

NATURAL RESOURCES TECHNICAL REPORT

**Replace Bridge No. 7 on US 64 over the Alligator River
Dare and Tyrrell counties, North Carolina**

**STIP HB-0001
WBS Element No. 49475.1.1**



**THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Environmental Coordination and Permitting**

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1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge no. 7 on US 64 over the Alligator River (STIP HB-0001) in Dare and Tyrrell counties (Figures 1 and 2). The following Natural Resources Technical Report (NRTR) has been prepared to assist in the preparation of a document for the purposes of the National Environmental Policy Act (NEPA) or the State Environmental Policy Act (SEPA).

2.0 METHODOLOGY

All work was conducted in accordance with the NCDOT Environmental Coordination and Permitting's Preparing Natural Resources Technical Reports Procedure and the latest NRTR Template November 2017. Field work was conducted on February 25 and 26, 2021. Jurisdictional areas identified in the study area were verified by the U.S. Army Corps of Engineers (USACE), the North Carolina Division of Water Resources (NCDWR), and the North Carolina Division of Coastal Management (NCDCM) on March 31, 2021. The principal personnel contributing to the field work and document is provided in Appendix B.

3.0 TERRESTRIAL COMMUNITIES

Three terrestrial communities were identified in the study area. Figure 4 shows the approximate 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).

Table 1. Coverage of terrestrial communities in the study area

Community	Dominant Species (scientific name)	Coverage (ac.)
Maintained / Disturbed	Tall fescue (<i>Festuca arundinacea</i>) Lamp rush (<i>Juncus effusus</i>) Loblolly pine (<i>Pinus taeda</i>)	24.9
Riverine Swamp Forest	Pond pine (<i>Pinus serotina</i>) Willow oak (<i>Quercus phellos</i>) Common reed (<i>Phragmites australis</i>)	69.5
Tidal Freshwater Marsh	Black needlerush (<i>Juncus roemerianus</i>) Smooth cordgrass (<i>Spartina alterniflora</i>) Sawgrass (<i>Cladium mariscoides</i>)	18.7
	Total	113.1

4.0 PROTECTED SPECIES

4.1 Endangered Species Act Protected Species

As of October 8, 2020 and September 17, 2020 the United States Fish and Wildlife (USFWS) Information for Planning and Consulting (IPaC) and USFWS County Listing

lists eighteen federally protected species under the Endangered Species Act (ESA) for Dare and Tyrrell Counties, respectively (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 Dare and Tyrrell counties.

Scientific Name	Common Name	Federal Status	County	Habitat Present	Biological Conclusion
<i>Alligator mississippiensis</i>	American alligator	T (S/A)	Dare / Tyrrell	Yes	Not Required
<i>Laterallus jamaicensis</i>	Black rail	T	Dare	Yes	MA-NLAA
<i>Chelonia mydas</i>	Green sea turtle	T	Dare	No	No Effect
<i>Eretmochelys imbricata</i>	Hawksbill sea turtle	E	Dare	No	No Effect
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle	E	Dare	No	No Effect
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	Dare	No	No Effect
<i>Caretta caretta</i>	Loggerhead sea turtle	T	Dare	No	No Effect
<i>Myotis septentrionalis</i>	Northern long-eared bat	T	Dare / Tyrrell	Yes	MA-LAA
<i>Charadrius melodus</i>	Piping plover	T	Dare	No	No Effect
<i>Calidris canutus rufa</i>	Red knot	T	Dare / Tyrrell	No	No Effect
<i>Canis rufus</i>	Red wolf	EXP	Dare / Tyrrell	Yes	MA-NLAA
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	Dare / Tyrrell	Yes	Unresolved
<i>Sterna dougallii dougalli</i>	Roseate tern	T	Dare	No	No Effect
<i>Trichechus manatus</i>	West Indian manatee	E	Dare / Tyrrell	Yes	MA-NLAA
<i>Amaranthus pumilus</i>	Seabeach amaranth	T	Dare	No	No Effect
<i>Acipenser brevirostrum</i>	Shortnose sturgeon ¹	E	Dare / Tyrrell	Yes	MA-NLAA
<i>Acipenser oxyrinchus oxyrinchus</i>	Atlantic sturgeon ¹	E	Dare / Tyrrell	Yes	MA-NLAA

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

EXP – Experimental Population; MA-LAA - May Affect - Likely to Adversely Affect; MA-NLAA - May Affect - Not Likely to Adversely Affect

* - Historic record (the species was last observed in the county more than 50 years ago)

1 – Species listed by NMFS only.

American Alligator

USFWS optimal survey window: year round (only warm days in winter)

Biological Conclusion: Not Required

Suitable habitat, consisting of large forested swamps, is present within the study area. However, species listed as threatened due to similarity of appearance do not require Section 7 consultation with the USFWS. A review of NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Black Rail

USFWS optimal survey window: year round

Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for the black rail is present within the study area, however minimal impacts to large marsh areas are anticipated to result from the project. No surveys for this species have been performed. A review of NHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Green Sea Turtle

USFWS/NMFS Recommended Survey Window: April-August

Biological Conclusion: No Effect

No habitat for the green sea turtle exists within the study area. The turtle is not expected to venture inland as far as the Alligator River, or to enter any of the canals that connect the study area to the Alligator River. This project will not affect the green sea turtle. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Hawksbill Sea Turtle

USFWS/NMFS Recommended Survey Window: April-August

Biological Conclusion: No Effect

No habitat for the hawksbill sea turtle exists within the study area. The turtle is not expected to venture inland as far as the Alligator River, or to enter any of the canals that connect the study area to the Alligator River. This project will not affect the hawksbill sea turtle. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Kemp's Ridley Sea Turtle

USFWS/NMFS Recommended Survey Window: April-August

Biological Conclusion: No Effect

No habitat for the Kemp's Ridley sea turtle exists within the study area. The turtle is not expected to venture inland as far as the Alligator River, or to enter any of the canals that connect the study area to the Alligator River. This project will not affect the Kemp's Ridley sea turtle. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Leatherback Sea Turtle

USFWS/NMFS Recommended Survey Window: April-August

Biological Conclusion: No Effect

No habitat for the leatherback sea turtle exists within the study area. The turtle is not expected to venture inland as far as the Alligator River, or to enter any of the canals that connect the study area to the Alligator River. This project will not affect the leatherback sea turtle. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Loggerhead Sea Turtle

USFWS/NMFS Recommended Survey Window: April-August

Biological Conclusion: No Effect

No habitat for the loggerhead sea turtle exists within the study area. The turtle is not expected to venture inland as far as the Alligator River, or to enter any of the canals that connect the study area to the Alligator River. This project will not affect the loggerhead sea turtle. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Piping Plover

USFWS Recommended Survey Window: year round

Biological Conclusion: No Effect

No suitable habitat is present within the study area. There are sandy beaches located along the eastern shore of the Alligator River within the study area. However, these areas are minimal in size and appear to be experiencing active erosion, preventing them from acting as suitable nesting habitat. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Red Knot

USFWS Recommended Survey Window: None

Biological Conclusion: No Effect

No suitable habitat is present within the study area. No coastal intertidal sediment areas are present within the study area. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Red Wolf

USFWS optimal survey window: year round

Biological Conclusion: May Affect – Not Likely to Adversely Affect

Suitable habitat for the red wolf, consisting of heavy vegetative cover and suitable availability of prey, is present within the study area. A review of NCNHP records, accessed March 25, 2021, indicates one known occurrence (EO ID: 23088) within 1.0 mile of the study area. Roadway improvements at either bridge approach are likely to result in only temporary disturbances and temporary territorial shifts for the red wolf.

Red-Cockaded Woodpecker

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

Biological Conclusion: Unresolved

Suitable nesting and foraging habitat for RCW is located within the project study area. Surveys for RCW in the project area are being performed in 2021. A summary will be provided upon conclusion of the surveys.

Roseate Tern

USFWS optimal survey window: June-August

Biological Conclusion: No Effect

No suitable habitat is present within the study area. No isolated, less disturbed coastal islands are present within the study area. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

West Indian Manatee

USFWS Recommended Survey Window: year round

Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat is present within the study area in Alligator River. A review of the NCNHP records, updated July 2018, indicates no known occurrences within 1.0 mile of the study area. The *Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters* (USFWS, 2003) will be implemented for this project to ensure no adverse effects occur.

Seabeach Amaranth

USFWS Optimal Survey Window: July through October

Biological Conclusion: No Effect

No suitable habitat is present within the study area. No barrier island beaches are present within the study area. A review of the NCNHP records, accessed March 25, 2021, indicates no known occurrences within 1.0 mile of the study area.

Shortnose Sturgeon

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

Biological Conclusion: May Affect, Not Likely to Adversely Affect

The Alligator River may offer suitable habitat for the sturgeon within the study area. Some canals and ditches in the study area may be adequate to support smaller anadromous species such as river herring, but are unlikely to provide habitat for the shortnose sturgeon. NCNHP records document no occurrences of shortnose sturgeon within the Alligator River. The closest NCNHP record is a historical occurrence in Albemarle Sound approximately 4 miles north of the project. Based on available information and communication with NOAA Marine Fisheries on 1/7/2021, the Biological Conclusion for shortnose sturgeon is May Affect, Not Likely to Adversely Affect due to lack of known occurrences.

Atlantic Sturgeon

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

Biological Conclusion: May Affect – Not Likely to Adversely Affect

The Alligator River may offer suitable habitat for the sturgeon within the study area. Some canals and ditches in the study area may be adequate to support smaller anadromous species such as river herring, but are unlikely to provide habitat for the Atlantic sturgeon. NCNHP records document EO 38940, the northern NC range of Atlantic sturgeon, within the study area. Based on available information and communication with NOAA Marine Fisheries on 1/7/2021, the Biological Conclusion for Atlantic sturgeon is May Affect, Not Likely to Adversely Affect due to lack of known occurrences.

Northern long-eared bat

The US Fish and Wildlife Service has revised the previous programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the northern long-eared bat (NLEB) (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities.

Although this programmatic covers Divisions 1-8, NLEBs are currently only known in 19 counties, but may potentially occur in 11 additional counties within Divisions 1-8.

NCDOT, FHWA, and USACE have agreed to two conservation measures which will

avoid/minimize mortality of NLEBs. These conservation measures only apply to the 30 currently known/potential counties shown on Figure 2 of the PBO at this time. The programmatic determination for NLEB for the NCDOT program is **May Affect, Likely to Adversely Affect**. The PBO will ensure compliance with Section 7 of the Endangered Species Act for ten years (effective through December 31, 2030) for all NCDOT project with federal nexus in Divisions 1-8, which includes Dare and Tyrrell counties, where HB-0001 is located.

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.

Suitable nesting and foraging habitat for bald eagle are present within the project study area. Surveys for bald eagles are being performed in 2021. A summary will be provided upon completion of the surveys.

4.3 Essential Fish Habitat

The National Marine Fisheries Service (NMFS) has identified the Alligator River as an Essential Fish Habitat. Table 3 lists the fish species that may occur in the study area that are managed by NMFS, including the life stages which are reported to occur.

Table 3. Managed fish species reported to occur in the study area

Species	Life Stage
Snapper Grouper ¹	Egg, Larva, Juvenile, Adult
Red Drum	Egg, Larva, Juvenile, Adult
Bluefish	Egg, Larva, Juvenile, Adult
Summer Flounder	Larva, Juvenile, Adult
Gag Grouper	Juvenile
Gray Snapper	Juvenile
Spanish Mackerel	Juvenile, Adult
Black Sea Bass	Larva, Juvenile, Adult
Spiny Dogfish	Juvenile, Adult
Brown Shrimp	Egg, Larva, Juvenile, Adult
Pink Shrimp	Egg, Larva, Juvenile, Adult
White Shrimp	Egg, Larva, Juvenile, Adult

1 – Snapper Grouper listed by NMFS as having EFH within the project area. All other species in Table 3 are listed on the Draft List of Essential Fish Habitat Species by Waterbody in North Carolina (October 1999).

5.0 WATER RESOURCES

Water resources in the study area are part of the Pasquotank River basin [U.S. Geological Survey (USGS) Hydrologic Unit 03010205]. One stream was identified in the study area (Table 4). The location of the stream is shown in Figure 3.

Table 4. Streams in the study area

Stream Name	Map ID	NCDWR Index Number	Best Usage Classification	Bank Height (ft)	Bankfull width (miles)	Depth (ft)
Alligator River	Alligator River	30-16-(7)	SC;Sw,ORW	-	3	15
Alligator River	Alligator River	30-16-(21.5)	SC;Sw	-	3	15

The Alligator River has been designated as an Outstanding Resource Water (ORW) from the mouth of Northwest Fork to U.S. Highway 64, south of the existing bridge. There are no designated water supply watersheds (WS-I or WS-II) within or within 1.0 mile downstream of the study area. The North Carolina 2018 Final and 2020 draft 303(d) lists of impaired waters identify the Alligator River 30-16-(7) as an impaired water for Legacy Category 5 Total Metals Assessment.

Twelve surface waters were identified in the study area (Table 5). The location of each surface water is shown in Figure 3.

Table 5. Surface waters in the study area

Surface Water	Jurisdictional	Map ID of Connection	Area (ac) in Study Area
PA	Yes	Alligator River	0.16
PB	Yes	Alligator River	0.18
PC	Yes	Alligator River	0.02
PD	Yes	Alligator River	<0.01
PE	Yes	Alligator River	0.18
PF	Yes	Alligator River	0.09
TA	Yes	Alligator River	0.65
TB	Yes	Alligator River	2.39
TC	Yes	Alligator River	0.4
TD	Yes	Alligator River	1.44
TE	Yes	Alligator River	<0.01
TF	Yes	Alligator River	1.68

6.0 REGULATORY CONSIDERATIONS

6.1 Clean Water Act Waters of the U.S.

One jurisdictional stream was identified in the study area (Table 6). The location of this stream is shown on Figure 3. The Alligator River has been designated as a warm water stream for the purposes of stream mitigation.

Table 6. Characteristics of jurisdictional streams in the study area

Map ID	Length (ft.)	Classification	Compensatory Mitigation Required	River Basin Buffer
Alligator River	1,091	Perennial	Yes	Not Subject
Total	1,091			

Seventeen jurisdictional wetlands were identified within the study area (Table 7). The location of these wetlands is shown on Figure 3. All wetlands in the study area are located within the Pasquotank River basin [USGS Hydrologic Unit 03010205]. USACE wetland determination forms and NCWAM forms for each site are included in a separate Preliminary Jurisdictional Determination Package.

Table 7. Characteristics of jurisdictional wetlands in the study area

Map ID	NCWAM Classification	NCWAM Rating	Hydrologic Classification	Area (ac.) in Study Area
WA	Riverine Swamp Forest	High	Riparian	23.10
WB	Riverine Swamp Forest	High	Riparian	18.20
WC	Tidal Freshwater Marsh	High	Riparian	9.15
WD	Riverine Swamp Forest / Tidal Freshwater Marsh	High	Riparian	2.67
WE	Riverine Swamp Forest	High	Riparian	1.95
WF	Riverine Swamp Forest	High	Riparian	0.21
WG	Riverine Swamp Forest	High	Riparian	2.96
WH	Riverine Swamp Forest	High	Riparian	19.56
WI	Riverine Swamp Forest	High	Riparian	0.07
WJ	Tidal Freshwater Marsh	High	Riparian	1.40
WK	Riverine Swamp Forest	High	Riparian	0.74
WL	Riverine Swamp Forest	High	Riparian	0.09
WM	Tidal Freshwater Marsh	High	Riparian	0.04
WN	Tidal Freshwater Marsh	High	Riparian	6.19
WO	Tidal Freshwater Marsh	High	Riparian	0.99
WP	Tidal Freshwater Marsh	High	Riparian	0.39
WQ	Tidal Freshwater Marsh	High	Riparian	0.09
Total				87.80

6.2 Construction Moratoria

Anadromous Fish Habitat has been identified within the study area. The Alligator River north of the existing US 64 bridge (30-16-(21.5) is classified as coastal Anadromous Fish Spawning Area (AFSA) under Marine Fisheries Commission (MFC) jurisdiction. The Alligator River south of the existing US 64 bridge (30-16-7) is classified as joint AFSA waters under the jurisdiction of MFC and the North Carolina Wildlife Resource Commission (WRC). No Primary Nursery Areas have been identified within the study area. A construction moratorium from February 15 to June 30 is likely to apply to this project.

6.3 N.C. River Basin Buffer Rules

The Pasquotank River Basin does not have stream buffer rules administered by NCDWR.

6.4 Rivers and Harbors Act Section 10 Navigable Waters

Alligator River has been designated by the USACE as a Navigable Water under Section 10 of the Rivers and Harbors Act.

6.5 Coastal Area Management Act Areas of Environmental Concern

The study area is located within the Estuarine and Ocean System Area of Environmental Concern (AEC). The Alligator River, as well as portions of TA, TB, and TD are designated as Estuarine Waters and Public Trust Waters. Coastal Shorelines include all lands within 75 feet of the normal high water level of estuarine waters and within 30 feet of the normal high water level of public trust waters. Additionally, CAMA coastal wetland is present at wetland sites WC, WN, WO, WP, and WQ (Figure 3).

6.6 Coastal Barrier Resources System

The study area is not located on a coastal barrier island.

7.0 REFERENCES

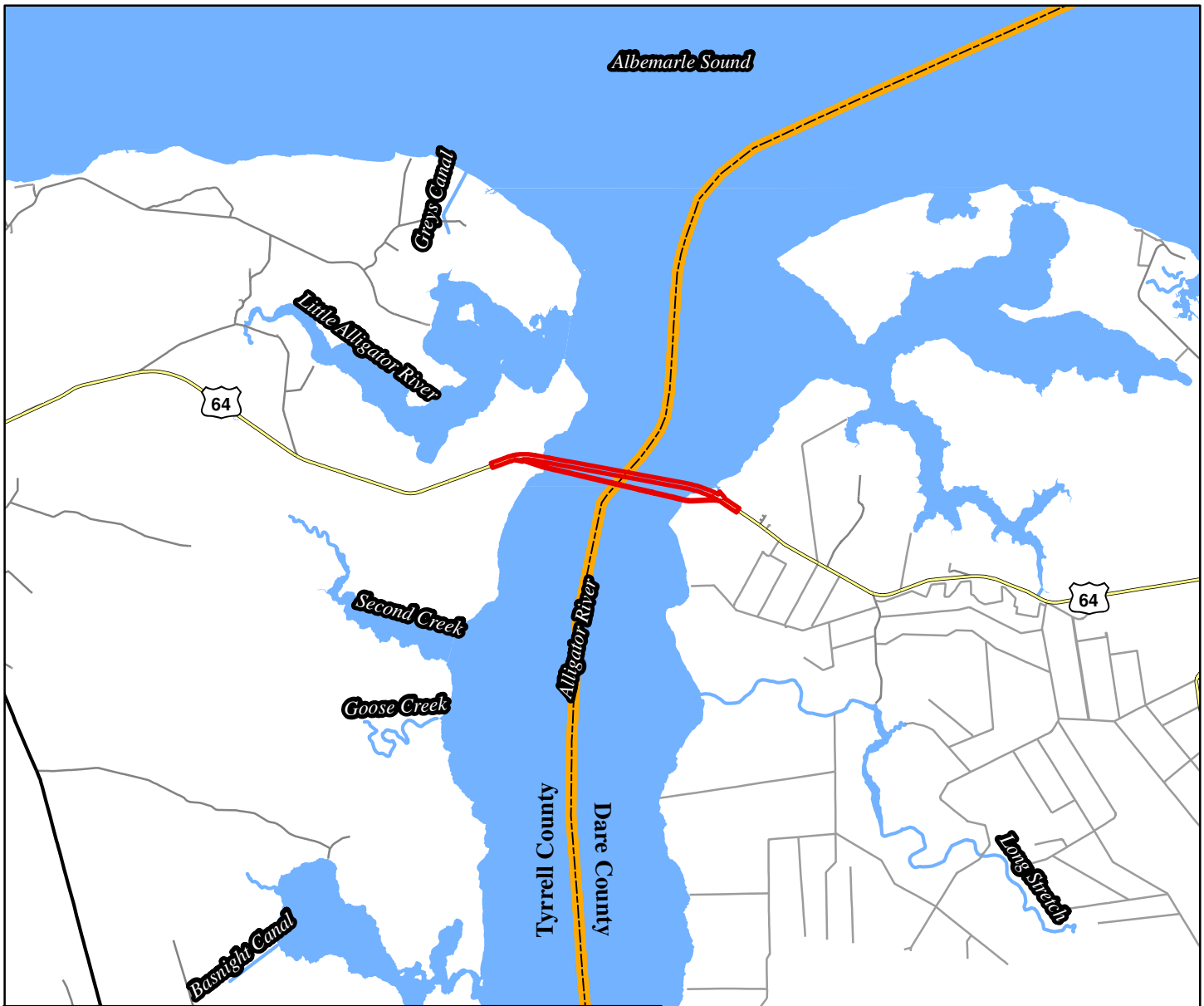
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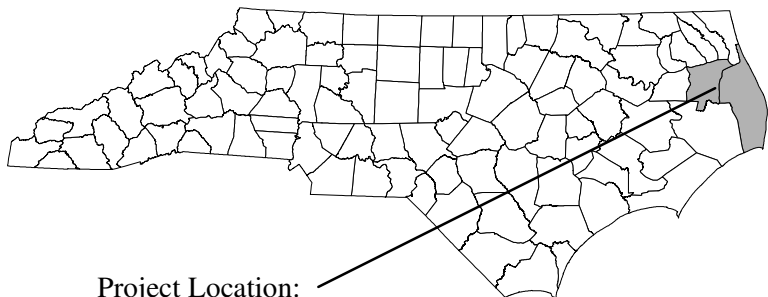
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Appendix A

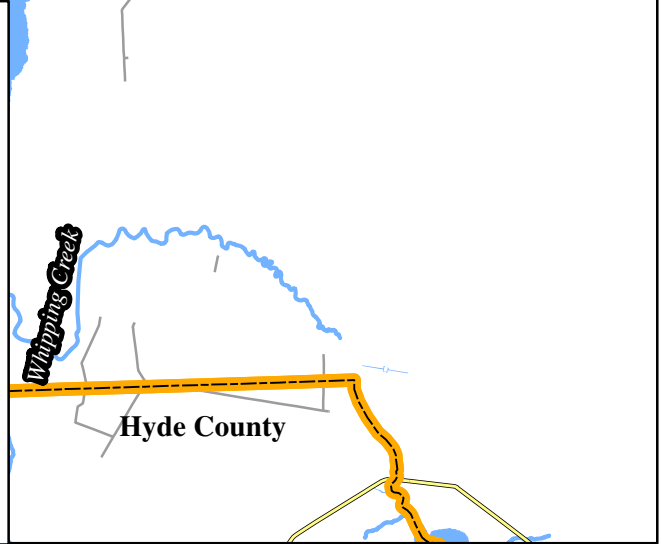
Figures



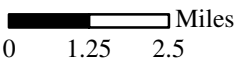
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Project Location:
Dare and Tyrrell counties



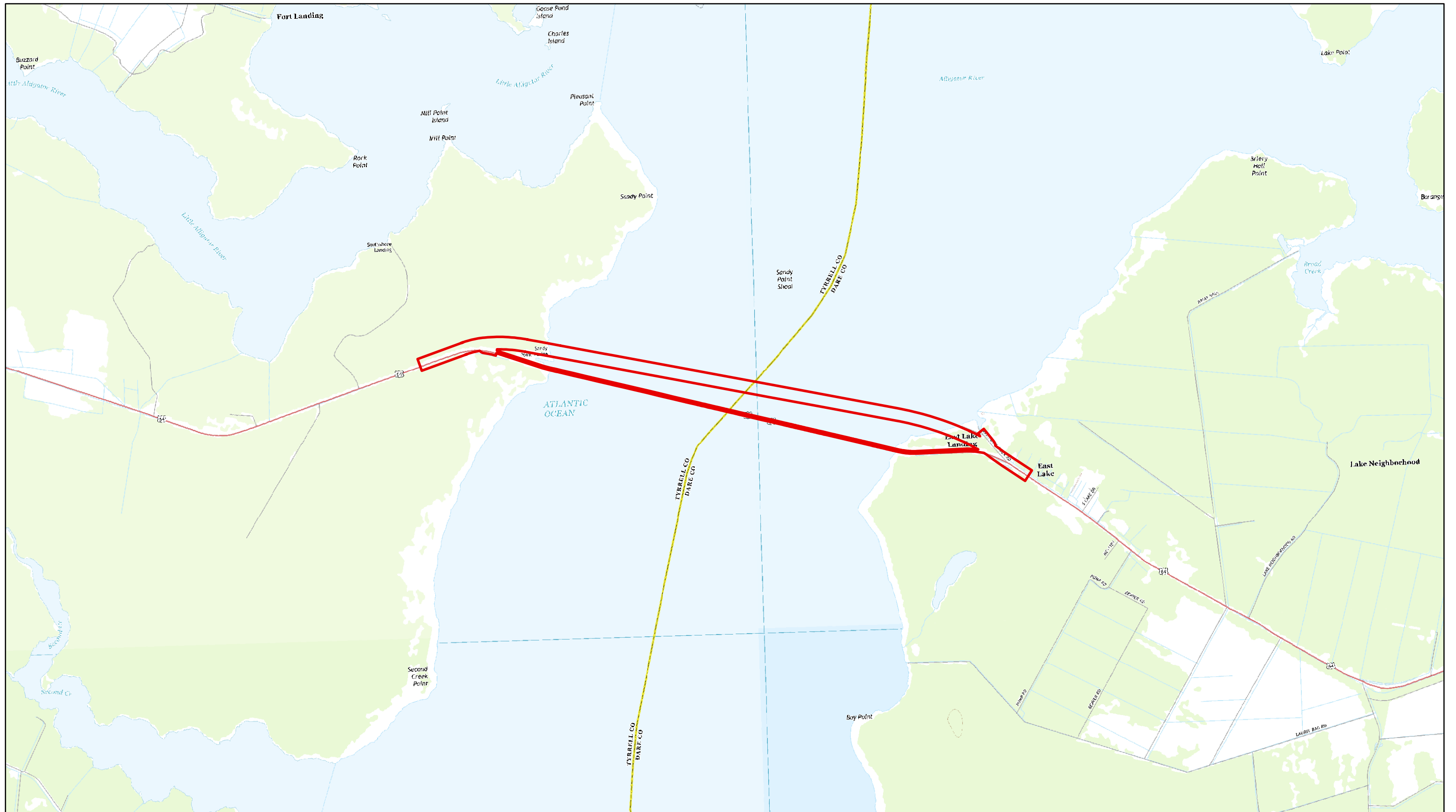
March 2021



- Study Area
- ~ USGS Named Stream

STIP HB-0001
Replace Bridge No.7 on US 64
over the Alligator River
Dare and Tyrrell counties, NC

Figure 1: Vicinity Map



0 0.25 0.5 Miles

Study Area

East Lake, Buffalo City, Fort Landing, and Frying Pan (2013) United States Geological Survey 1:24,000 Quadrangle Maps

Map Date: **March 2021**

Revised:

Revised:

Revised:

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Figure 2: Project Area Map
Sheet 2 of 2



0 1,000 2,000 Feet

Study Area Sheet Limits

2021 Aerial Photography

Map Date: **March 2021**

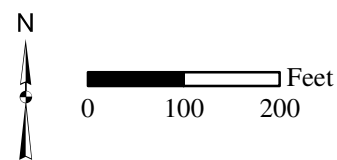
Revised:

Revised:

Revised:

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Replace Bridge No. 7 on US 64 over the Alligator River
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Map Sheet Index



- Study Area
- Sheet Limits
- Data Form Location
- ~ Perennial Stream
- Open Water
- 404 Wetland
- 404 / CAMA Wetland

2021 Aerial Photography

Map Date: March 2021
Revised: April 2021
Revised:
Revised:

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Figure 3: Jurisdictional Features Map
Sheet 1 of 5



0 100 200 Feet

Study Area
Sheet Limits

Data Form Location

Perennial Stream
Open Water

404 Wetland

404 / CAMA Wetland

2021 Aerial Photography

Map Date: March 2021

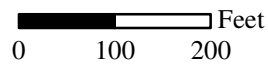
Revised: April 2021

Revised:

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Figure 3: Jurisdictional Features Map
Sheet 2 of 5



Study Area
 Sheet Limits

Data Form Location

Perennial Stream
 Open Water

404 Wetland
 404 / CAMA Wetland

2021 Aerial Photography

Map Date: March 2021

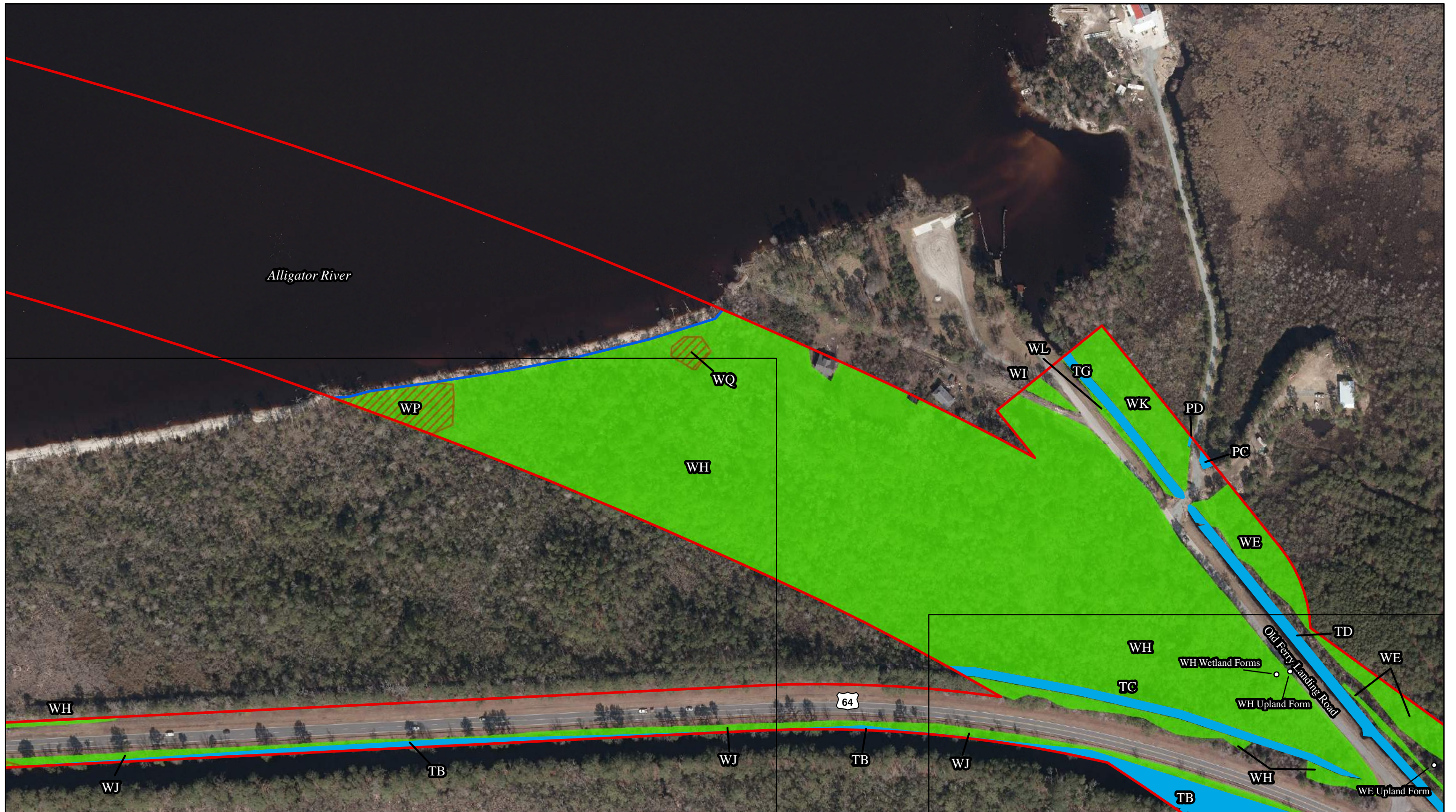
Revised: April 2021

Revised:

Revised:

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Figure 3: Jurisdictional Features Map
 Sheet 3 of 5



0 100 200 Feet

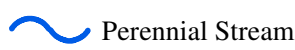


Study Area



Sheet Limits

○ Data Form Location



Perennial Stream



Open Water



404 Wetland



404 / CAMA Wetland

2021 Aerial Photography

Map Date: March 2021

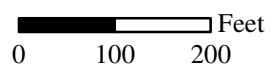
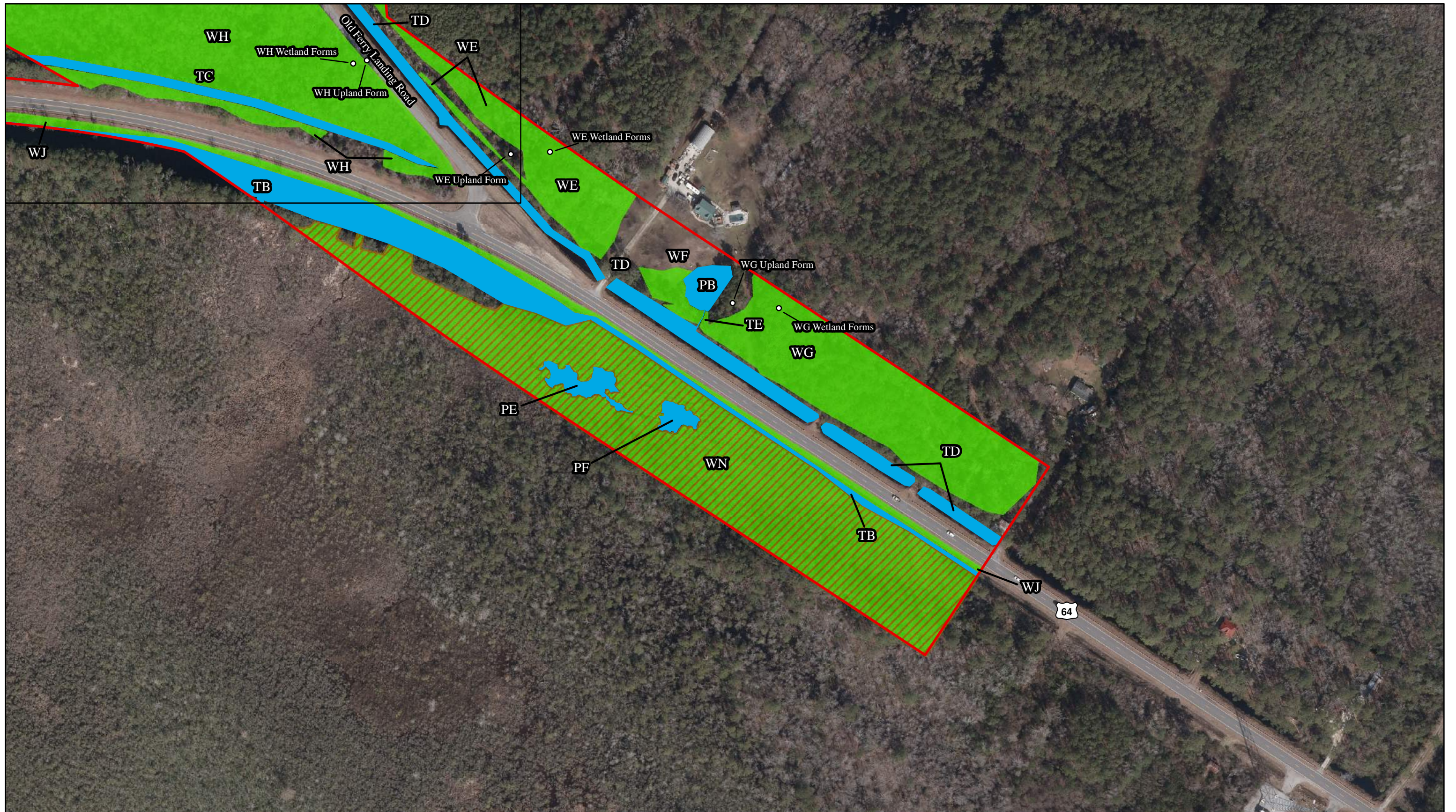
Revised: April 2021

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Figure 3: Jurisdictional Features Map
 Sheet 4 of 5



Study Area
Sheet Limits

Data Form Location

Perennial Stream
Open Water

2021 Aerial Photography

404 Wetland

404 / CAMA Wetland

Map Date: March 2021

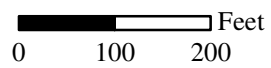
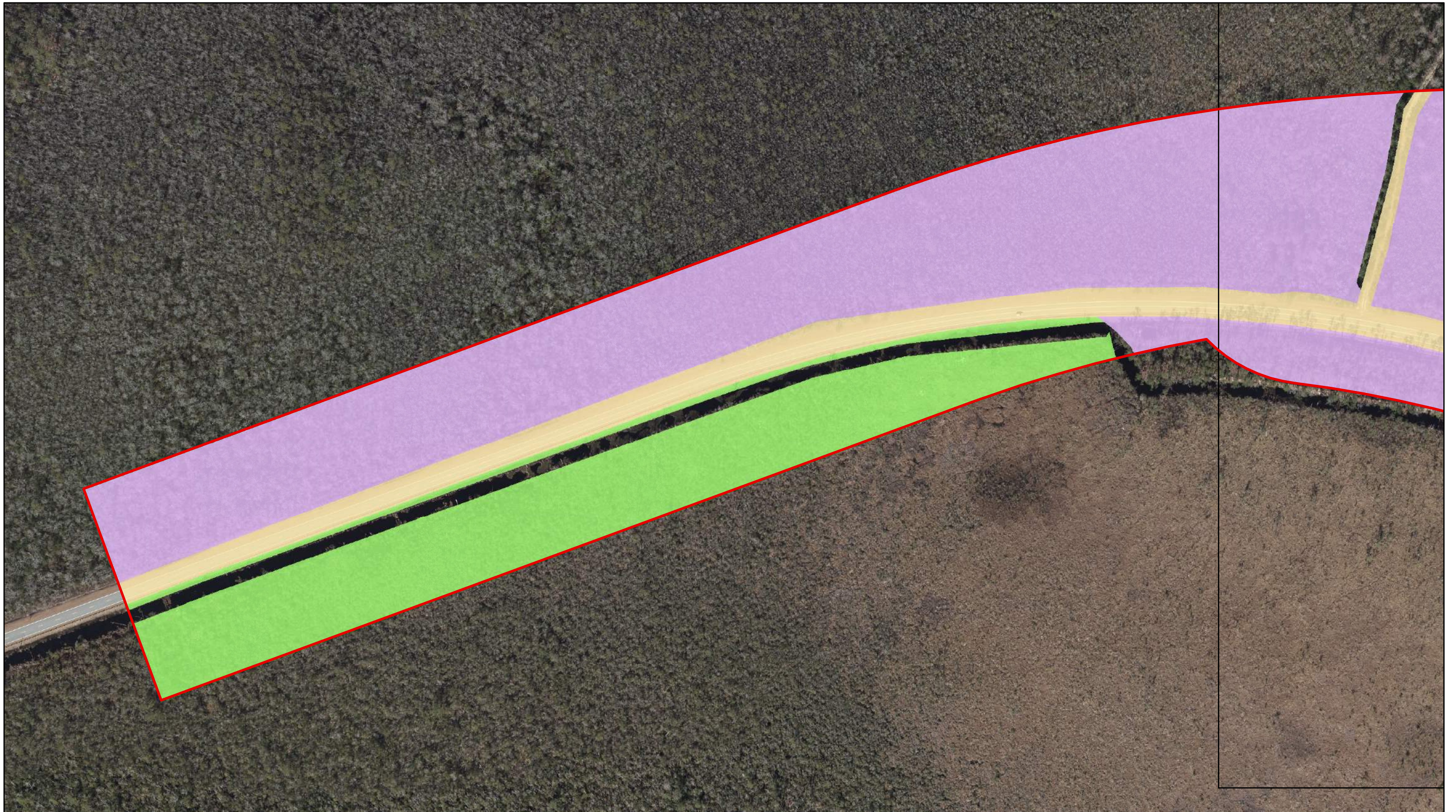
Revised: April 2021

Revised:

Revised:

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Figure 3: Jurisdictional Features Map
Sheet 5 of 5



- Study Area
 - Maintained / Disturbed
 - Riverine Swamp Forest
 - Tidal Freshwater Marsh
- 2021 Aerial Photography

Map Date: **March 2021**

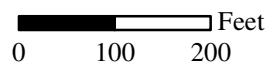
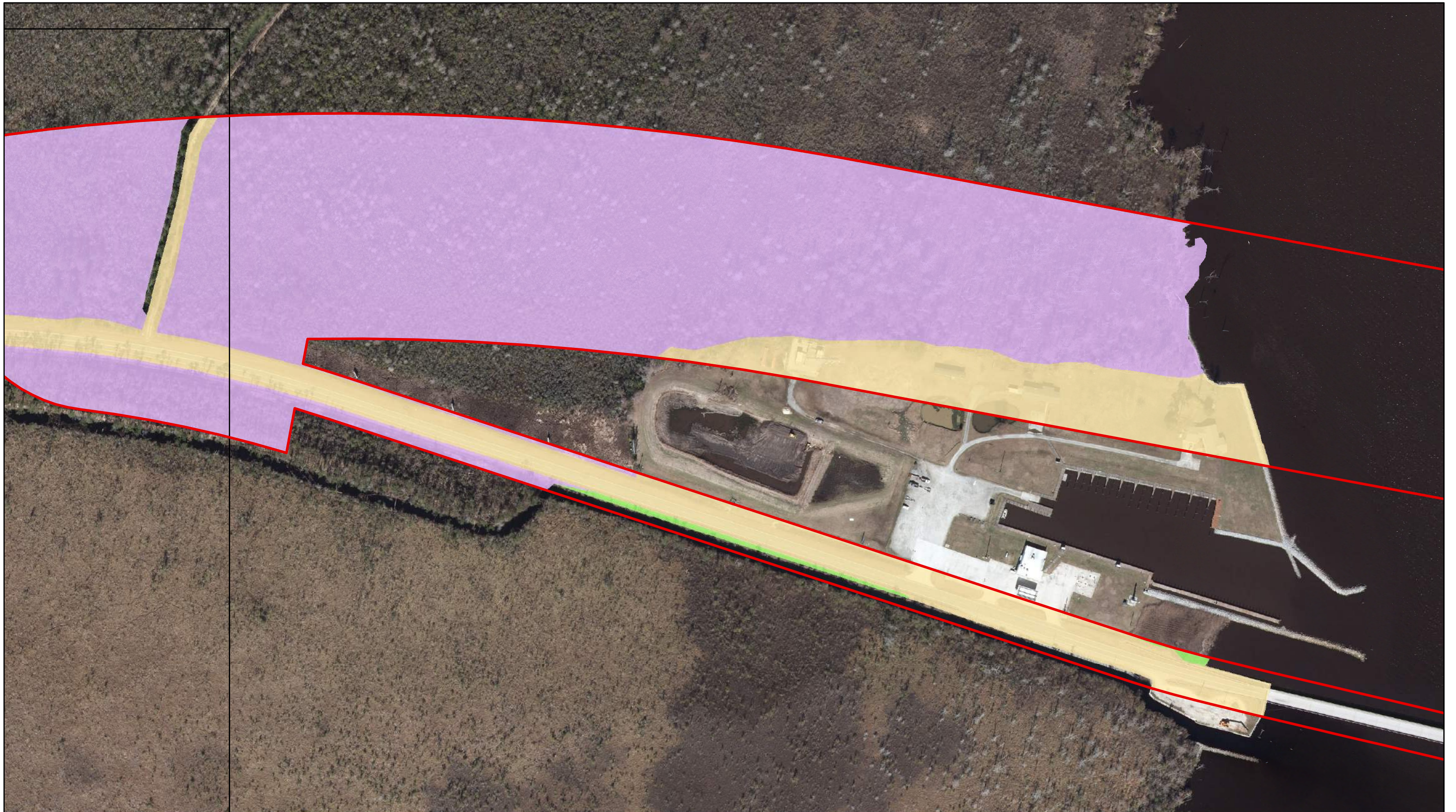
Revised: **April 2021**

Revised:

Revised:

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Figure 4: Terrestrial Communities Map
Sheet 1 of 5



- Study Area
 - Maintained / Disturbed
 - Riverine Swamp Forest
 - Tidal Freshwater Marsh
- 2021 Aerial Photography

Map Date: **March 2021**

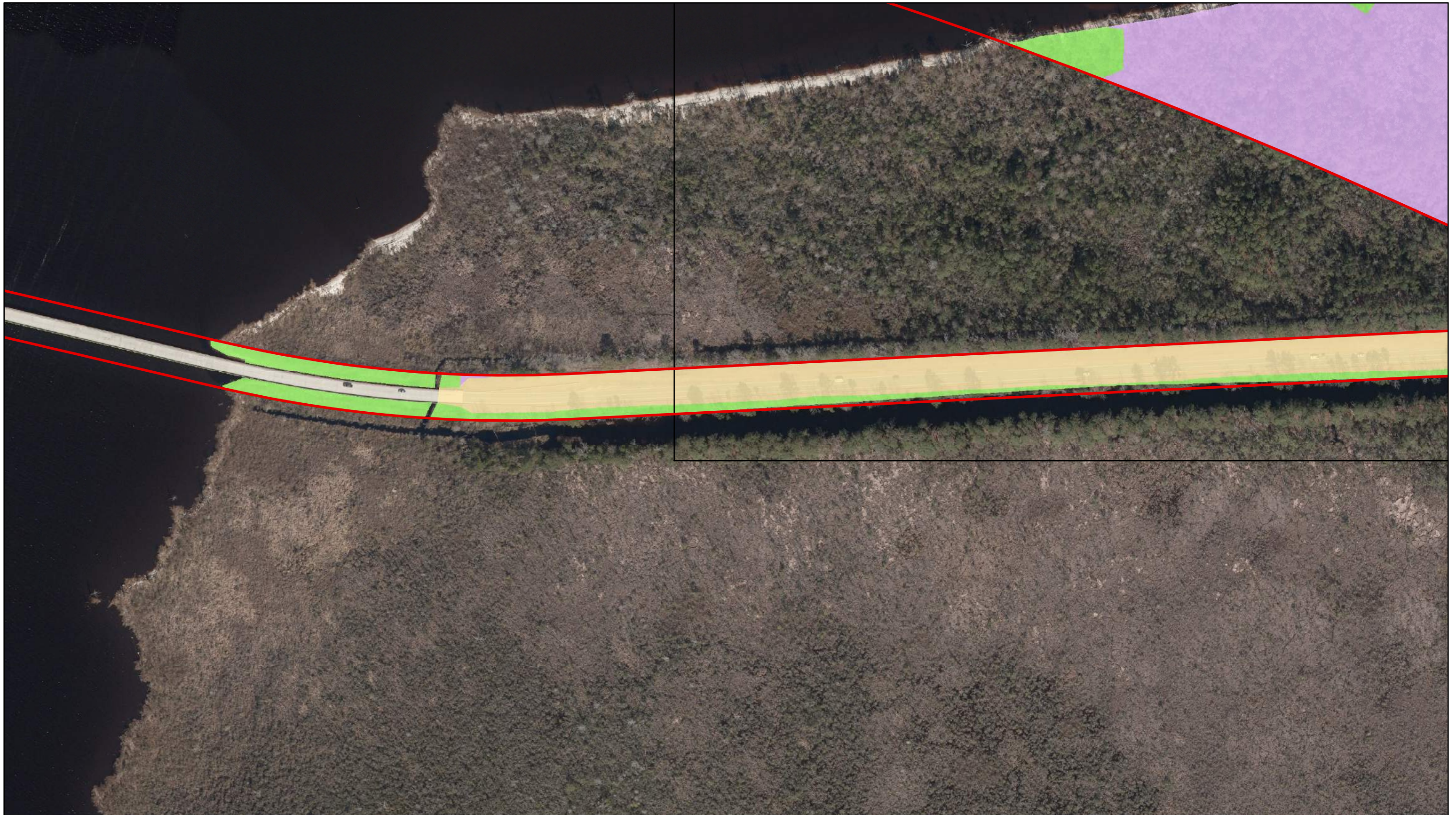
Revised: **April 2021**

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Figure 4: Terrestrial Communities Map
Sheet 2 of 5



0 100 200 Feet

- Study Area
 - Maintained / Disturbed
 - Riverine Swamp Forest
 - Tidal Freshwater Marsh
- 2021 Aerial Photography

Map Date: **March 2021**

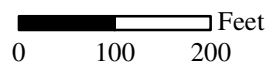
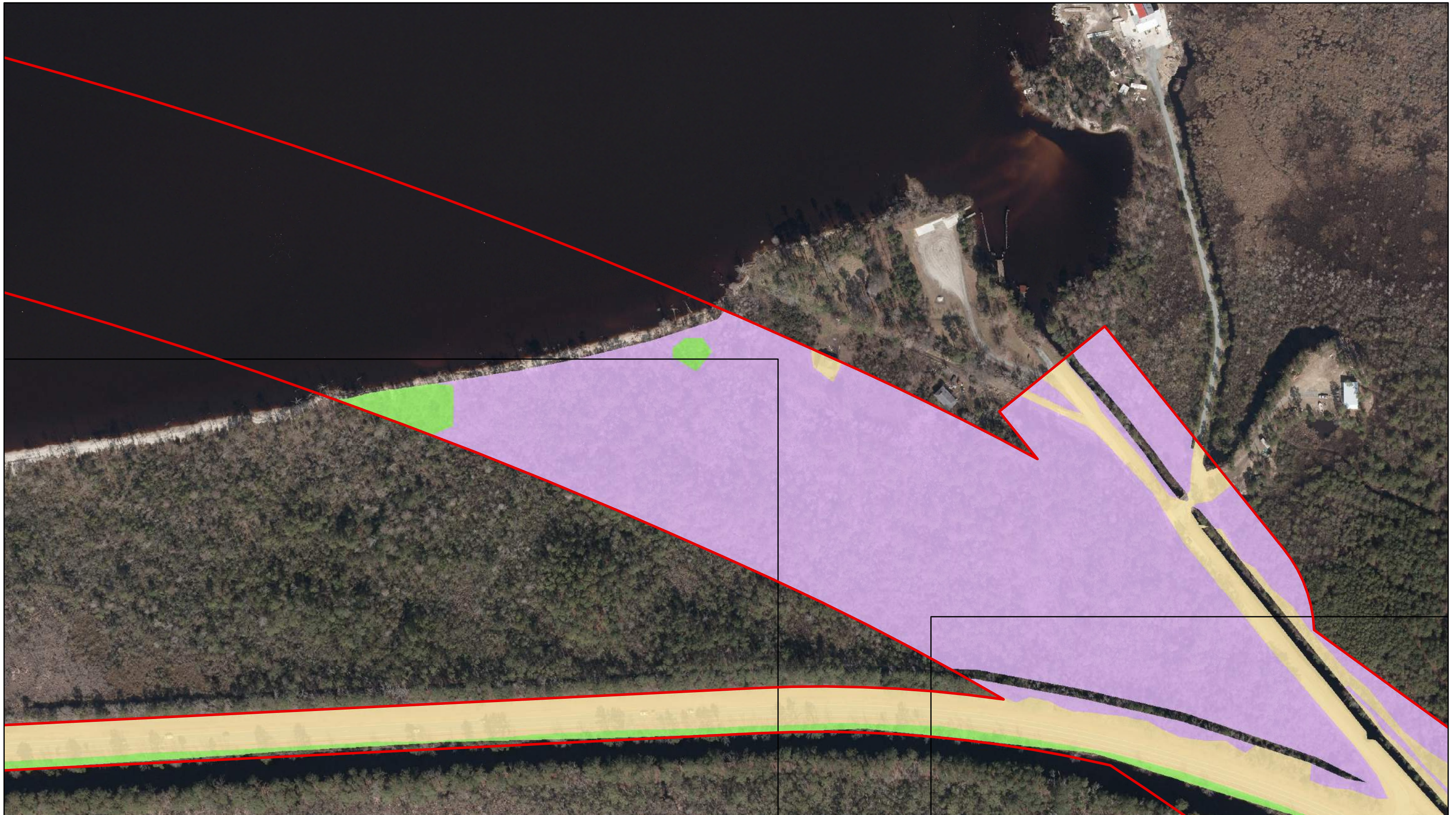
Revised: **April 2021**

Revised:

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Figure 4: Terrestrial Communities Map
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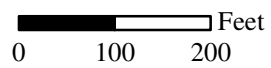
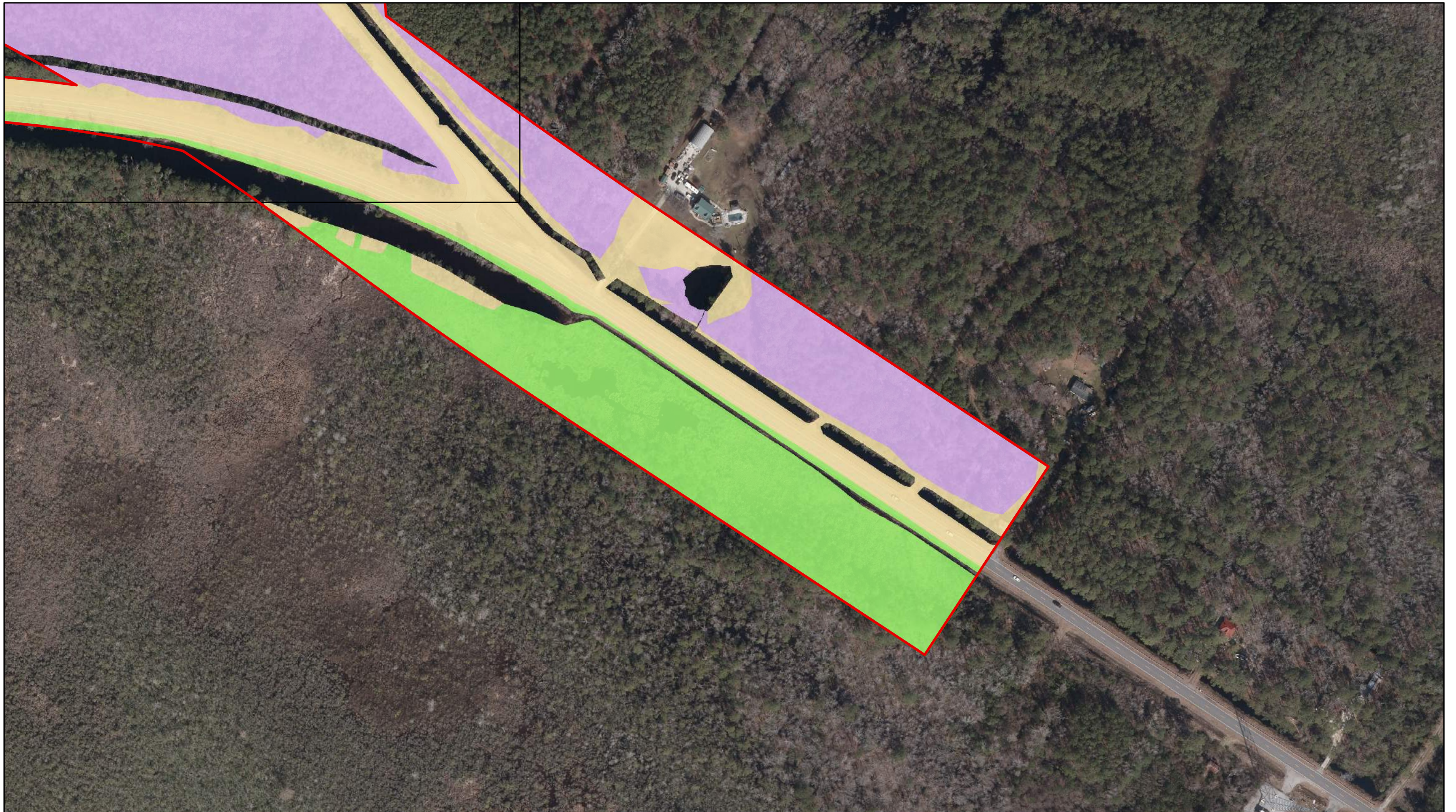
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Figure 4: Terrestrial Communities Map
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Appendix B

Qualifications of Contributors

Principal Investigator:	Rob Crowther
Education:	B.S. Environmental Resources Management, 2014
Experience:	Environmental Scientist, Carolina Ecosystems, Inc., 2015-Present Field Assistant, Virginia Tech, 2014
Responsibilities:	Wetland and stream delineation, GPS data collection, natural communities assessment, T&E species assessment, document review
Investigator:	Preston Butler
Education:	B.A. Environmental Studies, 2017
Experience:	Environmental Scientist, Carolina Ecosystem Inc., 2018-present Environmental Surveyor, Axiom Environmental, 2017-2018 Intern, EI Group, 2015-2017
Responsibilities:	Wetland and stream delineation, GPS data collection, natural communities assessment, T&E species assessment, document preparation
Investigator:	Matt Harrell
Education:	B.S. Environmental Science, (Water Science and Quality) 2018
Experience:	Environmental Scientist, Carolina Ecosystems, Inc., 2018-Present Lab Intern, Virginia Tech 2017
Responsibilities:	Wetland and stream delineation, GPS data collection, natural communities assessment, T/E species assessment
Investigator:	Phil May
Education:	B.S. Biology, 1992
Experience:	Senior Scientist, Carolina Ecosystems, Inc., 2006-Present Senior Scientist, HDR Engineering, Inc., 2001-2006 Staff Scientist, GN Richardson & Assoc., 1995-2001
Responsibilities:	Document review