DEPARTMENT OF THE ARMY PERMIT

Permittee: Florida Department of Transportation, District 3
Attn: Joy Swanson
1074 Highway 90
Chipley, Florida 32428

Permit No: SAJ-2012-00501 (SP-MMW)

Issuing Office: U.S. Army Engineer District, Jacksonville

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: The authorized work consists of permanent impacts to 1.31 acres of wetlands for the replacement of the structurally deficient SR 10 bridge over the Yellow River and resurfacing/reconstructing the roadway approaches. The span length will be increased by approximately 83 feet from 1,530 feet to 1,613 feet. In addition, there will be 1.62 acres of temporary wetland impacts associated with construction of a temporary construction access road.

The work described above is to be completed in accordance with the 10 pages of drawings and 4 attachments affixed at the end of this permit instrument.

Project Location: The State Road (SR) 10 (US 90) Yellow River Bridge Replacement project starts at Mile Post 10.807 east of Ellis Road and continues east approximately 0.947 miles to Mile Post 11.754 east of Antioch Road. The project is located in Sections 14 and 15, Township 03 North, Range 24 West, in Okaloosa County, Florida

Directions to site: From the intersection of SR90 and SR10, travel west on SR10 to the project site which begins at Antioch Road and ends at Ellis Road.

Approximate Central Coordinates: Latitude: 30.7527 North
Longitude: 86.6275 West

Permit Conditions

General Conditions:

1. The time limit for completing the work authorized ends on **December 4, 2018**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature and the mailing address of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. **Reporting Address:** All reports, documentation and correspondence required by the conditions of this permit shall be submitted to the following address: U.S. Army Corps of Engineers, Regulatory Division, Enforcement Section, 41 North Jefferson Street, Suite 301, Pensacola, Florida 32502. The Permittee shall reference this permit number, SAJ-2012-00501(SP-MMW), on all submittals.

2. **Commencement Notification:** Within 10 days from the date of initiating the authorized work, the Permittee shall provide to the Corps a written notification of the date of commencement of work authorized by this permit.

3. **Erosion Control:** Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the work area. Immediately after completion of the final grading of the land surface, all slopes, land surfaces, and filled areas shall be stabilized using sod, degradable mats, barriers, or a combination of similar stabilizing materials to prevent erosion. The erosion control measures shall remain in place and be maintained until all authorized work has been completed and the site has been stabilized.

4. **Cultural Resources/Historic Properties:**

a. No structure or work shall adversely affect impact or disturb properties listed in the National Register of Historic Places (NRHP) or those eligible for inclusion in the NRHP.

b. If during the ground disturbing activities and construction work within the permit area, there are archaeological/cultural materials encountered which were not the subject of a previous cultural resources assessment survey (and which shall include, but not be limited to: pottery, modified shell, flora, fauna, human remains, ceramics, stone tools or metal implements, dugout canoes, evidence of structures or any other physical remains that could be associated with Native American cultures or early colonial or American settlement), the Permittee shall immediately stop all work and ground-disturbing activities within a 100-meter diameter of the discovery and notify the Corps within the same business day (8 hours). The Corps shall then notify the Florida State Historic Preservation Officer (SHPO) and the appropriate Tribal Historic Preservation Officer(s) (THPO(s)) to assess the significance of the discovery and devise appropriate actions.

c. Additional cultural resources assessments may be required of the permit area in the case of unanticipated discoveries as referenced in accordance with the above Special Condition ; and if deemed necessary by the SHPO, THPO(s), or Corps, in accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO for finds under his or her jurisdiction, and from the Corps.

d. In the unlikely event that unmarked human remains are identified on non-federal lands, they will be treated in accordance with Section 872.05 Florida Statutes. All work and ground disturbing activities within a 100-meter diameter of the unmarked human remains shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archeologist within the same business day (8-hours). The Corps shall then notify the appropriate SHPO and THPO(s). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the State Archeologist and from the Corps.

5. **Mitigation Credit Purchase:** Wetland impacts for this project will be mitigated through the Northwest Florida Umbrella, Watershed-Based, Regional Mitigation Plan (UWRMP), as defined in the agreement between the Northwest Florida Water Management District (NWFWMD) and the U.S. Army Corps of Engineers, Jacksonville District, July 31, 2006. Within 30 days from the date of initiating the authorized work the Permittee shall provide verification to the Corps that 2.24 federal mitigation credits have been debited from the federal mitigation credit ledger for the Yellow River Ranch Mitigation Area (UWRMP 5.2.1). The required verifications shall reference this project's permit number (SAJ-2012-00501).

6. **Temporary Wetland Impacts:** Filter fabric shall be placed over the native soil prior to deposition of any fill material within the temporary access areas. Within 30 days from the date of completing the authorized work, the fill material shall be removed, and the contours, elevations, vegetation, and hydrology shall be restored to pre-construction conditions within the 1.68 acre temporary impact zone.

7. **As-Builts:** Within 60 days of completion of the authorized work or at the expiration of the construction authorization of this permit, whichever occurs first, the Permittee shall submit as-built drawings of the authorized work and a completed As-Built Certification Form (**Attachment #1**) to the Corps. The drawings shall be signed and sealed by a registered professional engineer and include the following:

a. A plan view drawing of the location of the authorized work footprint (as shown on the permit drawings) with an overlay of the work as constructed in the same scale as the attached permit drawings (8½-inch by 11-inch). The drawing should show all "earth disturbance," including wetland impacts, water management structures, and any on-site mitigation areas.

b. List any deviations between the work authorized by this permit and the work as constructed. In the event that the completed work deviates, in any manner, from the authorized work, describe on the As-Built Certification Form the deviations between the work authorized by this permit and the work as constructed. Clearly indicate on the as-built drawings any deviations that have been listed. Please note that the depiction and/or description of any deviations on the drawings and/or As-Built Certification Form does not constitute approval of any deviations by the U.S. Army Corps of Engineers.

c. The Department of the Army Permit number.

d. Include pre- and post-construction aerial photographs of the project site, if available.

8. **Biological Opinion:** This Corps permit does not authorize the Permittee to take an endangered species, in particular the Gulf sturgeon, the narrow pigtoe, the southern sandshell, or the fuzzy pigtoe. In order to legally take a listed species, the Permittee must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a BO under ESA Section 7, with "incidental take" provisions with which the Permittee must comply). The enclosed US Fish and Wildlife Service (FWS) Biological Opinion (BO) (**Attachment #2**) contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Authorization under this Corps permit is conditional upon compliance with all of the mandatory terms and conditions associated with incidental take of the attached BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with this Corps permit. The FWS is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

9. **Gulf Sturgeon Construction Conditions:** The Permittee shall comply with the Construction Special Provisions - Gulf Sturgeon Protection Guidelines, dated September 2012, and provided in **Attachment #3** of this permit.

10. **Eastern Indigo Snake Protection Measures:** The Permittee shall comply with U.S. Fish and Wildlife Service's "Standard Protection Measures for the Eastern Indigo Snake" dated February 12, 2004 and provided in **Attachment #4** of this permit."

11. **Fill Material**: The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, automotive parts, asphalt, construction materials, concrete block with exposed reinforcement bars, and soils

contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

12. **Regulatory Agency Changes**: Should any other regulatory agency require changes to the work authorized or obligated by this permit, the Permittee is advised that a modification to this permit instrument is required prior to initiation of those changes. It is the Permittee's responsibility to request a modification of this permit from the Panama City Regulatory Office.

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899
(33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision: This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions: General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Joy Swanson 12/9/13

(PERMITTEE) (DATE)

Joy Swanson; FDOT Permit Coordinator District 3

(PERMITTEE NAME-PRINTED)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

12/9/13

(DISTRICT ENGINEER) (DATE)

for Alan M. Dodd,
Colonel, U.S. Army
District Commander

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

_____ _____

(TRANSFEREE-SIGNATURE) (DATE)

_____

(NAME-PRINTED)

_____

(ADDRESS)

_____

(CITY, STATE, AND ZIP CODE)

Attachments to Department of the Army
Permit Number SAJ-2012-00501 (SP-MMW)

1. PERMIT DRAWINGS: 10 pages, dated June 2013.

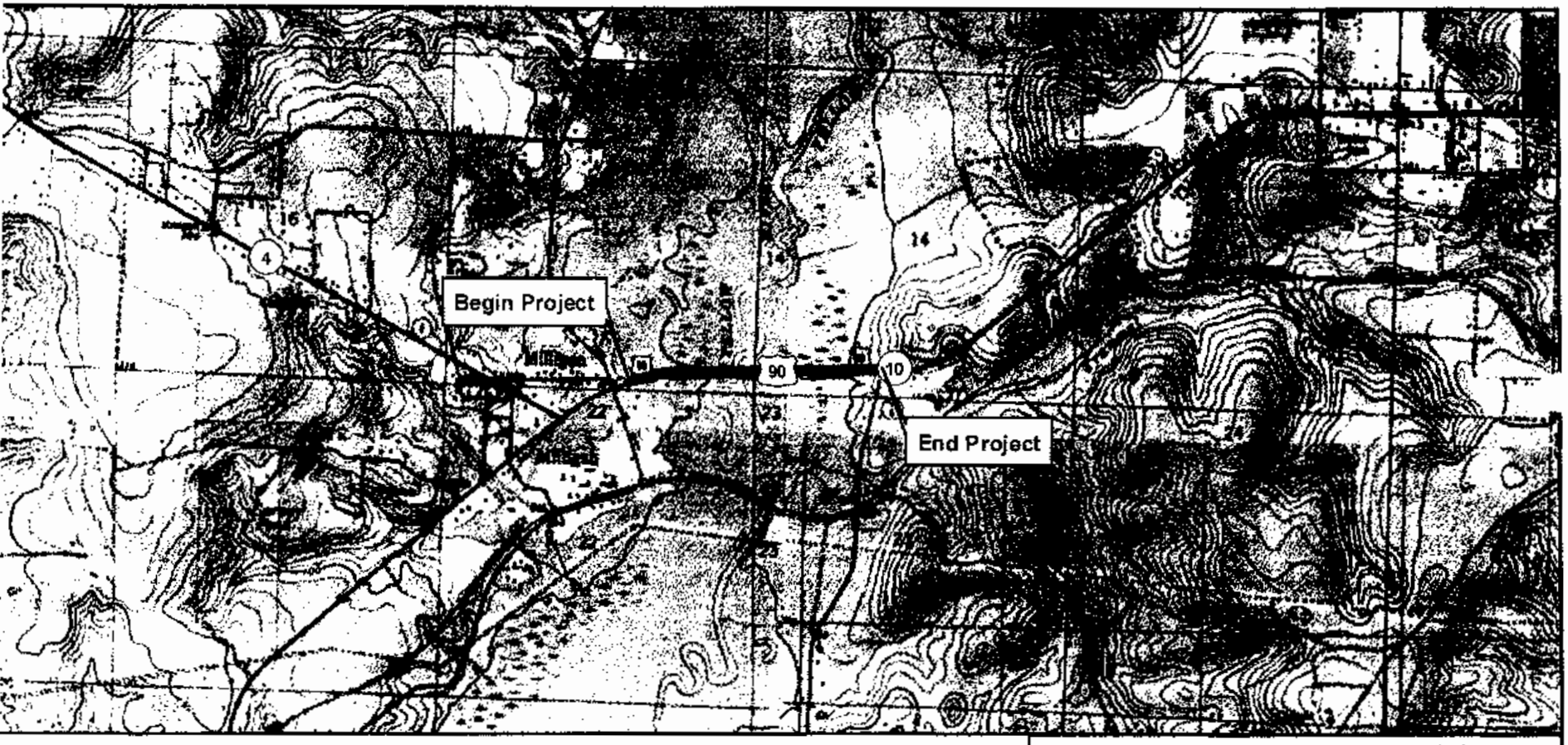
2. WATER QUALITY CERTIFICATION: Specific Conditions of the water quality certification and modification in accordance with General Condition number 5 on page 2 of this DA permit. 9 pages.

3. AS-BUILT CERTIFICATION FORM: 2 pages, labeled Attachment #1

4. BIOLOGICAL OPINION: 64 Pages, labeled Attachment #2.

5. GULF STURGEON CONSTRUCTION CONDITIONS: 2 pages, labeled Attachment #3.

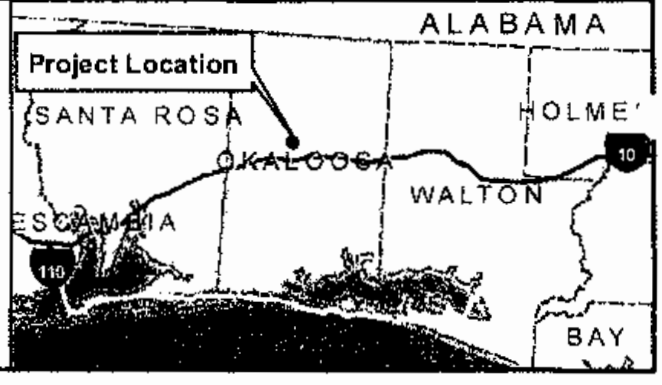
6. EASTERN INDIGO SNAKE CONSTRUCTION CONDITIONS: 3 pages, labeled Attachment #4.



USGS Quad Maps 5554 (Baker)
5553 (Crestview North)

Project Location:
Section: 14, 15
wnship: 3N
nge: 24W

FLDOT-3--SR 10 over Yellow River, FPN 424508
SAJ-2012-00508 (SP-MMW)



DRMP
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r, Riddle Mills, & Precourt, Inc.
ober 2010

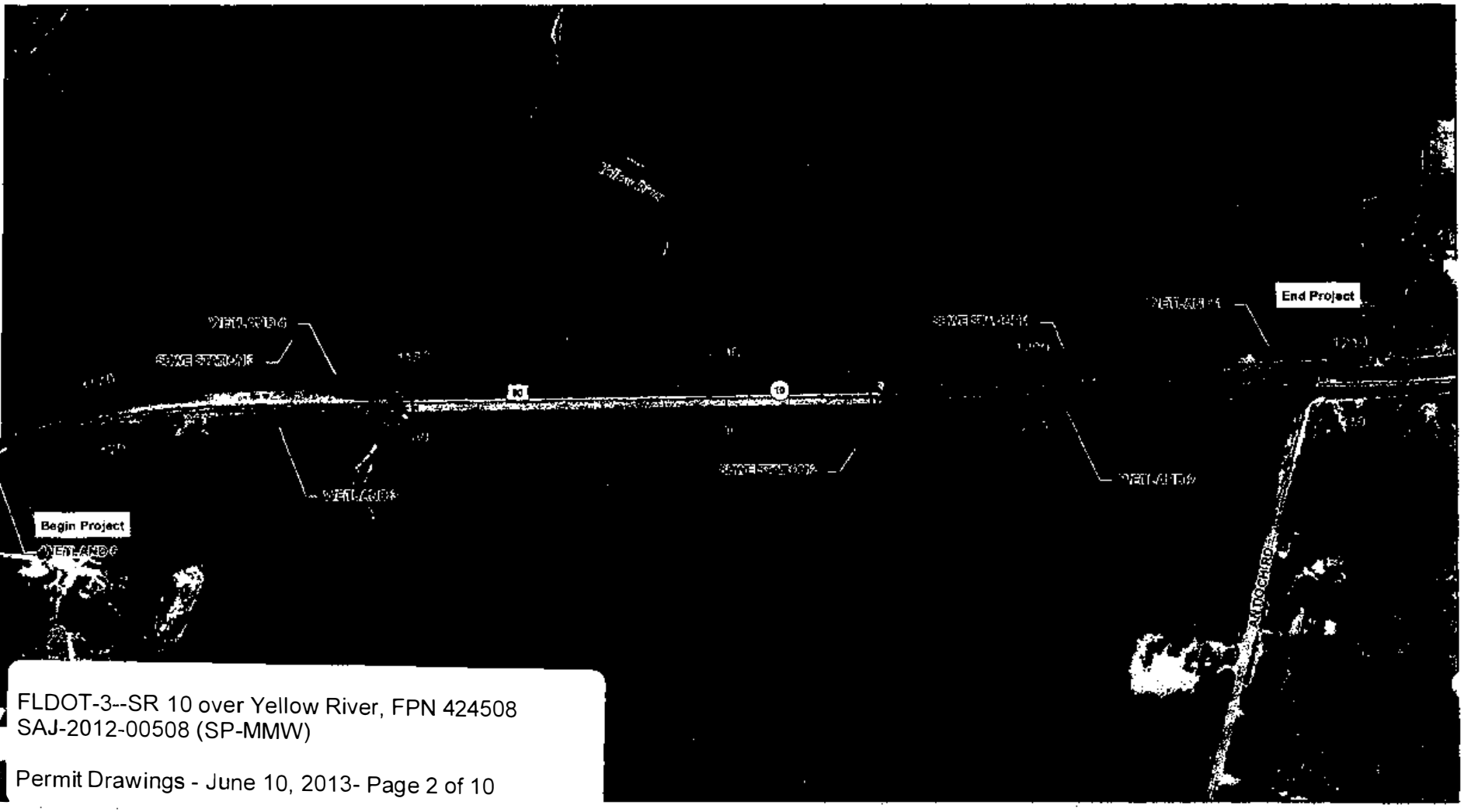
Location Map
SR 10 (US 90) Over Yellow River Bridge Replacement
FPID# 424508-1-52-01

Okaloosa County, Florida

1 inch = 0.5 miles

0 0.25 0.5 Miles

Figure 1



FLDOT-3--SR 10 over Yellow River, FPN 424508
SAJ-2012-00508 (SP-MMW)

Permit Drawings - June 10, 2013- Page 2 of 10

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2010

Wetland Location Map
SR 10 (US 90) Over Yellow River Bridge Replacement
FPID# 424508-1-52-01

Okaloosa County, Florida

Legend
- Project Limits
- Alignment
- Wetlands
- SHWE Station

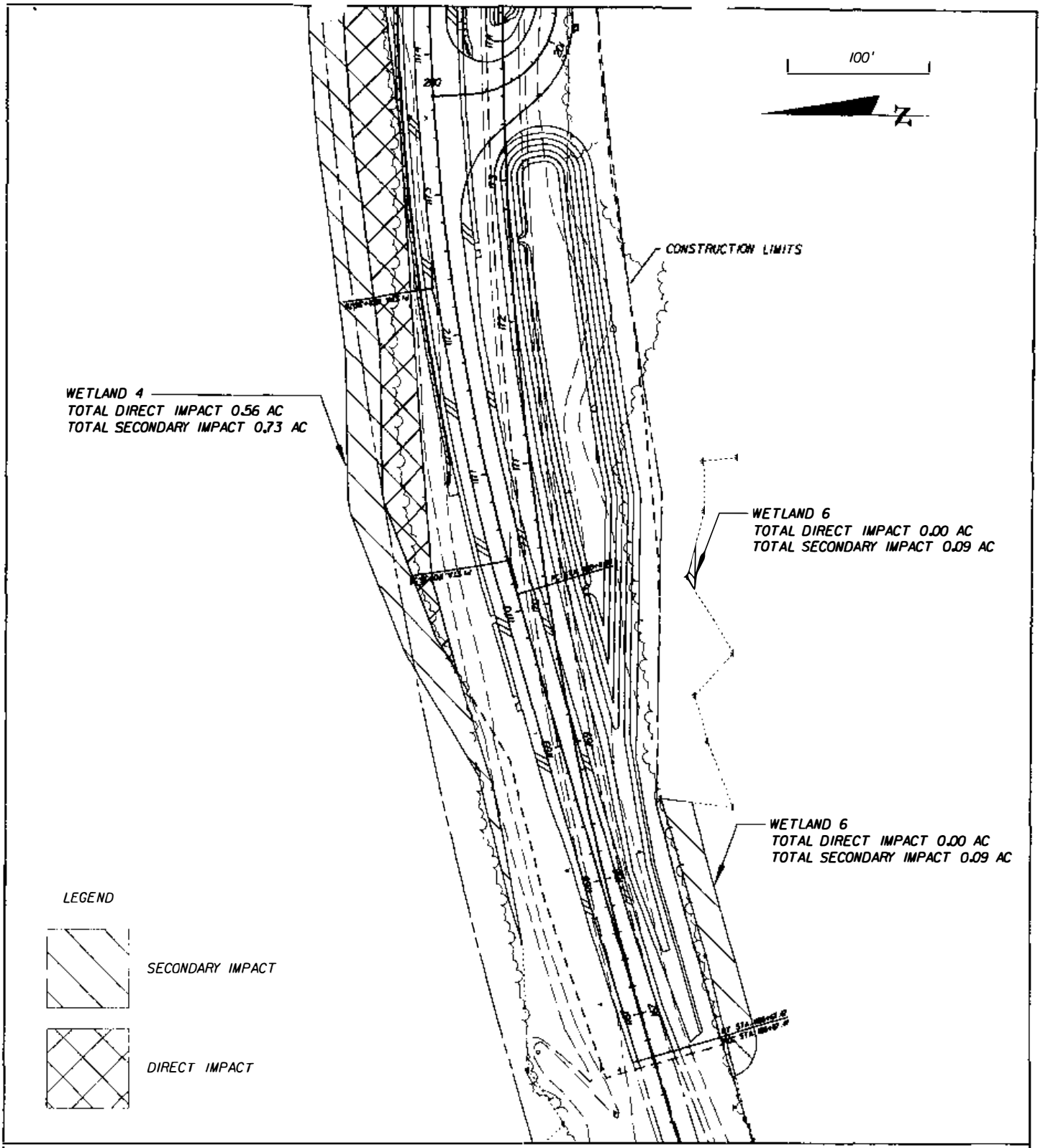
FEMA ZONE
AE

District Three

Feet
0 75 150 300

Data Source
Wetlands - Delineated by LREA biologist, 2010
FEMA - Okaloosa County, 2002
Aerial - Aerials Express, 2007

Figure
4



PROJECT:	SR 10 (US 90) OVER YELLOW RIVER BRIDGE REPLACEMENT	SECTIONS 14 - 15, TOWNSHIP 3 NORTH, RANGE 24 WEST	
		COUNTY OF OKALOOSA	
PURPOSE:	DREDGE AND FILL SKETCHES	STATE OF FLORIDA FPID 424508-1-52-01	
DATUM:	NAVD, 88	SHEET 1 OF 8	

S. SCOTT EARLY
LICENSE
No 51914

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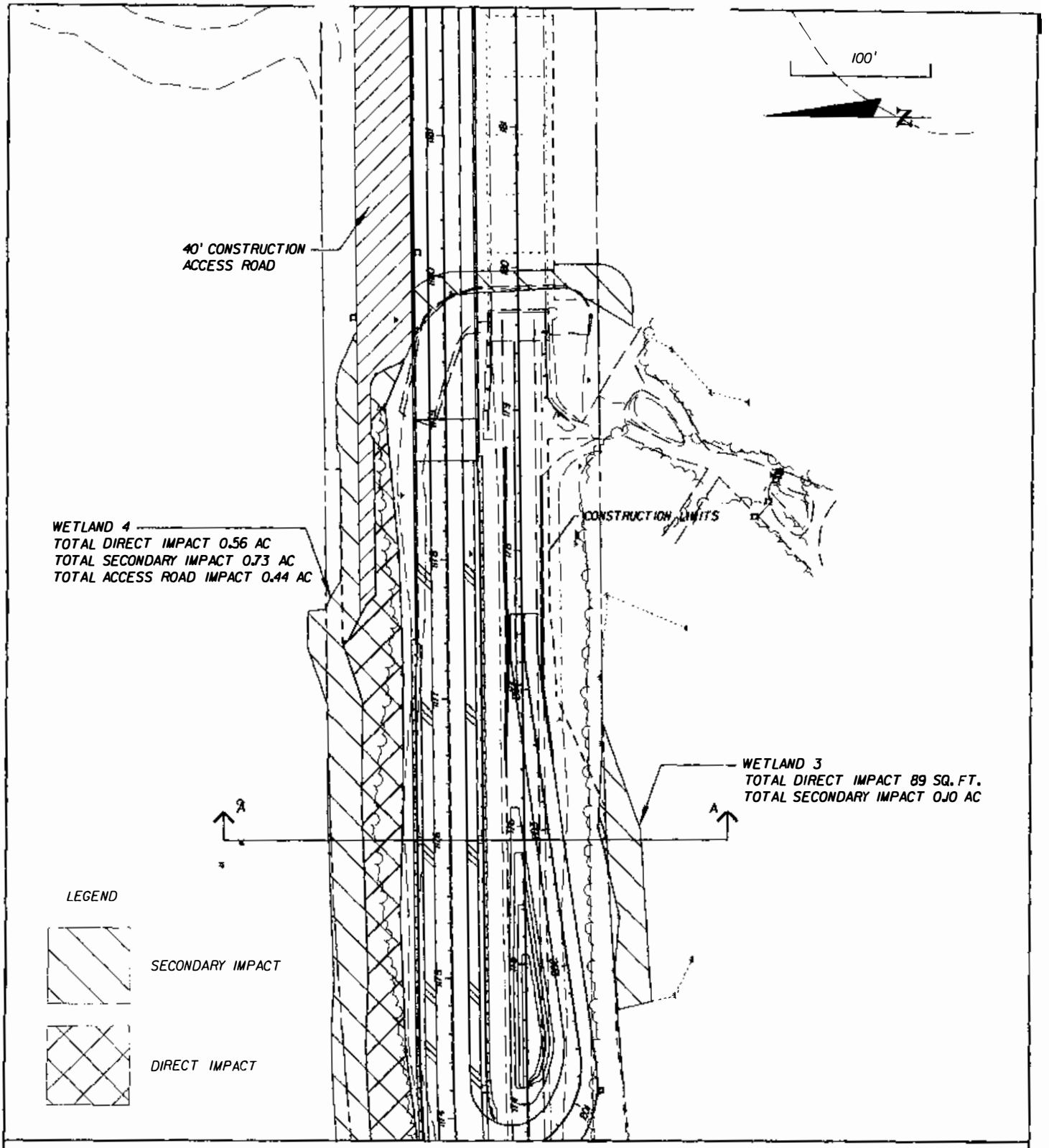
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836

FLDOT-3--SR 10 over Yellow River, FPN 424508
SAJ-2012-00508 (SP-MMW)

STATE OF FLORIDA
REGISTERED ENGINEER



PROJECT:	SR 10 (US 90) OVER YELLOW RIVER BRIDGE REPLACEMENT	SECTIONS 14 - 15, TOWNSHIP 3 NORTH, RANGE 24 WEST COUNTY OF OKALOOSA	
PURPOSE:	DREDGE AND FILL SKETCHES	STATE OF FLORIDA FPID 424508-1-52-01	
DATUM:	NAVD, 88	SHEET 2 OF 8	

S. SCOTT [illegible]
LICENSE
No 51914
STATE OF FLORIDA
PROFESSIONAL ENGINEER

DRMP
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DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
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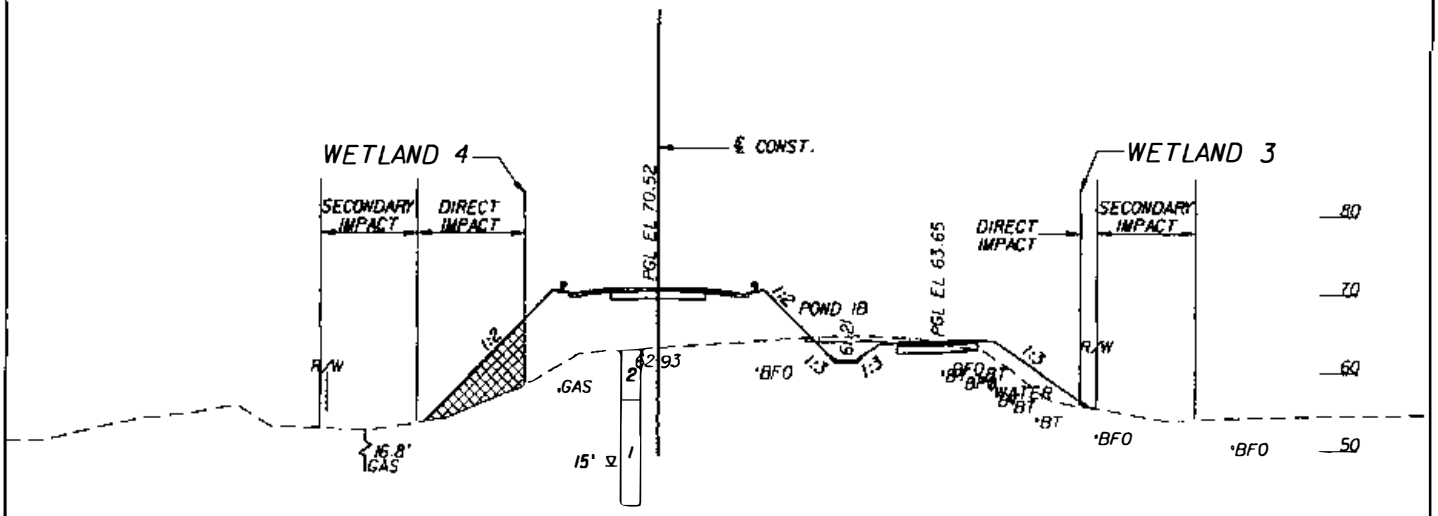

LEGEND

FILL

SECTION A-A
STA 1176+00
SCALE: 1"=50' HOIRZ.
1"=25' VERT.

PROJECT:	SR 10 (US 90) OVER YELLOW RIVER BRIDGE REPLACEMENT	SECTIONS 14 - 15, TOWNSHIP 3 NORTH, RANGE 24 WEST	
		COUNTY OF OKALOOSA	
PURPOSE:	DREDGE AND FILL SKETCHES	STATE OF FLORIDA FPID 424508-1-52-01	
DATUM:	NAVD, 88	SHEET 3 OF 8	

S. SCOTT [illegible]
LICENSE
No 51914
STATE OF FLORIDA
[illegible] ENGINEER

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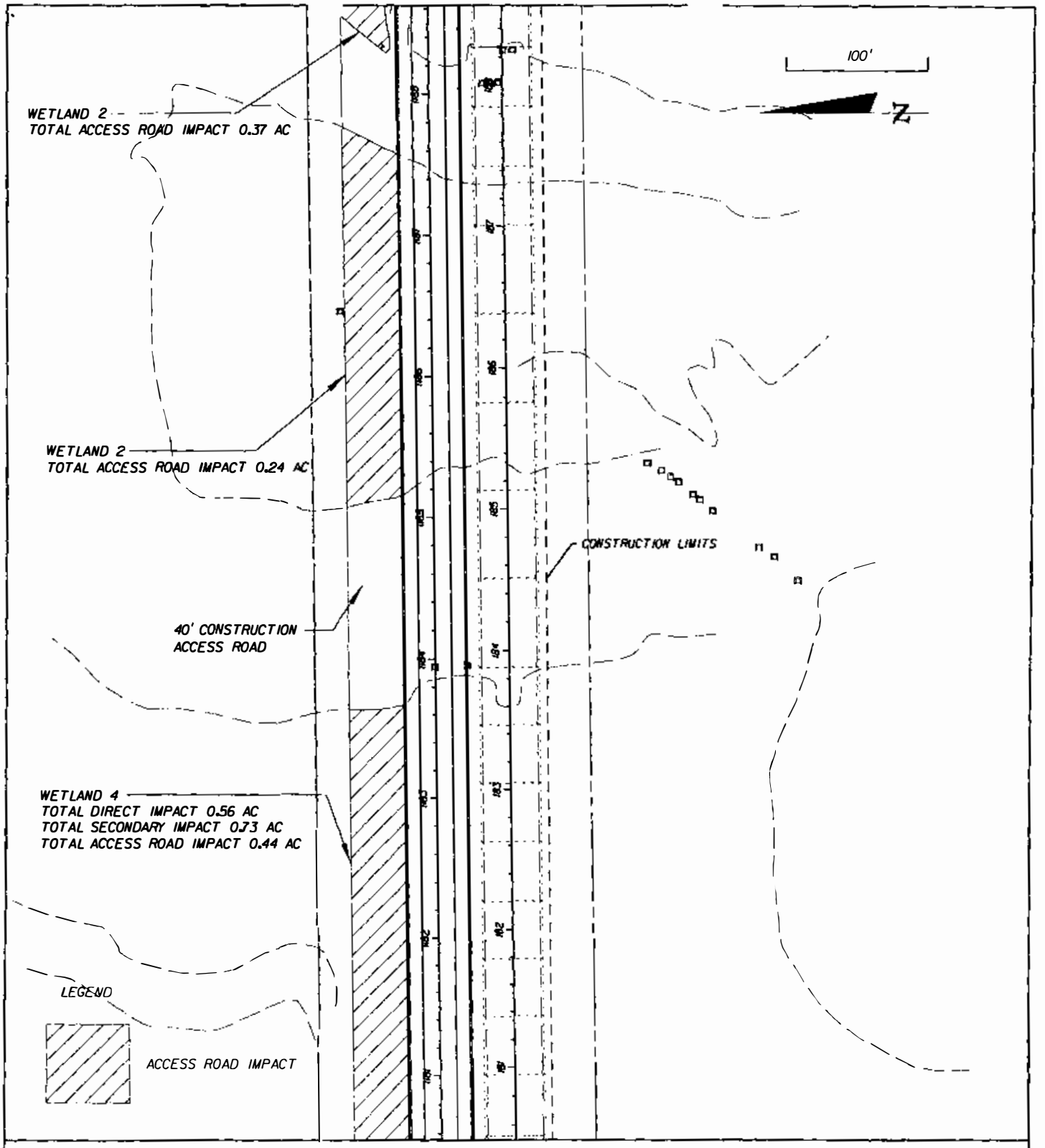
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836

FLDOT-3--SR 10 over Yellow River, FPN 424508
SAJ-2012-00508 (SP-MMW)

Permit Drawings - June 10, 2013 - Page 3 of 8



PROJECT: SR 10 (US 90)
OVER YELLOW RIVER BRIDGE REPLACEMENT

SECTIONS 14 - 15, TOWNSHIP 3 NORTH, RANGE 24 WEST.

COUNTY OF OKALOOSA

PURPOSE: DREDGE AND FILL SKETCHES

STATE OF FLORIDA
FPID 424508-1-52-01

DATUM: NAVD, 88

SHEET 4 OF 8

STATE OF FLORIDA LICENSE No 51914

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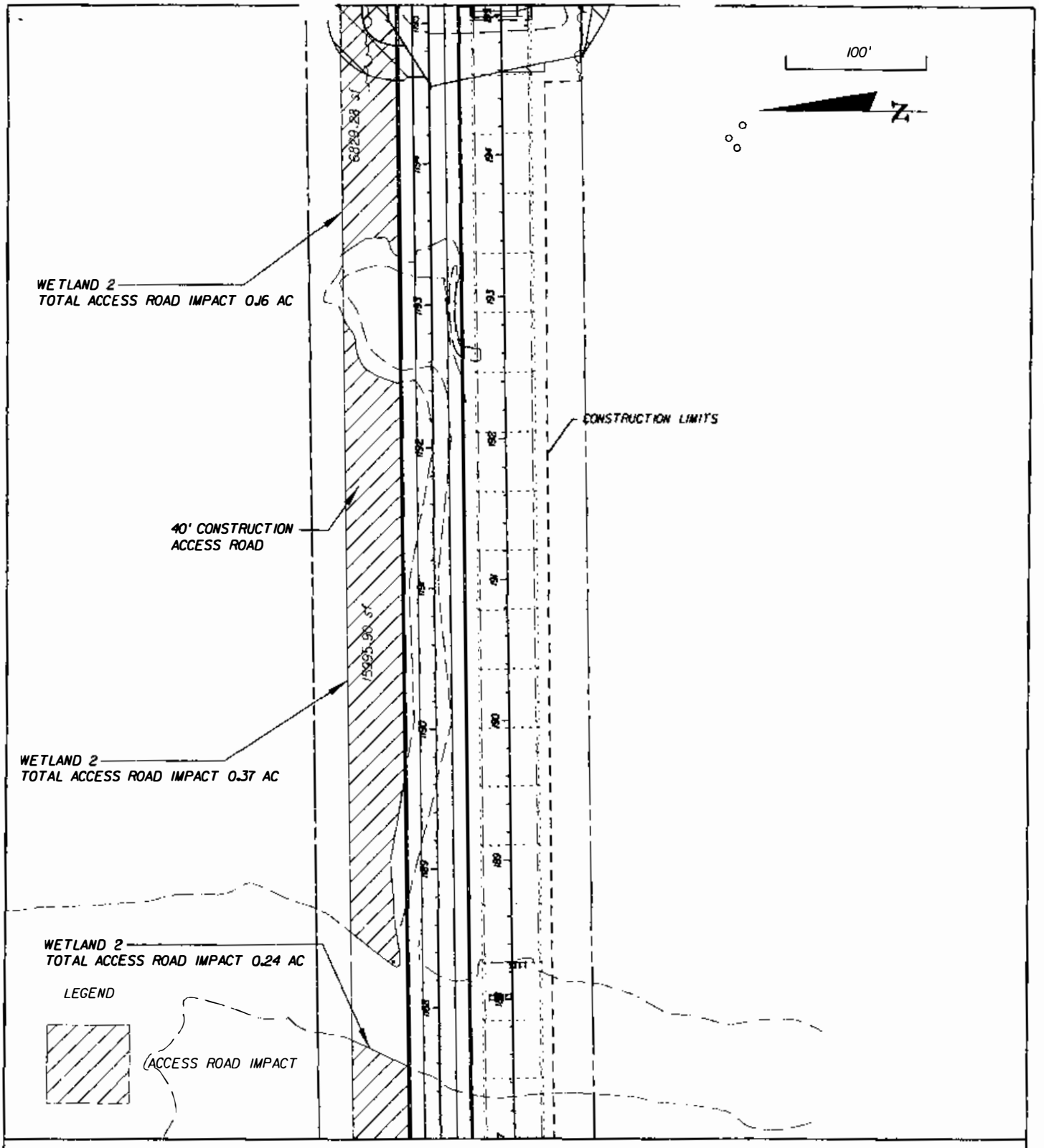
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836

STATE OF FLORIDA LICENSED ENGINEER



PROJECT:	SR 10 (US 90) OVER YELLOW RIVER BRIDGE REPLACEMENT	SECTIONS 14 - 15, TOWNSHIP 3 NORTH, RANGE 24 WEST
		COUNTY OF OKALOOSA
PURPOSE:	DREDGE AND FILL SKETCHES	STATE OF FLORIDA FPID 424508-1-52-01
DATUM:	NAVD, 88	SHEET 5 OF 8

S. SCOTT [illegible]
LICENSE
No 51914

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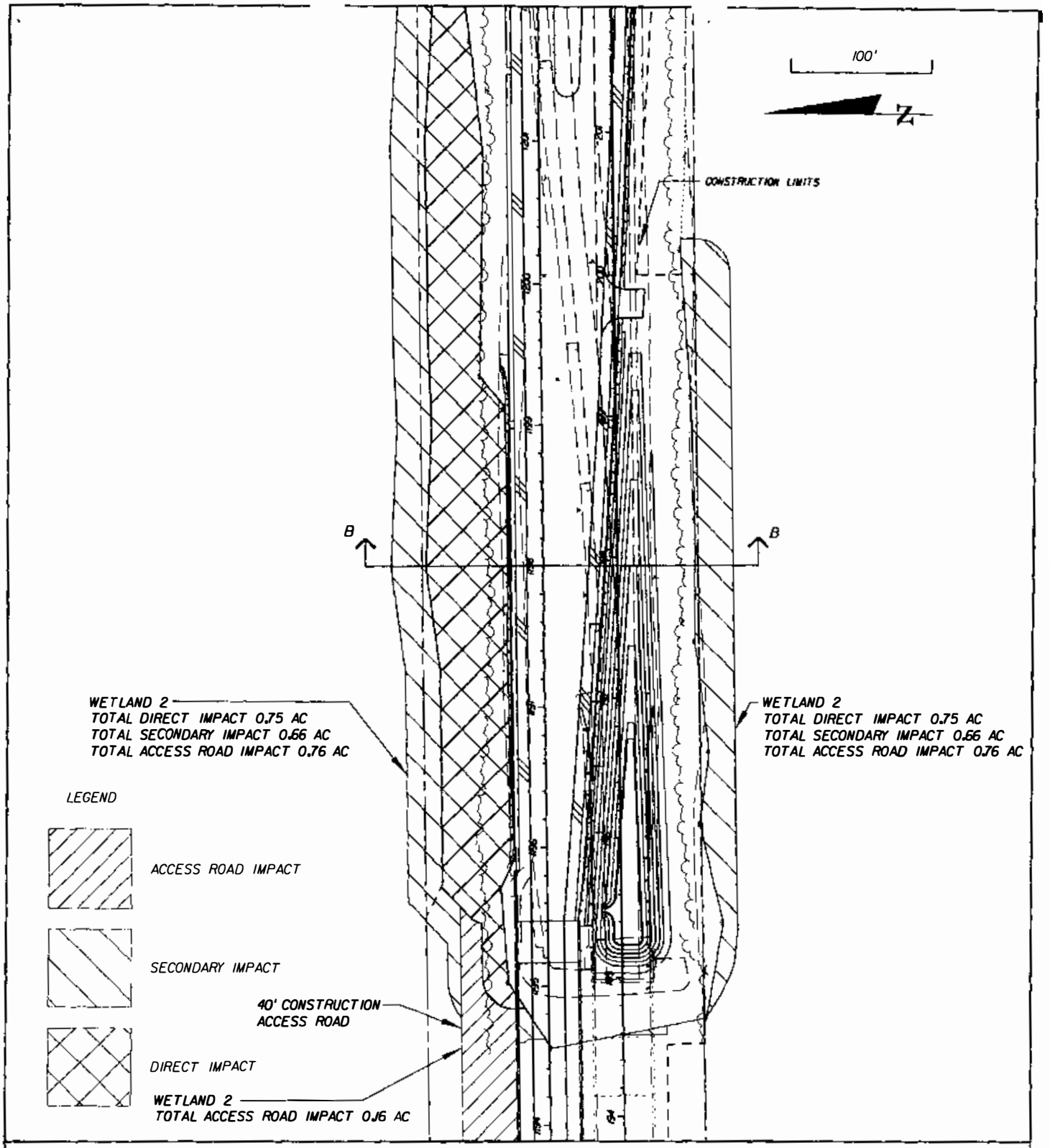
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32
PHONE: (407) 896-0594 FAX: (407) 896-4836

STATE OF [illegible] ENGINEER



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PURPOSE:	DREDGE AND FILL SKETCHES	STATE OF FLORIDA FPID 424508-1-52-01
DATUM:	NAVD, 88	SHEET 6 OF 8

S. SCOTT EARLY
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ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
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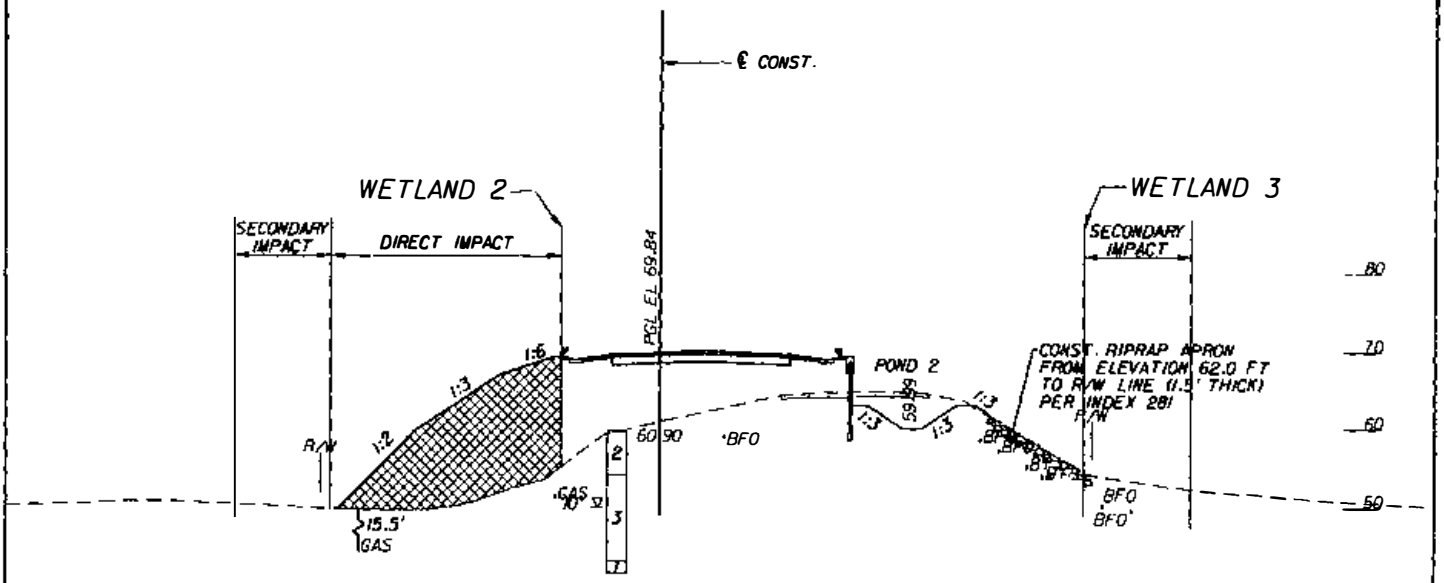

LEGEND

FILL

SECTION B-B
STA 1198+00
SCALE: 1"=50' HOIRZ.
1"=25' VERT.

PROJECT:	SR 10 (US 90) OVER YELLOW RIVER BRIDGE REPLACEMENT	SECTIONS 14 - 15, TOWNSHIP 3 NORTH, RANGE 24 WEST COUNTY OF OKALOOSA	
PURPOSE:	DREDGE AND FILL SKETCHES	STATE OF FLORIDA FPID 424508-1-52-01	
DATUM:	NAVD, 88	SHEET 7 OF 8	

STATE OF FLORIDA LICENSED No 51914 PROFESSIONAL ENGINEER

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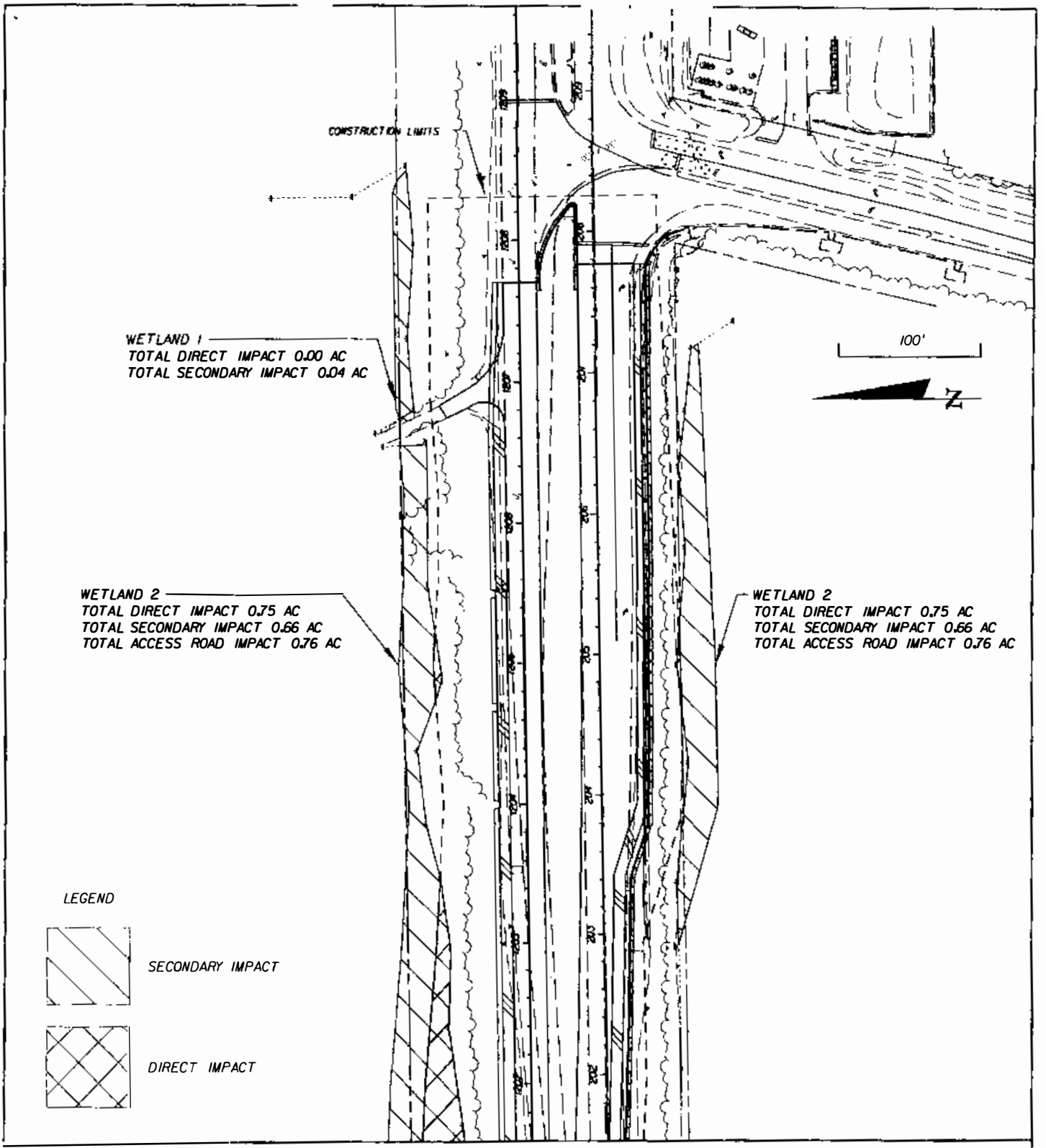
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
941 LAKE BALDWIN LANE, ORLANDO, FLORIDA 32814
PHONE: (407) 896-0594 FAX: (407) 896-4836

FLDOT-3--SR 10 over Yellow River, FPN 424508
SAJ-2012-00508 (SP-MMW)



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PURPOSE:	DREDGE AND FILL SKETCHES	STATE OF FLORIDA FPID 424508-1-52-01	
DATUM:	NAVD, 88	SHEET 8 OF 8	

S. SCOTT EARLY
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STATE OF FLORIDA
ENGINEER

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FLDOT-3--SR 10 over Yellow River, FPN 424508
SAJ-2012-00508 (SP-MMW)

- **The term limits of this authorization**

You are advised to read and understand these conditions and drawings prior to commencing the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings. If you are utilizing a contractor, the contractor also should read and understand these conditions and drawings prior to commencing the authorized activities. Failure to comply with these conditions, including any mitigation requirements, shall constitute grounds for revocation of the Permit and appropriate enforcement action by the Department.

Operation of the facility is not authorized except when determined to be in conformance with all applicable rules and this permit/certification/authorization and sovereignty submerged lands authorization, as specifically described above.

SPECIFIC CONDITIONS

PRIOR TO CONSTRUCTION

1. All contractors involved in this permitted activity shall be provided copies of this permit in its entirety. A copy shall remain onsite at all times during the activities.

2. If the approved permit drawings conflict with the specific conditions, then the specific conditions shall prevail.

3. This permit does not authorize the construction of any additional structures not illustrated on the permit drawings.

4. Prior to construction, the limits of the impacts authorized by this permit shall be clearly flagged and staked by the agent and/or contractor. All construction personnel shall be shown the locations of all wetland areas outside the construction area to prevent encroachment of equipment into these areas.

5. The permittee shall schedule a pre-construction meeting with the Department's compliance and enforcement staff to help ensure all permit requirements, conditions, and specific conditions are met. This meeting shall take place before commencement of any of the activities authorized by this permit. Please call Kenny Dickey at (850) 595-0580 or Kenneth.Dickey@dep.state.fl.us to schedule a meeting.

6. Prior to the initiation of any work authorized by this permit, floating turbidity screens with weighted skirts that extend to within 1 foot of the bottom shall be placed as shown on sheets 65 - 97 in the attached permit drawings. The screens shall

be maintained and shall remain in place for the duration of the project construction to ensure that turbidity levels outside the construction area do not exceed 29 NTU's above background levels. The permittee shall be responsible for ensuring that turbidity control devices are inspected daily and maintained in good working order so that there area no violations of state water quality standards outside of the turbidity screens. Turbidity shall be monitored as described in the monitoring portion of this permit.

CONSTRUCTION ACTIVITIES

7. Erosion, sedimentation, and turbidity controls shall be implemented as specified on Sheets 65 - 97 of the attached permit drawings, and shall be according to Section 104 of the Florida Department of Transportation - Standard Specifications for Road and Bridge Construction, and to any stricter standard as required in these Specific Conditions.

8. Best management practices for erosion control shall be implemented and maintained at all times during construction to prevent siltation and turbid discharges in excess of State water quality standards pursuant to Rule 62-302, F.A.C. The permittee shall be responsible for ensuring that erosion control devices/procedures are inspected and maintained daily during all phases of construction authorized by this permit until all areas that were disturbed during construction are sufficiently stabilized to prevent erosion, siltation, and turbid discharges.

9. The following construction sequence shall be followed for temporary placement of fill for the temporary construction access road.

    a. Prior to the placement of fill, filter fabric shall be placed over the native soil.

    b. The temporary fill shall be stabilized immediately after completion so as not to allow the erosion of material into the waterbody/wetlands.

    c. Within 14 days of the completion of that portion of construction which required the temporary fill, that fill shall be removed and the elevation contours in the area of temporary fill shall be restored to those originally present so as to promote natural revegetation of the area.

    d. Erosion and sedimentation controls shall be maintained until the areas are stabilized by establishment of substantial vegetative cover.

10. This permit does not authorize any dewatering activities. The permittee shall notify the Department before conducting dewatering activities as well as obtain the proper permits for such activities if needed.

11. Substances in concentrations that injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, animals, or plants shall not be present.

12. All watercraft associated with the construction of the permitted structure shall only operate within waters of sufficient depth so as to preclude bottom scouring and prop dredging.

13. Construction equipment shall not be repaired or refueled in wetlands or elsewhere within waters of the state.

14. All material used as fill shall be clean material and shall not be contaminated with vegetation, garbage, trash, tires, hazardous, toxic waste or other materials that are not suitable for construction within waters of the state as so determined by the Department.

15. No rutting or damage that would otherwise affect hydrology within the impact site is authorized.

16. Culvert placement shall occur at the locations that are indicated on the permit drawings. The diameter of the culverts shall not be decreased in size nor shall the length of the culverts that are indicated on the permit drawings be increased or decreased.

17. In order to maintain a hydrologic connection, all culverts shall be kept clear and free of sediment, trash, vegetation, and other debris.

18. If scouring occurs down from the culverted, wet crossings, the permittee shall be responsible for upgrading the structure to properly accommodate the hydrologic flow.

19. All cleared vegetation, excess lumber, scrap wood, trash, garbage, and any other type of construction debris shall be removed from wetlands/waters of the state within 14 days of completion of the work authorized in this permit.

20. If during the progress of this project prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical

remains that could be associated with Native American cultures or early colonial or American settlement are encountered at any time within the project site area, the permitted project should cease all activities involving subsurface disturbance in the immediate vicinity of such discoveries. The permittee, or other designee, shall contact the Florida Department of State, Division of Historical Resources, Review and Compliance Section at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Project activities should not resume without verbal and/or written authorization from the Division of Historical Resources. In the event that unmarked human remains are encountered during permitted activities, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, Florida Statutes.

21. All storage or stockpiling of tools or materials shall be limited to uplands or within the impact areas authorized by this permit.

MITIGATION

22. 2.04 units of functional loss shall be mitigated for in accordance with Section 373.4137, Florida Statutes.

MONITORING/REPORTING

23. Monitoring for turbidity shall be conducted for the duration of the project. Sampling will commence prior to, but no more than 24 hours before initiation of any dredging or filling activities.

24. Turbidity samples shall be collected with a Kemmerer, Van Dorn, or a similar sampler that is designed to collect in situ water samples. Samples shall be analyzed immediately after collection with a turbidimeter that produces results in Nephelometric measurements. The field sample results shall be accurately recorded to the precision capabilities (decimal place) of the instrument. Field turbidimeter results shall be rounded to the next whole number (ex. 15.23 NTUs shall be recorded; however the results shall be interpreted as 16.00 NTUs). If monitoring reveals turbidity levels greater than or equal to 29 NTUs above background level, the permittee shall cease all work pursuant to Specific Condition 25.

25. If monitoring reveals turbidity levels greater than or equal to 29 NTUs above background, the permittee shall take the following measures:

a. Immediately cease all work contributing to the water quality violation. Work which may contribute to the violation shall not resume until corrective measures have been taken and turbidity levels have returned to acceptable levels; and

b. Stabilize exposed soils contributing to the violation. Modify work procedures responsible for the violation, install additional turbidity containment devices, repair non-functioning turbidity containment devices; and

c. Increase monitoring frequency to every 2 hours until turbidity levels are less than 29 NTUs above background. Operations may not resume until the water quality standard for turbidity has returned to less than 29 NTUs above background.

d. The violation(s) shall be immediately reported to the Department of Environmental Protection, Submerged Lands & Environmental Resources Program, Compliance and Enforcement Section, Suite 202, Northwest District Office, 160 West Government Street, Pensacola, Florida 32501-5794, in writing or be telephone at (850) 595-8300. The report shall include a description of the corrective actions being taken or proposed to be taken. The report shall be made to the Department as soon as normal business hours resume if violation(s) are noted after normal business hours, on holidays, or on weekends. A copy of the monitoring data sheets, which indicate violation(s), shall be forwarded immediately to the Department.

Failure to report violation(s) or to follow correct procedures before resuming work shall constitute grounds for permit revocation and may subject the permittee to formal enforcement action.

STORMWATER SPECIFIC CONDITIONS:

CONSTRUCTION/POST CONSTRUCTION ACTIVITIES

26. The "Yellow River Bridge - Stormwater System Maintenance Plan", as approved and enclosed with this permit, shall be implemented.

27. If construction of the stormwater management system authorized by this ERP, individual stormwater permit has not been completed and continued use of the system formally transferred to the operating phase before the expiration date of this permit, then at least 60 days before such expiration date, the permittee shall apply

for another individual stormwater permit for construction, using the forms and accompanied by the fee required by rules in effect at that time. The application shall be timely and sufficient, as defined in subsection 62-4.090(1), F.A.C.

28. The construction phase expires at 11:59 p.m. on the date indicated on the cover page of this permit.

29. For emergencies involving a serious threat to the public health, safety, welfare, or environment, the emergency telephone contact number is **800-320-0519** (State Warning Point). The Department telephone number for reporting nonthreatening problems or system malfunctions is (850) 595-0663, day or night.

30. The permittee shall ensure that the storm water prevention plan and specific details involving use of erosion controls included in the plan set enclosed with this permit, are followed by the contractor.

31. If any construction de-watering is required, which results in an offsite discharge of groundwater, the permittee and/or the contractor shall ensure that the requirements of pertinent portions of Chapter 62-621, F.A.C. are met. Please contact Bill Armstrong, P.E., at 850-595-0554, for more information.

32. The mailing address for submittal of forms for the "Construction Commencement Notice", "As-Built Certification ...", "Request for Conversion of Stormwater Management Permit Construction Phase to Operation and Maintenance Phase", or other correspondence is FDEP, SLERP, 160 Governmental Center, Pensacola, Florida, 32502.

GENERAL CONDITIONS

1. All activities authorized by this permit shall be implemented as set forth in the plans, specifications and performance criteria approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity may constitute grounds for revocation or enforcement action by the Department, unless a modification has been applied for and approved in accordance with Rule 62-346.100, F.A.C.

2. This permit or a copy thereof, complete with all conditions, attachments, exhibits, and modifications, shall be kept at the work site of the permitted activity during the construction phase. The complete permit shall be available for review at the work site upon request by the Department staff. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit. A weather-resistant sign, measuring at least 8 1/2 inches by 11 inches, and including the

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

160 W. GOVERNMENT STREET, SUITE 308
PENSACOLA, FLORIDA 32502-5740

RICK SCOTT
GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

September 03, 2013

Joy Giddens – Permits Coordinator, FDOT District 3
1074 Highway 90
Chipley, FL 32428
Joy.Giddens@dot.myflorida.com

Project Name: SR 10 (US 90) Yellow River Bridge Replacement
File No.: 46-0310023-002-EM, modification of Permit No.: 46-0310023-001-EI

Dear Ms. Giddens:

Your request to modify this permit has been received and reviewed by Department staff. The modifications are to utilize temporary construction platforms over open-water areas within the existing sovereign submerged lands Easement No. 00336(4202-46), which will increase the requirement for compensation for wetland impacts pursuant to Section 373.4137, Florida Statutes (F.S.) from 2.04 credits as determined by UMAM to 2.40 credits.

The above changes are not expected to adversely affect water quality and will not be contrary to the public interest provided the attached wetland impact drawings replace wetland impact drawings pages 4 and 5 of 8 (Permit drawings 4 and 5 of 109) as issued. There are no additional specific conditions associated with this modification.

Since the proposed modification is not expected to result in any permanent adverse environmental impact or water quality degradation, the permit is hereby modified as requested. By copy of this letter and the attached drawings, we are notifying all necessary parties of the modification(s).

This letter of approval does not alter the original expiration date, June 20, 2017, Specific or General Conditions, or monitoring requirements of the permit. This letter and accompanying drawings must be attached to the original permit.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be file (received) in the Office of General Counsel of the Department at 3900 Commonwealth Blvd., Tallahassee, Florida 32399-3000. Petitions filed by the permittee and the parties listed below must be filed within fourteen (14) days of receipt of this letter. Petitioner shall mail a copy of the petition to the permittee at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information:

a) The name, address, and telephone number of each petitioner, the permittee's name and address, the Department Permit File Number and the county in which the project is proposed;

b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

c) A statement of how each petitioner's substantial interests are affected by the Department's action; or proposed action;

d) A statement of the material facts disputed by petitioner, if any;

e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this letter. Persons whose substantial interest will be affected by any decision of the Department with regard to the permit have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within fourteen (14) days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed with the time specified for filing a petition and conforms to Rule 62-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further order of the Department.

Any party to this letter has the right to seek judicial review of the order pursuant to Section 120.68, Florida Statutes, by filing a Notice of Appeal pursuant to Rule 9.110, Florida Statute of Appellate Procedure, with the Clerk of the Department in the Office of the General Counsel, MS 35, 3900 Commonwealth Blvd., Tallahassee, Florida 32399-3000; and by filing a copy with the appropriate District Court of Appeal. The Notice of Appeal must be filed within thirty (30) days from the date the Notice of Permit Modification is filed with the Clerk of the Department.

Sincerely,

Elizabeth Mullins Orr
Program Administrator
Submerged Lands and Environmental
Resources Program

EMO:hm

Enclosure: Permit Drawings (2 pages)

c: U.S. Army Corps of Engineers
DEP, Office of General Counsel
Okaloosa County
George McLatchey, DRMP, Inc. (gmclatchey@drmp.com)
Bryant King, DRMP, Inc. (bking@drmp.com)

CERTIFICATE OF SERVICE

The undersigned hereby certifies that this permit modification and authorization to use sovereignty submerged lands, including all copies, were mailed and/or emailed before the close of business on September 03, 2013, to the above listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to 120.52(9),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Clerk

September 03, 2013
Date

AS-BUILT CERTIFICATION BY PROFESSIONAL ENGINEER

Submit this form and one set of as-built engineering drawings to the U.S. Army Corps of Engineers, Enforcement Section, U.S. Army Corps of Engineers, Regulatory Division, Enforcement Section, 2833 NW 41st Street, Unit 130 Gainesville, FL 32606. If you have questions regarding this requirement, please contact the Enforcement Branch at 904-232-3131.

1. Department of the Army Permit Number: SAJ-2012-00501(SP-MMW)

2. Permittee Information:

Name: _____

Address: _____

_____

3. Project Site Identification (physical location/address):

_____

_____

_____

4. As-Built Certification: I hereby certify that the authorized work, including any mitigation required by Special Conditions to the permit, has been accomplished in accordance with the Department of the Army permit with any deviations noted below. This determination is based upon on-site observation, scheduled, and conducted by me or by a project representative under my direct supervision. I have enclosed one set of as-built engineering drawings.

_____ _____

Signature of Engineer Name (*Please type*)

_____ _____

(FL, PR, or VI) Reg. Number Company Name

_____ _____ _____

City State ZIP

(Affix Seal)

_____ _____

Date Telephone Number

Identify any deviations from the approved permit drawings and/or special conditions (attach additional pages if necessary):

SR 10 (US 90) Yellow River Bridge Replacement
Federal Highway Administration
Florida Department of Transportation
Okaloosa County, Florida

Biological Opinion
September 5, 2013

Prepared by:
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City, FL

FLDOT-3-SR 10 over Yellow River, FPN 424508
SAJ-2012-00508 (SP-MMW)

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ACRONYMNS

Act	Endangered Species Act
AFB	Air Force Base
BA	Biological Assessment
BMPs	Best Management Practices
BO	Biological Opinion
CALTRANS	California Department of Transportation
CEI	Construction and Engineering Inspection
CH	Critical Habitat
CPUE	Catch Per Unit Effort
CR	County Road
dB_{cSEL}	Cumulative Sound Exposure Level
dB_{peak}	Peak Sound Pressure Level
dB_{RMS}	Root Mean Square Sound Exposure Level
DO	Dissolved Oxygen
DoD	Department of Defense
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
FPID	Federal Project Identification

HUC	Hydrologic Unit Code
NE	No Effect
NEPA	National Environmental Policy Act
NLAA	May Affect, Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
NWFWMD	Northwest Florida Water Management District
PCE	Primary Constituent Element
ROW	Right-of-Way
RPM	Reasonable and Prudent Measure
SEL	Sound Exposure Level
Service	U.S. Fish and Wildlife Service
SR	State Road
Trinity	Trinity Analysis and Development Corporation
TNC	The Nature Conservancy
YOY	Young of Year

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Field Office
1601 Balboa Avenue
Panama City, Florida 32405

Tel: (850) 769-0552
Fax: (850) 763-2177

September 5, 2013

Mr. David C. Hawk
Acting Division Administrator
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Attn: Mr. Joseph Sullivan

Re: FWS Log No. 2013-F-0098
Date Started: January 14, 2013
Agency: Federal Highway Administration
Applicant: Florida Department of Transportation
Project Title: SR 10 (US 90) Yellow River Bridge Replacement
FPID: 424508-1-32-01
Location: Yellow River
County: Okaloosa County, FL

Dear Mr. Hawk:

This letter transmits the Fish and Wildlife Service's (Service) biological opinion (BO) for actions to be taken during the replacement of the State Road (SR) 10 (US 90) Yellow River Bridge, in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.) Your letter requesting formal consultation was received on April 24, 2013. Our BO is based on information provided in the biological assessment (BA), your responses to our requests for additional information, Service investigations in the project area, discussions with experts in the field, and other sources of information. A complete administrative record of this consultation is on file at the Service's Panama City, Florida field office.

This BO refers only to the potential effects of the Florida Department of Transportation's (FDOT's) proposed replacement of the US 90 bridge over the Yellow River on the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and its critical habitat, and three species of freshwater mussels: the threatened fuzzy pigtoe (*Pleurobema strodeanum*), threatened narrow pigtoe (*Fusconaia escambia*), and threatened southern sandshell (*Hamiota australis*) and their critical habitat.

Table 1 identifies other federally listed species potentially occurring within the Action Area. The FDOT has determined that bridge construction activities may affect, but are not likely to adversely affect (NLAA) the Choctaw bean (*Villosa choctawensis*), southern kidneyshell (*Ptychobranchus jonesi*), and Okaloosa darter (*Etheostoma okaloosae*). The Service concurs with this determination. In addition, the FDOT has determined that no suitable habitat is present and the work will have no effect (NE) on the eastern indigo snake (*Drymarchon corais couperi*), red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria americana*), and listed plants. As a precaution to assure species protection, FDOT committed to following Eastern indigo snake protection measures for this project (see Appendix A). An assessment was also made for the bald eagle (*Haliaeetus leucocephalus*), protected under the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668c) and Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712). No bald eagles or their nests have been documented within 10 miles of the area. The FDOT believes that the action will have no effect on the bald eagle. No further coordination is needed for these species and they will not be discussed further in this BO.

Table 1. Other federally protected species evaluated for effects.

	[illegible] Action Area	[illegible] Action Area	[illegible]
Eastern indigo snake[1]	No	No	NE
Red-cockaded woodpecker	No	No	NE
Choctaw bean	Yes	No	NLAA
Southern kidneyshell	Yes	No	NLAA
Wood stork	No	No	NLAA
Bald eagle[2]	No	No	NE

1Will follow *Standard Eastern Indigo Snake Protection Measures.*
[2]Protected under the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668c) and Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712).

Consultation History

July 17-31, 2009 — During the preliminary bridge replacement investigation, the FDOT requested technical assistance by email with the Service on the need for candidate mussel surveys. The Service recommended surveys as a proposal to list candidate mussels in the Yellow River was expected in 2010.

April 1, 2010	A conference call was held between FDOT and the Service to discuss timing for candidate mussel surveys in the Yellow River. The Service recommended surveying in the late summer of 2011.
November 2010	Mussel surveys were conducted by Dr. Michael Gangloff of Southeastern Aquatic Research during the first week of November. Three of the five candidate mussel species that occur in the Yellow River were found within the survey area near US 90.
May 5, 2011	The FDOT provided a letter requesting concurrence with their determination that the proposed project "may affect, but is not likely to adversely affect" (NLAA) listed species.
May 31, 2011	The Service sent a letter providing concurrence that the proposed work is NLAA the red-cockaded woodpecker and eastern indigo snake. The Service recommended formal consultation for the Gulf sturgeon and provided potential conservation measures to minimize adverse effects to both the Gulf sturgeon and freshwater mussels.
October 4, 2011	The Service published the proposed rule in the Federal Register to list eight mussels - including those in the Yellow River basin – for protection under the Endangered Species Act and proposed critical habitat.
October 10, 2012	The Service published the final rule in the Federal Register listing eight mussels - including those in the Yellow River basin - as protected under the Endangered Species Act and designated critical habitat.
January 14, 2013	The Service received a letter from the Federal Highway Administration (FHWA) requesting initiation of formal consultation for freshwater mussels and providing a BA.
February 6, 2013	The Service sent a letter to FHWA requesting additional information and clarification of their effect determinations. The FHWA had not requested formal consultation for Gulf sturgeon, although the BA had a determination of "may affect, likely to adversely affect" for this species.
April 23, 2013	The FHWA provided a letter with updated effect determinations, a revised BA, and comments/responses to the Service's request for additional information.
May 7, 2013	The Service acknowledged by letter the initiation of formal consultation for this project, with an expected completion date on no later than September 5, 2013.
July 22, 2013	The Service provided a draft biological opinion to FHWA and FDOT for review.

BIOLOGICAL OPINION

1.0 DESCRIPTION OF PROPOSED ACTION

The Florida Department of Transportation (FDOT) District 3 proposes to replace the US 90 Yellow River Bridge (Bridge No. 570004) in Okaloosa County, Florida. The project will extend from Mile Post 10.807 east of Ellis Road for 0.947 mile to Mile Post 11.754 east of Antioch Road. A map of the proposed project area is given in Figure 1.

The current bridge typical section consists of two 12-foot lanes, 8-foot shoulders, and concrete barrier walls for a total roadway width of 40 feet. The current roadway typical section consists of two 12-foot lanes, and 5-foot paved shoulders. The proposed bridge dimensions will be similar to the existing with an addition of 4 feet in width to meet updated design standards. The span length will be increased by 83 feet from 1,530 feet to 1,613 feet. The number of bents will be reduced from 34 to 19. Bents will be located to avoid the deepest natural channel area and there will be fewer bents in the stream. Features such as the increased length and fewer spans will improve protection of the river's natural channel. Work will be conducted using cranes from a temporary access road and temporary work bridge constructed to the north of the proposed bridge within the existing right-of-way (ROW). The temporary access road will have filter fabric placed over the natural soils prior to deposition of fill material.

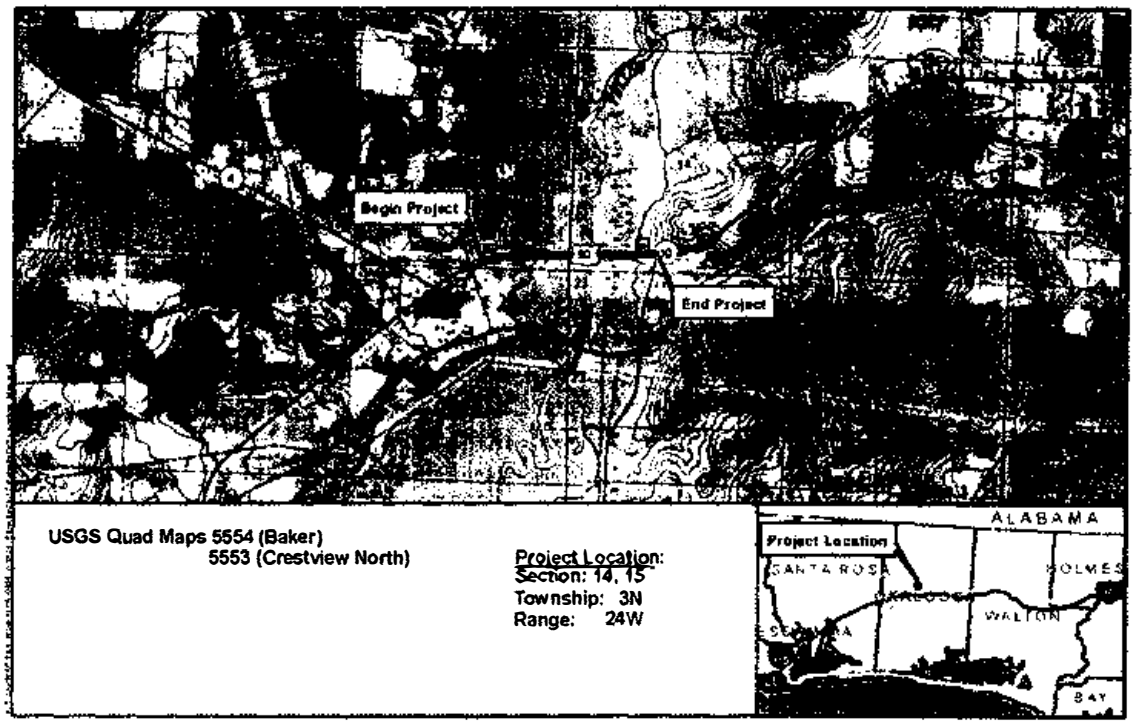

Figure 1. Project location map for US 90 Yellow River Bridge.

For the purposes of this BO, we have defined in-river work as all work occurring within the banks and bed of the river main channel at bents 7 and 8. In-river also refers to bents 11 and 12 in the eastern side channel during periods when water levels at the piles are 3 feet deep or greater. Drilled shaft pile construction will be used during construction of the proposed bridge to minimize sound propagation during in-river work activities. The temporary work bridge is expected to use driven piles so that they can be easily removed after the project is complete. Eight shafts will be placed within the main channel of the river. There are four shafts each for bents 7 and 8. Two additional bents (11 and 12) are located along an eastern side channel. Potential sedimentation from pile drilling will be contained using a turbidity barrier or another system to contain sedimentation consistent with a water quality control plan.

Upon completion of the project, fill and filter fabric will be removed from the temporary access road and the area will regenerate vegetation by natural recruitment. Staging areas will occur in uplands or within identified temporary impact areas. The existing superstructure will be completely removed. Each span will be saw-cut lengthwise and removed by a crane. Existing piles will either be removed completely or cut to below the river bottom. Explosives will not be used for bridge removal. The demolished bridge and fill materials will be disposed of properly at an approved off-site facility.

The limits of construction will be contained within silt fences, turbidity barriers, and other erosion control and water quality protection measures. Any offsite staging, storage, and parking areas will be identified as needed by the contractor and undergo a separate review by FDOT for endangered species and other issues.

1.1 Purpose and Need

The project purpose is to replace the existing bridge with a bridge that meets current design standards. The existing bridge is structurally deficient. It was built in 1962 and widened in 1992.

1.2 Action Area

The action area is defined at 50 CFR 402 to mean "all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." Therefore, the action area may be larger than the construction limits of the project. The impact radius for roads is variable, depending on the ecological factor under consideration and the habitat the road traverses. For example, sediment from a road or bridge can affect stream habitat and fish populations for downstream distances of 1,000 meters (3,280 feet) and greater (Forman et al. 2003). Effects on wildlife (woodland birds, snakes, and deer) due to traffic disturbance, noise, and vibrations from a moderately busy road can extend from 300 to 1,000 meters (984 to 3,280 feet) (Forman et al. 2003). Other broad-scale ecological landscape effects (habitat fragmentation, fish barrier, disrupted wildlife movement corridors, human access impacts) can extend well beyond 1,000 meters (3,280 feet) (Forman et al. 2003).

The action area for this biological opinion is (1) the 200-foot (61 m) right-of-way (ROW) for the 0.946-mile (1.5 km) length of the project; (2) a buffer of 1,000 feet (105 m) on either side of the

ROW; (3) upstream of the bridge to 1,640 feet (0.5 km); and (4) downstream of the bridge approximately 3,280 feet (1 km). The 200-foot ROW will encompass the entire work area, which varies in width along the project corridor. A buffer of an additional 1,000 feet is included to address potential effects that may extend into the terrestrial and aquatic environment outside of the road ROW (*e.g.* sedimentation from erosion during high rainfall events). The action area includes 3,280 feet downstream from the bridge to address potential downstream turbidity and other environmental effects. This distance encompasses the entire downstream mussel search area and potential downstream mussel relocation sites. The action area includes the upstream mussel search area (1,640 feet) which also provides potential mussel relocation sites. The use of Best Management Practices (BMPs) for water quality protection, environmentally sensitive construction techniques, and other conservation measures are expected to minimize the zone of influence for the project. The action area encompasses approximately 271.73 acres.

1.3 Conservation Measures

Conservation measures are actions to benefit or promote the recovery of a listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant and serve to minimize or compensate for project effects on the listed species. The biological assessment (BA) states the FDOT will implement the following avoidance and minimization measures to reduce impacts to the Gulf sturgeon, freshwater mussels, and their critical habitat.

General Measures

1. The proposed bridge will be constructed along the previously impacted alignment of the pre-1962 bridge to avoid impacts to undisturbed habitat.

2. Wetland impacts will be avoided, minimized, and offset by following the pre-1962 bridge alignment, increasing the length of the bridge span by 83 feet and removing the existing embankment within the floodplain, and mitigating unavoidable losses according to Florida Statute 373.4137.

3. Stormwater will be designed to comply with the requirements of FDOT, and the Florida Department of Environmental protection (FDEP) in coordination with the Northwest Florida Water Management District (NWFWMD). Stormwater management (treatment and attenuation) is designed in accordance with FDOT Chapter 14-86, Florida Administrative Code (FAC), and FDEP and NWFWMD Chapter 62-346.

Gulf Sturgeon

4. The FDOT will implement appropriate measures resulting from the consultation with the Service for the Gulf sturgeon, such as: timing bridge construction activities to account for the sturgeon spawning season and implementation of applicable BMPs to allow for normal Gulf sturgeon migration and routine habitat usage by sturgeon of any life stage.

5. *Construction Special Provisions - Gulf Sturgeon Protection Guidelines (September 2012)* will be implemented during the construction of this project. See Appendix B.

6. Drill shaft pile construction will be used for the proposed replacement bridge to minimize sound propagation during in-river work activities (bents 7, 8, 11, 12).

7. In-river bridge construction related activities[1] will be timed to take place avoiding periods of known increased Gulf sturgeon activity such as during peak migration periods, allowing safe and unobstructed migratory passage to and from the sturgeon's riverine spawning sites. The timing restrictions apply to the work bridge as well as the replacement bridge. These timing restrictions do not apply to the western oxbow of the river.

    a. No piling installation will be conducted in the main channel at bents 7 and 8 from March through May in the Yellow River.

    b. No piling installation will be conducted in the eastern side channel at bents 11 and 12 during peak sturgeon migration in April when water levels reach or exceed 3 feet.

    c. No night-time in-river (bents 7, 8, 11, 12) installation of pilings (drilled shafts for the permanent bridge and driven pile for the work bridge) will be conducted during March through November. Night-time is defined as 30-minutes after sunset to 30-minutes before sunrise.

8. Construction equipment will be staged and stored in upland areas.

9. If a sturgeon is seen within 100 yards of active daily construction operations or vessel movement, all appropriate precautions will be implemented to ensure its protection. These precautions will include ceasing operation of any in-water equipment so that it comes no closer than 50 feet of a sturgeon. Furthermore, operation of any mechanical construction equipment will cease immediately if a sturgeon is seen within a 50-foot radius of the equipment. Activities will not resume until the protected species has departed the project area of its own volition.

10. If a sturgeon is in imminent danger, distress, or has been killed, work will cease in the area, and the FDOT will immediately coordinate with the Service for further instruction.

11. The Contractor will consider and implement, where practical, innovative, environmentally sensitive construction techniques to avoid/minimize impacts to Gulf sturgeon sensitive areas.

12. Explosives will not be used for the demolition of the existing bridge. If it is determined during construction that the use of explosives is necessary, the Contractor will re-coordinate with the Service prior to their use.

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1 Refers to sediment disturbing activities within the river such as pile installation, placement of rip rap, dredging, bank stabilization, etc. It does not refer to barge and boat traffic on the river.

13. In-river demolition work activities (*e.g.* pile cutting, pile removal) will avoid the Gulf sturgeon migratory window of March through May for bents 7 and 8. Demolition work activities will be avoided in April for bents 11 and 12 if the water level at the piles is 3 feet deep or greater.

Freshwater Mussels

14. A relocation plan will be implemented for all individual mussels within the relocation area on the main channel as described in the Mussel Relocation Plan and approved by the Service. Mussels will be moved prior to the start of in-river work, but not during their reproductive period (April to mid-June). Due to recent high river flows, the Service has approved a broader-than-usual window of October 1, 2013 to March 31, 2014 for relocating mussels. Once mussels are relocated, no additional timing restrictions apply for mussels.

15. Conservation measures such as sediment and erosion control will be used to minimize sedimentation at all times.

16. Methods such as turbidity monitoring will be instituted to ensure enforcement and effectiveness of erosion control measures.

17. Turbidity barriers will be placed in the river (bents 7, 8, 11, 12) as needed for further siltation control. In-river turbidity barriers will be consistent with the *Gulf Sturgeon Protection Guidelines*.

18. Every effort will be made to avoid any chemical contamination to the waters, and adjacent habitats of the Yellow River. Should any contamination of these habitats or waters occur, construction within the area would immediately cease while containment and remediation actions occur and the appropriate agencies are notified.

2.0 STATUS OF THE SPECIES

2.1 Gulf Sturgeon

2.1.1 Species Description

The Gulf sturgeon (*Acipenser oxyrinchus* (=*oxyrhynchus*) *desotoi*), also known as the Gulf of Mexico sturgeon, is an anadromous fish (breeding in freshwater after migrating up rivers from marine and estuarine environments), inhabiting coastal rivers from Louisiana to Florida during the warmer months and over wintering in estuaries, bays, and the Gulf of Mexico. It is a nearly cylindrical primitive fish embedded with bony plates or scutes. The head ends in a hard, extended snout; the mouth is inferior and protrusible and is preceded by four conspicuous barbels. The caudal fin (tail) is heterocercal (upper lobe is longer than the lower lobe). Adults range from 1.2 to 2.4 m (4 to 8 ft) in length, with adult females larger than males. The Gulf sturgeon is distinguished from the geographically disjunct Atlantic coast subspecies (*A. o. oxyrinchus*) by its longer head, pectoral fins, and spleen (Vladykov 1955; Wooley 1985). King

et al. (2001) have documented substantial divergence between *A. o. oxyrinchus* and *A. o. desotoi* using microsatellite DNA testing.

2.1.2 Critical Habitat Description

The Service and National Marine Fisheries Service (NMFS) jointly designated Gulf sturgeon critical habitat on April 18, 2003 (68 FR 13370, March 19, 2003). Gulf sturgeon critical habitat includes areas within the major river systems that support the seven currently reproducing subpopulations and associated estuarine and marine habitats. Gulf sturgeon use rivers for spawning, larval and juvenile feeding, adult resting and staging, and moving between the areas that support these life history components. Gulf sturgeon use the lower riverine, estuarine, and marine environment during winter months primarily for feeding and for inter-river movements.

Fourteen areas (units) are designated as Gulf sturgeon critical habitat (Figure 2). Critical habitat units encompass approximately 2,783 km (1,729 mi) of riverine habitats and 6,042 km^2 (2,333 mi^2) of estuarine and marine habitats, and include portions of the following Gulf of Mexico rivers, tributaries, estuarine and marine areas:

Unit 1	Pearl and Bogue Chitto Rivers in Louisiana and Mississippi;
Unit 2	Pascagoula, Leaf, Bowie, Big Black Creek and Chickasawhay Rivers in Mississippi;
Unit 3	Escambia, Conecuh, and Sepulga Rivers in Alabama and Florida;
Unit 4	Yellow, Blackwater, and Shoal Rivers in Alabama and Florida;
Unit 5	Choctawhatchee and Pea Rivers in Florida and Alabama;
Unit 6	Apalachicola and Brothers Rivers in Florida;
Unit 7	Suwannee and Withlacoochee River in Florida;
Unit 8	Lake Pontchartrain (east of causeway), Lake Catherine, Little Lake, the Rigolets, Lake Borgne, Pascagoula Bay and Mississippi Sound systems in Louisiana and Mississippi, and sections of the state waters within the Gulf of Mexico;
Unit 9	Pensacola Bay system in Florida;
Unit 10	Santa Rosa Sound in Florida;
Unit 11	Nearshore Gulf of Mexico in Florida;
Unit 12	Choctawhatchee Bay system in Florida;
Unit 13	Apalachicola Bay system in Florida; and
Unit 14	Suwannee Sound in Florida.

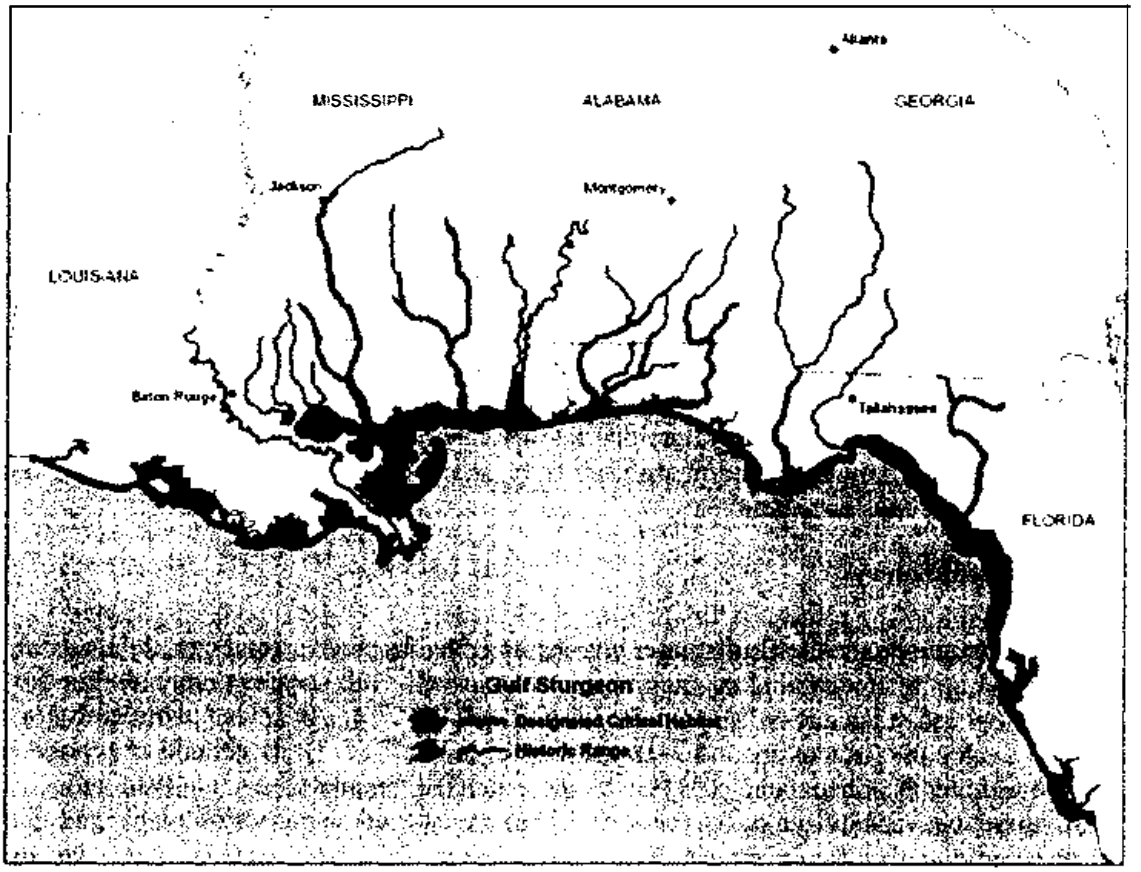

Figure 2. Designated critical habitat and historic range of Gulf sturgeon.

Critical habitat determinations focus on those physical and biological features (primary constituent elements [PCEs]) that are essential to the conservation of the species (50 CFR 424.12). Federal agencies must ensure that their activities are not likely to result in the destruction or adverse modification of designated critical habitats. Therefore, proposed actions that may affect designated critical habitat require an analysis of potential impacts to the PCEs. The PCEs of Gulf sturgeon critical habitat are:

- Abundant food items, such as detritus, aquatic insects, worms, and/or mollusks, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages;
- Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
- Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal

riverbed depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions;

- A flow regime (*i.e.,* the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;
- Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
- Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
- Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (*e.g.*, an unobstructed river or a dammed river that still allows for passage).

2.1.3 Life History

Like most sturgeons, the Gulf sturgeon is characterized by large size, longevity, delayed maturation, high fecundity, and far-ranging movements. Gulf sturgeon typically live for 20-25 years, but can reach ages of at least 42 years old (Huff 1975). Age at sexual maturity ranges from 8-12 years for females and 7-9 years for males (Huff 1975). High fecundity has been demonstrated by Chapman et al. (1993), who estimated that mature female Gulf sturgeon weighing between 29 and 51 kg (64 and 112 lb) produce an average of 400,000 eggs. Long-range migrations from the open Gulf of Mexico to bays and estuaries to coastal rivers are also common. Migratory behavior of the Gulf sturgeon is likely influenced by sex and reproductive status (Fox et al. 2000), change in water temperature (Wooley and Crateau 1985; Chapman and Carr 1995; Foster and Clugston 1997), and increased river flow (Chapman and Carr 1995; Heise et al. 1999a, b; Sulak and Clugston 1999; Ross et al. 2000 and 2001b; Parauka et al. 2001; B. Tate, pers. comm. 2012).

In general, all life stages of Gulf sturgeon migrate into rivers in the spring (from late February to May), where sexually mature sturgeon spawn when the river temperatures rises to between 17-25°C. Similar to Atlantic sturgeon, Gulf sturgeon are believed to exhibit a long inter-spawning period, with male Gulf sturgeon capable of annual spawning, but females requiring more than one year between spawning events (Huff 1975; Fox et al. 2000) and only a small percentage of females spawn in a given year (Sulak and Clugston 1999; Pine et al. 2001). Therefore, Gulf sturgeon population viability is highly sensitive to changes in adult female mortality and abundance (Pine et al. 2001; Flowers 2008).

Spawning occurs in the upper reaches of rivers, at least 100 km (62 miles) upstream of the river mouth (Sulak et al. 2004), in habitats consisting of one or more of the following: limestone bluffs and outcroppings, cobble, limestone bedrock covered with gravel and small cobble, gravel, and sand (Marchant and Shutters 1996; Sulak and Clugston 1999; Heise et al. 1999a; Fox et al. 2000; Craft et al. 2001; USFWS unpub. data 2005; Pine et al. 2006). These hard bottom substrates are required for egg adherence and shelter for developing larvae (Sulak and Clugston

1998). Documented spawning depths range from 1.4 to 7.9 m (4.6 to 26 ft) (Fox et al. 2000; Ross et al. 2000; Craft et al. 2001; USFWS unpub. data 2005; Pine et al. 2006).

Gulf sturgeon eggs are demersal and adhesive, and require at least 2 to 4 days to hatch (Parauka et al. 1991; Chapman et al. 1993). After hatching, larval Gulf sturgeon are particularly sensitive to water temperatures above 25°C (Chapman and Carr 1995). Young-of-year (YOY) fish disperse widely throughout the river and remain in freshwater for 10 to 12 months after spawning occurs (Sulak and Clugston 1999). They are typically found in open sand-bottom habitat away from the shoreline and vegetated habitat.

Throughout early spring to late autumn, Gulf sturgeon of all ages remain in freshwater until fall (6 to 9 months) (Odenkirk 1989; Foster 1993; Clugston et al. 1995; Fox et al. 2000; Sulak et al. 2009). They typically occupy discrete areas either near the spawning grounds (Wooley and Crateau 1985; Ross et al. 2001b) or downstream areas referred to as summer resting or holding areas. These resting areas are often located in deep holes, and sometimes shallow areas, along straight-aways ranging from 2 to 19 m (6.6 to 62.3 ft) deep (Wooley and Crateau 1985; Morrow et al. 1998; Ross et al. 2001a, b; Craft et al. 2001; Hightower et al. 2002), and frequently near (not in) natural springs (Clugston et al. 1995; Foster and Clugston 1997; Hightower et al. 2002). The substrates consisted of mixtures of limestone and sand (Clugston et al. 1995), sand and gravel (Wooley and Crateau 1985; Morrow et al. 1998), or just sandy substrate (Hightower et al. 2002). With the exception of YOY fish, Gulf sturgeon do not typically feed during freshwater residency (Mason and Clugston 1993; Gu et al. 2001). Sulak et al. (2012) reported that the vast majority (~94%) of juvenile, subadult, and adult Gulf sturgeon sampled from the Suwannee River exhibited complete feeding cessation for the 8-9 month summer residency; however, a small percentage (~6%) of juveniles and subadults did feed in freshwater.

All non-YOY begin to migrate downstream from fresh to saltwater around September (at about 23°C [73°F]) through November (Huff 1975; Wooley and Crateau 1985; Foster and Clugston 1997), and they spend the cool months in estuarine areas, bays, or in the Gulf of Mexico (Odenkirk 1989; Foster 1993; Clugston et al. 1995; Fox et al. 2002). During the fall migration, Gulf sturgeon may require a period of physiological acclimation to changing salinity levels, referred to as osmoregulation or staging (Wooley and Crateau 1985). This period may be short (Fox et al. 2002) as sturgeon develop an active mechanism for osmoregulation and ionic balance by age 1 (Altinok et al. 1998). Some adult Gulf sturgeon may also spawn in the fall (Randall and Sulak 2012).

Throughout fall and winter, juveniles feed in the lower salinity areas in the river mouth and estuary (Sulak and Clugston 1999; Sulak et al. 2009), while subadults and adults migrate and feed in the estuaries and nearshore Gulf of Mexico habitat (Foster 1993; Foster and Clugston 1997; Edwards et al. 2003, 2007; Parkyn et al. 2007). Some Gulf sturgeon may also forage in the open Gulf of Mexico (Edwards et al. 2003).

The Gulf sturgeon is a benthic (bottom dwelling) suction feeder: it feeds mostly upon small invertebrates in the substrate using its highly protrusible tubular mouth. The type of invertebrates ingested varies by habitat but are mostly soft-bodied animals that occur in sandy substrates. Young-of-the-year Gulf sturgeon feed on freshwater aquatic invertebrates, mostly

insect larvae and detritus (Mason and Clugston 1993; Sulak and Clugston 1999; Sulak et al. 2009). Juveniles (less than 5 kg (11 lbs), ages 1 to 6 years) forage in lower salinity habitats near the river mouth and in the estuaries, and subadults and adults feed in the estuary and nearshore feeding grounds in the Gulf of Mexico (Foster 1993; Foster and Clugston 1997; Edwards et al. 2003, 2007; Parkyn et al. 2007). Prey in estuarine and marine habitats include amphipods, brachiopods, lancelets, polychaetes, gastropod mollusks, shrimp, isopods, bivalve mollusks, and crustaceans (Huff 1975; Mason and Clugston 1993; Carr et al. 1996; Fox et al. 2000; Fox et al. 2002). Ghost shrimp (*Lepidophthalmus louisianensis*) and haustoriid amphipods (e.g., *Lepidactylus* spp.) are strongly suspected to be important prey for adult Gulf sturgeon over 1 m (3.3 ft) in length (Heard et al. 2000; Fox et al. 2002).

Marine movement, habitat, and feeding data indicate that Gulf sturgeon prefer open, sandy habitat containing high abundances of known benthic prey (Fox et al. 2002; Parauka et al. 2001; Harris et al. 2005). In bays and estuaries, Gulf sturgeon generally prefer shallow (depths less than 3.5 m, 11.5 ft) areas (Parauka et al. 2001; Craft et al. 2001) or deep holes near passes (Craft et al. 2001). Gulf sturgeon using nearshore Gulf of Mexico areas are generally found at depths less than 6-10 m (33 ft) (Ross et al. 2001a; Fox et al. 2002; Rogillio et al. 2002; Parauka 2012 pers. comm.). Generally, fish are found in near shore areas off Perdido Bay and between Pensacola and Apalachicola Bays (Fox et al. 2002; Parauka 2012 pers. comm.) and in the Mississippi Sound along the barrier islands, where they are relocated most often at the passes between islands (Ross et al. 2001a; Rogillio et al. 2002). Telemetry-tagged Gulf sturgeon from different natal river systems are regularly detected in the same marine foraging areas.

Previous tagging studies indicated that Gulf sturgeon exhibit river fidelity (USFWS and GSMFC 1995). Stabile et al. (1996) identified five regional or river-specific stocks (from west to east): (1) Lake Pontchartrain and Pearl River, (2) Pascagoula River, (3) Escambia and Yellow Rivers, (4) Choctawhatchee River, and (5) Apalachicola, Ochlockonee, and Suwannee Rivers. Dugo et al (2004) reported that genetic structure occurs at the drainage level for the Pearl, Pascagoula, Escambia, Yellow, Choctawhatchee, and Apalachicola rivers (no samples were taken from the Suwannee population). Additional genetic studies by Brian Kreiser at the University of Southern Mississippi indicate that there is strong population structure in all rivers across its range, and a clear difference between populations east and west of Mobile Bay (B. Kreiser 2012 pers. comm.). Gulf sturgeon do make inter-river movements (USFWS unpubl. data 2012; Krieser 2012 pers. comm.), and more genetic research is needed to determine if inter-stock movement is resulting in inter-stock reproduction.

2.1.4 Population Status

Historically, the Gulf sturgeon occurred from the Mississippi River east to Tampa Bay (Figure 2). Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida. Sporadic occurrences have been recorded as far west as the Rio Grande River between Texas and Mexico, and as far east and south as Florida Bay (Wooley and Crateau 1985; Reynolds 1993).

In the late 19th century and early 20th century, the Gulf sturgeon supported an important commercial fishery, providing eggs for caviar, flesh for smoked fish, and swim bladders for

isinglass, which is a gelatin used in food products and glues (Huff 1975; Carr 1983). Gulf sturgeon numbers declined due to overfishing throughout most of the 20th century. The decline was exacerbated by habitat loss associated with the construction of dams and sills (low dams), mostly after 1950. In several rivers throughout the species' range, dams and sills have severely restricted sturgeon access to historic migration routes and spawning areas (Wooley and Crateau 1985; McDowall 1988).

On September 30, 1991, the Service and the National Marine Fisheries Service (NMFS) listed the Gulf sturgeon as a threatened species under the Act (56 FR 49653). Threats and potential threats identified in the listing rule included: construction of dams, modifications to habitat associated with dredging, dredged material disposal, de-snagging (removal of trees and their roots) and other navigation maintenance activities; incidental take by commercial fishermen; poor water quality associated with contamination by pesticides, heavy metals, and industrial contaminants; aquaculture and incidental or accidental introductions; and the Gulf sturgeon's long maturation and limited ability to recolonize areas from which it is extirpated.

The Service and NMFS conducted a 5 year status review in 2009 where we concluded that the following threats continue to affect Gulf sturgeon and its habitat: impacts to habitats by dams, dredging, point and nonpoint discharges, climate change, bycatch, red tide, and collisions with boats (USFWS and NMFS 2009). Additional threats may include ship strikes and potential hybridization due accidental release of non-native sturgeon. These threats persist to varying degrees in different portions of the species range. The juvenile stage of Gulf sturgeon life history is the least understood, and perhaps the most vulnerable as this cohort remains in the river for the first years of its life and is therefore exposed to most of the threats faced by the species and its habitat. Further, the species long-lived, late-maturing, intermittent spawning characteristics make recovery a slow process.

Currently, seven rivers are known to support reproducing subpopulations of Gulf sturgeon. Table 2 lists these rivers and most-recent estimates of subpopulation size. Abundance numbers indicate a roughly stable or slightly increasing population trend over the last decade in the eastern river systems (Florida), with a much stronger increasing trend in the Suwannee River and a possible decline in the Escambia River. Populations in the western portion of the range (Mississippi and Louisiana) have never been nearly as abundant, and their current status is unknown as comprehensive surveys have not occurred in the past ten years.

At this time, the Service characterizes the status of the species as stable; however, the status of the subpopulations in the Pearl and Pascagoula rivers is uncertain. These rivers do not have current population estimates and have recently been threatened by hurricanes, the Deepwater Horizon oil spill, and a pot-liquor spill in the Pearl River. The Gulf sturgeon continues to meet the definition of a threatened species. While some riverine populations number in the thousands, abundance of most populations is in the hundreds. Loss of a single year class could be catastrophic to some riverine populations with low abundance. Further, while directed fisheries no longer occur, many threats continue and new ones are arising. Data are not yet available to determine if Gulf sturgeon recovery is limited by factors affecting recruitment (e.g., spawning habitat quantity or quality), adult survival (e.g., incidental catch in fisheries directed at other species), or the late-maturing, intermittent reproductive characteristics of the species.

2.1.5 Analysis of the Species/Critical Habitat Likely to be Affected

This BO addresses the effects of replacing the US 90 Yellow River bridge on the Gulf sturgeon and its designated critical habitat. The Gulf sturgeon is found seasonally in the Yellow River and its distributaries from early spring until late fall.

The Yellow River is one of seven rivers currently known to support a reproducing subpopulation of Gulf sturgeon. The critical habitat in the Yellow River system is included in Unit 4 (the Yellow River mainstem, downstream to its discharge at Blackwater Bay, and all Yellow River distributaries). Unit 4 provides spawning sites and potential summer resting areas for the Yellow River Gulf sturgeon subpopulation. Road and bridge construction may affect water and sediment quality in the Yellow River, and alter migratory behavior as a result of physical and acoustic effects from pile driving and other work activities within the river. Therefore, in this BO we limit our analysis of effects to Gulf sturgeon to the Yellow River subpopulation of the species in critical habitat Unit 4.

Table 2. Estimated size of known reproducing subpopulations of Gulf sturgeon.
In some cases, multiple estimates are presented based on differences in population estimation models used. All estimates apply to a proportion of the population exceeding a minimum size, which varies by researchers according to the sampling method used. CI = confidence interval. NR = not reported.

River	Year of data collection	Abundance Estimate	Lower Bound 95% CI	Upper Bound 95% CI	Source
Pearl	2001	430	323	605	Rogillio et al. 2001
Pascagoula	2000	181	38	323	Ross et al. 2001
Pascagoula	2000	206	120	403	Ross et al. 2001
Pascagoula	2000	216	124	429	Ross et al. 2001
Escambia	2006	451	338	656	USFWS 2007
Yellow	2011	1,036	724	1,348	USFWS 2012 unpub. data
Choctawhatchee	2008	3,314	NR	NR	USFWS 2009
Apalachicola	2005	2,000	NR	NR	Pine and Martell 2009a
Apalachicola	2010	1,292	616	1,968	USFWS 2010 unpub. data
Suwannee	2004	10,000	NR	NR	Pine and Martell 2009a
Suwannee	2006	9,728	6,487	14,664	Randall 2008
Suwannee	2007	14,000	NR	NR	Sulak 2008

2.2 Freshwater Mussels

2.2.1 Species Description

The narrow pigtoe (*Fusconaia escambia*) has a moderately thick, subtriangular to squarish shaped shell that reaches about 75 mm (3.0 in.). The periostracum (outer shell surface) is usually reddish brown to black in color. The shell nacre (inner shell surface) is white to salmon in color with iridescence near the posterior margin (Williams and Butler 1994; Williams *et al.* 2008).

The narrow pigtoe is known from the Escambia River drainage in Alabama and Florida, and the Yellow River drainage in Florida. The species inhabits medium creeks to medium rivers, in areas with slow to moderate current, and is typically found in stable substrates of sand, sand and gravel, or silty sand (Williams *et al.* 2008). The narrow pigtoe is somewhat unusual in that it tolerates a small reservoir environment (Williams 2009 pers. comm.). Reproducing narrow pigtoe populations were found in Point A Lake and Gantt Lake reservoirs in relatively high numbers in areas with firm, stable sand substrates with little or no silt accumulation (Pursifull 2006 pers. obs.). The narrow pigtoe appears to require stable habitat, and is found in relatively high abundance only in a few areas with very stable habitat.

The southern sandshell (*Hamiota australis*) has a moderately thin, elliptical shaped shell that is smooth and shiny and reaches about 83 mm (2.3 in.) in length. The periostracum is greenish in color in young specimens, becoming dark greenish brown to black with age, with many variable green rays. The shell nacre is bluish white and iridescent. Sexual dimorphism is present as a slight inflation of the posterioventral shell margin of females (Williams and Butler 1994; Williams *et al.* 2008). The southern sandshell is typically found in small creeks and rivers in slow to moderate current. The species is most often found in stable substrates of sand or mixtures of sand and fine gravel (Williams and Butler 1994; Williams *et al.* 2008). The species is reported to require clear streams. Specimens are found in turbid water; however, abundance is lower at these sites compared to clear water streams (Blalock-Herod *et al.* 2002).

The fuzzy pigtoe (*Pleurobema strodeanum*) has a moderately thin, oval to subtriangular shaped shell that reaches about 75 mm (3.0 in.) in length. The periostracum has a cloth-like texture and is usually dark brown to black in color. The nacre is bluish white, with slight iridescence near the margin (Williams and Butler 1994; Williams *et al.* 2008). The fuzzy pigtoe is found in medium creeks to medium rivers in slow to moderate current. The species is typically found in stable substrates of sand and silty sand (Williams *et al.* 2008).

The narrow pigtoe, southern sandshell, and fuzzy pigtoe pigtoe, along with 5 other mussel species, were first identified as candidates for protection under the Endangered Species Act in the May 4, 2004, Federal Register (69 FR 24876). The three species were listed as threatened species under the Act on November 9, 2012 (USFWS 2012).

2.2.2 Critical Habitat Description

Critical habitat was designated for the narrow pigtoe, southern sandshell, and fuzzy pigtoe and five other mussel species in 2012 (USFWS 2012). Nine units and 1,494 miles of river and creek channels were designated as critical habitat for the eight species. Five units are designated for the narrow pigtoe and total approximately 1,112 miles of river and creek channels in the Escambia River drainage in Alabama and Florida and the Yellow River drainage in Florida. Six units are designated for the southern sandshell and fuzzy pigtoe and total approximately 2,222 miles of river and creek channels in the Escambia, Yellow, and Choctawhatchee River drainages in Alabama and Florida. Unit GCM5 is the only unit designated in the Yellow River drainage. Unit GCM5 encompasses 247 km (153 mi) of the Yellow River mainstem, the Shoal River mainstem, and three tributary streams in Santa Rosa, Okaloosa, and Walton Counties, Florida, and Covington County, Alabama.

Critical habitat identifies specific areas that are essential to the conservation of a listed species and that may require special management considerations or protection. Section 7(a)(2) of the Act requires that each federal agency shall, in consultation with the Service, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat.

The following constituent elements are part of the critical habitat designation and are essential to the conservation of the narrow pigtoe, southern sandshell, and fuzzy pigtoe:

1. Geomorphically stable stream and river channels and banks (channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation).

2. Stable substrates of sand or mixtures of sand with clay or gravel with low to moderate amounts of fine sediment and attached filamentous algae.

3. A hydrologic flow regime (magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found, and to maintain connectivity of rivers with the floodplain, allowing the exchange of nutrients and sediment for habitat maintenance, food availability, and spawning habitat for native fishes.

4. Water quality, including temperature (not greater than 32 °C), pH (between 6.0 to 8.5), oxygen content (not less than 5.0 mg/L), hardness, turbidity, and other chemical characteristics necessary for normal behavior, growth, and viability of all life stages.

5. The presence of fish hosts. Diverse assemblages of native fish species will serve as a potential indication of host fish presence until appropriate host fishes can be identified for the narrow pigtoe. For the fuzzy pigtoe, the presence of blacktail shiner (*Cyprinella venusta*) will serve as a potential indication of fish host presence. For the southern

sandshell, the presence of native basses will serve as a potential indication of fish host presence.

2.2.3 Life History

Like other freshwater mussels, the narrow pigtoe, southern sandshell, and fuzzy pigtoe feed by filtering food particles from the water column. The specific food habits of the species are unknown, but other freshwater mussels have been documented to feed on detritus (decaying organic matter), diatoms (various minute algae) and other algae and phytoplankton (microscopic floating aquatic plants), and zooplankton (microscopic floating aquatic animals).

The reproductive cycle of the narrow pigtoe, southern sandshell, and fuzzy pigtoe is similar to that of other native freshwater mussels. Males release sperm into the water column, and the sperm are then taken in by the females through their siphons during feeding and respiration. The females brood the fertilized eggs in their gills until the larvae are (glochidia) fully developed. Females of some species release their glochidia into the water, either individually (sometimes in mucus strands for suspension), in packets termed conglutinates, or in one large mass known as a superconglutinate (Barnhart *et al.* 2008). In other species (mostly lampsilines), females transmit glochidia directly to the host fish by using their mantel flap to lure fish to attack (Barnhart *et al.* 2008). The mussel glochidia that attach to the appropriate fish species will then parasitize the host for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom where they continue to develop, provided they land in suitable substrate with the correct water conditions.

Little is known about the specific reproductive biology of the narrow pigtoe. The species is believed to be a short-term brooder, with females gravid during spring and summer (Williams *et al.* 2008, p. 317). The host fish for the narrow pigtoe is currently unknown. The southern sandshell is a long-term brooder, and females are gravid from late summer or autumn to the following spring (Williams *et al.* 2008, p. 338). The southern sandshell is one of only four species that produce a superconglutinate to attract a host. The superconglutinate mimics the shape, coloration, and movement of a fish and is produced by the female mussel to hold all glochidia (larval mussels) from one year's reproductive effort (Haag *et al.* 1995). Preliminary host trials indicate the southern sandshell, like other Hamiota species, uses predatory sunfishes such as basses (Johnson 2013 pers. comm.). The fuzzy pigtoe is a short-term brooder, with females gravid from mid-March to May. The blacktail shiner (*Cyprinella venusta*) was found to serve as a host for fuzzy pigtoe glochidia in a preliminary study trial (White *et al.* 2008).

Some freshwater mussels are long-lived and slow-growing, while others grow quickly and have short life spans. Generally, heavy-shelled species grow slowly (Coon et al. 1977; Hove and Neves 1994) and tend to reach higher maximum ages (Stansbery 1961) relative to thin-shelled species. A recent age and growth study of 57 freshwater mussel species, mostly from the southern US, found growth and longevity varied greatly across species. Maximum ages ranged from 4 to 91 years and varied among major unionid taxonomic groups (Haag and Rypel 2011, p. 234). A very tight relationship was observed between growth rate and longevity, finding that slow growing mussels (like Amblemini, Pleurobemini, and Quadrulini) tend to reach higher maximum ages than fast growing species (such as Andontini) (Haag and Rypel 2011, p. 238).

The life span, growth rate, and many other aspects of narrow pigtoe, southern sandshell, and fuzzy pigtoe life history are currently unknown.

2.2.4 Distribution and Status

The narrow pigtoe is endemic to the Escambia River drainage in Alabama and Florida, and to the Yellow River drainage in Florida (Williams *et al.* 2008). In the Escambia River drainage, the narrow pigtoe stills occurs in nearly all of its historical range and is known from a total of 28 locations. The species appears to be extirpated from some localized areas, and was not detected at 3 out of 10 historical sites that were surveyed recently. Its abundance in the Escambia River drainage is relatively low, except in a few areas with very stable habitat including Gantt Reservoir in Alabama and the lower portion of the Escambia River near Molino, Florida. The narrow pigtoe is rare in the Yellow River drainage. The species is currently known from 5 locations on the main stem, and a total of only 23 individuals have been collected in the Yellow River drainage since 1995.

The southern sandshell is endemic to the Escambia River drainage in Alabama, and the Yellow and Choctawhatchee River drainages in Alabama and Florida (Blalock–Herod *et al.* 2002). The southern sandshell persists in its historic range; however, its range is fragmented and numbers appear to be declining (Williams *et al.* 2008). In the Escambia River drainage, the species was detected at 1 of 4 historic locations surveyed recently. Also, its numbers are very low in the drainage; a total of 20 individuals from 6 locations have been collected in the Escambia River drainage since 1995. Southern sandshell numbers in the Yellow River drainage are also fairly low, with 65 individuals collected recently at a total of 17 locations. The species was not detected at 2 of the 4 historic locations examined recently in the drainage. In the Choctawhatchee River drainage, the number of historic locations that currently support the species has declined from 16 to 5, and it appears to be extirpated from some areas in the central portion of the Choctawhatchee River main channel and from some tributaries. Sedimentation could be one factor contributing to its decline. In order to reproduce, the southern sandshell must attract a sight-feeding fish to its superconglutinate lure. Waters clouded by silt and sediment would reduce the chance of this interaction occurring (Haag *et al.* 1995).

The fuzzy pigtoe is endemic to the Escambia, Yellow, and Choctawhatchee River drainages in Alabama and Florida (Williams *et al.* 2008). Within the Escambia River drainage, the fuzzy pigtoe was detected at 15 of the 21 historic locations surveyed since 1995; however, its status in the drainage is difficult to assess as 9 historical sites have not been surveyed since 1995, and at least 3 other sites have vague localities. The fuzzy pigtoe is exceedingly rare in the Yellow River drainage, where it is currently known from 1 of 4 historic locations. In 2010, a single individual was collected in the main channel, just upstream of the US 90 bridge during the survey conducted for this project. This is the only recent collection of the species in the Yellow River drainage. Its range in the Yellow River drainage has declined, and the species may no longer occur in the upper portion of the drainage. In the Choctawhatchee River drainage, the fuzzy pigtoe stills occurs in nearly all of its historic range and is currently known from a total of 50 locations; however, the species has become extirpated in localized areas. Fuzzy pigtoes were detected at only 8 of the 15 historic locations that were resurveyed recently in the drainage (there are 18 total historic locations).

Reasons for decline

The habitats of freshwater mussels are vulnerable to modification and water quality degradation from a number of human activities. The primary reason for the decline of these mussels has been the modification and destruction of their stream and river habitat, with sedimentation as the leading cause. Their stream habitats are subject to pollution and alteration from a variety of sources including adjacent land use activities, in-water activities, effluent discharges, and impoundments. Nonpoint-source pollution carried by land surface runoff originates from many land use activities and includes sediments, fertilizer, herbicide and pesticide residues, animal wastes, septic tank leakage, gray water discharge, and oils and greases. Current activities that negatively affect mussel populations include unpaved road crossings, improper silviculture and agriculture practices, highway construction, housing developments, pipeline crossings, and cattle grazing. These activities can result in physical disturbance of stream substrates or the riparian zone, excess sedimentation and nitrification, decreased dissolved oxygen concentration, increased acidity and conductivity, and altered flow.

Sedimentation is one of the most significant pollution problems for aquatic organisms (Williams and Butler 1994). Heavy sediment loads can destroy mussel habitat, resulting in a corresponding shift in mussel fauna (Brim Box and Mossa 1999). Excessive sedimentation can lead to rapid changes in stream channel position, channel shape, and bed elevation (Brim Box and Mossa 1999). Sedimentation has also been shown to impair the filter feeding ability of mussels. When in high silt environments, mussels may keep their valves closed more often, resulting in reduced feeding activity (Ellis 1936) and high amounts of suspended sediments can dilute their food source (Dennis 1984). Increased turbidity from suspended sediment can reduce or eliminate juvenile mussel recruitment (Negus 1966, Brim Box and Mossa 1999). Many mussel species use visual cues to attract host fishes; such a reproductive strategy depends on clear water. For example, increased turbidity may impact the southern sandshell life cycle by reducing the chance that a sight-feeding host fish will encounter the visual display of its superconglutinate lure (Haag *et al.* 1995, Blalock-Herod *et al.* 2002). Excessive sedimentation has been observed by biologists surveying for mussels in the streams and rivers of the Escambia and Yellow river basins (USFWS 2012). The Nature Conservancy assessed habitat at 44 known mussel sites in the Yellow River watershed in 2009-10 and found most to be in either fair or poor condition with 75% exhibiting a high or moderate risk of sedimentation (Herrington *et al.* 2010).

Other factors affecting the decline of mussels include municipal and industrial effluents, pesticides, excessive nutrients, impoundment of stream channels, recurring drought and flooding, contaminant spills, and introduced Asian clam. These threats are currently impacting these species and impacts are likely to continue into the future. In addition, there is growing concern that climate change may lead to an increased frequency of severe storms and droughts that could detrimentally affect mussels. The present conservation status, complex life histories, and specific habitat requirements of freshwater mussels suggest that they may be quite sensitive to climate change (Hastie et al. 2003). Specific effects of climate change to mussels, their habitat, and their fish hosts could include changes in stream temperature regimes, the timing and levels of precipitation causing more frequent and severe floods and droughts, and alien species introduction. Increases in temperature and reductions in flow may also lower dissolved oxygen

levels in interstitial habitat which can be lethal to juveniles (Sparks and Strayer 1998). Effects to mussel populations from these environmental changes could include reduced abundance and biomass, altered species composition, and host fish considerations (Galbraith et al. 2010).

2.2.5 Analysis of the Species/Critical Habitat Likely to be Affected

Biologists with Southeastern Aquatic Research conducted a mussel survey at the US 90 bridge site on November 2, 2010. The survey targeted all available mussel habitat in an area extending from 500 m upstream to 1,000 m downstream of the bridge crossing. Survey teams conducted 4 extensive visual-tactile searches totaling 17.08 person-hours. Surveyors used mask and snorkel along stream margins and in shallow runs and SCUBA in deeper runs and pools. Live or fresh dead shells of 13 native mussel species were found at the site. Three federally protected species were collected and include 20 live southern sandshells, 3 live narrow pigtoes, and 1 live fuzzy pigtoe. In total, 630 mussels were collected within the 1.5 km survey reach (mean catch per unit effort (CPUE) = 36.4 mussels/hr.). The Choctaw bean (*Villosa choctawensis*) is the only other federally protected mussel species occurring in the Yellow River drainage. The species has been collected in the Yellow River main channel in northern Okaloosa County, Florida. However, it has never been collected below the State Road 2 crossing, and likely is not present at the bridge site.

3.0 ENVIRONMENTAL BASELINE

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

3.1 Gulf Sturgeon

3.1.1 Status of the Species within the Action Area

The action area extends from 1,640 ft (0.5 km) upstream to 3,280 ft (1 km) downstream of the US 90 Yellow River crossing, and also includes the 200-ft road ROW and a 1,000-ft buffer on either side of the ROW. Although the action area does not include the full extent of Gulf sturgeon habitat in the Yellow River, this project has the potential to affect the entire Yellow River subpopulation because all life stages must pass up- and downstream of the project. Therefore, the status of the subpopulation in the Yellow River is the same as its status in the action area.

The Yellow River subpopulation of Gulf sturgeon was estimated to be roughly 1,300 net vulnerable (roughly age 4+) individuals in 2011 (USFWS unpub data 2012). A similar census in the fall of 2003 estimated the population size was 911 individuals (Berg et al. 2007), which

indicates that the population may have been growing at a rate of about 5% per year for the past ten years (depending on the accuracy of the estimates). Pine et al. (2001) found positive population growth of about 5% annually for adults within the Suwannee River subpopulation, and this is believed to be the maximum average annual rate of increasing Gulf sturgeon populations over time. Evidence of recruitment has also been observed in recent years, suggesting that the Yellow River subpopulation is viable (*i.e.*, regularly reproducing) (Berg *et al.* 2007; Kreiser *et al.* 2008; USFWS 2011-2012 unpub data).

Gulf sturgeon are known to spawn at sites within about a 5-km (~ 3-mi) reach of the Yellow River downstream of SR 55 (approximately rkm 130) in Alabama near the Florida border (Kreiser et al 2008; USFWS 2010-2012 unpub. data). The Service also confirmed spawning at a site in Florida downstream of CR 2 (USFWS 2011 unpub. data). Several holding areas have been identified by Craft et al. (2001) in the lower river downstream of rkm 60. The most populated holding area was found between SR 87 and Boiling Creek (rkm 11-16), and additional sites have been documented near Miller's Bluff (rkm 23), south of River's Edge Campground (rkm 42), and Gin Hole Landing (rkm 58) (Craft et al. 2001). The Service has also recently confirmed the continued use of these areas.

Three recent telemetry studies have advanced knowledge of Gulf sturgeon movement and habitat use in the Yellow River: 1) Eglin Air Force Base (AFB) and the Department of Defense (DoD) funded telemetry in marine environments near Eglin AFB from 2008-2010, 2) the National Oceanic and Atmospheric Administration (NOAA) funded a telemetry study assessing adult mortality rates since 2010, and 3) additional telemetry work was funded under the Natural Resources Damage Assessment (NRDA) of the Deepwater Horizon oil spill beginning in 2010. These studies have resulted in a total of approximately 200 telemetry-tagged adult Gulf sturgeon in the Yellow and Blackwater rivers in 2012. The Service monitored riverine movement and habitat use of these tagged fish in the Yellow River in 2011 and 2012. Telemetry receivers were placed at 5-kilometer (km) intervals in the lower river, additional receivers were placed near known and suspected spawning sites, and data was downloaded every 4-8 weeks. A receiver was placed just downstream of the US 90 bridge, which picked up transmissions approximately 500 m upstream and downstream of the bridge.

Figures 3 and 4 describe the pattern of movement and habitat use in the vicinity of the bridge in 2011 and 2012. Figure 3 describes the number of individuals observed by month, and Figure 4 describes residency (*e.g.*, how frequently individuals are detected at the same receiver near the US 90 bridge). Generally, Gulf sturgeon enter the river in late February or early March. Results indicate that the area around the US 90 bridge was actively used from March through September. The sturgeon in the Yellow River appear to be influenced by flood events to migrate to their spawning areas further upstream (USFWS 2011-2012 unpub data). This could be a result of several years of drought conditions in the region during much of the sampling period. The primary months of movement near the US 90 bridge during this period was March through May, with some movement during the summer months as well (June through August). The data suggests that late spawning (September 2011) may occasionally occur in the Yellow River, most likely during drought years (Van Vrancken pers. comm. 2013). Autumn spawning is a regularly noted occurrence by Gulf sturgeon in the Suwannee River system (Randall and Sulak 2012).

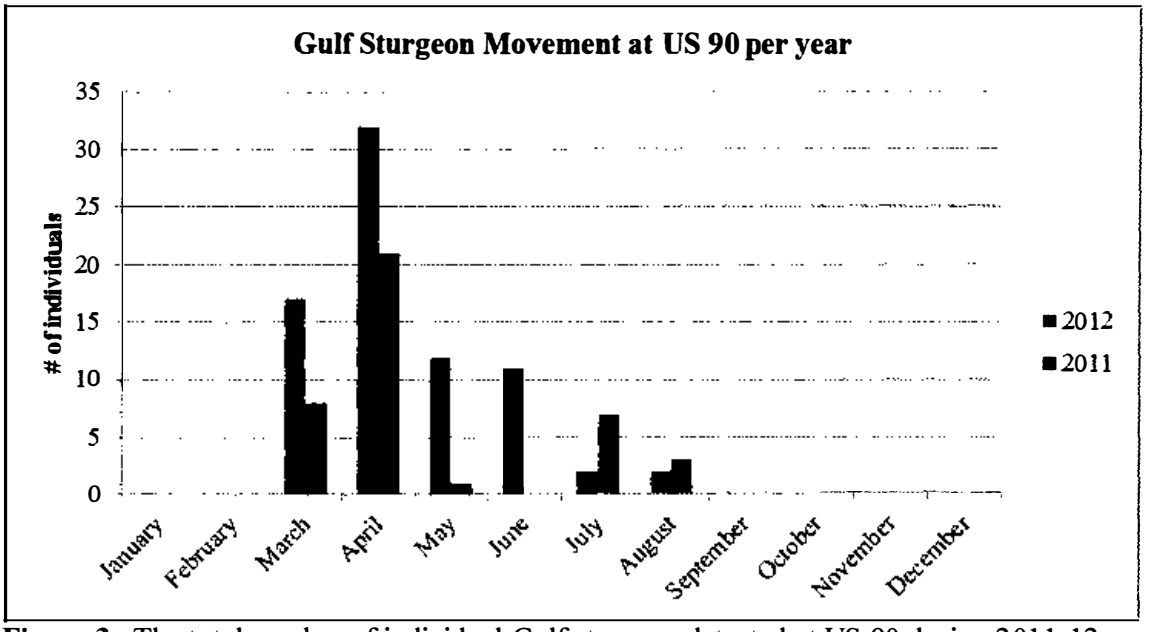

Figure 3. The total number of individual Gulf sturgeon detected at US 90 during 2011-12.

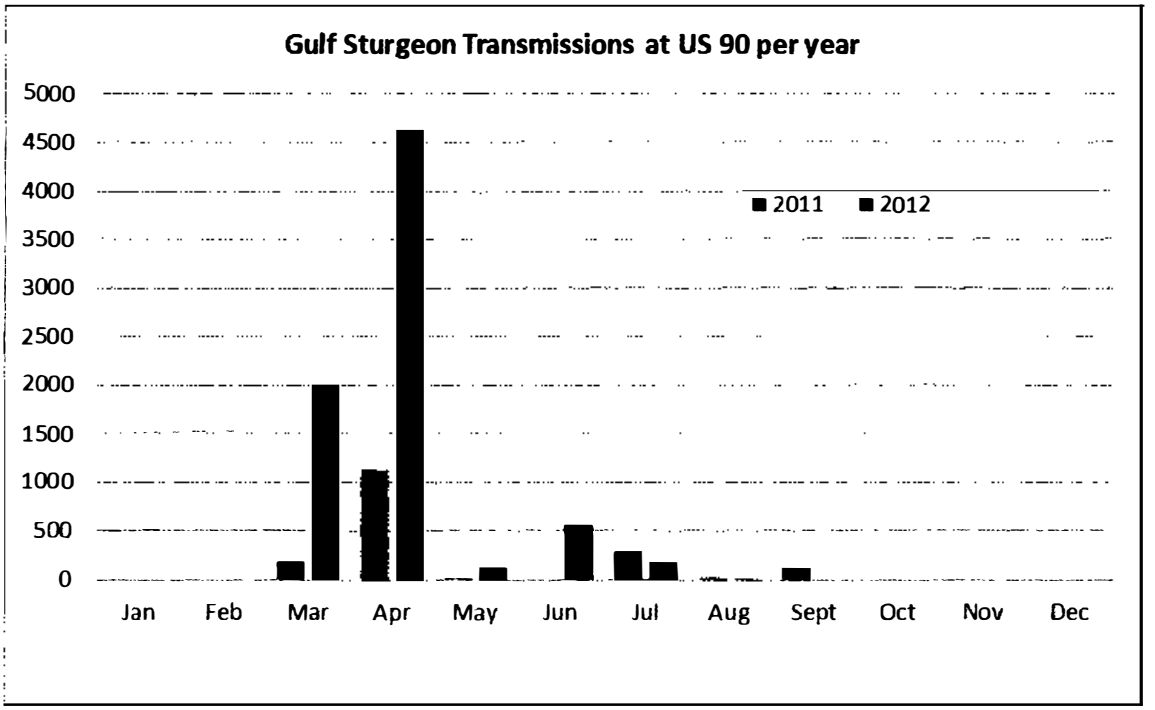

Figure 4. The total number of detections of Gulf sturgeon at US 90 during 2011-12.

3.1.2 Status of the Critical Habitat within the Action Area

This portion of the environmental baseline section focuses on Unit 4 Yellow River, the designated critical habitat for the Gulf sturgeon in the action area, describing what we know about the physical and biological features (PCEs) that are essential to the species' conservation within the action area. The action area does not include the estuarine critical habitat in Unit 9 Pensacola Bay, as we do not expect impacts of bridge construction to extend beyond 3,280 feet (1 km) downstream; therefore, PCEs for estuarine or marine habitat are not discussed.

1. Food items:

Riverine benthic invertebrate communities serve as prey primarily for YOY and juvenile Gulf sturgeon (see Section 2.3). Lewis (2010) summarized recent invertebrate collections in the action area and found that communities were dominated by midge (Tendipedidae) and mayfly (Ephemeroptera) larvae, oligochaetes and bivalves (particularly the Asian clam, *Corbicula fluminea*). Overall, Yellow River habitats were considered relatively productive compared to other Pensacola Bay river systems (*i.e.*, Blackwater and Escambia rivers). There is no evidence to indicate the food resources in the Yellow River are inadequate to support YOY and juvenile Gulf sturgeon at this time.

2. Riverine spawning sites:

As described in Section 3.1, Gulf sturgeon spawn at sites above rkm 125 near the Alabama/Florida border and at one site below CR 2 in Florida. All of the sites consist of hard bottom substrate including claystone, limestone, and boulder. The availability, and likely the suitability, of hard-bottom areas for spawning varies with flow, *i.e.,* more of the hard-bottom habitat is inundated at higher flow and less at lower flow.

The Yellow River Basin is increasingly impacted by excessive sedimentation from bank instability and unpaved road crossings (Herrington *et al.* 2010), and sedimentation has been identified as a problem at several of these spawning sites (Craft *et al.* 2001; Lewis 2010; Herrington *et al.* 2010). In particular, the Dripping Rock area (*e.g.,* the furthest upstream spawning site at rkm 134) was characterized by a bare and breached riverbank and an unpaved road resulting in an estimated 60 tons of excess sediment per year to the river. This area was recently restored by DoD, the Service, the Nature Conservancy, and the Florida Fish and Wildlife Conservation Commission by grading, stabilizing and re-vegetating the breached bank, and by closing, grading, filling, and seeding the unpaved road for long-term sediment stabilization.

Although there are impacts to spawning sites from sedimentation, the status of this constituent element is stable. Spawning has been documented at Dripping Rock despite sedimentation in the reach, and the population structure shows evidence of regular recruitment (Berg *et al.* 2007; USFWS 2011 unpub data). We are unaware of specific spawning habitat alterations that may limit the ability of the designated critical habitat to function for the conservation of the species.

3. Riverine aggregation areas:

As described in Section 3.1, at least four Gulf sturgeon holding areas occur in the Yellow River downstream of rkm 60. The nearest known aggregation area is Gin Hole Landing at rkm 58, approximately 7.4 miles downstream of US 90. At this time, we are unaware of specific alterations to riverine aggregation areas that may limit the ability of the designated critical habitat to function for the conservation of the species.

4. Flow regime:

The Yellow River exhibits moderate seasonality in flows (Lewis 2010), with highest flows in the winter and early spring and lowest flows in the fall. A precursory look at the record of flow at the USGS gage in Milligan, FL, indicates that there are no major differences in the flow regime from August 1938 to current. Figure 5 compares the distribution of annual flow from 1938-1958 and 1992-2012. The assumption is that flows in the time period prior to 1960 would be less affected by consumptive uses from development and agricultural irrigation that have occurred more recently in the Yellow River basin. Overall, annual flows are slightly lower in recent times than the assumed more natural flows recorded before 1960; however, the pattern is similar and differences are small. Surface water from the Yellow River basin has not played a major role in water supply (NWFWMD 2012), and most of the water supply for municipal and agricultural uses comes from the sand and gravel aquifer. At this time, we are unaware of specific flow regime alterations that may limit the ability of the designated critical habitat to function for the conservation of the species.

5. Water quality:

The Yellow River system is subject to a variety of nonpoint pollution sources (especially urban runoff from Crestview) and input from wastewater reuse facilities (Thorpe *et al.* 1997). Despite these impacts, water quality throughout the system has been described as "excellent", "some of the most pristine water quality in the state", and "high quality" (FDEP 1996; FDEP 1998; Lewis 2010, respectively). Currently only three segments of the Yellow River and two segments of the Shoal River were included on the verified list of impaired waters, and impairments are for fecal coliform and mercury in fish tissue (FDEP 2006).

Sturgeons are more sensitive to hypoxia (insufficient oxygen levels) than other well known oxyphillic species, such as rainbow trout (Secor and Niklitschek 2001). Sturgeons have a limited behavioral and physiological capacity to respond to hypoxia, and basal metabolism, growth, consumption, and survival are sensitive to changes in oxygen levels (Secor and Niklitschek 2001). The sensitivity of sturgeons to low dissolved oxygen (DO) conditions appears to decrease as the fish matures, with YOY fish being the most sensitive. In laboratory experiments, young (< 77 days old) shortnose sturgeon (*A. brevirostrum*) died at oxygen levels of 3.0 mg/l and all sturgeon died at oxygen levels of 2.0 mg/l (Jenkins *et al.* 1993). Niklitschek and Secor (2009) tested YOY Atlantic sturgeon at 20°C and found a no effect at 6.70 mg/L, high mortality at 3.47 mg/L, and chronic deleterious effects of 4.82 mg/L. Lewis (2010) summarized DO collection data from 22 sites in the Yellow River from the 2009 Florida STORET database. Dissolved

oxygen throughout the river was fairly high (> 6 mg/L). Several sites had values between 4-5 mg/L; however, the low values usually occurred during single sampling events, and observed concentrations were only below 4 mg/L on one occasion.

At this time, it appears that water quality in the Yellow River critical habitat unit is adequate for the conservation of Gulf sturgeon.

6. Sediment quality:

Herrington *et al.* (2010) recently completed an inventory of impaired sites in the Yellow River basin and concluded that the Yellow River Basin is increasingly impacted by excessive sedimentation primarily from unpaved road crossings and also from bank instability. Assessments of sediment contamination in the Yellow River have not been conducted, but it is reasonable to suspect some level of contamination since the basin has experienced extensive logging and receives nonpoint source pollution and sedimentation from agricultural areas, unpaved roads, and urban runoff (Thorpe *et al.* 1997).

At this time, the status of the sediment quality PCE of Gulf sturgeon critical habitat in the Yellow River is not pristine, but we do not have evidence that it is limiting the ability of the designated critical habitat to function for the conservation of the species. We are not aware of sediment quality impairments that have resulted in death, injury, or reduced growth and reproductive success to Gulf sturgeon in this system, and the subpopulation appears to be slowly increasing (see section 3.1.1).

7. Safe and unobstructed migratory pathways:

The Yellow River is free-flowing. At this time, we are unaware of any other ongoing hazards or obstructions that may limit migratory movements within Yellow River critical habitat unit.

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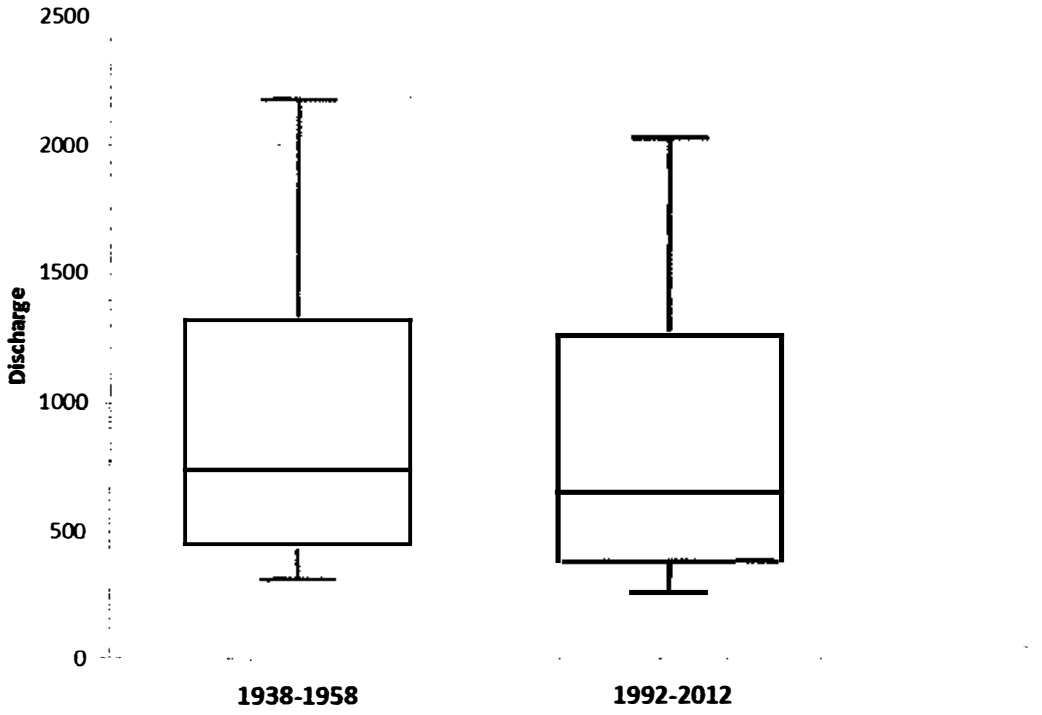

Figure 5. Comparison of annual flows at the USGS gage on the Yellow river near Milligan, FL from 1938-1958 and 1992-2012.

3.1.3 Factors Affecting the Species Environment within the Action Area.

No other actions affecting the species environment are expected within the action area. However, FDOT has proposed to add a twin span to the SR 87 Yellow River bridge which is located approximately 36.5 miles downstream of the US 90 bridge. Formal section 7 consultation was completed for the SR 87 bridge on April 10, 2013 (FWS # 2013-F-0033). The contract let date where the contractor can begin work is still uncertain, although work may begin in 2016. While this project is outside of the action area, the entire Yellow River subpopulation of sturgeon must pass both the SR 87 bridge and US 90 bridge as they move up and down the river. Fish affected by the US 90 project will also likely be affected by the SR 87 bridge construction.

3.2 Freshwater Mussels

3.2.1 Status of the Species within the Action Area

The 2010 mussel survey shows that densities of all mussels (including federally protected) are relatively low near the bridge compared to densities up- and downstream of the bridge. In

general, mussels were most abundant near the downstream (CPUE = 40.3 and 51.7) and near the upstream (CPUE 40.7) ends of the study reach, and were scarce near the bridge (CPUE 12.8).

The survey indicated that at least 20 southern sandshells, 3 narrow pigtoes, and 1 fuzzy pigtoe are present within project area. This is the only recent collection of the fuzzy pigtoe documented in the Yellow River. The CPUE for the 1.5 km project area was 1.2 southern sandshells, 0.2 narrow pigtoes, and 0.06 fuzzy pigtoes per hour. Based on limited survey data collected from other main channel locations within the Yellow River, it appears that southern sandshell, narrow pigtoe, and fuzzy pigtoe populations within the action area are average to below average (average in the areas up- and downstream of the bridge and below average near the footprint). As described in the status of the species above, populations of all three species are currently declining within the Yellow River drainage. It appears that their populations within the action area are similarly declining.

3.2.2 Status of the Critical Habitat within the Action Area

The action area includes 1 km downstream and 0.5 km upstream of the existing bridge site where direct and indirect impacts from the proposed project could occur, all within critical habitat. Therefore, approximately 1.5 km of critical habitat in the Yellow River Unit is within the action area. As stated above, the entire Yellow River critical habitat unit encompasses 247 km (153 mi) of stream channel. The action area includes about 0.6 percent of the critical habitat unit.

The constituent elements necessary for critical habitat are present within the project area and show some indications of impact from previous bridge construction and demolition activities, and by the existing structure. The following is a list of the constituent elements provided by critical habitat in the action area:

1. Geomorphically stable stream channels and banks:

   It was noted during the 2010 survey that mussels were most abundant at the downstream end of the study reach from the public boat ramp and downstream for 500 meters to the railroad crossing. Habitat was more favorable in this reach where the left descending bank of the Yellow River is stabilized by a limestone/mudstone outcropping. Mussels were also abundant at the upstream end of the study reach where they were aggregated in muddy sand along shallow, gently sloping banks. Shifting, unstable sand was noted in the upstream main channel possibly as a result of localized bank erosion. This suggests that much of the action area is geomorphically stable. Mussels were much fewer near the bridge, possibly as a result of impacts resulting from the bridge piers. These structures may cause local alterations to flow patterns, increased bed scour around the piers, and changes in bed elevation.

2. Stable substrates of sand or mixtures of sand with clay or gravel with low to moderate amounts of fine sediment:

Most of the substrate is stable and appropriate for mussels as discussed above. However within the upstream main channel the substrate is unstable, shifting sands. This is likely the result of nearby bank erosion.

3. Hydrologic flow regime (magnitude, frequency, duration, and seasonality of discharge over time) necessary to maintain benthic habitats where the species are found:

   As discussed in more detail above (Section 3.1.2, Subsection 4 Flow Regime), at this time, we are unaware of specific flow regime alterations that limit the ability of the designated critical habitat in the action area to function for the conservation of freshwater mussels.

4. Water quality, including temperature, pH, oxygen content, hardness, turbidity, and other chemical characteristics:

   As discussed in more detail above (Section 3.1.2, Subsection 5. Water Quality), the Yellow River is subject to a variety of nonpoint pollution sources such as urban runoff from Crestview and input from wastewater reuse facilities. Overall, water quality throughout the system has been described as "excellent". Currently, stormwater discharges directly into the river from the existing bridge. There could be temporary and permanent localized impacts to water quality due to runoff carrying contaminants and sediments into the river from the bridge and nearby roadway.

5. Fish hosts:

   The southern sandshell is known to use largemouth bass (Micropterus salmoides) bass as its host fish and likely uses other bass species as well. The blacktail shiner (*Cyprinella venusta*) is a known host fish for the fuzzy pigtoe. Both fish species are common and occur throughout Yellow River drainage including the action area. The host fish for the narrow pigtoe is not known, however, diverse assemblages of native fish species will serve as a potential indication of host fish presence.

3.2.3 Factors Affecting the Species' Environment within the Action Area

This section describes factors affecting the environment of the species or critical habitat in the action area. The baseline includes State, tribal, local, and private actions already affecting the species or that will occur contemporaneously with the consultation in progress. The existing US 90 roadway and bridge, and a downstream boat ramp and rail bridge are within the action area, and past construction of these structures and the presence of bridge pilings and rip rap in the waterway have impacted the aquatic habitat in the action area. The survey report indicated that the existing bridge structure may be impacting local habitat conditions based on the fact that mussel densities increased with distance from the bridge. The report also noted that much of the substrate in the main channel at the upstream end of the action area was comprised of unstable, shifting sand, and attributed this to bank erosion due to local riparian disturbances. We are not aware of other specific factors affecting the environment within the action area. As a whole,

these species are threatened by habitat degradation caused by dams, dredging, pollution, sedimentation, non-native invasive species, and water withdrawals.

4.0 EFFECTS OF THE ACTION

4.1 Factors to be Considered

This section includes an analysis of the direct and indirect effects of the proposed action on the species and critical habitat and its interrelated and interdependent activities. Our analysis of the effect of road and bridge construction considers the following factors:

Proximity of the action: The proposed action will affect designated critical habitat and all life stages of Gulf sturgeon in the Yellow River because all life stages must pass up- and downstream of the project. The proposed action will affect designated critical habitat and all life stages of the southern sandshell, narrow pigtoe, and fuzzy pigtoe in the Yellow River. These mussels spend their entire lives within the action area, all of which is designated as critical habitat for these species.

Distribution: The action area is a 1.5 km segment of the Yellow River channel in Okaloosa County, Florida that begins 0.5 km (1,640 ft) upstream of the existing bridge to 1 km (3,280 ft) downstream. The Gulf sturgeon is known to reproduce in seven rivers across its range, and all seven rivers are designated critical habitat. The Yellow River critical habitat unit is in the center of the species' range and comprises 7% of designated riverine critical habitat; however, critical habitat will only be affected in the Yellow River from 0.5 km (1,640 ft) upstream of the bridge to 1 km (3,280 ft) downstream. Therefore, less than 1% of designated Gulf sturgeon riverine critical habitat may be affected by the proposed action. The Yellow River subpopulation was estimated to be 1,036 net-vulnerable individuals in 2011, which is about 5-6% of the range-wide Gulf sturgeon estimation.

Total critical habitat designated for the fuzzy pigtoe, narrow pigtoe, and Southern sandshell is 2,222 km (1,379 miles), 1,112 km (689 miles), and 2,222 km (1,379 miles), respectively. The Yellow River (GCM Unit 5) comprises approximately 11% of total critical habitat for the fuzzy pigtoe and Southern sandshell, and 22.2% of the critical habitat for the narrow pigtoe. Approximately 0.6% of GCM Unit 5 may be affected.

Timing: The construction let date is currently April 30, 2014, with construction expected to begin on August 1, 2014. Mussels will be relocated from the main channel (bents 7 and 8) between October 1, 2013 and March 31, 2014, thus avoiding their 2014 reproductive season (April to mid-June). Eight drill shafts will be placed in the main channel of the Yellow River. There are four shafts each for bents 7 and 8. Two bents (11 and 12) are located on the eastern side channel with four shafts each. The consultant estimated the time to complete drilling on the 8 shafts in the main channel is 3 weeks. An additional 3 weeks will be needed to complete the 8 shafts on the eastern side channel.

Drilling shafts in the main channel (bents 7 and 8) is prohibited during the Gulf sturgeon spring migration (March through May). Drilling shafts in the eastern side channel (bents 11 and 12) is

prohibited during peak sturgeon migration (April) if water levels are 3 feet or greater. Demolition of the existing bridge structure will take approximately 110 construction days; it will not occur during the Gulf sturgeon spring migration (March through May) of any year. In-river demolition of the existing bridge and dismantling of the work bridge is expected to occur within 3 to 4 months of the completed construction of the new Yellow River Bridge. The duration to complete the entire project is 555 days or by the end of February 2016; this estimate does not account for rain or weather delays, special events days, and holidays.

Nature of the effect:

Gulf sturgeon
Direct impacts may consist of: injuring, crushing or burying individual Gulf sturgeon and their prey species by construction activities with machinery, and/or sediment suspension and deposition during construction and demolition, especially if piles are removed;; disturbance of individuals due to increased noise and vibrations from drilling shafts; displacement of individuals; and habitat loss due to the addition of in-river structures, increased scour, riparian vegetation removal, decreased woody debris, potential increases in stream temperature, and the addition of fine sediments. Indirect impacts from construction may consist of altered water quality, habitat quality, and behavior of Gulf sturgeon within the stream segment. Altered behavior could include increased stress responses and disruption of migration due to construction activities (*e.g.*, elevated noise, sediment controls or equipment blocking passage, etc.), resulting in lost or reduced recruitment and/or reduced feeding due to construction activities. Elevated levels of fine sediments may affect breathing, feeding, and reproduction. Invertebrate populations, a food source for YOY and juvenile sturgeon, may also be depressed.

Direct and indirect effects may occur primarily within the Yellow River from 0.5 km (1,640 ft) upstream of the bridge and downstream as far as 1 km (3,280 ft). Activities that cause erosion and sedimentation into the stream could extend over 1,000 m (3,280 ft) downstream and even to the downstream extent of the 12-digit HUC under very high rainfall conditions; however, erosion control measures should greatly reduce these effects. In addition, road capacity improvement projects can lead to additional development within the watershed. The following agreed-upon conservation measures will greatly reduce the direct and indirect impacts from the project: the use of environmentally-sensitive bridge construction; timing of in-river bridge construction and demolition activities to avoid the peak spring migration period (March through May); prohibiting nighttime piling installation from March through November; using BMPs to control erosion, sedimentation, and turbidity; and conveying stormwater to ponds for pre-treatment before discharge.

Freshwater mussels
Stream habitat will be impacted permanently by the construction of the two bents within the river main channel (bents 7 and 8). Habitat at the eastern side channel and western oxbow is not suitable for mussels. Suitable stream habitat at the construction site will also be affected for the duration of the construction and demolition and likely for some period after completion of the projects. Direct impacts may consist of: injuring, crushing or burying individual mussels by construction activities with machinery, and/or sediment suspension and deposition; disturbance of host fish due to increased noise and vibrations from drilling shafts; displacement of

individuals; and habitat loss due to the addition of in-river structures, increased scour, riparian vegetation removal, decreased woody debris, potential increases in stream temperature, and the addition of fine sediments. Indirect impacts from construction may consist of altered water quality and habitat quality within the stream segment. Measures to reduce effects include erosion control measures, avoiding work during the 2014 mussel reproductive season (April to mid-June), and relocating individual mussels from the area where the project effects are most likely to occur.

Duration: The duration of impacts will be both short- and long-term. The duration of all work activities is estimated at 555 days. Work within the Yellow River main channel is expected to be completed in a three-week period with 3 days needed to drill each of 8 shafts. Impacts potentially can occur during the period of excavating and grading the river embankments and during construction of the temporary work bridge. Impacts are also likely to occur during demolition, especially from sediment disturbance when the piles are removed or cut. Some indirect impacts due to the presence of the bridge will be permanent, resulting from the continuing presence of the structure itself in a new, although previously impacted, location. These effects may be both short-term (such as periodic maintenance activities) and long-term (altered river hydrology and geomorphology; increased magnitude and frequency of floods and debris flows, etc.). Roads can be a major sediment source throughout their existence. Vehicular traffic is a source of chemical contamination from metals, petroleum products, and occasional toxic spills. Roads may also provide a new access point for human activity, thereby causing the spread of non-native plants, fish and mollusks, and pathogens.

Disturbance frequency: Construction activities will result in a prolonged, one-time disturbance to critical habitat within the Action Area and to the Yellow River subpopulation of Gulf sturgeon and the freshwater mussel populations. Drilling shaft for the pilings will occur as short-term pulses (*i.e.* hours), separated by virtually instantaneous and complete recovery periods. These disturbances are likely to occur intermittently throughout the day for up to six weeks. Pile removal or cutting will also occur as short-term pulses over a similar frequency and duration in the late fall and winter. In the main channel (bents 7 and 8), no in-river work activities associated with work bridge construction, replacement bridge construction, and bridge demolition will occur during the March through May main migratory period for Gulf sturgeon. In the eastern side channel (bents 11 and 12) no in-river work activities associated with work bridge construction, replacement bridge construction, and bridge demolition will occur during the April peak migratory period when water levels are 3 feet or greater. Night-time disturbance will not occur in-river (bents 7, 8, 11, 12) when Gulf sturgeon may be present (March through November). Mussels will be moved prior to the start of in-water work but not during their 2014 reproductive period (April-mid-June) to avoid construction impacts.

Water quality impairment will also occur as short-term pulses (*i.e.*, minutes to hours) during construction and demolition, most likely due to sediment disturbance from pile drilling removal or cutting and/or erosion during precipitation events. Water quality impairment may continue due to stormwater runoff for the design life of the bridge. Physical habitat alteration due to modification and replacement of existing in-river and over-water structure also occur intermittently during construction, and will remain as the final, as-built project footprint for the design life of the bridge.

Disturbance intensity and severity: The direct and temporary impacts are expected to occur during the construction phase of the project. Since work for the entire project will be approximately 555 days, the impacts of the proposed action are expected to affect multiple generations of Gulf sturgeon. We also expect individual Gulf sturgeon to use the areas in the project footprint routinely from late February through November and to recolonize daily if they are temporarily displaced during construction or demolition.

We do not have population estimates for any of these mussel species; however, considering their densities in this area and the size of the impacted area, we expect that relatively few individuals will be permanently affected. The proposed project will impact a relatively small amount of habitat within the action area, much less than 1% of the designated critical habitat in the Yellow River drainage. It is anticipated that most of the impacts will be temporary degradation, and that only a very small amount of habitat that will be permanently altered or destroyed. It is expected that the majority of individuals of each species will recover from the effects of the proposed project and that most of the habitat in the action area will eventually recover from impacts of the project.

The intensity and severity of the impacts will be reduced by implementing many of the conservation measures in the proposal. These measures include but are not limited to, the use of environmentally-sensitive bridge construction; timing of in-river (bents 7, 8, 11, 12) replacement bridge and work bridge construction, and demolition related activities to avoid the main sturgeon spring migration period (March through May); prohibiting night-time piling installation (bents 7, 8, 11, 12) from March through November; drilling shafts rather than pile driving to reduce noise levels and vibration; relocating mussels prior to in-river work; using BMPs to control erosion, sedimentation, and turbidity; and conveying stormwater to treatment ponds to eliminate direct run off into the river.

4.2 Analysis for Effects of the Action

Direct effects

This analysis will focus on the effects of the proposed work activities on the aquatic environment, including the Yellow River and adjacent riparian areas. The effects of roads and bridges on aquatic systems have been well-studied and can extend considerable distances beyond the project's construction footprint. Actions that may result in direct impacts to listed species include land clearing and grading, the construction of a temporary access road and work structure, the installation of new bridge structures, the demolition and removal of the existing bridge structures, and potential toxic spills. All of these activities have the potential to kill and injure both Gulf sturgeon and mussels (as well as their host fish), either by crushing them; poisoning them with the release of some toxic substance; or causing sedimentation, which may suffocate them. These actions also may result in direct impacts to their habitat. Construction of this new bridge will require the placement of 8 shafts in the river channel, which will result in 100.5 ft^2 of permanent fill. In addition the presence of the shafts within the channel will alter flow patterns which could cause substrate instability and bank erosion around and immediately downstream of the shafts.

Construction activity results in equipment in the river including boats, barges, temporary structures, pilings, and erosion control materials. Gulf sturgeon are known to jump out of the water, and may be struck by boats. The physical placement of bents may crush and kill individuals of the species that are within the work area, especially mussels which have very limited mobility. Erosion control material may impede movements and migration of sturgeon through and around the area. Toxic materials, *e.g.* petroleum products and other contaminants may inadvertently be released in the work area and cause physical harm to these aquatic species. Noise and vibration from heavy equipment and construction activities may increase ambient sound levels and/or cause disturbance which alters fish behavior.

All these impacts discussed have the potential to detrimentally affect Gulf sturgeon and freshwater mussels. However, the work activities with the greatest likelihood to affect listed aquatic species are associated with: piling installation and removal, especially within the river; land clearing/grubbing/filling activities in the adjacent riparian areas; and demolition of the existing bridge. These activities will cause noise, vibration, increased presence of people and machinery, debris, physical structure in habitat, and periods of increased turbidity. The greatest potential effects will likely be from noise and reduced water quality.

Noise:

Piling installation may result in underwater sound pressures that can disturb, harass, or harm fish. Fish with swim bladders, such as Gulf sturgeon, are particularly sensitive to underwater impulsive sounds with a sharp sound pressure peak occurring in short time intervals (Caltrans 2001). Freshwater mussels require host fish for certain life cycle stages; these host fish also may be impacted by noise, which could indirectly affect the mussels if the behavior or presence of the host species is altered. FDOT proposes to drill shafts to support the US 90 Yellow River Bridge. Driven piles will be used only for the temporary work bridge as they are more easily removed than drilled shafts. Impacts from the work bridge pilings are expected to be of short duration since they aren't driven as deeply as permanent piles. While impact pile driving and the effects of associated sound propagation on fish is better understood, little literature is available on the effects of drilling shafts. Because physical impact is avoided, drilling shaft is thought to produce minimal vibration and lower amplitude noise (http://construction.about.com/od/Industrial-Projects/a/Bored-Pile-Advantages.htm; June 18, 2013). In addition, drilled shaft installation may produce higher frequency sound components as it involves metal against metal. High frequency sound attenuates much more rapidly than low frequency sound (Urick 1983).

A recent baseline study in Virginia provided the first noise measurements for an oscillator system for drilled shafts (Knik Arm Bridge and Toll Authority 2011). At 30 m, the root mean square (rms) values ranged from 115.6 to 141.5 dB (referenced to 1 micropascal (μPa)), with a mean of 121.6 dB re 1 μPa. A conservative approach was used and all background construction sounds were included. Most of the recorded noise dissipated rapidly over distance. While sound propagation varies depending on environmental properties such as water depth, substrate, bottom topography and composition, and the physical properties of the equipment used, these field

values help support the concept that drilling shaft does not produce noise at levels that physically harm fish. The levels measured are well below the interim criteria for injury to fish agreed to by the Fisheries Hydroacoustic Working Group (2008).

Some degree of disturbance from noise above ambient sound levels is still reasonably expected to occur even if it doesn't cause physical harm. Removing the old bridge will require drilling and saw-cutting which also cause noise, turbidity, and elevated human activity levels in the river. Fish are likely to avoid areas being disturbed by the noise, vibration, and turbidity that may result from constructing the pilings and removing the old bridge structure. To reduce potential effects from noise and disturbance, FDOT will restrict main channel in-river (bents 7 and 8) work activities to avoid time periods when the Gulf sturgeon is most likely to be migrating to and from spawning sites in the Yellow River (March – May). Similarly, no in-river work will occur in the eastern side channel (bents 11 and 12) during the April peak migratory period for sturgeon when water levels are 3 feet or greater. To provide periods that are free from disturbance within the river, FDOT will conduct no night-time piling installation (at bents 7, 8, 11, 12) from March through November when sturgeon are known to be present in the river. Also, no blasting will be used for the bridge demolition.

Reduced Water Quality:

Road and bridge construction commonly result in increased sedimentation in riverine environments. Sediment and contaminants are likely to be released into the water by construction activities that are part of the proposed action, including geotechnical surveys, excavation, grading, filling, pile installation and removal, and in-river work that is necessary to rehabilitate or construct the road and bridges, construct and maintain the stormwater facilities, and remove the existing bridge. Soil disturbance will increase the rate at which wind and water erosion will carry sediment into the Yellow River. Pile installation and removal will also disturb the sediments in the footprint and result in some re-suspension of material into the water column. However, because the piles occupy a small area of primarily sandy substrates that are often rearranged by river currents, any increase in turbidity will likely be small and in a short-term pulse.

Contamination of sediment from the project area is probable from runoff and automobile releases. Discharge of stormwater runoff from contributing impervious areas associated with the proposed action will also contribute a variety of pollutants to Yellow River that originate directly from automobiles and indirectly via aerial deposition from industrial and agricultural production. These pollutants will include, but are not limited to, nutrients, metals (arsenic, copper, chromium, lead, mercury, and nickel), PAHs, sediment, and pesticides (Buckler and Granato 1999; Colman et al. 2001; Kayhanian et al. 2003). Nutrients and other oxygen demanding substances in stormwater lower oxygen levels in receiving waters and may lead to oxygen depletions. Additionally, the use of heavy construction equipment results in small, unpredictable releases of fuel, lubricant, and hydraulic fluids. The release of construction material, though minor is likely to occur as well (grinding slurry, concrete, and rubble).

The FDOT proposes to capture, manage, and treat stormwater in three stormwater treatment ponds (Ponds 1A, 1B, and 2). Scuppers on the bridge will allow some stormwater to drain

directly into the Yellow River. Compensatory treatment will occur in two additional areas as well by overtreatment in Pond 1A to account for the area of scuppers. The proposed treatment will not eliminate all stormwater pollutants, especially during periods of high rainfall volume. Thus, some adverse effects of stormwater runoff will exist for the design life of the road and bridge crossing.

The Gulf sturgeon and their critical habitat are likely to be affected by reduced water quality through increased sedimentation and contamination associated with road and bridge construction and demolition, and stormwater discharge. Sedimentation from soil disturbance in and near the stream may interfere with proper respiratory functioning, smother in-stream habitat and reduce the prey base for YOY and juvenile Gulf sturgeon, and reduce channel capacity. Loss of channel capacity leads to greater bank erosion, channel widening, increased temperatures and other alterations adverse to the Gulf sturgeon. However, the erosion control plan should reduce the potential for impacts to Gulf sturgeon and its critical habitat. Although little is known about contaminant effects directly on Gulf sturgeon, specific impacts of pollution and contamination on other sturgeons have been identified to include muscle atrophy, abnormality of gonad, sperm and egg development, morphogenesis of organs, tumors, and disruption of hormone production (Graham 1981; Altuf'yev et al. 1992; Dovel et al. 1992; Georgi 1993; Romanov and Sheveleva 1993, Heath 1995; Khodorevskaya et al. 1997; Kruse and Scarnecchia 2002). However, due to stormwater treatment, and the relatively small amount of time that any heavy equipment will be in the water and the use of proposed conservation measures, any increase in contaminants is likely to be small and infrequent.

Increase suspended solids (turbidity) in the water column has the potential to impair the ability for freshwater mussels to breathe and feed. The activities may cause disturbances that cause mussels to close their valves for long periods of time, affecting normal feeding, respiration, and reproductive activities. To minimize erosion and sedimentation impacts to the river, the FDOT will implement avoidance and minimization measures outlined in Section 10 of the BA. In addition, downstream mussel populations will be protected from silt and sediment displaced by construction activities through a combination of silt fencing and turbidity barriers, as well as minimizing disturbance of riverside wetlands and banks. The following agreed-upon conservation measures will greatly reduce the impacts to mussels from the project: the use of environmentally-sensitive bridge construction; moving mussels prior to the start of in-river construction activities on the main channel (bents 7 and 8), avoiding moving mussels within their 2014 reproductive period (April to mid-June), using BMPs to control erosion, sedimentation, and turbidity; and conveying stormwater to ponds for pre-treatment before discharge.

To protect individuals within the project's footprint, all southern sandshell, narrow pigtoe, fuzzy pigtoe, and other federally or state protected mussel species encountered within the impact zone will be relocated. The impact zone includes the footprint of the temporary work bridge, the footprint of the new and existing bridges, and an upstream and downstream buffer. The upstream limit of the impact zone is 25 feet upstream of the northern existing ROW line, the 200-ft ROW, and 125 feet downstream of the ROW, a total stream length of approximately 350 feet (107 m). A survey will be conducted prior to the start of in-water work, and all individuals within this area will be moved to a suitable site identified in the relocation plan. Relocating mussels is considered a viable option to protect individuals occurring within the footprint of a

project. However, adverse effects are possible with relocated individuals, including mortality, reduced fitness and reduced reproductive success. Survival after relocation hinges on selecting a proper recipient site that contains suitable habitat in areas where substrates are stable and mussel species with similar habitat preferences are present. It is expected that the majority of individuals relocated will recover from the effects of the relocation. A relocation plan will be developed in cooperation with the Service's Panama City Field Office and approved prior to the start of in-water work. The relocation plan will detail appropriate collection methods, tagging and recapture, handling and transportation of individuals, and monitoring protocols, which includes the monitoring of the relocation site for recovery, survival, movement, and growth of mussels for a period of 2 years. The Service is working with DRMP to revise and finalize the relocation procedures identified within the BA.

Potential Beneficial Effects

The bridge construction and demolition project will have some negative impacts but may have some long term beneficial effects.

1. *Increased span length.* The new bridge will span an additional 83 feet of river floodplain. This increase in span length should better facilitate flows under the bridge, and alleviate hydraulic stress during high flow events. The increase in span length may result in localized improvement of habitat quality and potentially have a beneficial effect on both Gulf sturgeon and mussels.

2. *Reduction of direct stormwater runoff.* Stormwater from the existing bridge enters the river directly from the bridge decks. The new bridge will collect and direct stormwater into catch basins, and the stormwater will then flow through a vegetated buffer before entering the river. Stormwater coming off the approaching roadways at the bridge locations will be managed in a similar manner. The elimination/reduction of runoff into the Yellow River may result in localized improvement of water quality and potentially have a beneficial effect on Gulf sturgeon and mussels.

Indirect Effects

Indirect effects are defined as those that are caused by or result from the proposed action and are later in time but are still reasonably certain to occur. The infrastructure improvements associated with bridge replacements/upgrades could indirectly affect and improve traffic levels, better accommodate larger vehicles, or reduce travel times, all of which could have land development impacts outside the project area. Given that the project involves the replacement of existing structure in essentially the same location, and that traffic capacity will remain the same for the new bridge, it is not likely that the new structure would increase accessibility to the adjacent land or result in changes in the type or volume of traffic using the structure.

Interrelated and Interdependent Actions

We must consider along with the effects of the action the effects of other federal activities that are interrelated to, or interdependent with, the proposed action (50 CFR sect. 402.02).

Interrelated actions are part of a larger action and depend on the larger action for their justification. Interdependent actions have no independent utility apart from the proposed action. At this time, the Service is unaware of actions that satisfy the definitions of interrelated and interdependent actions that will not themselves undergo section 7 in the future, or that are not already included in the Baseline.

4.3 Species Response to the Proposed Action

Effects to Gulf Sturgeon

While the use of the conservation measures described above should greatly reduce direct impacts to individual Gulf sturgeon and critical habitat, some injury and mortality is expected along with displacement of fish for the time period that in-river work will take place. Mortality may result from boat strikes, construction debris, equipment movement, muck removal, placement of fill, and sedimentation. Displacement will result from disturbance, increased human presence, and the noise associated with construction activities, including demolition of the existing structure. Direct impacts of injury or mortality would most likely occur within the 200-foot work area. Effects of disturbance and displacement from elevated noise and vibration associated with pile installation and removal, and other construction activities may occur upstream and downstream of the bridge. Due to the use of drilled shaft, increased sound levels should be minimal and effects are not expected to extend beyond 100 feet from the edge of the 200-ft construction zone. Some direct effects from reduced water quality are reasonably certain to occur downstream from the bridge crossing and are expected to occur within 300 feet of the construction zone. Indirect effects for this project include the potential accumulation of small levels of contaminants from stormwater runoff that carry dirt/dust and petroleum products from road use. These indirect effects would contribute to degraded water quality. The indirect effect of increased human development is not expected from this action since the project doesn't increase traffic capacity or provide new access into previously undeveloped areas.

The proposed action would result in a prolonged (555 days total), temporary disturbance to Gulf sturgeon within the Action Area. Direct impacts are expected to occur during the bridge construction phase of the project. Because the entire Yellow River subpopulation of Gulf sturgeon must pass through the action area, all of the individuals have the potential to be affected by the proposed project; however, we do not expect impacts to be substantial. In general, the proposed project will result in additional boat traffic and potential for interaction between boats and equipment and Gulf sturgeon in the river. Given the small increase in boat traffic, the slow speeds that these boats are expected to operate at, the risk of boat and equipment strikes is not high, and we expect few interactions. We cannot quantify the number of individuals that may be directly taken through interactions with boats or equipment or the number of individuals indirectly affected by elevated noise from pile installation, because it depends on the number of individuals in the area of impact, which varies widely based on time of year and habitat condition. Potential impacts to feeding are expected to be minimal because YOY sturgeon are wide-ranging, and invertebrate food sources are abundant in the Yellow River. Potential impacts to migration and spawning are also expected to be minimal as a result of avoiding pile

installation and bridge demolition during the peak migration periods. Effects of sedimentation and contamination will be greatly reduced through the use of stormwater treatment ponds and an effective erosion control plan.

Effects to Gulf Sturgeon Critical Habitat

The proposed action has the potential to affect the following PCEs of critical habitat in the lower Yellow River: 1) food items, 2) riverine aggregation areas, 3) water quality, 4) sediment quality, and 5) safe and unobstructed migratory pathways. These impacts will be temporary and have the greatest potential to occur during bridge construction and demolition. Impacts to water quality, sediment quality, and food resources could occur from sedimentation and contamination; however, any impacts will be greatly reduced through the use of stormwater treatment ponds and an effective erosion control plan. Riverine aggregation areas and safe and unobstructed migratory pathways both have the potential to be affected by elevated noise from pile installation, bridge demolition, and displacement from other construction activities. However, the nearest known aggregation area is approximately 7.4 miles downstream. These impacts are also greatly reduced through the use of conservation measures described above. None of the impacts are expected to permanently modify PCEs of the designated critical habitat.

Effects to Mussels

The 2010 mussel survey at the bridge site indicated that at least 20 southern sandshells, 3 narrow pigtoes, and 1 fuzzy pigtoe are present within the action area, and at least 3 of these mussels (2 southern sandshells and 1 narrow pigtoe) are present in the expected impact zone. However, not all individuals may have been found during the survey. In general, mussels can be very difficult to locate in the substrate, and most mussel surveys detect only those specimens located at or on the surface of the substrate. Several factors can affect the ability to detect freshwater mussels during visual surveys such as water clarity and depth, mussel species and life stage, season, and habitat (Strayer and Smith 2003). In addition, visual searches are not suited for detecting small individuals and juveniles and those that bury deep in the sediment (Strayer and Smith 2003). Therefore, it is likely that additional mussels were present in the project area which were overlooked or were not visible on the surface of the stream bottom.

It is difficult to accurately estimate of the total number of mussels that will be impacted. Studies examining capture/recapture probabilities show the likelihood of detecting individual mussels can vary widely. The recapture (capture) probability for shinyrayed pocketbook from Sawhatchee Creek ranged from a low of 49% in 2006 to 83% in 2008 (Wisniewski pers. comm. 2011). A study conducted on 4 mussel species in the Altamaha River, a large lowland river in Georgia, found capture probabilities ranged from 8 to 20% and was lowest in swiftwater and greatest in slackwater (Meador et al. 2011). Both studies searched for mussels at or just below the substrate surface, therefore, the number of individuals present in the search area but not detected was likely higher. Due to its similarities to the Altamaha River and to take a precautionary approach, we've assumed capture probabilities for the Yellow River are approximately 8-20%. Based on the number of individuals located in the action area, and considering the factors that may affect detectability in the action area, we estimate that between 100-250 southern sandshells, 15-37 narrow pigtoes, and 5-12 fuzzy pigtoes are present in the

1.5-kilometer action area. Even with all protective measures in place, we expect some level of impacts to mussels within the 200-foot (61-m) construction zone from construction activities 24-foot upstream buffer, and an additional 125 feet (38-m) downstream from potential sedimentation and water quality impacts. Within this 350-foot (107-m) impact zone, we estimate that between 10-25 southern sandshells, 5-12 narrow pigtoes, and 0-1 fuzzy pigtoes are present.

Since all individuals detected within the impact zone will be relocated to an unaffected area, we expect that the actual numbers injured, killed, or otherwise adversely affected will be lower than the number estimated present. Although we do not have range-wide population estimates for any of the three species, we do know from recent surveys in various portions of their ranges that these numbers represent a very small percentage of each species' population.

Effects to Mussel Critical Habitat

The proposed project will permanently alter or destroy a very small amount critical habitat – much less than 1% of the designated critical habitat in the Yellow River drainage. It is not expected to appreciably change or reduce the availability of habitat for listed mussels within the action area. Outside of the permanent habitat losses, we anticipate temporary degradation to critical habitat within the action area. Once the new bridge support structures are completed and existing pilings are removed, there is likely to be some unavoidable, localized reconfiguration of the riverbed. Slight modifications in flow and current patterns within the river channel may occur as new bridge support structures are constructed and old piles are removed.

Primary constituent elements should not be permanently altered through project implementation and the action would not diminish the conservation value of critical habitat. For the PCEs of the critical habitat: 1) Impacts to the geomorphic stability of the Yellow River channel caused by the current bridge will likely continue with the new bridge, and some slight shift in the channel may occur. Overall channel function is expected to remain good and will not be permanently modified by the project. 2) Conditions that select for preferred substrates should not be permanently affected by the project. While construction activities could lead to additional sediment loads, erosion control measures and following BMPs should reduce this risk. 3) The action will not alter the hydrologic flow regime necessary for mussel conservation. All occupied mussel habitat will retain flowing water throughout the duration of work. While there may be some slight modification to current patterns during construction, river dynamics should return to a similar baseline condition once work is complete. 4) Water quality may experience some temporary degradation due to increases in turbidity, however these effects should be short-term (such as during construction of new supports and pulling/cutting old piles). 5) The structure of the fish host community could experience temporary effects. However, by timing in-water work to avoid the mussels' breeding season, there will be no effect to the mussels' ability to infect fish hosts. No impediment to fish passage or movement through the action area is expected.

The proposed project will impact a relatively small amount of habitat. It is expected that the majority of individuals of each species will recover from the effects of the proposed project and that habitat in the action area will not be permanently altered or lost.

5.0 CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any specific plans within the Action Area that would not be covered under section 7.

6.0 CONCLUSION

Gulf Sturgeon

Our analysis indicates that the proposed project would have a negative, but not appreciable effect on the survival and recovery of Gulf sturgeon. Most direct and indirect effects will occur within the 200-ft work area, although some effects (*e.g.* noise, sedimentation, vibration, human activity) may occur further upstream and downstream of the project; however, the effects are considered small, temporary and reversible. Given that the subpopulation of Gulf sturgeon in the Yellow River is stable or increasing, the probability of species extinction is low. In addition, the proposed project is not likely to appreciably diminish the critical habitat's capability to provide the intended conservation role for the Gulf sturgeon. The nature of effects to critical habitat is relatively small, dynamic, and would not produce permanent alterations to any PCE.

After reviewing the current status of the Gulf sturgeon, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the proposed replacement of the US 90 bridge on the Yellow River is not likely to jeopardize the continued existence of the Gulf sturgeon or destroy or adversely modify its designated critical habitat.

Freshwater Mussels

After reviewing the current status of the southern sandshell, narrow pigtoe, and fuzzy pigtoe; the environmental baseline for the action area; the effects of bridge construction and demolition; measures identified in the FDOT's BA to help minimize the potential impacts of the proposed project and assist in the protection, management, and recovery of the species; the absence of previously issued Service biological opinions that have allowed incidental take; any potential interrelated and interdependent actions associated with the proposed action; and any potential cumulative effects, it is the Service's biological opinion that the US 90 Yellow River bridge replacement project, as proposed is not likely to jeopardize the continued existence of the southern sandshell, narrow pigtoe, or fuzzy pigtoe. Critical habitat will not be adversely modified or destroyed by implementing this project as proposed.

7.0 INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined

as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering [50 CFS §17.3]. Incidental take is defined as take that is incidental to, and not the purpose of, an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by FDOT so that they become binding conditions of any contract, grant or permit issued by the FHWA, as appropriate, for the exemption in section 7(o)(2) to apply. FHWA and FDOT have a continuing duty to regulate the activity covered by this incidental take statement. If FHWA and FDOT: (1) fail to assume and implement the terms and conditions or, (2) fail to require any contracted group to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, FHWA and FDOT must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(I)(3)]

7.1 Amount Or Extent Of Take Anticipated

Gulf Sturgeon

Incidental take is expected to be in the form of temporary direct and indirect impacts resulting from construction activities, elevated noise levels and vibration, human disturbance, impaired water quality, and habitat degradation. While injury or mortality of individuals is possible, the risk will be reduced by the use of environmentally-sensitive bridge construction techniques, and conservation measures that minimize the impacts of pile installation, erosion, and ground disturbance. As described above (Effects of the Action), we cannot quantify the number of individuals that may be directly or indirectly affected by the proposed action because it depends on the number of individuals in the area of impact, which varies widely based on time of year and habitat condition. Therefore, take cannot be accurately quantified as the number of individual Gulf sturgeon that are reasonably certain to be injured or killed, or indirectly impacted through habitat degradation. We instead consider take in terms of habitat as follows:

1. *Collisions with boats, equipment, and falling debris:* Take as a result of physical injury or death may occur as a result of boat or equipment strikes, and other activities associated with in-river construction. These effects would be most likely to occur within the 200-foot construction area.

2. *Noise*: Take may occur due to sound levels of construction activities above ambient sound levels. The effects of noise are not expected to extend more than 100 feet

upstream and downstream beyond the perimeter of the 200-ft construction zone. Effects are limited to behavioral disturbance which likely will cause fish to avoid the area.

3. *Reduced Water Quality*: Take caused by reduced water quality due to construction and demolition activities and stormwater is reasonably certain to occur from the bridge crossing and extend up to 3,280 feet downstream. The best available indicators for the extent of take due to reduced water quality are evidence of turbidity released during construction. This variable is proportional to the amount of construction-related disturbance of upland and stream channel habitats that results in erosion and suspended sediment in runoff and the water column. We anticipate that these effects should not result in a visible turbidity plume more than 300 feet from the project footprint. The best available indicator for the extent of take due to reduced water quality is no more than a 10% cumulative increase in natural stream turbidity 300 feet from an upland or in-river construction activity, as measured relative to a control point immediately upstream of the turbidity-causing activity. Another indicator of take due to reduced water quality is turbidity in excess of the 29 NTUs above ambient as allowed under the Florida Department of Environmental Protection's (FDEP) stormwater permit.

Thus, Gulf sturgeon take in the form of physical harm, mortality, or harassment is expected to include the following linear measurement of habitat in the Yellow River: the 200-foot ROW, 100 feet upstream of the ROW, and 300 feet downstream of the ROW for a total distance of 600 linear feet. Table 3 summarizes expected take below.

Freshwater Mussels

The Service anticipates that incidental take of no more than 25 southern sandshells, 12 narrow pigtoes, and 1 fuzzy pigtoe may occur as the result of the proposed project within a 350-foot impact zone. These numbers are higher than the observed number of each species found in the impact zone because all individuals of the species may not have been found during the survey. Current knowledge does not provide for extrapolation of the true number present based on the number that was observed. The level of take is, therefore, an educated guess based on our knowledge that the detection of individuals will depend on numerous variables such as species, life stage, water velocity, depth, and clarity, survey methods and effort, surveyor experience, season, catchment size, and substrate. These and other factors may confound an accurate count of all mussels present in the impact area. However, we believe these numbers represent a reasonable expectation of the total number of individuals present in the impact area and will allow for the completion of the project without undue risk to the species present. Take of these species is expected in the form of kill, harm, and harassment through bridge construction and removal, relocation, and also as a result of effects associated with sedimentation and other habitat alterations, some of which may occur later in time.

At this time, 2 southern sandshells and 1 narrow pigtoe are known to be located in the construction impact zone. Another survey will be completed prior to construction. All individuals found in this area will be re-located to the designated relocation site.

Table 3. The riverine habitat and associated individuals affected by the proposed project. This estimate is based on the best available information.

Species	***Habitat***	***Individuals***	***Take Type***
Gulf sturgeon	600 linear feet	*All adult and juvenile sturgeon within the habitat area that may be harmed, killed, or harassed by construction work activities and increased turbidity levels.*	*Harm, Harass, or Kill*
Southern sandshell		*25*	*Harm, Harass, or Kill*
Narrow pigtoe		*12*	*Harm, Harass, or Kill*
Fuzzy pigtoe		*1*	*Harm, Harass, or Kill*

7.2 Effect Of The Take

In the accompanying biological opinion, the Service determined that this level of anticipated take will not result in jeopardy to the Gulf sturgeon, southern sandshell, fuzzy pigtoe, and narrow pigtoe, or the destruction or adverse modification of their designated critical habitat. Measures to reduce potential impacts to the Gulf sturgeon, southern sandshell, fuzzy pigtoe, and narrow pigtoe and their critical habitat have been incorporated into the plans for this road construction project.

7.3 Reasonable And Prudent Measures

The Service believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize the incidental take of Gulf sturgeon, freshwater mussels, and their critical habitat as a result of replacing the US 90 Yellow River bridge. Each RPM will be implemented by associated terms and conditions given in the section to follow. FHWA, as the lead federal agency, shall assure that the following reasonable and prudent measures, with their associated terms and conditions are implemented by the FDOT and their contractor.

RPM 1: Gulf sturgeon and freshwater mussel protection, and habitat protection and restoration procedures to minimize impacts from all the construction activities shall be implemented.

RPM 2: Ensure that the terms and conditions are accomplished and completed as detailed in this incidental take statement including completion of reporting requirements.

7.4 Terms and Conditions

In order to be exempt from the prohibition of section 9 of the Act, FHWA must ensure that the FDOT and their contractors comply with the following terms and conditions, which implement the preceding reasonable and prudent measures. All conservation measures described in the BA and listed above are hereby incorporated by reference as terms and conditions within this document pursuant to 50 CFR § 402.14(I) with the addition of the following terms and conditions. All terms and conditions are non-discretionary.

RPM 1

1.1 The FDOT will provide an information package at the Pre-Construction Conference to educate the Contractor on the subject of the listed species, the laws protecting such species, and the civil and criminal penalties for harming, harassing, or killing such species.

1.2 The FDOT shall provide a final mussel relocation plan for approval by the Service and conduct relocation activities in accordance with the plan.

1.3 The FDOT or their contractors shall conduct a mussel survey just prior to the start of in-river construction activities, and relocate all federally protected mussels encountered within the construction impact zone to a site designated in the relocation plan.

1.4 The FDOT shall provide a detailed report of the mussel relocation event and an annual monitoring report of the relocation recipient site. A report shall be provided: (a) 30 days following relocation; and (b) annually for two years post-relocation, beginning one year following the relocation event, and as described in the Mussel Relocation Plan. The report shall be forwarded to the Service's Panama City Field Office within 30 days of conducting the surveys. Future surveys shall follow the Freshwater Mussel Survey Protocol for the Southeastern Atlantic Slope and Northeastern Gulf Drainages in Florida and Georgia. Data to be collected during the surveys shall include: (a) observed species and number of individuals; (b) size, sex, and reproductive status (if possible) of protected species; (c) water levels; (d) flow rates; (e) stream stability; (f) turbidity; (g) bank vegetation and stability; (h) water temperature; and (i) sedimentation levels.

1.5 The Contractor will consider and implement where practical innovative, environmentally sensitive construction techniques to avoid/minimize impacts to listed species and sensitive areas.

1.6 All timing restrictions applicable to construction of the permanent bridge will also apply to construction of the temporary in-river work structure.

1.7 The Erosion Control Plan/Stormwater Pollution Prevention Plan (SPPP) will be provided to the Service for comment prior to the start of work. Substantive changes to the SPPP during construction will also be reported to the Service.

1.8 The Erosion Control Plan/SPPP will be strictly adhered to, including the installation and maintenance of structures and demolition of the current structure. Temporary erosion control devices will be installed prior to clearing and grubbing activities. Other measures in the plan will include:

a. All turbidity barriers placed in the river will be consistent with the *Gulf Sturgeon Protection Guidelines.*
b. Stockpiled materials will be placed in a manner to prevent rain runoff from washing materials into the river.
c. The Erosion Control Plan will include redundant measures for the width of the ROW along the Yellow River to provide "back-up protection" should one layer of protection be breached. An example would be a double row of silt fencing.
d. The Erosion Control Plan will include daily monitoring of erosion control devices that protect the waters of the Yellow River.

1.9 In the event of erosion control failure with impacts to the Yellow River, the Contractor will notify the FDOT, FHWA, and Service to determine: (1) whether incidental take was exceeded, (2) if additional protection measures are needed to avoid future impacts to listed species from sedimentation, and (3) if stream restoration is needed. The Service will be available to assist the FDOT with development of a stream restoration plan should it become necessary

1.10 Stream turbidity will be monitored by the Project Administrator or his designee before construction in various places on the river (upstream, downstream, etc.) to establish a baseline. During construction and demolition, the Project Administrator will be responsible for monitoring turbidity levels daily for any earthwork activities near the Yellow River to ensure that turbidity levels do not increase above the level allowed by the FDEP permit (29 NTUs above ambient). Construction activities found to be associated with the increased turbidity levels will not be allowed to resume until the turbidity levels return to that of ambient. All other construction activities having no effect on the deviant turbidity levels will be allowed to resume once the source has been identified.

1.11 Boats and barges used in support of construction activities will be removed from the main Gulf sturgeon migration route (main channel; bents 7 and 8) during periods of inactivity.

1.12 A post-construction field review will be conducted by FDOT and the Service to determine if the project has impacted the Yellow River and if stream restoration is needed.

1.13 Conservation measures and best management practices outlined in the BA and these terms and condition shall be included as enforceable provisions of the construction contract. Failure to comply with all applicable conservation measures outlined in the BA, unless they conflict with provisions in these terms and conditions, and all terms and conditions included here may invalidate protective coverage of ESA section 7(o)(2) regarding the incidental take of listed species.

RPM 2

2.1 Upon locating a dead, injured, or sick individual of an endangered or threatened species, notification must be made to the Fish and Wildlife Service Law Enforcement Office, Groveland, Florida at (352) 429-1037 within 24 hours. FDOT will first contact Eglin Natural Resource Section at (850) 882-4164, who will then the Service's Law Enforcement within the 24-hour window. Eglin will provide additional notification to the Fish and Wildlife Service's Field Office at Panama City, Florida at (850) 769-0552 within 48 hours. Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

2.2 A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Project Leader, U.S. Fish and Wildlife Service, 1601 Balboa Avenue, Panama City, Florida, 32405, within 60 days of the completion of construction. This report shall include the dates of work, assessment and actions taken to address impacts to the Gulf sturgeon and freshwater mussels, if they occurred.

8.0 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by conducting conservation programs for the benefit of endangered and threatened species. Towards this end, conservation recommendations are discretionary activities that an action agency may undertake to minimize or avoid the adverse effects of a proposed action, help implement recovery plans, or develop information useful for the conservation of listed species.

Little is known on the level of sound generated from various pile installation methods and its effects on Gulf sturgeon. There is not an extensive body of literature on the effects of pile driving and drilling shafts on fishes and many of the existing studies were conducted under conditions that make the interpretation of the results uncertain. FDOT has several upcoming projects to construct bridges in Gulf sturgeon critical habitat that provide good opportunities to collect basic data on sound generation for both pile driving and drilled shaft pile installation methods. Therefore, the Service recommends that FHWA and FDOT consider funding a study to monitor sound levels during various pile installation activities for Florida rivers. This data could be used to assist in future section 7 consultations.

9.0 REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the BA. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information shows that the action may affect listed species in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by

the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. This biological opinion was formulated by evaluating the effects of the action assuming that construction would begin within the next five years. If the let date does not occur within five years of this biological opinion, the Service would consider that the action was modified in a manner not considered in this opinion, and we would recommend reinitiating formal consultation.

We appreciate the cooperation of FHWA, FDOT, and their consultants in preparing this biological opinion. We look forward to working closely with you in implementing its provisions and other conservation actions for listed species. Please contact Ms. Mary Mittiga at ext. 236 for questions/comments on this consultation, Ms. Karen Herrington at ext. 250 for information on the Gulf sturgeon, and Sandy Pursifull at ext. 240 for information on freshwater mussels.

Sincerely,

Dr. Don W. Imm
Project Leader

cc: (electronic copies)
ACOE, Panama City, FL (Melinda Witgenstein)
FDOT, District 3, Chipley, FL (Laura Haddock, Natalie Furman)
FWC, Tallahassee, FL (David Cook, Jeffrey Wilcox)
FWS, Atlanta, GA (Shirley Morrow)
FWS, Niceville, FL (Bill Tate)

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APPENDIX A

Standard Protection Measures for Eastern Indigo Snake

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE

1. An eastern indigo snake protection/education plan shall be developed by the applicant or requestor for all construction personnel to follow. The plan shall be provided to the Service for review and approval at least 30 days prior to any clearing activities. The educational materials for the plan may consist of a combination of posters, videos, pamphlets, and lectures (*e.g.*, an observer trained to identify eastern indigo snakes could use the protection/education plan to instruct construction personnel before any clearing activities occur). Informational signs should be posted throughout the construction site and along any proposed access road to contain the following information:

    a. a description of the eastern indigo snake, its habits, and protection under Federal Law;
    b. instructions not to injure, harm, harass or kill this species;
    c. directions to cease clearing activities and allow the eastern indigo snake sufficient time to move away from the site on its own before resuming clearing; and,
    d. telephone numbers of pertinent agencies to be contacted if a dead eastern indigo snake is encountered. The dead specimen should be thoroughly soaked in water and then frozen.

2. If not currently authorized through an Incidental Take Statement in association with a Biological Opinion, only individuals who have been either authorized by a section 10(a)(1)(A) permit issued by the Service, or by the State of Florida through the Florida Fish Wildlife Conservation Commission (FWC) for such activities, are permitted to come in contact with an eastern indigo snake.

3. An eastern indigo snake monitoring report must be submitted to the appropriate Florida Field Office within 60 days of the conclusion of clearing phases. The report should be submitted whether or not eastern indigo snakes are observed. The report should contain the following information:

    a. any sightings of eastern indigo snakes and
    b. other obligations required by the Florida Fish and Wildlife Conservation Commission, as stipulated in the permit.

Revised February 12, 2004

APPENDIX B

Construction Special Provisions

Gulf Sturgeon Protection Guidelines

September 2012

CONSTRUCTION SPECIAL PROVISIONS
GULF STURGEON PROTECTION GUIDELINES
(PURSUANT TO NMFS AND USFWS)

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is listed under the Endangered Species Act as threatened. It is managed under the joint jurisdiction of the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Potential habitat for the Gulf sturgeon is located within the limits of this project.

The following special provisions will be incorporated into any construction contract where involvement with sturgeon may occur:

The FDOT has coordinated with the NMFS and USFWS early in the project development stage. The following provisions are intended to avoid/ protect known spawning habitats, nursery areas, feeding areas and thermal refuges.

1. The Florida Department of Transportation (FDOT) shall advise all FDOT project personnel and Contractor personnel on the project that there are civil and criminal penalties for harming, harassing or killing sturgeon. The FDOT and the Contractor will be held responsible for any sturgeon harmed, harassed, or killed as a result of the project activity.

2. The FDOT shall provide information to all FDOT and Contract personnel for identification of sturgeon.

3. Appropriate work shift personnel will be instructed in the appearance, habits, biology, migratory patterns, and preservation of sturgeon. At least one of these trained personnel will be on site during construction activities to maintain a constant surveillance for these species, assure the cessation of activities (such as dredging, excess turbidity, and construction barge activity), which may endanger these species, and assure that uninhibited passage for the animals is provided.

4. Post signs on site warning of the presence of sturgeon, of their endangered status and federal protection, and precautions needed.

5. Turbidity from construction activity will be adequately controlled to prevent degradation of the quality and transparency of the water. When sturgeon are present, turbidity curtains of appropriate dimension will be used to restrict the animals' access to the work area. Pollution booms or turbidity curtains should use tangle resistant or hemp rope when anchoring, or employ surface anchors' to prevent entangling sturgeon. Continuous surveillance will be maintained in order to free animals which may become trapped in silt or turbidity barriers.

6. No dredging of the river bottom will be conducted for barge access.

7. Drilled shaft pile construction will be used whenever prudent and feasible as determined by FDOT.

8. Care shall be taken in lowering equipment or material below the water surface and into the stream bed. These precautions will be taken to ensure no harm occurs to any sturgeon which may enter the construction area undetected.

9. Construction debris shall not be discarded into the water.

10. If the use of explosives is necessary, the following protection measures will be employed for projects in FDOT's District 3

    a. In riverine areas:
    - No blasting will occur in known spawning, staging, feeding, or nursery areas.
    - In-water explosive work should be avoided between the months of April to October.
    - If explosive work becomes necessary within the April to October time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.

    b. In estuarine areas:
    - No blasting will occur in known spawning, staging, feeding, or nursery areas.
    - In-water explosive work should be avoided between the months of October to April.
    - If explosive work becomes necessary within the October to April time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.

    c. In the event that a sturgeon is killed during blasting, the NMFS and the USFWS will be notified immediately.

    National Marine Fisheries Service
    by email at:
    takereport.nmfsser@noaa.gov

    US Fish and Wildlife Service
    1601 Balboa Ave.
    Panama City, Florida 32405
    Tel: (850) 769-0552

11. Any sturgeon carcass will be secured on site or held in a freezer until an agency representative arranges for its transport for analysis.

12. Following completion of the project, a report summarizing any involvement with sturgeon will be prepared for USFWS and NMFS.

C:\Users\mmittiga\Documents\Endangered\Biological Opinions\US 90 Yellow River bridge\Final BO\US 90 Yellow River Bridge_finalBO_20130905.docx

CONSTRUCTION SPECIAL PROVISIONS
GULF STURGEON PROTECTION GUIDELINES
(PURSUANT TO NMFS AND USFWS)

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is listed under the Endangered Species Act as threatened. It is managed under the joint jurisdiction of the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Potential habitat for the Gulf sturgeon is located within the limits of this project.

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2. The FDOT shall provide information to all FDOT and Contract personnel for identification of sturgeon.

3. Appropriate work shift personnel will be instructed in the appearance, habits, biology, migratory patterns, and preservation of sturgeon. At least one of these trained personnel will be on site during construction activities to maintain a constant surveillance for these species, assure the cessation of activities (such as dredging, excess turbidity, and construction barge activity), which may endanger these species, and assure that uninhibited passage for the animals is provided.

4. Post signs on site warning of the presence of sturgeon, of their endangered status and federal protection, and precautions needed.

5. Turbidity from construction activity will be adequately controlled to prevent degradation of the quality and transparency of the water. When sturgeon are present, turbidity curtains of appropriate dimension will be used to restrict the animals' access to the work area. Pollution booms or turbidity curtains should use tangle resistant or hemp rope when anchoring, or employ surface anchors' to prevent entangling sturgeon. Continuous surveillance will be maintained in order to free animals which may become trapped in silt or turbidity barriers.

6. No dredging of the river bottom will be conducted for barge access.

7. Drilled shaft pile construction will be used whenever prudent and feasible as determined by FDOT.

8. Care shall be taken in lowering equipment or material below the water surface and into the stream bed. These precautions will be taken to ensure no harm occurs to any sturgeon which may enter the construction area undetected.

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       - If explosive work becomes necessary within the October to April time frame, a non-lethal "Fish Scare" charge will be detonated one minute prior to detonation of the underwater blast.

    c. In the event that a sturgeon is killed during blasting, the NMFS and the USFWS will be notified immediately.

       National Marine Fisheries Service
       by email at:
       takereport.nmfsser@noaa.gov

       US Fish and Wildlife Service
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       Panama City, Florida 32405
       Tel: (850) 769-0552

11. Any sturgeon carcass will be secured on site or held in a freezer until an agency representative arranges for its transport for analysis.

12. Following completion of the project, a report summarizing any involvement with sturgeon will be prepared for USFWS and NMFS.

STANDARD PROTECTION MEASURES FOR THE EASTERN INDIGO SNAKE
U.S. Fish and Wildlife Service
August 12, 2013

The eastern indigo snake protection/education plan (Plan) below has been developed by the U.S. Fish and Wildlife Service (USFWS) in Florida for use by applicants and their construction personnel. At least **30 days prior** to any clearing/land alteration activities, the applicant shall notify the appropriate USFWS Field Office via e-mail that the Plan will be implemented as described below (North Florida Field Office: jaxregs@fws.gov; South Florida Field Office: verobeach@fws.gov; Panama City Field Office: panamacity@fws.gov). As long as the signatory of the e-mail certifies compliance with the below Plan (including use of the attached poster and brochure), no further written confirmation or "approval" from the USFWS is needed and the applicant may move forward with the project.

If the applicant decides to use an eastern indigo snake protection/education plan other than the approved Plan below, written confirmation or "approval" from the USFWS that the plan is adequate must be obtained. At least 30 days prior to any clearing/land alteration activities, the applicant shall submit their unique plan for review and approval. The USFWS will respond via e-mail, typically within 30 days of receiving the plan, either concurring that the plan is adequate or requesting additional information. A concurrence e-mail from the appropriate USFWS Field Office will fulfill approval requirements.

The Plan materials should consist of: 1) a combination of posters and pamphlets (see **Poster Information** section below); and 2) verbal educational instructions to construction personnel by supervisory or management personnel before any clearing/land alteration activities are initiated (see **Pre-Construction Activities** and **During Construction Activities** sections below).

POSTER INFORMATION

Posters with the following information shall be placed at strategic locations on the construction site and along any proposed access roads (a final poster for Plan compliance, to be printed on 11" x 17" or larger paper and laminated, is attached):

DESCRIPTION: The eastern indigo snake is one of the largest non-venomous snakes in North America, with individuals often reaching up to 8 feet in length. They derive their name from the glossy, blue-black color of their scales above and uniformly slate blue below. Frequently, they have orange to coral reddish coloration in the throat area, yet some specimens have been reported to only have cream coloration on the throat. These snakes are not typically aggressive and will attempt to crawl away when disturbed. Though indigo snakes rarely bite, they should NOT be handled.

SIMILAR SNAKES: The black racer is the only other solid black snake resembling the eastern indigo snake. However, black racers have a white or cream chin, thinner bodies, and WILL BITE if handled.

LIFE HISTORY: The eastern indigo snake occurs in a wide variety of terrestrial habitat types throughout Florida. Although they have a preference for uplands, they also utilize some wetlands

and agricultural areas. Eastern indigo snakes will often seek shelter inside gopher tortoise burrows and other below- and above-ground refugia, such as other animal burrows, stumps, roots, and debris piles. Females may lay from 4 - 12 white eggs as early as April through June, with young hatching in late July through October.

PROTECTION UNDER FEDERAL AND STATE LAW: The eastern indigo snake is classified as a Threatened species by both the USFWS and the Florida Fish and Wildlife Conservation Commission. "Taking" of eastern indigo snakes is prohibited by the Endangered Species Act without a permit. "Take" is defined by the USFWS as an attempt to kill, harm, harass, pursue, hunt, shoot, wound, trap, capture, collect, or engage in any such conduct. Penalties include a maximum fine of $25,000 for civil violations and up to $50,000 and/or imprisonment for criminal offenses, if convicted.

Only individuals currently authorized through an issued Incidental Take Statement in association with a USFWS Biological Opinion, or by a Section 10(a)(1)(A) permit issued by the USFWS, to handle an eastern indigo snake are allowed to do so.

IF YOU SEE A LIVE EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and allow the live eastern indigo snake sufficient time to move away from the site without interference;
- Personnel must NOT attempt to touch or handle snake due to protected status.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- If the snake is located in a vicinity where continuation of the clearing or construction activities will cause harm to the snake, the activities must halt until such time that a representative of the USFWS returns the call (within one day) with further guidance as to when activities may resume.

IF YOU SEE A DEAD EASTERN INDIGO SNAKE ON THE SITE:

- Cease clearing activities and immediately notify supervisor or the applicant's designated agent, **and** the appropriate USFWS office, with the location information and condition of the snake.
- Take photographs of the snake, if possible, for identification and documentation purposes.
- Thoroughly soak the dead snake in water and then freeze the specimen. The appropriate wildlife agency will retrieve the dead snake.

Telephone numbers of USFWS Florida Field Offices to be contacted if a live or dead eastern indigo snake is encountered:

North Florida Field Office – (904) 731-3336
Panama City Field Office – (850) 769-0552
South Florida Field Office – (772) 562-3909

PRE-CONSTRUCTION ACTIVITIES

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.

2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.

3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

DURING CONSTRUCTION ACTIVITIES

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).

2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.

3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

POST CONSTRUCTION ACTIVITIES

Whether or not eastern indigo snakes are observed during construction activities, a monitoring report should be submitted to the appropriate USFWS Field Office within 60 days of project completion. The report can be sent electronically to the appropriate USFWS e-mail address listed on page one of this Plan.

Bruner, Joseph Brandon

From: Marshall, Amanda
Sent: Tuesday, January 07, 2014 8:25 AM
To: Bruner, Joseph Brandon
Subject: RE: status reports

All of my projects are on track, but here's a few that might come up in the Prod Mtg. If anything else comes up just send me a text. I'll let you know what I hear back from Melissa Hoover on SR 87.

- SR 87: On 12/19, Melissa Hoover said Eglin was ready to sign the MOA, then it could be sent to FHWA and SHPO for signature. I just sent her an email asking for the status of this. Once the MOA is complete, Eglin will be ready to review/approve the EA. Here's the order of which everything must occur for us to get our Reevaluation approved by FHWA.

  1. Complete MOA
  2. Eglin Approve EA
  3. FDOT Complete Section 4(f) Requirements (Natalie is working on this)
  4. Revise Reevaluation to include EA and Section 4 (f) info.
  5. Submit Reevaluation to FHWA for approval.

- SR 79 – 220773-9 Phase C & D: Waiting for updated plans so these reevaluations can be completed.

- Ochlockonee Bay Bike Trail – Phase 5A (414032-2) & Phase 5B (TBD): This project has an accelerated schedule. The CRAS has been sent to FHWA/SHPO for concurrent review. As long as their review stays on schedule, we plan to have this project complete by the end of January.

From: Bruner, Joseph Brandon
Sent: Monday, January 06, 2014 9:44 AM
To: Hagans, Alan; Williams, April; Joy Swanson; Furman, Natalie; Marshall, Amanda; Carlisle, Virginia
Subject: status reports

Need updates by cob Tuesday. Thanks.

J. BRANDON BRUNER, P.E.
District Environmental Management Engineer
FDOT District Three
Environmental Management Office
Ph: 850.330.1509
Fax: 850.330.1486
