US 701 Bridge Replacement Project Over the Great Pee Dee River, Great Pee Dee River Overflow, and Yauhannah Lake
Horry and Georgetown Counties, South Carolina

ENVIRONMENTAL ASSESSMENT
AND
PROGRAMMATIC 4(f) EVALUATION
FOR THE
WACCAMAW NATIONAL WILDLIFE REFUGE

Submitted by the
U.S. Department of Transportation
Federal Highway Administration
and
S.C. Department of Transportation

In cooperation with
United States Fish and Wildlife Service
and
United States Coast Guard

APPENDIX A

Programmatic 4(f) Evaluation for the Waccamaw National Wildlife Refuge

File No. 22.124 B

Project No. BR88(044)

PIN 30688X

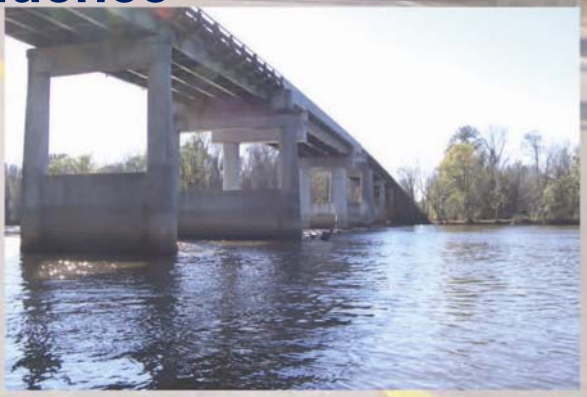
US 701 Bridge Replacement Project over the Great Pee Dee River, Great Pee Dee River Overflow and Yauhannah Lake

Horry and Georgetown Counties, South Carolina

Environmental Assessment and Programmatic 4(f) Evaluation for the Waccamaw National Wildlife Refuge

APPENDIX B

Supporting Documentation and Correspondence



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I. INTRODUCTION

The proposed project consists of the replacement of three bridges on US 701 over the Great Pee Dee River, Great Pee Dee River Overflow and Yauhannah Lake in Georgetown and Horry Counties, South Carolina. The requirements of Section 4(f) apply to the proposed project because the proposed Build Alternative requires the use of land from a wildlife and waterfowl refuge. FHWA/SCDOT determined, by applying the FHWA's Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway Projects with Minor Involvements with Public Parks, Recreation Lands, and Wildlife and Waterfowl Refuges[1], issued on December 23, 1986, that the proposed project is a minor involvement with the Waccamaw National Wildlife Refuge. Therefore, a Programmatic Section 4(f) Evaluation is required.

II. APPLICABILITY WITH PROGRAMMATIC SECTION 4(f)

The Waccamaw National Wildlife Refuge (WNWR) meets the applicability requirements established in FHWA's Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway Projects with Minor Involvements with Public Parks, Recreation Lands, and Wildlife and Waterfowl Refuges, issued on December 23, 1986. The use of the nationwide evaluation is based upon meeting the following seven criteria:

1) *The proposed project is designed to improve the operational characteristics, safety, and/or physical condition of existing highway facilities on essentially the same alignment.*

   The proposed project is for replacing the existing structurally deteriorated and functionally obsolete US 701 Bridges on essentially the same alignment. The proposed project is not intended to increase capacity, but rather to increase safety and the physical condition of the existing highway and bridge facility.

2) *The Section 4(f) lands are publicly owned parks, recreation lands, or wildlife and waterfowl refuges located adjacent to the existing highway.*

   The Waccamaw National Wildlife Refuge is located adjacent to the existing US 701.

3) *The amount and location of the land to be used shall not impair the use of the remaining Section 4(f) land, in whole or in part, for its intended purpose.*

   The total amount of land to be acquired from any Section 4(f) site shall not exceed the values in the following Table:

Total Size of Section 4(f) Site	*Maximum to Be Acquired*
< 10 acres	*10 percent of site*
10 acres - 100 acres	*1 acre*
> 100 acres	*1 percent of site*

[1] http://www.environment.fhwa.dot.gov/4f/4fnationwideevals.asp

Permanent impacts to WNWR for Alternative 2 alignment include an use of approximately 4.25 acres of Refuge land parallel and directly adjacent to the existing US 701 alignment. This will be less than 1% of the Refuge property. Presently, the WNWR encompasses nearly 27,000 acres and the proposed acquisition boundary spans over 55,000 acres. The WNWR should experience no net loss as a result of SCDOT's plans to replace the property impacted. The use of the WNWR will continue for its intended purpose.

4) *The proximity impacts of the project on the remaining Section 4(f) land shall not impair the use of such land for its intended purpose.*

The WNWR was established in 1997 and was located on both sides of the existing US 701 alignment. Alternative 2 is located to the north of the existing alignment, placing the proposed alignment further away from the Cowford Swamp area. The swallow tailed kite, a Federal species of concern and State endangered species, is known to use the wooded swamp around the Cowford Lake as a nesting area. By placing the proposed alignment further away, the impacts to the Cowford Swamp area would be minimized. The wildlife-depended recreational activities will not be impacted due to the relocation of US 701. Therefore the proposed US 701 alignment will not impair the use of the WNWR for its intended purpose.

5) *The officials having jurisdiction over the Section 4(f) land must agree, in writing, with the assessment of the impacts of the proposed project on, and the proposed mitigation for, the Section 4(f) lands.*

The Refuge Manager has provided a written concurrence that the location of the land to be used will not impair the use of the remaining property, in whole or in part, for its intended purpose. A copy of the written concurrence is included in Page A-24.

6) *For projects using land from a site purchased or improved with funds under the Land and Water Conservation Fund Act, the Federal Aid in Fish Restoration Act (Dingell-Johnson Act), the Federal Aid in Wildlife Act (Pittman-Robertson Act), or similar laws, or the lands are otherwise encumbered with a Federal interest (e.g., former Federal surplus property), coordination with the appropriate Federal agency is required to ascertain the agency's position on the land conservation or transfer.*

The USFWS purchased several tracts of the WNWR property with funds under the Land and Water Conservation Fund (LWCF) Act. In a discussion between the FHWA and the National Park Service (NPS), the NPS confirmed that since USFWS received the LWCA funds directly from the Congress, FHWA/SCDOT would not have to go back through NPS to get approval for the conversion. Instead, FHWA/SCDOT would be able to work directly with the USFWS to complete the conversion process for the LWCF properties. A copy of e-mails containing this discussion is included in Page A-31.

7) *The project does not require preparation of an environmental impact statement.*

An Environmental Assessment document is prepared for the proposed US 701 Project.

Based on the criteria above, the proposed US 701 project's use of the Waccamaw National Wildlife Refuge is being processed using the 4(f) Programmatic Evaluation.

A. Proposed Action

The proposed action considers the replacement of three existing US 701 bridges over Yauhannah Lake, the Great Pee Dee River and the Great Pee Dee River Overflow, and the realignment of an approximately two mile long section of US 701 located in Georgetown and Horry Counties. The project would involve the bridge replacements as well as the construction of a new roadway approach alignment. The project corridor crosses the referenced water bodies, as well as extensive flood plain forested wetlands. See Figure A.1 for a project location map. The Waccamaw National Wildlife Refuge occupies a major portion of the project corridor.

i. Purpose

The purpose of the project is to replace the existing structurally deteriorated and functionally obsolete US 701 bridges and maintain the principal direct rural connection between the larger towns of Conway and Georgetown, as well as the smaller communities such as Bucksport and Yauhannah in between. During the construction of the replacement bridges and approaches, traffic will be maintained on the existing facilities. These existing bridges will be demolished upon completion of construction.

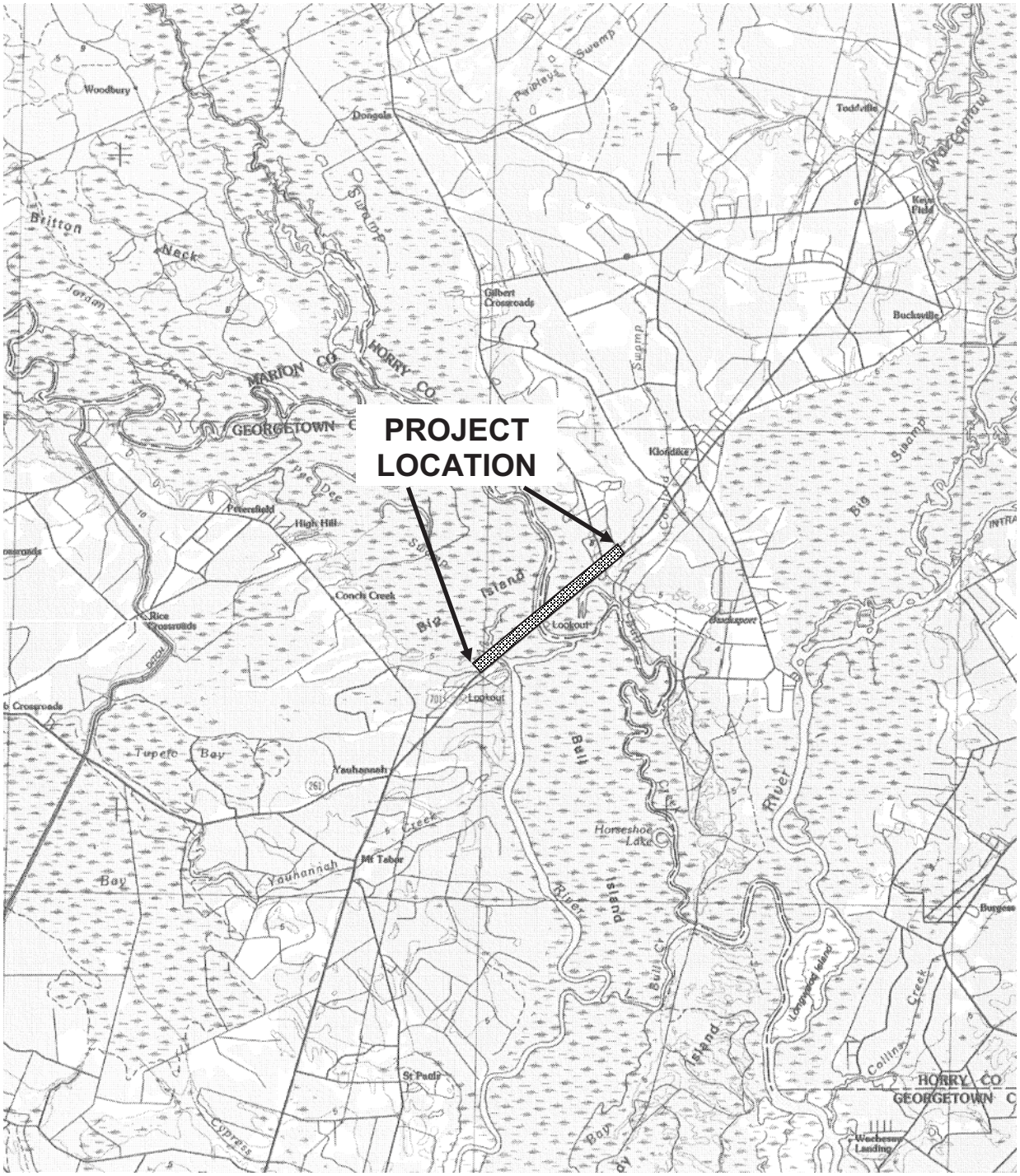
ii. Need

The total cost for this entire project is estimated as $45,000,000 including all construction and right of ways costs. This project is listed in the Statewide Transportation Improvement Program (STIP) document, as revised on February 21, 2013. The existing bridges were built in the early 1950s replacing the older bridges constructed circa 1920. The existing bridges have been inspected by the Department and having been rated structurally deficient are in need of replacement for public safety reasons. In fact, at its June 2008 Project Prioritization Workshop, the SCDOT Commission ranked this project as the 13th most critical bridge replacement project in the entire state of South Carolina.

The direct US 701 route from Yauhannah to Conway is approximately 18 miles. In comparison, the most direct alternate route to Conway, via SR 261 and SR 41 to US 378, would be approximately 55 miles. Conversely, the direct US 701 route from Bucksport to Georgetown is approximately 24 miles, whereas the most direct alternate route to Georgetown would be approximately 57 miles after traveling north on US 701 from Bucksport to Conway, traveling east to US 17, and then south to Georgetown. No other significant bridging is available over the Great Pee Dee River system in this area except for the US 378 bridge, located approximately 24 miles to the northwest, or the US

17 bridge over the Waccamaw River, located approximately 21 miles to the south-southwest.

Replacement of these three existing bridges was determined urgent by the Department and the Federal Highway Administration (FHWA) considering the physical condition of the existing structures.



Shaded Area Indicates County Location in SC

FIGURE A.1: PROJECT LOCATION MAP
U.S. 701 BRIDGE REPLACEMENT PROJECT
HORRY AND GEORGETOWN COUNTIES, S.C.

SCALE 0 2 Miles

N

B. Section 4(f) Resource

Waccamaw National Wildlife Refuge

A major portion of the project corridor traverses the Waccamaw National Wildlife Refuge, which in the area of the corridor, is predominantly forested wetland. The Refuge is adjacent to US 701 on both sides of the roadway. In 1997, a Final Environmental Impact Statement (FEIS) was prepared for the proposed establishment of the Waccamaw National Wildlife Refuge by the U.S. Fish and Wildlife Service (USFWS). USFWS proposed to establish the refuge in the vicinity of the Great Pee Dee and Waccamaw Rivers in Georgetown, Horry and Marion Counties, South Carolina. The purposes of the proposed refuge would be to (1) protect and manage diverse habitat components within an important coastal river ecosystem for the benefit of endangered and threatened species, freshwater and anadromous fish, migratory birds, and forest wildlife, including a wide array of plants and animals associated with bottomland hardwood habitats; and, (2) provide compatible wildlife-dependent recreational activities including hunting, fishing, wildlife observation, photography, and environmental education and interpretation for the enjoyment of present and future generations[2]. The proposal was developed by the USFWS in coordination with the State of South Carolina and other Federal agencies. Future improvements and widening of the existing US 701 within the proposed refuge was recognized in the FEIS. Presently, the refuge land totals 27,000 acres. The refuge is actively pursuing the acquisition process for expansion to over 55,000 acres[3].

Subsequent to the establishment of the Waccamaw National Wildlife Refuge, the USFWS acquired the 22 acre Yauhannah Bluff property located in Georgetown County near the southern end of US 701 bridge replacement project. The bluff property became the planned location for the refuge visitor center. During the planning process, USFWS and SCDOT communicated about the future improvements and widening of US 701 prior to locating the Visitor Center. Construction of the Visitor Center located on the downstream side of US 701 was completed in 2009.

Figure A.2 includes a layout map of the refuge. The current activities at the refuge include boating, canoeing, and kayaking in the rivers and creeks; wildlife observation and photography; hiking along the Great Pee Dee River and Bull Creek in the vicinity of the existing US 701 bridge just north of Yauhannah Lake; and freshwater fishing, hunting, and environmental education activities.

The Cowford Lake wetland complex, located downstream of the existing US 701 alignment, is comprised of a combination of a tidally influenced freshwater oxbow lake and a ridge and swale forested wetland topography which has evolved over thousands of years of river alignment adjustments. The lake has a beaver pond at its headwaters. The forested wetlands adjacent to the lake offer brood rearing habitat for wood ducks

[2] United States Department of the Interior, Fish and Wildlife Service, Southeast Region, "Final Environmental Impact Statement, Proposed Establishment of Waccamaw National Wildlife Refuge", Volume I, April 1997.

[3] http://www.fws.gov/waccamaw

and hooded mergansers as well as foraging habitat for white ibis and wood storks. The lake itself offers shallow water, vegetated spawning habitat for numerous freshwater fish species. Freshwater mussels can frequently be found where water flows from intersecting streams are present. The forested wetlands located between Cowford Lake and the Great Pee Dee River is the northernmost documented nest site for the Swallow-tailed Kite (*Elanoides forticatus*) which is both a state listed species and focal species for the Refuge. This nest site has been active for over 10 years and in 2009, an artificial nest structure was installed in a tree in this area as part of a larger study using artificial nesting structures to improve site selection. This structure was the only artificial structure used by kites throughout the study area in 2009.

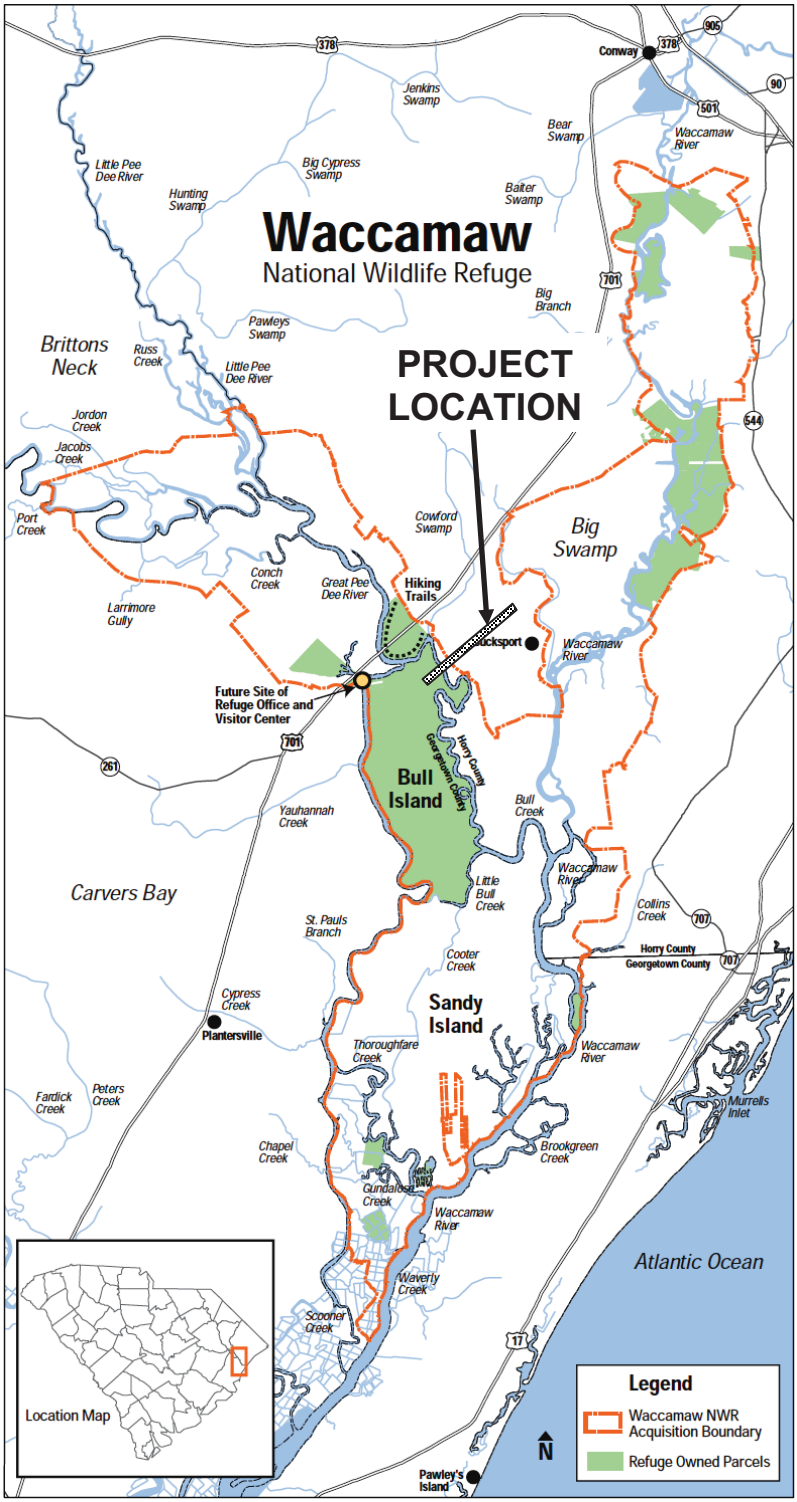


FIGURE A.2: WACCAMAW NATIONAL WILDLIFE REFUGE
U.S. 701 BRIDGE REPLACEMENT PROJECT
HORRY AND GEORGETOWN COUNTIES, S.C.

Map is Property of USFWS.

III. ALTERNATIVES AND FINDINGS

A. Do Nothing

The "no-build" alternative, which consists of the Department making no improvements, was considered to receive necessary maintenance repair; however, the "no-build" alternative would not improve the safety and structural characteristics of the bridge / highway system. The no-build alternative is not being pursued because of the extreme cost of maintaining the existing bridges, inability to improve safety and functional aspects of the existing bridges, and the inconvenience to the public due to repeated lane closures and detours associated with future maintenance operations. Therefore, this alternative is not considered acceptable, although this alternative would completely avoid all Section 4(f) uses.

B. Replace on Existing Alignment

This alternative analysis considered the replacement of the alignment on the same existing alignment. This alternative would completely avoid all Section 4(f) uses other than some temporary use of the Waccamaw National Wildlife Refuge during construction. Replacement on existing alignment would require the road to be closed during construction, resulting in traffic detours ranging from 37 additional miles from Yauhannah to Conway to 33 additional miles from Bucksport to Georgetown. It is estimated the existing facility would have to be closed for more than 3 years to accommodate the construction. Due to these detour considerations and the need to maintain the principal direct rural connection between the larger towns of Conway and Georgetown, as well as the smaller communities such as Bucksport and Yauhannah in between, this alternative would cause a community disruption of extraordinary magnitude. It also would result in adverse economic impacts to the community. This alignment, although considered feasible, is not considered prudent and has been eliminated from further consideration.

C. New Location Alignment

In order to avoid the properties currently owned by the Refuge and to provide connectivity between Conway and Georgetown, alternative roadway alignments would have to shift over 1.5 miles upstream of the existing Great Pee Dee floodplain crossing or over 5 miles downstream of that crossing. In order to construct a crossing that avoids the current Refuge properties, it would be necessary to construct an entirely new roadway including bridges and causeways, and the new roadway would be at least seven (7) miles in length to include approximately 2.8 miles of temporary and/or permanent floodplain disturbance. At this existing US 701 crossing, the floodplain is approximately 1.6 miles wide which is the most narrow floodplain width between Conway and Georgetown. If new location avoidance alternatives require new floodplain crossings that are at least 2.8 miles in length and the existing crossing is only 1.6 miles in length, new location alternatives would result in substantial adverse environmental impacts by causing substantial damage to wetlands so alternatives on new location are therefore considered not prudent for this project.

D. Build Alternatives

Several alternative new alignments were considered in the preliminary alignment selection process, and six feasible build alternatives were considered for further development. Other alternatives were not investigated further since both the impacts and the costs were significantly higher. Each build alternative considered one travel lane in each direction that is 12 feet wide, and a shoulder in each direction of travel that is 10 feet wide. Details of alternative analysis are located in Section III of the EA. Alternatives 2 and 3 resulted in the least overall impacts, and these alternatives are described below.

i. Alternative 3 (Downstream)

Alternative 3 involves construction in a new alignment approximately 55 feet southeast (downstream) of the centerline of the existing alignment, see Figures 3 and 4. Alternative 3 generally positions the new alignment along the same alignment as the original US 701 bridge constructed circa 1920. This alignment would encroach into the Waccamaw Wildlife Refuge in Georgetown County. Other environmental issues associated with this alternative include the impacts on the USFWS Visitors Center property and private properties along the downstream side of the south roadway approach, and wetland impacts. However, Alternative 3 has the minimum impacts to the wetland and the least relocation and residential property impacts. Alternative 3 will position the new facility where the floodplains were disturbed by the construction of the original US 701 Bridge constructed circa 1920.

Impacts from Alternative 3 would be as follows:

No. of Residential Relocations:	0
Acreage:	0.00
No. of Residential Total Take (w/o Relocation):	0
Acreage:	0.00
No. of Residential Partial Take:	2
Acreage:	0.20
Refuge Property Take	
Acreage:	6.55
Wetland Impact – Permanent Acreage:	8.55
Wetland Impact – Temporary Acreage:	11.45

The habitat on the downstream side of the bridge includes the relatively unique ecosystem around the freshwater, but tidally influenced Cowford Lake. Alternative 3 would result in additional clearing and access road construction which would eliminate most of the forested wetlands remaining between the bridges and Cowford Lake which currently serve as a natural filter for storm water runoff flowing into the lake. This forested wetland buffer strip provides an important wildlife corridor for both forest wildlife and wading birds including the federally endangered wood stork, which has been known to forage along the edge of Cowford Lake.

The Cowford Lake wetland complex is comprised of a combination of a tidally influenced freshwater oxbow lake and a ridge and swale forested wetland topography which has evolved over thousands of years of river alignment adjustments. The lake has a beaver pond at its headwaters. The forested wetlands adjacent to the lake offer brood rearing habitat for wood ducks and hooded mergansers as well as foraging habitat for white ibis and wood storks.

The lake itself offers shallow water, vegetated spawning habitat for numerous freshwater fish species. Freshwater mussels can frequently be found where water flows from intersecting streams are present. The forested wetlands located between Cowford Lake and the Great Pee Dee River is the northernmost documented nest site for the Swallow-tailed Kite (*Elanoides forticatus*) which is both a state listed species and focal species for the US Fish and Wildlife Service. This nest site has been active for over 10 years and in 2009, an artificial nest structure was installed in a tree in this area as part of a larger study using artificial nesting structures to improve site selection. This structure was the only artificial structure used by kites throughout the study area in 2009.

ii. Alternative 2 (Upstream/Preferred)

Alternative 2 involves construction on a new alignment approximately 55 feet northwest (upstream) of the centerline of the existing alignment, see Figures A.5 and A.6. 55 feet has been established as the minimum offset distance from the existing centerline that will permit the safe operation of the existing US 701 roadway and provide adequate space for drainage provisions during construction. This alignment would encroach into the Waccamaw Wildlife Refuge in Georgetown County. Other environmental issues associated with this alternative include the impact on private properties along the upstream side of the north and south roadway approach, and wetland impacts.

Impacts from Alternative 2 would be as follows:

No. of Residential Relocations:	1
Acreage:	0.94
No. of Residential Total Take (w/o Relocation):	0
Acreage:	0.00
No. of Residential Partial Take:	7
Acreage:	1.28
Refuge Property Take	
Acreage:	4.25
Wetland Impact - Permanent Acreage:	9.47
Wetland Impact – Temporary Acreage:	11.07

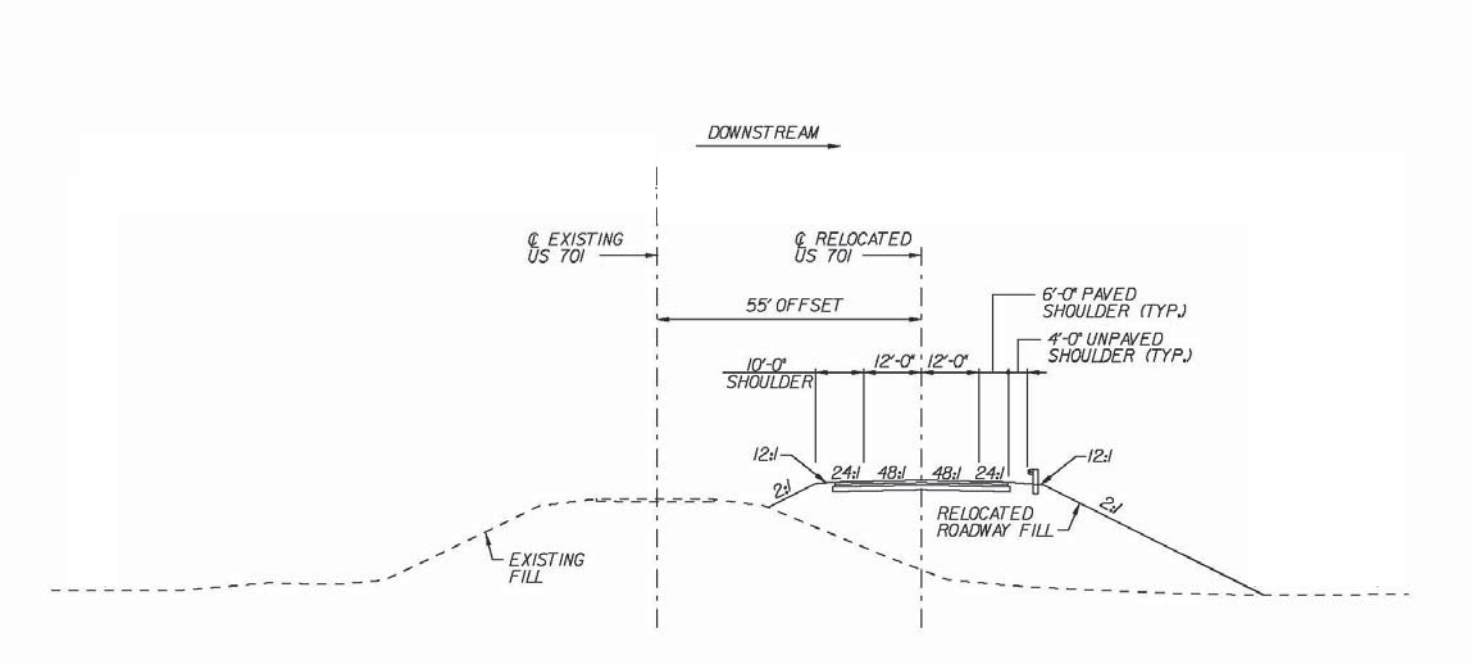
Alternative 2 would result in approximately 1.0 acre greater permanent wetland impacts than Alternative 3. However, the USFWS expressed preference for the new US 701 alignment to be placed upstream of the current alignment. On September 28, 2012, the Refuge Manager and biologists from the USFWS and SCDOT had a meeting at the

disadvantages of Alternative 3 versus Alternative 2 alignments were made. Based on their field analysis and observations, the group concluded that:

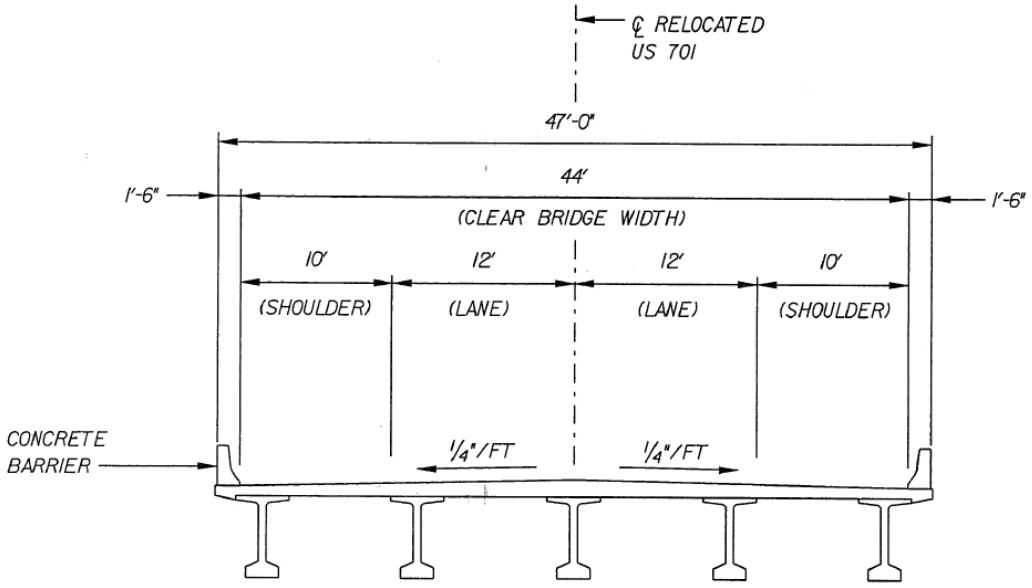
- The wetlands impacted by Alternative 2 would be of a lesser quality;
- Construction of Alternative 3 would result in degradation of many species' habitats; and,
- Alternative 2 should be selected as the preferred alternative.

SCDOT Biologist prepared a report summarizing the analysis and field observations. A copy of the report is included in Page A-33.

Therefore, Alternative 2 has been selected as the preferred alternative.

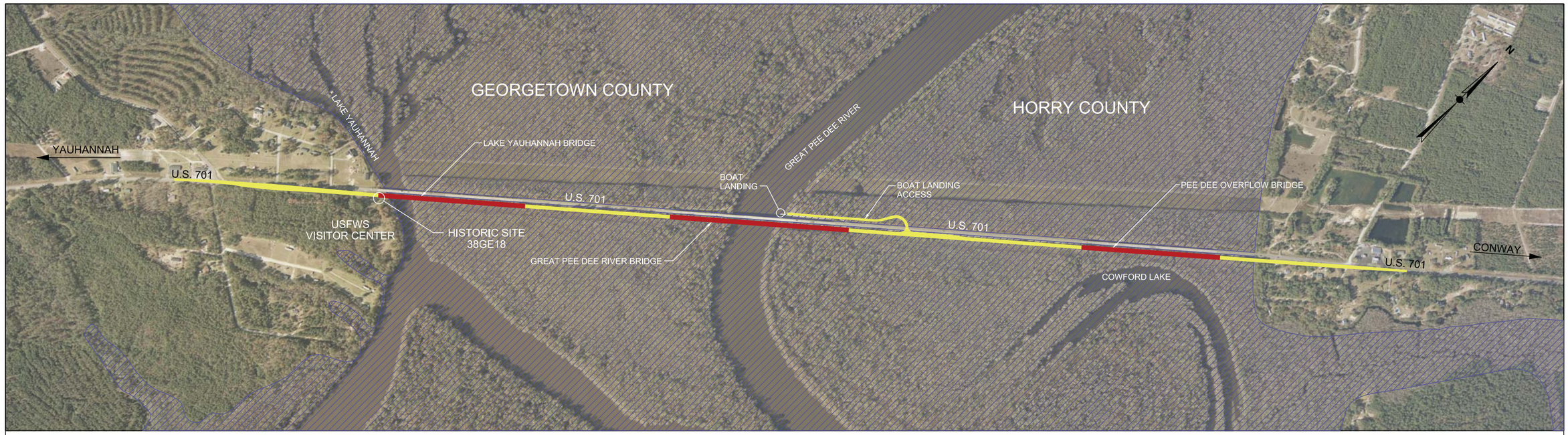


Proposed Typical Roadway Section



Proposed Typical Bridge Section

FIGURE A.3 – TYPICAL SECTIONS – ALTERNATIVE 3



ALTERNATIVE 3 (55' OFFSET DOWNSTREAM)

LEGEND:

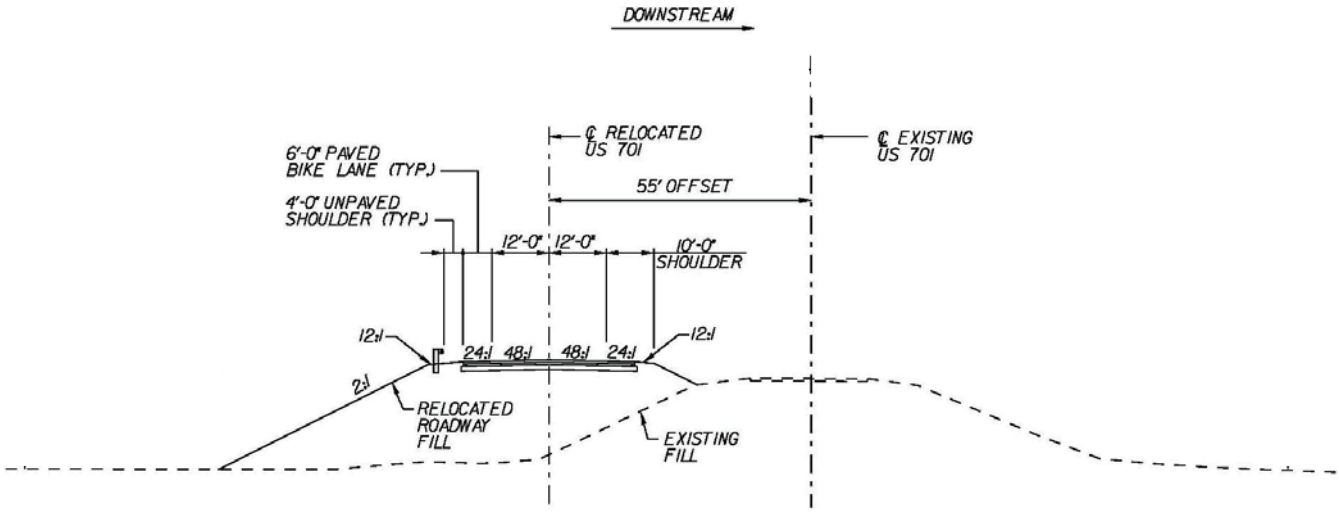
- PROPOSED ROADWAY
- PROPOSED BRIDGE
- 100 YEAR FLOOD PLAIN

FIGURE **A.4**

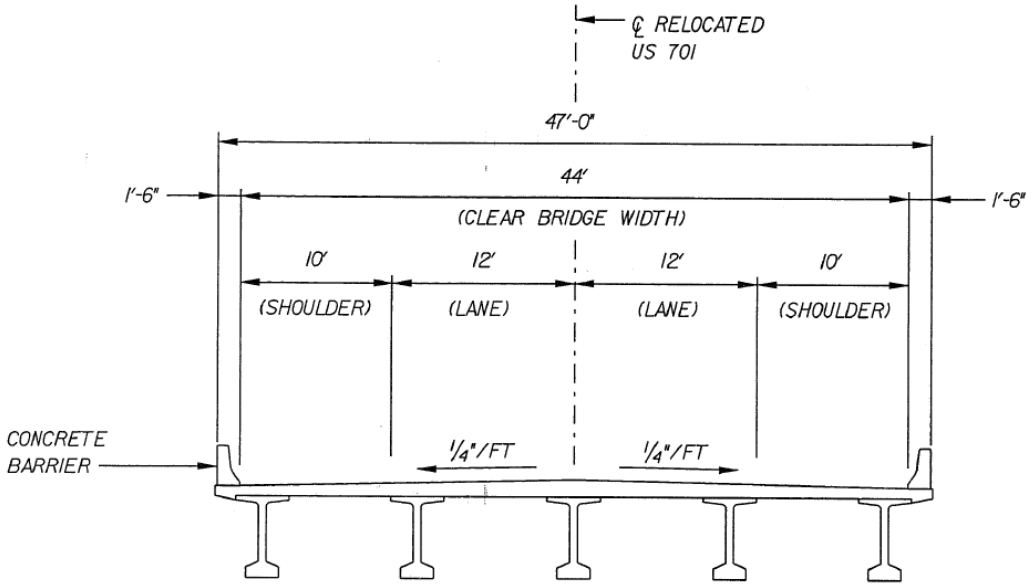
TUHIN BASU & ASSOCIATES, INC.

REPLACMENT OF US 701 BRIDGES OVER GREAT PEE DEE RIVER, PEE DEE OVERFLOW & LAKE YAUHANNAH

HORRY/GEORGETOWN COUNTIES, SC

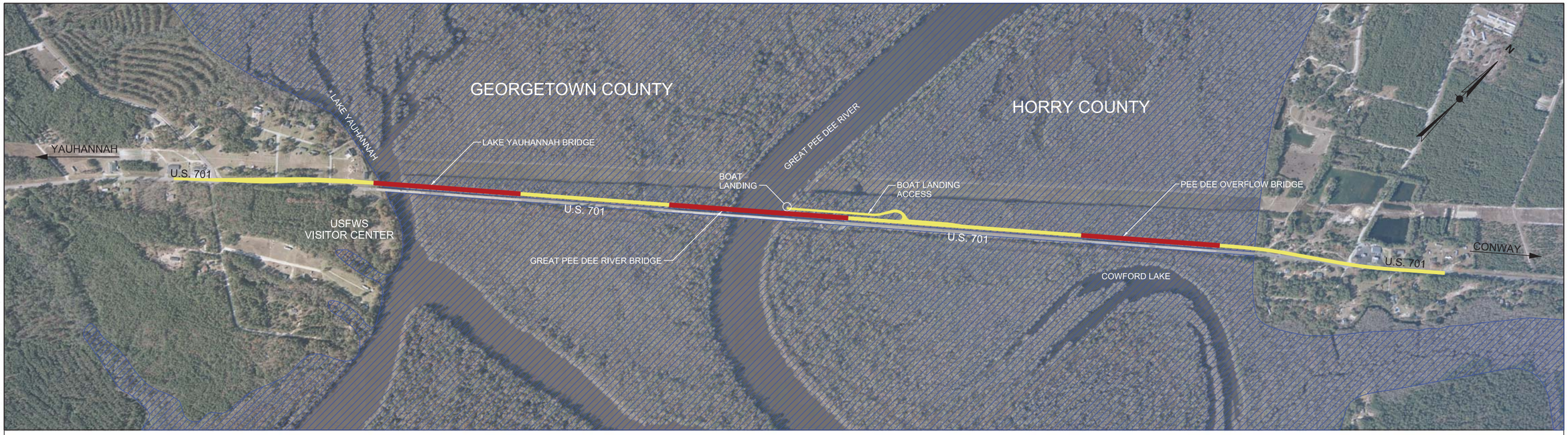


Proposed Typical Roadway Section



Proposed Typical Bridge Section

FIGURE A.5 – TYPICAL SECTIONS – ALTERNATIVE 2 PREFERRED ALTERNATIVE)



ALTERNATIVE 2 (55' OFFSET UPSTREAM)

PREFERRED ALTERNATIVE

LEGEND:

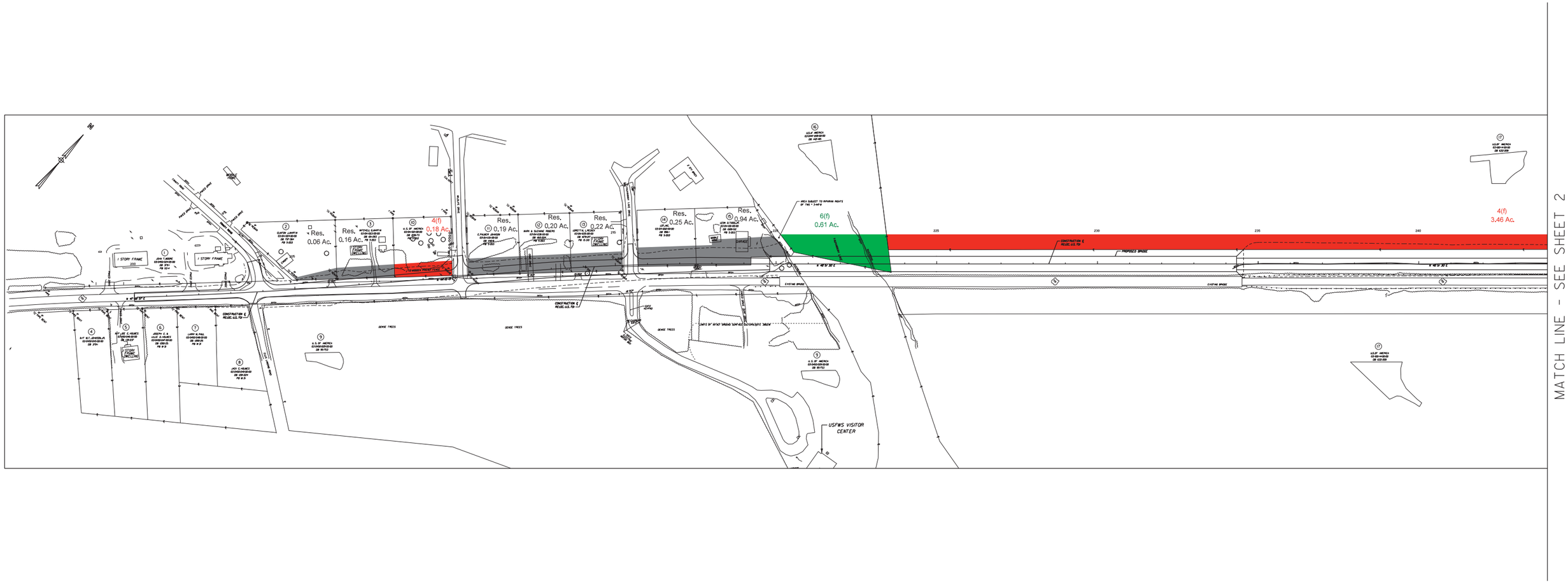
- PROPOSED ROADWAY
- PROPOSED BRIDGE
- 100 YEAR FLOOD PLAIN

FIGURE A.6

TUHIN BASU & ASSOCIATES, INC.

REPLACMENT OF US 701 BRIDGES OVER GREAT PEE DEE RIVER, PEE DEE OVERFLOW & LAKE YAUHANNAH

HORRY/GEORGETOWN COUNTIES, SC



LEGEND

- 4(f) PROPERTY IMPACT
- 6(f) PROPERTY IMPACT
- RESIDENTIAL PROPERTY IMPACT

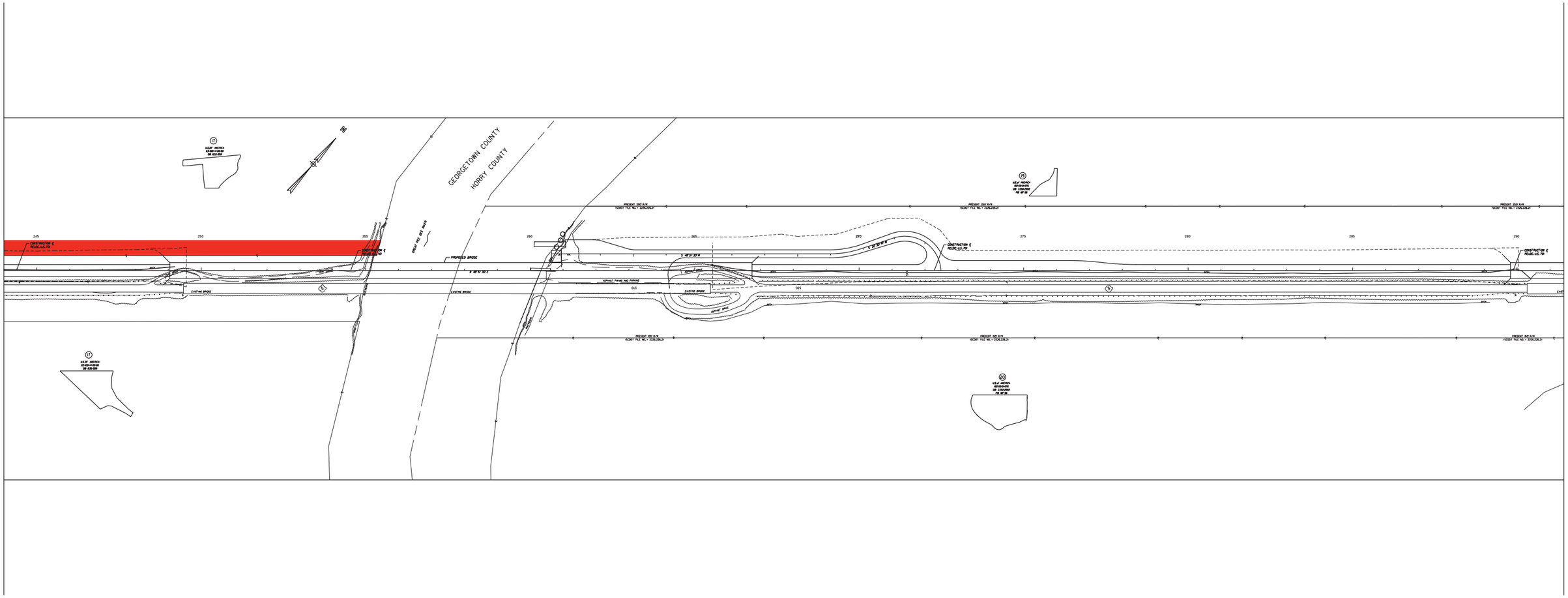
FIGURE A.7
U.S. 701 - ALTERNATIVE 2
DRAFT 4(f) / 6(f) PROPERTY IMPACTS PLAN
SHEET 1 OF 3

SCALE: 1" = 300'
JANUARY 15, 2013

SCDOT

REPLACEMENT OF US 701 BRIDGES OVER GREAT PEE DEE RIVER, PEE DEE OVERFLOW & YAUHANNAH LAKE

HORRY/GEORGETOWN COUNTIES, SC



LEGEND

- 4(f) PROPERTY IMPACT
- 6(f) PROPERTY IMPACT
- RESIDENTIAL PROPERTY IMPACT

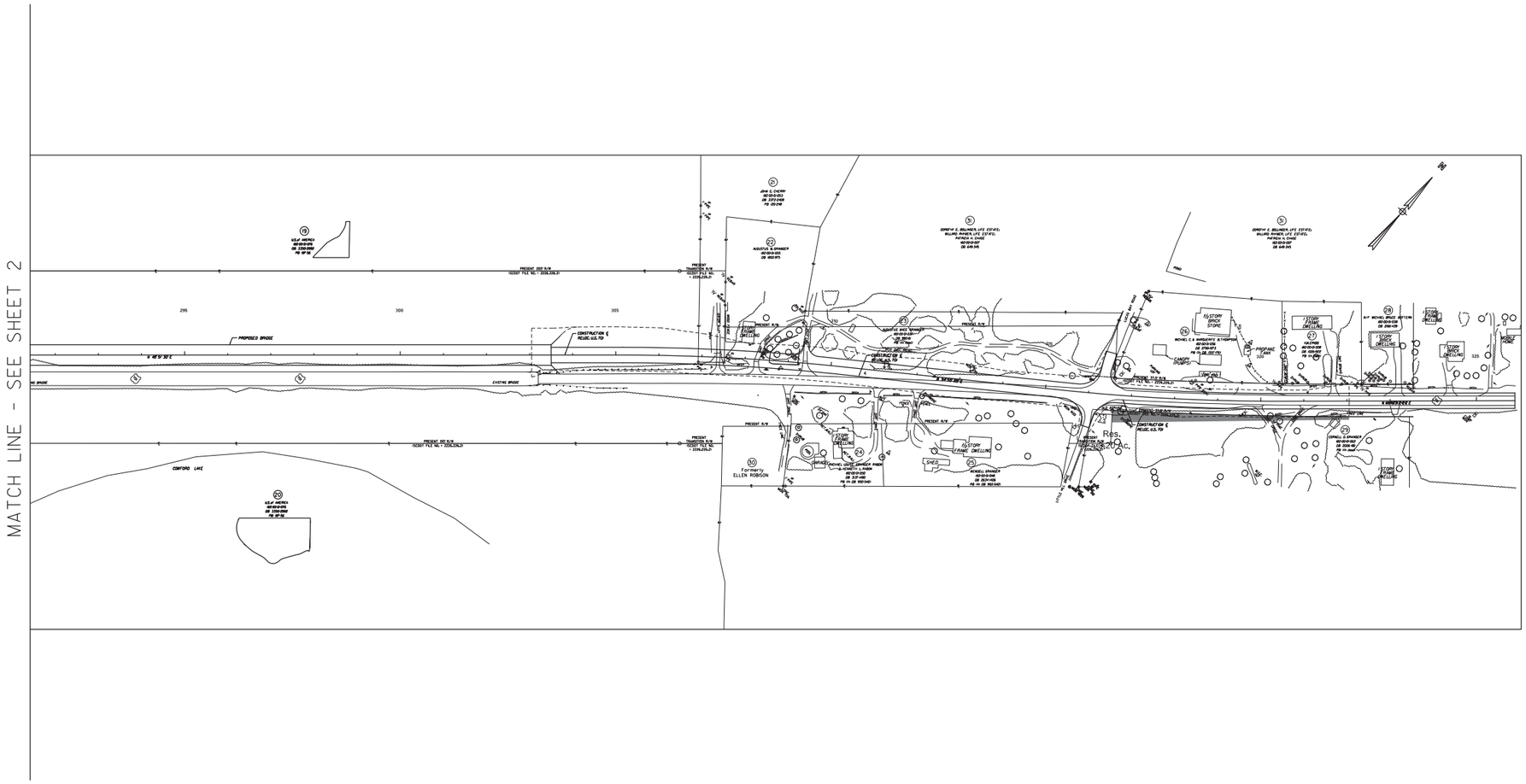
FIGURE A.7
U.S. 701 - ALTERNATIVE 2
DRAFT 4(f) / 6(f) PROPERTY IMPACTS PLAN
SHEET 2 OF 3

SCALE: 1" = 300'
JANUARY 15, 2013

SCDOT

REPLACEMENT OF US 701 BRIDGES OVER GREAT PEE DEE RIVER, PEE DEE OVERFLOW & YAUHANNAH LAKE

HORRY/GEORGETOWN COUNTIES, SC



LEGEND

- 4(f) PROPERTY IMPACT
- 6(f) PROPERTY IMPACT
- RESIDENTIAL PROPERTY IMPACT

FIGURE A.7
U.S. 701 - ALTERNATIVE 2
DRAFT 4(f) / 6(f) PROPERTY IMPACTS PLAN
SHEET 3 OF 3

SCALE: 1" = 300'
JANUARY 15, 2013

SCDOT

REPLACEMENT OF US 701 BRIDGES OVER GREAT PEE DEE RIVER, PEE DEE OVERFLOW & YAUHANNAH LAKE

HORRY/GEORGETOWN COUNTIES, SC

IV. MEASURES TO MINIMIZE HARM

A. Design Strategies

"All possible planning" as defined in 23 CFR 774.17 includes all reasonable measures to minimize harm and mitigate for adverse impacts and effects. Throughout the alternatives development process, various design strategies and measures have been incorporated into the design of the alternatives to avoid or minimize impacts to Section 4(f) and other sensitive resources within the study area. These minimization measures included minor adjustments of vertical alignment, and application of steeper side slopes of 2H:1V to the typical sections to minimize the encroachments into the Section 4(f) properties and wetlands by reducing the overall width of the improved area. This section of the Programmatic Section 4(f) Evaluation documents all possible planning performed to minimize harm for the Section 4(f) property.

A major portion of the existing US 701 alignment traverses the Waccamaw National Wildlife Refuge. Alternatives 2 and 3 have been placed adjacent and parallel to the existing alignment and will utilize as narrow a width as possible from the refuge property. The Waccamaw National Wildlife Refuge has approximately 27,000 acres of land at this time, with plans to acquire more land increasing the total refuge property to 55,000 acres. The amount of land to be incorporated into this project will be less than 1% of the total Refuge property.

Alternative 2 alignment is located parallel and adjacent to the existing alignment and utilizes new roadway fill overlapped with the existing fill. The bridge over the Great Pee Dee River will be longer than the existing bridge and furthermore, the bridge spans for all three bridges will be generally longer than the existing bridge spans. By placing the new roadway fill overlapped with the existing embankment (i.e., by not putting an independent embankment further away), the floodplain/wetland habitat in this area will not be fragmented.

The project will encroach on the Waccamaw NWR property. Waccamaw NWR is a relatively new refuge, and USFWS plans to continuously improve the public use areas and opportunities for compatible wildlife-dependant recreational activities including hiking, fishing, wildlife observation, photography, and environmental education. The proposed project will provide safer access to the Waccamaw NWR property and the visitors/education center from US 701. This safe access should allow for the increased level of intended future use of the refuge by the public

B. Mitigation

FHWA/SCDOT acknowledged in the EA document that the proposed alignments will encroach into the Refuge property. After coordination with USFWS, SCDOT will carry out the following additional compensatory mitigations:

1. **Move New US 701 Alignment to the Upstream of the Current Alignment** – The USFWS showed preference in the new US 701 alignment to be located on the upstream side of the current alignment. Alignment Alternative 3 (55 feet downstream of the existing alignment) would have the least wetland impacts and least property relocations. But Alternative 2 has the least impact to the Cowford Lake ecosystem which is the focus of the Refuge. The SCDOT will adopt

Alignment Alternative 2 (55 feet upstream of the current alignment) which will cause approximately 1.0 acre of additional wetland impacts and more property relocations.

2. **Add a Left Turn Lane on US 701 at the Entrance of the Waccamaw Wildlife Refuge Visitors Center** – Currently, the vehicles wait on the southbound lane of US 701 until there is an opportunity to turn left at the entrance of the visitors center. This is not a safe situation considering the current location of the entrance road and the high speed southbound traffic coming off the bridge. The addition of a left turn lane will enhance the safety at this location and encourage use by citizens for many years to come.

3. **Monitoring of Historic Site 38GE18** – A large portion of Historic Site 38GE18 has been severely damaged or destroyed. However, a 20-foot wide strip on the USFWS property is intact and contributes to the National Register eligibility of the site. The SCDOT has made a commitment of monitoring of this site by one of the Department's archaeologists during ground disturbing construction activities. Personnel from SHPO, the Catawba Indian Nation THPO, and USFWS Regional Historic Preservation Officer will be informed of these monitoring activities and afforded an opportunity to be present on-site if desired. If any inadvertent damage occurs to the site, or any late archeological manifestations are discovered, reports will be made to SHPO, the Catawba Indian Nation THPO, and USFWS Regional Historic Preservation Officer. SCDOT's commitments also include that if any significant portions of the site are encountered, construction activities in that area will be halted and it will be treated as a late discovery.

4. **Mitigate Right of Way Acquisition from the USFWS Property** – The project will encroach on the Refuge property. In order to gain access for construction and maintain the replacement bridges and roadway, SCDOT must purchase minimal strips of property from the Refuge. SCDOT will provide compensatory mitigation by transferring real property that has similar characteristics or by paying an agreed upon lump sum that the Refuge can use to purchase replacement property.

V. COORDINATION

23 CFR 774.5 states prior to making Section 4(f) approvals under 23 CFR 774.3(a), the Section 4(f) Evaluation shall be provided for coordination and comment to the official(s) with jurisdiction over the Section 4(f) resource and to the Department of the Interior, and as appropriate to the Department of Agriculture and the Department of Housing and Urban Development. The Department has been in the process of on-going coordination with agency with jurisdiction for the 4(f) property.

The U.S Fish and Wildlife Service (USFWS) is an official with jurisdiction over the Waccamaw National Wildlife Refuge. The Department conducted ongoing meetings beginning April 28, 2005 regarding the development of this project. USFWS has expressed preference in placing the new alignment upstream of existing US 701. USFWS expressed concerns on the issues, such as, sensitivity of the Cowford Swamp area, the sensitivities of various species, the construction of the refuge visitor center, noise impacts, wildlife and floodwater passage, and clarity on the easement issues.

VI. CONCLUSION

The impacts imposed upon the Section 4(f) resource by the proposed US 701 Project are minor. For Alternative 2, the amount and location of land required from the Waccamaw National Wildlife Refuge will not impair the activities, features, attributes, or intended use of the property, nor result in proximity impacts.

US 701 Bridge Replacement Project Over the Great Pee Dee River, Great Pee Dee River Overflow, and Yauhannah Lake
Horry and Georgetown Counties, South Carolina

Programmatic 4(f) Evaluation for the Waccamaw National Wildlife Refuge

Submitted by the
U.S. Department of Transportation
Federal Highway Administration
and
S.C. Department of Transportation

ATTACHMENTS

File No. 22.124 B

Project No. BR88(044)

PIN 30688X

U.S. Department of Transportation
Federal Highway Administration

South Carolina

1835 Assembly Street, Suite 1270
Columbia, South Carolina 29201
803-765-5411
803-253-3989

October 17, 2012

In Reply Refer To:
HDA-SC

Mr. Marshall Craig Sasser
Refuge Manager
Waccamaw National Wildlife Refuge
21424 N. Fraser Street
P.O. Box 1439
Georgetown, SC 29440

Dear Mr. Sasser:

The South Carolina Department of Transportation (SCDOT) in coordination with the Federal Highway Administration South Carolina Division (FHWA-SC) proposes to replace the existing U.S. 701 bridges over the Great Pee Dee River, Great Pee Dee overflow and Yauhannah Lake. The U.S. 701 bridge replacement project consists of the replacement and realignment of an approximately two mile long section of U.S. 701 located in Georgetown and Horry Counties. The purpose of the project is to replace the existing structurally deteriorated and functionally obsolete bridges and maintain the principal direct rural connection between the larger towns of Conway and Georgetown, as well as the smaller communities such as Bucksport and Yauhannah.

The Waccamaw National Wildlife Refuge (WNWR) was established in 1997 and is located adjacent to both sides of the existing U.S. 701 bridges. Through coordination with your office, the newly constructed bridges are proposed to be located north of the existing bridges in order to minimize impacts to the refuge. By locating the new bridges to the north, impacts to the Cowford Swamp area will be minimized. Shifting away from Cowford Swamp and the existing oxbow lake has been the preferred option by your office and others. One other advantage of shifting to the north would be that lower quality wetlands will be impacted. Wetlands are of a lesser quality due to an old road bed running along the upstream side of the existing bridges.

A Programmatic Section 4(f) Evaluation will be prepared in order to evaluate the impacts of the proposed project prior to the approval of any use of refuge land. This evaluation will address any feasible and prudent alternatives and all practicable planning measures to minimize harm to the refuge. In coordination with your office, FHWA-SC feels that the project meets FHWA's Programmatic Section 4(f) criteria for minor involvements with public parks, recreational lands, and wildlife and waterfowl refuges (attached).

Permanent impacts to the WNWR include a loss of approximately 5 acres of land parallel and directly adjacent to the existing bridges. Presently the WNWR encompasses nearly 27,000 acres and the proposed acquisition boundary spans over 55,000 acres. Based on these acreages, the project would impact 0.0185 percent of the existing refuge. The WNWR should see no net loss as a result of SCDOT's plans to replace the property impacted. Table 1 provides a comparison of impacts from the various alternatives. SCDOT plans to work with your office to find suitable replacement property to be turned over to the U.S. Fish and Wildlife Service (USFWS) as part of the mitigation for the project's impacts.

Table 1

Property Impacts	Alt. 1	Alt. 2 (Preferred	Alt. 3	Alt. 4	Alt. 5
Residential Relocations	2	1	0	0	0
Acreage	1.62	0.94	0.00	0.00	0.00
Residential Take w/out Relocation	1	0	0	0	0
Acreage	0.73	0.00	0.00	0.00	0.00
Residential Partial Take	4	6	2	1	5
Acreage	0.64	1.04	0.16	0.15	0.34
Refuge Property (acres)	5.94	4.44	6.23	7.43	9.75
Wetland Impacts					
Permanent	10.92	9.50	8.25	10.12	15.69
Temporary	12.31	11.20	11.60	12.57	8.88

We ask for your concurrence that the location of the land to be used as a result of Alternative 2 shall not impair the use of the remaining Section 4(f) property, in whole or in part, for its intended purpose. The total amount to be acquired does not exceed 1 percent of the refuge which is within the criteria set by FHWA to qualify the project to be processed under the Programmatic Section 4(f) Evaluation for minor involvements with wildlife and waterfowl refuges.

If you concur with this assessment please sign below and return a copy to my office. We look forward to a continued coordination with you as this project progresses. Please address any questions you may have to Mr. J. Shane Belcher at 803-253-3187 or by e-mail at jeffrey.belcher@dot.gov.

Sincerely,

J. Shane Belcher

(for) Robert L. Lee
Division Administrator

Enclosures

CONCURRENCE:

Signed: _____ Date: 10/17/2012
Mr. Marshall Craig Sasser
Refuge Manager – Waccamaw National Wildlife Refuge

cc: Mr. Tyke Redfearn, SCDOT Program Manager
Mr. Henry Phillips, SCDOT NEPA Environmental Coordinator

Final Nationwide Section 4(f) Evaluation and Approval for Federally-Aided Highway Projects with Minor Involvements with Public Parks, Recreation Lands, and Wildlife and Waterfowl Refuges

This programmatic Section 4(f) evaluation has been prepared for projects which improve existing highways and use minor amounts of publicly owned public parks, recreation lands, or wildlife and waterfowl refuges that are adjacent to existing highways. This programmatic Section 4(f) evaluation satisfies the requirements of Section 4(f) for all projects that meet the applicability criteria listed below. No individual Section 4(f) evaluations need be prepared for such projects. (Note: a similar programmatic Section 4(f) evaluation has been prepared for projects which use minor amounts of land from historic sites).

The FHWA Division Administrator is responsible for reviewing each individual project to determine that it meets the criteria and procedures of this programmatic Section 4(f) evaluation. The Division Administrator's determinations will be thorough and will clearly document the items that have been reviewed. The written analysis and determinations will be combined in a single document and placed in the project record and will be made available to the public upon request. This programmatic evaluation will not change the existing procedures for project compliance with the National Environmental Policy Act (NEPA) or with public involvement requirements.

Applicability

This programmatic Section 4(f) evaluation may be applied by FHWA only to projects meeting the following criteria:

1. The proposed project is designed to improve the operational characteristics, safety, and/or physical condition of existing highway facilities on essentially the same alignment. This includes "4R" work (resurfacing, restoration, rehabilitation, and reconstruction), safety improvements, such as shoulder widening and the correction of substandard curves and intersections; traffic operation improvements, such as signalization, channelization, and turning or climbing lanes; bicycle and pedestrian facilities; bridge replacements on essentially the same alignment; and the construction of additional lanes. This programmatic Section 4(f) evaluation does not apply to the construction of a highway on a new location.
2. The Section 4(f) lands are publicly owned public parks, recreation lands, or wildlife and waterfowl refuges located adjacent to the existing highway.

3. The amount and location of the land to be used shall not impair the use of the remaining Section 4(f) land, in whole or in part, for its intended purpose. This determination is to be made by the FHWA in concurrence with the officials having jurisdiction over the Section 4(f) lands, and will be documented in relation to the size, use, and/or other characteristics deemed relevant.

   The total amount of land to be acquired from any Section 4(f) site shall not exceed the values in the following Table:

Total Size of Section 4(f) Site	Maximum to Be Acquired
< 10 acres	10 percent of site
10 acres - 100 acres	1 acre
> 100 acres	1 percent of site

4. The proximity impacts of the project on the remaining Section 4(f) land shall not impair the use of such land for its intended purpose. This determination is to be made by the FHWA in concurrence with the officials having jurisdiction over the Section 4(f) lands, and will be documented with regard to noise, air and water pollution, wildlife and habitat effects, aesthetic values, and/or other impacts deemed relevant.

5. The officials having jurisdiction over the Section 4(f) lands must agree, in writing, with the assessment of the impacts of the proposed project on, and the proposed mitigation for, the Section 4(f) lands.

6. For projects using land from a site purchased or improved with funds under the Land and Water Conservation Fund Act, the Federal Aid in Fish Restoration Act (Dingell-Johnson Act), the Federal Aid in Wildlife Act (Pittman-Robertson Act), or similar laws, or the lands are otherwise encumbered with a Federal interest (e.g., former Federal surplus property), coordination with the appropriate Federal agency is required to ascertain the agency's position on the land conversion or transfer. The programmatic Section 4(f) evaluation does not apply if the agency objects to the land conversion or transfer.

7. This programmatic evaluation does not apply to projects for which an environmental impact statement (EIS) is prepared, unless the use of Section 4(f) lands is discovered after the approval of the final EIS. Should any of the above criteria not be met, this programmatic Section 4(f) evaluation cannot be used, and an individual Section 4(f) evaluation rust be prepared.

Alternatives

The following alternatives avoid any use of the public park land, recreational area, or wildlife and waterfowl refuge:

1. Do nothing.
2. Improve the highway without using the adjacent public park, recreational land, or wildlife and waterfowl refuge.
3. Build an improved facility on new location without using the public park, recreation land, or wildlife or waterfowl refuge.

This list is intended to be all-inclusive. The programmatic Section 4(f) evaluation does not apply if a feasible and prudent alternative is identified that is not discussed in this document. The project record must clearly demonstrate that each of the above alternatives was fully

evaluated before the FHWA Division Administrator concluded that the programmatic Section 4(f) evaluation applied to the project.

Findings

In order for this programmatic Section 4(f) evaluation to be applied to a project, each of the following findings must be supported by the circumstances, studies, and consultations on the project:

1. **Do Nothing Alternative**. The Do Nothing Alternative is not feasible and prudent because: (a) it would not correct existing or projected capacity deficiencies; or (b) it would not correct existing safety hazards; or (c) it would not correct existing deteriorated conditions and maintenance problems; and (d) not providing such correction would constitute a cost or community impact of extraordinary magnitude, or would result in truly unusual or unique problems, when compared with the proposed use of the Section 4(f) lands.

2. **Improvement without Using the Adjacent Section 4(f) Lands**. It is not feasible and prudent to avoid Section 4(f) lands by roadway design or transportation system management techniques (including, but not limited to, minor alignment shifts, changes in geometric design standards, use of retaining walls and/or other structures, and traffic diversions or other traffic management measures) because implementing such measures would result in: (a) substantial adverse community impacts to adjacent homes, businesses or other improved properties; or (b) substantially increased roadway or structure cost; or (c) unique engineering, traffic, maintenance, or safety problems; or (d) substantial adverse social, economic, or environmental impacts; or (e) the project not meeting identified transportation needs; and (f) the impacts, costs, or problems would be truly unusual or unique, or of extraordinary magnitude when compared with the proposed use of Section 4(f) lands. Flexibility in the application of American Association of State Highway and Transportation Officials (AASHTO) geometric standards should be exercised, as permitted in 23 CFR 625, during the analysis of this alternative.

3. **Alternatives on New Location**. It is not feasible and prudent to avoid Section 4(f) lands by constructing on new alignment because (a) the new location would not solve existing transportation, safety, or maintenance problems; or (b) the new location would result in substantial adverse social, economic, or environmental impacts (including such impacts as extensive severing of productive farmlands, displacement of a substantial number of families or businesses, serious disruption of established patterns, substantial damage to wetlands or other sensitive natural areas, or greater impacts to other Section 4(f) lands or (c) the new location would substantially increase costs or engineering difficulties (such as an inability to achieve minimum design standards, or to meet the requirements of various permitting agencies such as those involved with navigation, pollution, and the environment); and (d) such problems, impacts, costs, or difficulties would be truly unusual or unique, or of extraordinary magnitude when compared with the proposed use of Section 4(f) lands. Flexibility in the application of AASHTO geometric standards should be exercised, as permitted in 23 CFR 625, during the analysis of this alternative.

Measures to Minimize Harm

This programmatic Section 4(f) evaluation and approval may be used only for projects where the FHWA Division Administrator, in accordance with this evaluation, ensures that the proposed action includes all possible planning to minimize harm. This has occurred when the officials having jurisdiction over the Section 4(f) property have agreed, in writing, with the assessment of impacts resulting from the use of the Section 4(f) property and with the mitigation measures to be provided. Mitigation measures shall include one or more of the following:

1. Replacement of lands used with lands of reasonably equivalent usefulness and location and of at least comparable value.
2. Replacement of facilities impacted by the project including sidewalks, paths, benches, lights, trees, and other facilities.
3. Restoration and landscaping of disturbed areas.
4. Incorporation of design features (e.g., reduction in right-of-way width, modifications to the roadway section, retaining walls, curb and gutter sections, and minor alignment shifts); and habitat features (e.g., construction of new, or enhancement of existing, wetlands or other special habitat types); where necessary to reduce or minimize impacts to the Section 4(f) property. Such features should be designed in a manner that will not adversely affect the safety of the highway facility. Flexibility in the application of AASHTO geometric standards should be exercised, as permitted in 23 CFR 625, during such design.
5. Payment of the fair market value of the land and improvements taken or improvements to the remaining Section 4(f) site equal to the fair market value of the land and improvements taken.
6. Such additional or alternative mitigation measures as may be determined necessary based on consultation with, the officials having jurisdiction over the parkland, recreation area, or wildlife or waterfowl refuge.

If the project uses Section 4(f) lands that are encumbered with a Federal interest (see **Applicability**), coordination is required with the appropriate agency to ascertain what special measures to minimize harm, or other requirements, may be necessary under that agency's regulations. To the extent possible, commitments to accomplish such special measures and/or requirements shall be included in the project record.

Coordination

Each project will require coordination in the early stages of project development with the Federal, state and/or local agency officials having jurisdiction over the Section 4(f) lands. In the case of non-Federal Section 4(f) lands, the official with jurisdiction will be asked to identify any Federal encumbrances. Where such encumbrances exist coordination will be required with the Federal agency responsible for the encumbrance.

For the interests of the Department of Interior, Federal agency coordination will be initiated with the Regional Directors of the U.S. Fish and Wildlife Service, the National Park Service,

and the Bureau of Reclamation; the State Directors of the Bureau of Land Management, and the Area Directors of the Bureau of Indian Affairs. In the case of Indian lands, there will also be coordination with appropriate Indian Tribal officials.

Before applying this programmatic evaluation to projects requiring an individual bridge permit the Division Administrator shall coordinate with the U.S. Coast Guard District Commander.

Copies of the final written analysis and determinations required under this programmatic Section 4(f) evaluation shall be provided to the officials having jurisdiction over the involved Section 4(f) area and to other parties upon request.

Approval Procedure

This programmatic Section 4(f) approval applies only after the FHWA Division Administrator has:

1. Determined that the project meets the applicability criteria set forth above;
2. Determined that all of the alternatives set forth in the Findings section have been fully evaluated;
3. Determined that the findings in this document (which conclude that there are no feasible and prudent alternatives to the use of the publicly owned public park, recreation area, or wildlife or waterfowl refuge) are clearly applicable to the project;
4. Determined that the project complies with the Measures to Minimize Harm section of this document;
5. Determined that the coordination called for in this programmatic evaluation has been successfully completed;
6. Assured that the measures to minimize harm will be incorporated in the project; and
7. Documented the project file clearly identifying the basis for the above determinations and assurances.

Issued on: 12/23/86 Approved: /Original Signed By/ Ali F. Sevin Office of Environmental Policy Federal Highway Administration

Tuhin Basu

From: Redfearn, Tyke [RedfearnWT@dot.state.sc.us]
Sent: Wednesday, October 10, 2012 5:06 PM
To: tkbasu@tbaengineering.com
Subject: FW: 6f Conversion Requirements & Refuges 08.28.12

Hey Tuhin- Below is information regarding 6(f) and the WNWR.

William "Tyke" Redfearn III, P.E.
Assistant Program Manager
SCDOT | RPG2 - Pee Dee Region
955 Park Street, Room 508
Columbia, SC 29202-0191
Office: (803) 737-1430 | Fax: (803) 737-1881
RedfearnWT@SCDOT.ORG

From: Belcher, Jeffery - FHWA
Sent: Tuesday, August 28, 2012 10:00 AM
To: Redfearn, Tyke; Marshall_Sasser@fws.gov
Cc: tkbasu@tbaengineering.com; Jeanette_Harrison@fws.gov; Phillips, Henry; Barbee, Michael W.
Subject: 6f Conversion Requirements
Importance: High

All,

After receiving the funding info for the various tracts at WNWR from USFWS ROW (thanks again Jeanette), I touched base with Mr. Joel Lynch of the NPS again yesterday to discuss conversion procedures for the LWCF properties at the WNWR. Mr. Lynch stated that since USFWS received the LWCF funds directly from Congress that we would not have to go back through the NPS (as normal) to get approval for the conversion. Instead we (FHWA/SCDOT) would be able to work directly with USFWS to complete the conversion process for the LWCF properties and find replacement property. This is good news as I believe it will speed up the overall process and we'll be able to work out mitigation for the property impacts in a more streamlined fashion.

Thanks,

J. Shane Belcher
Environmental Coordinator
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201
Phone: 803-253-3187
Fax: 803-253-3989

From: Redfearn, Tyke [mailto:RedfearnWT@dot.state.sc.us]
Sent: Tuesday, August 28, 2012 8:28 AM
To: Marshall_Sasser@fws.gov
Cc: Belcher, Jeffrey (FHWA); tkbasu@tbaengineering.com
Subject: RE: US 701 Aug 16 2012 Refuge mtg notes DRAFT

Okay. Thanks for letting us know.

William "Tyke" Redfearn III, P.E.

From: Marshall_Sasser@fws.gov [mailto:Marshall_Sasser@fws.gov]
Sent: Monday, August 27, 2012 9:11 PM
To: Redfearn, Tyke
Cc: Belcher, Jeffery - FHWA; tkbasu@tbaengineering.com
Subject: Re: US 701 Aug 16 2012 Refuge mtg notes DRAFT

Tyke,

I received an email today from our Regional Solicitor stating that we can probably go approve a programatic 4(f) review if the the preferred alignment is on the upstream side of the current alignment. I will forward his email next week when I return from annual leave.

Thanks,

Craig

From: "Redfearn, Tyke" [RedfearnWT@dot.state.sc.us]
Sent: 08/27/2012 05:40 PM GMT
To: Marshall Sasser
Cc: "Belcher, Jeffery - FHWA" <Jeffrey.Belcher@dot.gov>; "tkbasu@tbaengineering.com" <tkbasu@tbaengineering.com>
Subject: US 701 Aug 16 2012 Refuge mtg notes DRAFT

Good Afternoon Craig- Attached are draft meeting notes from our August 16 meeting at the USFWS Refuge. Shane and Tuhin provided their comments/revisions so we would like for you to do the same. Please review the draft notes, and let us know your thoughts. Thank you!

William "Tyke" Redfearn III, P.E.
Assistant Program Manager
SCDOT | RPG2 - Pee Dee Region
955 Park Street, Room 508
Columbia, SC 29202-0191
Office: (803) 737-1430 | Fax: (803) 737-1881
RedfearnWT@SCDOT.ORG

US 701 BRIDGE REPLACEMENT OVER GREAT PEE DEE AND OVERFLOWS

New Preferred Alternative 2 Environmental Impact Analysis Relative to Old Preferred Alternative 3*

Alternative 2 involves construction of a new alignment approximately 55 feet northwest (upstream) of the centerline of the existing alignment. 55 feet has been established as the minimum offset distance from the existing centerline that will permit the safe operation of the existing US 701 roadway and provide adequate space for drainage provisions during construction. The two primary environmental issues associated with this alternative include wetland impacts and wildlife impacts. In addition, there are secondary issues involving relocation of a public boat ramp, impacts to properties, and some utility relocations.

Wetlands

Alternative 2 would result in approximately 1.25 acres greater permanent wetland impacts than Alternative 3 (the downstream alternative). However, based on a field analysis and observations conducted by biologists from the SCDOT and the US Fish and Wildlife Service, the wetlands impacted by Alt. 2 would be of a lesser quality due to an old road bed running along the upstream side of the bridge. This road bed has resulted in less potential biomass due to observations of lower populations of mature obligate wetland plant species in the floodplain. In addition, the nearby regularly maintained power line right of way keeps a large swath of wetland on the upstream side in an unnatural immature palustrine emergent wetland state. This marsh-type environment has a significantly different and less diverse biotic community than the primarily palustrine forested wetland and palustrine unconsolidated bottom wetland communities on the downstream side of the existing bridge.

One method of assessing the value and function of wetlands is in terms of wildlife habitat. The U.S. Fish and Wildlife Service (USFWS) Resource Category criteria are outlined in the USFWS Mitigation Policy, 46 CFR 7644-7663. Resource categories and mitigation planning techniques are assigned based on the following criteria:

- Category 1 - Communities of one-of-a-kind high value to wildlife, unique and irreplaceable on a national or eco-regional basis, habitat is not replaceable in kind based on present-day scientific and engineering skills within a reasonable time frame.

- Category 2 - Communities of high value to wildlife, which are relatively scarce or are becoming scarce on a national, or eco-regional basis, habitat, can be replaced in kind within a reasonable time frame based on present-day scientific and engineering skills.

- Category 3 - Community types of high to medium wildlife value which are relatively abundant on a national basis, out-of-kind replacement is allowable if a tradeoff analysis demonstrates equivalency of substituted habitat type and/or habitat values. These sites are often in conjunction with a replenishing source.

- Category 4 - Community types of low to medium wildlife value, generally losses will not have a substantial adverse effect on important fish and wildlife resources. These sites have often been affected by the present roadway or human

disturbances and are usually isolated.

Based on these criteria and the Department's on-site analysis, the wetlands on the upstream side best fit Category 4, except they are not isolated and the wetlands on the downstream side best fit Category 3, and with the possibility of even some Category 2 wetlands present.

In addition to general wetland protection, the habitat on the downstream side of the bridge includes the relatively unique ecosystem around Cowford Lake. Alternative 3 would result in additional clearing and access road construction which would eliminate most of the forested wetlands remaining between the bridges and Cowford Lake which currently serve as a natural filter for storm water runoff flowing into the lake. This forested wetland buffer strip provides an important wildlife corridor for both forest wildlife and wading birds including the federally endangered wood stork, which has been known to forage along the edge of Cowford Lake.

Wildlife

Alternative 3 potentially could impact wildlife around Cowford Lake thru greater noise impacts, due to the clearing of the forested buffer between the bridges and the lake. These impacts would be avoided by utilizing Alternative 2. The Cowford Lake wetland complex is comprised of a combination of an oxbow lake and a ridge and swale forested wetland topography which has evolved over thousands of years of river alignment adjustments. The lake has a beaver pond at its headwaters. The forested wetlands adjacent to the lake offer brood rearing habitat for wood ducks and hooded mergansers as well as foraging habitat for white ibis and wood storks. These behaviors could potentially be affected by increased roadway noise.

The lake itself offers shallow water, vegetated spawning habitat for numerous freshwater fish species. Freshwater mussels can frequently be found where water flows from intersecting streams are present. The forested wetlands located between Cowford Lake and the Great Pee Dee River is the northernmost documented nest site for the Swallow-tailed Kite (*Elanoides forticatus*) which is both a state listed species and focal species for the US Fish and Wildlife Service. This nest site has been active for over 10 years and in 2009, an artificial nest structure was installed in a tree in this area as part of a larger study using artificial nesting structures to improve site selection. This structure was the only artificial structure used by kites throughout the study area in 2009.

Another state listed species has a population in the project area, the Rafinesque's big eared bat. These bats use these forested wetlands and open water areas as their primary foraging areas and often roost in hollow trees, old barns, or other structures along the river and beneath bridges.

Construction of Alternative 3 would result in degradation of many of these species' habitats. Therefore, as a result of these new analyses and considerations, Alternative 2 has been selected as the new preferred alternative, as opposed to the previous selection of Alternative 3.

*Some of the data used in this analysis was obtained during an onsite meeting on 9/28/2012 with USFWS Refuge Managers Craig Sasser and Terry Peacock, USFWS Biologist Mark Caldwell, and SCDOT Biologist Ed Frierson.

Signed: Ed Frierson

LAKE