	~	~	~

Trap #	Day 1	Day 2	Day 3	Day 4
3	X	Blue Crab (1)	~	~
4	X	~	~	American Eel (1)
5	X	~	~	~
6	X	~	~	~
7	X	~	~	~
8	X	~	~	~
9	X	~	Pirate Perch (1)	~
10	X	~	~	~

**Table 6. Site 6 - Brice Creek-Old Airport Road Trapping Surveys January 27-31, 2020 Species Found**

Trap #	Day 1	Day 2	Day 3	Day 4
1	X	~	~	~
2	Pointed Campeloma	~	Pirate Perch (1), Warmouth (1)	Pointed Campeloma
3	~	~	~	Bluespotted Sunfish (1), <i>Procambarus</i> sp. (1)
4	~	~	Pirate Perch (1)	Pirate Perch (1)
5	American Eel (2)	~	~	~
6	~	Bluespotted Sunfish (1)	~	~
7	~	~	~	<i>Procambarus</i> sp. (1)
8	~	Pirate Perch (1)	~	~
9	~	~	American Eel (1)	~
10	~	~	~	~
11	~	~	~	~
12	~	Bluespotted Sunfish (1)	~	~
13	X	~	Bluespotted Sunfish (1)	~
14	X	~	~	~
15	X	Pirate Perch (1)	~	Bluespotted Sunfish (1)

**Table 7. Site 6 - Brice Creek at Old Airport Road Trapping Surveys February 25-27, 2020 Species Found**

Trap #	Day 1	Day 2
1	~	~
2	~	Pirate Perch (1)
3	~	~
4	~	~
5	Bluespotted Sunfish (1)	Bluespotted Sunfish (1)
6	~	~
7	Bluespotted Sunfish (1)	Bluespotted Sunfish (1)
8	~	Bluespotted Sunfish (1)

Trap #	Day 1	Day 2
9	~	~
10	~	~

**Table 8. Site 7 - Brice Creek at Country Line Road Trapping Surveys February 25-27, 2020 Species Found**

Trap #	Day 1	Day 2
1	~	Bluespotted Sunfish (1)
2	~	~
3	~	~
4	~	~
5	~	~
6	~	Yellow Bullhead (1)
7	~	~
8	~	~
9	~	~
10	~	Bluespotted Sunfish (1)

## 6.0 DISCUSSION/CONCLUSIONS

The target species, Neuse River Waterdog, was not found during these efforts. Based on the survey results and habitat conditions observed, effects to the Neuse River Waterdog are unlikely to occur from project construction in the study area. Strict adherence to erosion control standards should minimize the potential for any adverse impacts to occur. Biological conclusions on potential impacts from the project to the target species are provided below.

The USFWS is the regulating authority for Section 7 Biological Conclusions and as such, it is recommended that they be consulted regarding their concurrence with the finding of this document. The federal action agency, or its nonfederal designee (NCDOT) must render a biological conclusion for each species.

While the following species is not currently federally protected and a biological conclusion is not necessary at the time of the writing of this report, if the species was to receive federal protection, appropriate biological conclusions are as follows:

### **Recommended Biological Conclusion Neuse River Waterdog: May Affect/Not Likely to Adversely Affect**

Neuse River Waterdog was not located during these efforts. The two sampling locations within the Scotts Creek drainage and the Brice Creek location in the vicinity of the WRC boat landing are heavily influenced by the tidal cycle and based on the presence of the Atlantic Rangia are brackish. While the salinity tolerance of the Neuse River Waterdog is not reported, it is only known from freshwater habitats. As such no project related effects to the species are expected within these waterbodies (Scott Creek System, lower portion of Brice Creek), as habitat conditions are not suitable.

Although the other two sampling locations within Brice Creek (Old Airport Road and Country Line Road) appear to be freshwater, the brackish conditions between this location and the known population in the upper portions of the Trent River is likely a barrier to colonization. Based on the survey results and the barrier between known populations and this portion of Brice Creek, the Neuse River Waterdog is unlikely to be present. However, given the presence of suitable habitat (lotic freshwater stream of sufficient size), its presence cannot be ruled out entirely, as such it is concluded that the project construction is Not Likely to Adversely Affect the Neuse River Waterdog.

## 7.0 LITERATURE CITED

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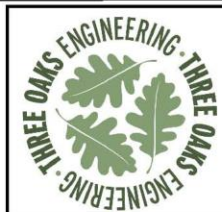
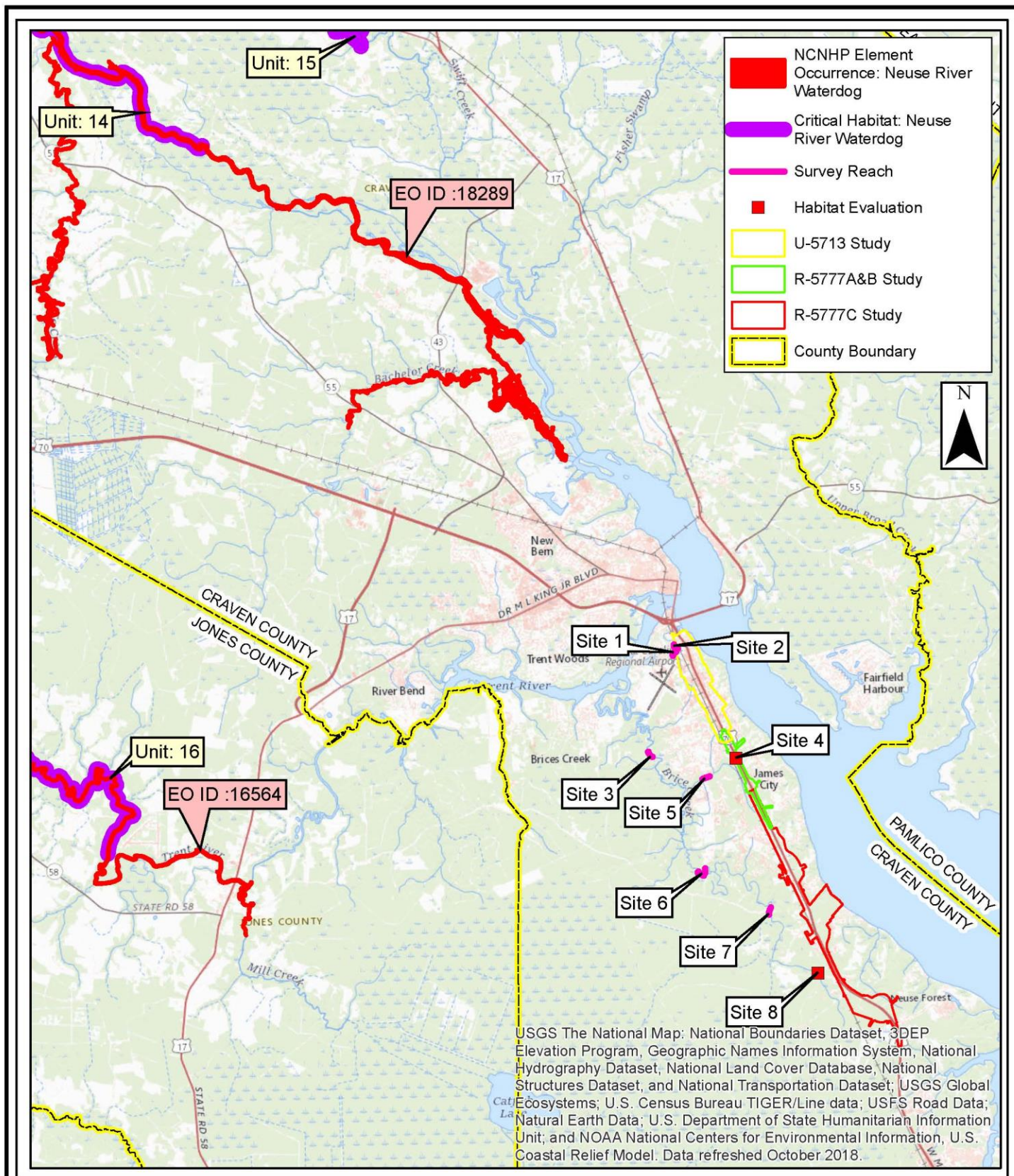


## **APPENDIX A**

### **Figures**





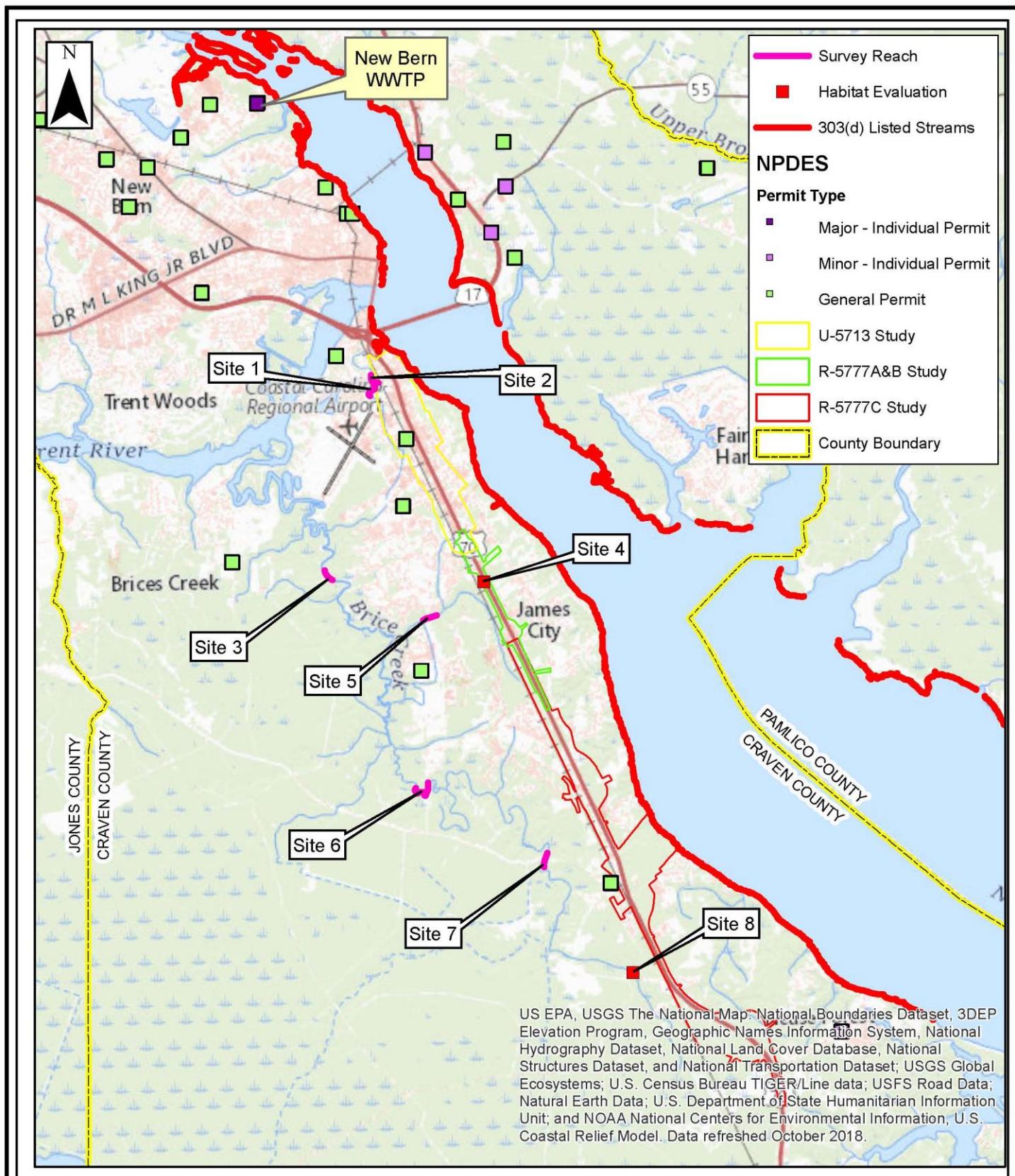


**Neuse River Waterdog Survey Report**  
 (STIP No.'s U-5713, R-5777A,  
 R-5777B, R-5777C)  
**Neuse River Waterdog Element**  
**Occurrences and Critical Habitat**  
 Craven County, North Carolina

Date: March 2020  
 Scale: 0 1 2 Miles  
 Job No.: 20-301  
 Drawn By: KEMS  
 Checked By: TWS

Figure  
**2**





# **RED-COCKADED WOODPECKER SURVEY REPORT**

**Improvements to U.S. 70 from east of the SR 1116 (E. Thurman Road) intersection to the  
Proposed Havelock Bypass  
Craven County, North Carolina**

**STIP R-5777C  
WBS Element No. 44648.1.4**



**THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
Division of Highways – Division 2**

**July 2020**

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## 1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) proposes improvements to U.S. 70 from east of the SR 1116 (E. Thurman Road) intersection to the proposed Havelock Bypass (STIP No. R-5777C) in Craven County, North Carolina (Figure 1). This red-cockaded woodpecker (RCW) survey report has been prepared in compliance with NCDOT Natural Environment Section (NES) RCW protocol (version 1.4) requirements. In addition to satisfying NCDOT Natural Resource Technical Report (NRTR) requirements, this RCW survey report will also provide supplementary documentation to the United States Forest Service (USFS) Biological Evaluation (BE) report, which provides survey results for not only federally threatened and endangered species, but also state-listed and locally-rare species tracked by the Croatan National Forest (CNF).

RCW's are southeastern piney-woods specialists. Although they evolved primarily within the fire-maintained longleaf pine ecosystem of the southeastern Coastal Plain, they also occupy, or once-occupied (e.g., Kentucky, Missouri, and Tennessee), more interior fire-maintained pine forests. Although RCW's primarily nest in longleaf pine, they certainly are not restricted to this species. They are also known to nest in loblolly, pond, pitch, slash, shortleaf, and Virginia pines. Regardless of which pine-dominated ecosystem they evolved in, RCW's require open forest structure, which is typically maintained by fire (with an exception occurring in the swamp forests of northeastern North Carolina). RCW's excavate nesting cavities in living pine trees  $\geq 60$  years of age that are contiguous with open pine stands at least 30 years of age, which constitute appropriate foraging habitat. The foraging range of the RCW is normally no more than a half-mile from nesting sites. This RCW survey was conducted to determine if suitable foraging and nesting habitat is present within the R-5777C study area (hereinafter "study area"), and within a half-mile radius of suitable habitat occurring within the study area (Figure 2).

## 2.0 METHODOLOGY AND QUALIFICATIONS

The study area was initially screened for the presence of homogenous pine stands using the most current orthoimagery available. These pine stands were then visited and assessed for overstory pine species composition as well as tree age and density and recent forest management methods, or lack thereof. Select overstory pines were aged using an increment-borer in the field. Using these methods, suitable RCW foraging and nesting habitat was identified within the study area (Figures 2-3). Due to the presence of suitable habitat within the study area, pine stands within a half-mile radius of suitable RCW habitat located within the study area were also surveyed. Each pine stand constituting suitable RCW habitat within, and within a half-mile radius of suitable RCW habitat within the study area, was assigned a stand number (Figures 2-3). Three Oaks Engineering (Three Oaks) staff member Nathan Howell conducted RCW surveys on the following dates: November 20-21, 2019 and January 29-30 and February 17, 2020.

The principal personnel contributing to this document were:

Principal

Investigator: Nathan Howell

Education: B.S. Fisheries, Wildlife, and Conservation Biology, North Carolina State University, 2013

M.S. Plant and Microbial Biology, North Carolina State University, 2015

Experience: Environmental Scientist, Three Oaks Engineering, October 2015 – Present

Responsibilities: Federally threatened and endangered species surveys

### 3.0 SURVEY RESULTS

The North Carolina Natural Heritage Program (NCNHP) Data Explorer was used to screen for historic and extant RCW populations within the study area and within a half-mile radius of the study area prior to conducting RCW field surveys. The most recent NCNHP dataset (April 2020) shows no RCW populations within 1.0 mile of the study area. Two RCW populations occur within 1.5 miles of the study area (Element Occurrence [EO] No.'s 15 and 434). Each of these occurrences are considered current, with the last reported observations being in 2018. Like the NCNHP dataset, current USFS RCW occurrence data indicate no known RCW populations within, or within a half-mile radius of the study area.

Unless noted otherwise, pine stands located within and within a half-mile of the study area that are not depicted as foraging or nesting habitat in Figures 2-3 did not possess the necessary habitat elements to warrant such a designation. These stands currently lack appropriate management practices (e.g., prescribed fire, selective hardwood thinning), stand age, density, species composition, or a combination of these characteristics. Stands not receiving proper forest management practices possess mid-story and understory layers too thick for RCW foraging or colonization.

Four stands within the study area possess suitable RWC habitat, while nine stands constituting suitable habitat occur within the half-mile radius of these four stands located within the study area (Figures 2-3). These sites are discussed below.

#### Stands 1, 3, 8 and 9

These privately-owned pine-dominated forest stands occur within (Stands 1 and 3) and outside of (Stands 8 and 9) the study area. They are currently being managed for timber production by the Weyerhaeuser Company (hereafter Weyerhaeuser). Overstory tree species are comprised primarily of loblolly pine; however, sweetgum, tulip poplar, oak and hickory are also present. Overstory loblolly pines within these stands range between 27-35 years of age. These stands were commercially thinned in 2011. As a result, their mid- and understories are open enough to justify their designation as suitable RCW foraging habitat. The same cannot be said for the privately-owned, Weyerhaeuser-managed tracts on the opposite side of US 70. These stands are also managed for timber production. Overstory pines within these tracts age between 22-35 years. Although the age of overstory pines within these stands meet the requirements for RCW foraging



habitat in the strict sense, forest stand conditions are not conducive to RCW foraging or nesting due to high stand densities and basal area. These stands have not been thinned since 2007 and receive no prescribed fire.

## **Stand 2**

This forest stand occurs within the half-mile buffer zone. It is owned by the North Carolina Coastal Land Trust and currently receives no applied forest or wildlife management practices. Some overstory pines within this stand exceed 60 years of age. Much of this stand is too thick to be considered appropriate RCW habitat; however, some eastern portions of the stand are open enough to be considered marginal nesting habitat. The western half of the stand is dominated by loblolly pine. The eastern half consists of a roughly 60/40 pine/hardwood ratio. Due to the site possessing marginal habitat at best, transects were not walked. Aural and visual surveys were conducted around the periphery of the stand.

## **Stands 4-7**

These four pine-dominated stands occur within the half-mile buffer zone. They all occur on a single parcel owned by CNF (Parcel ID 6-213-209). This parcel is currently owned by the USFS but is actively managed for wildlife by the North Carolina Wildlife Resources Commission (NCWRC). Prescribed fire and selective hardwood thinning have recently been implemented in some areas of the parcel. Stands within this parcel possess an open to semi-open hardwood mid-story. Some overstory pines within these stands exceed 60 years of age. Anecdotal sighting reports of foraging RCW's within this parcel have been made by USFS foresters, but no official data corroborating these sightings exist. These four stands possess the necessary habitat elements to be designated as appropriate nesting habitat.

Transects through this parcel were walked on February 17, 2020. One start-cavity (Cavity No. 1; Appendix B) was found roughly 70 feet up from ground-level in a large loblolly pine. This tree is in a canopy gap opening not far from a bicycle/hiking path (Latitude: 34.97192, Longitude: -76.954610). The cavity is about 2 inches in diameter and about 2 inches deep. USFS staff were notified (via email correspondence dated February 18, 2020) of this potential RCW start-cavity. USFS staff later examined the cavity and determined it to be the result of pileated woodpecker activity as opposed to red-cockaded woodpeckers. However, they committed to monitoring the tree to ensure this was the case.

## **Stands 10-11**

These two pine-dominated stands occur on USFS property (Parcel No. 6-205-001). They do not appear to have received prescribed fire in recent years but possess the necessary stand age and openness to be considered appropriate nesting habitat. Stand 11 was heavily thinned in 2009 and possesses an open canopy structure. Although the canopy is open, understory woody vegetation has not been suppressed since 2009 and will become an inhibiting factor to RCW colonization in forthcoming years without fire or mechanical thinning. Due to their size and open structure, transects were not walked through these sites. Instead, aural, and visual surveys were conducted along their peripheries on January 30, 2020. No RCW's or RCW cavities were observed.

## Stand 12

This pine-dominated stand occurs on USFS property (Parcel No. 7-054-041). The CNF Ranger Station, helicopter pad, and workshop all occur within this stand. This stand does not receive forest management practices due to its proximity with the ranger station and its outbuildings. This stand possesses some overstory pines  $\geq 60$  years of age, but they are all scattered around areas of anthropogenic disturbance associated with the ranger station and workshop. The homogenous pine stand immediately east of the workshop possesses the necessary age and structural requirements to be considered appropriate foraging habitat.

## Stand 13

Stand 13 consists of all remaining lands on the ranger station parcel. These pine-dominated stands are actively managed with prescribed fire. They possess overstory pines  $\geq 60$  years of age and the open conditions necessary to be designated as appropriate nesting habitat. Transects through this stand were walked on November 20-21, 2019. No RCW's or RCW cavities were observed. Additionally, no RCW's or cavities were observed in calendar years 2019 or 2020 while conducting jurisdictional waters delineations and protected species surveys.

**Table 1. Survey Results by Stand number**

Stand Number	Age of Pines (Yrs.)	% Pine Overstory	Suitable Foraging Habitat?	Suitable Nesting Habitat?	RCW's or Cavities Observed?
Stand 1	27-35	90	Yes	No	None
Stand 2	60+	60-90	Yes	Yes	None
Stand 3	27-35	90	Yes	No	None
Stand 4	50-60+	60-80	Yes	Yes	None
Stand 5	50-60+	60-80	Yes	Yes	None
Stand 6	50-60+	60-80	Yes	Yes	None
Stand 7	50-60+	60-80	Yes	Yes	None
Stand 8	27-35	90	Yes	No	None
Stand 9	27-35	90	Yes	No	None
Stand 10	50-60+	60-80	Yes	Yes	None
Stand 11	50-60+	100	Yes	Yes	None
Stand 12	30-60	100	Yes	No	None
Stand 13	50-60+	60-90	Yes	Yes	None

No RCW's or RCW cavities were observed during survey efforts in 2019 or 2020. Additionally, NCNHP and USFS occurrence data indicate no active or historical RCW populations within the study area or within a mile of the study area. Therefore, the Biological Conclusion for RCW on this project is No Effect.

## 4.0 REFERENCES

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North Carolina Natural Heritage Program (NCNHP). 2020. Natural Heritage Data Explorer [Web Application]. NCDNCR, Raleigh, NC. Available at: [www.ncnhp.org](http://www.ncnhp.org). Accessed: February 5, 2020.

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 1989. Soil Survey of Craven County, North Carolina.

United States Fish and Wildlife Service (USFWS). Red-cockaded Woodpecker (*Picoides borealis*) species profile. Available at: <http://www.fws.gov/rcwrecovery/rcw.html>. Accessed: February 5, 2020.

## **Appendix A**

### **Figures**





Prepared For:



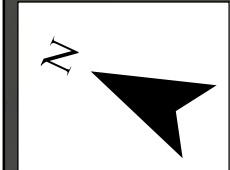
US 70 Improvements from SR 1116  
(Thurman Rd) to the Havelock Bypass  
(TIP R-5777C)

Vicinity Map  
Craven County, North Carolina

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Scale:	0 1,000 2,000 Feet
Job No.:	19-007
Drawn By:	NDH
Checked By:	JM

Figure  
1





**Legend**

R-5777C Study Area

R-5777C RCW Halfmile Buffer

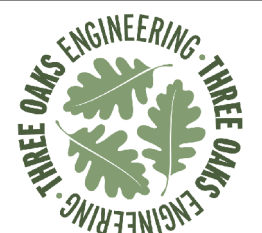
**R-5777C RCW Habitat**

Foraging

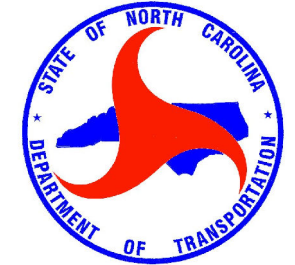
Nesting

Railroads

Streets



Prepared For:



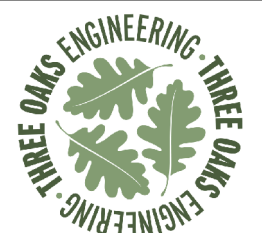
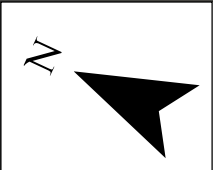
US 70 Improvements  
from SR 1116  
(Thurman Road)  
to the  
Havelock Bypass  
NCDOT STIP: R-5777C

Red-cockaded  
Woodpecker (RCW)  
Suitable Habitat  
Location Overview Map

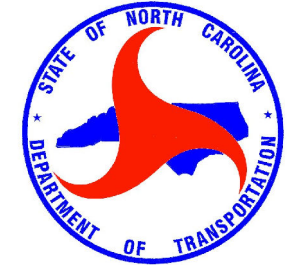
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Figure  
**2**





Prepared For:



US 70 Improvements  
from SR 1116  
(Thurman Road)  
to the  
Havelock Bypass  
NCDOT STIP: R-5777C

Red-cockaded  
Woodpecker (RCW)  
Habitat Map  
Neuse Forest Tracts

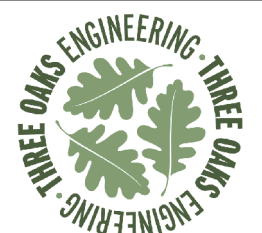
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Figure  
**3a**

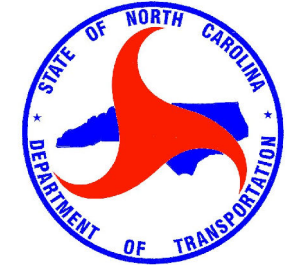
**Legend**

- R-5777C Study Area
- R-5777C RCW Halfmile Buffer
- R-5777C RCW Habitat**
  - Foraging
  - Nesting
- Railroads
- Streets





Prepared For:



US 70 Improvements  
from SR 1116  
(Thurman Road)  
to the  
Havelock Bypass  
NCDOT STIP: R-5777C

Red-cockaded  
Woodpecker (RCW)  
Habitat Map  
Riverdale Tracts

Date:	February 2020	
Scale:	0 500 1,000 Ft	
Job No.:	19-007	
Drawn By:	NDH	Checked By: JSM

Figure  
**3b**



## **Appendix B**

### **Photos**



**Photo 1:** Pileated woodpecker (*Dryocopus pileatus*) start cavity from Stand No. 7.