HERBERT HOOVER DIKE MAJOR REHABILITATION
GLADES, HENDRY, MARTIN, OKEECHOBEE AND PALM BEACH COUNTIES

ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT

HERBERT HOOVER DIKE
CULVERT REPLACEMENT AND REMOVAL

U.S. Army Corps of Engineers
Jacksonville District

May 2011

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FINDING OF NO SIGNIFICANT IMPACT
HERBERT HOOVER DIKE MAJOR REHABILITATION CULVERT REPLACEMENT AND REMOVAL
GLADES, HENDRY, OKEECHOBEE, PALM BEACH, AND MARTIN COUNTIES, FLORIDA

Based on the information analyzed and presented in the Environmental Assessment (EA) attached hereto, dated May 2011, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are, in summary:

a. The proposed action would occur within the existing Federal right-of-way. The proposed action is considered maintenance on an existing Federal project.

b. The goal of the rehabilitation of the Herbert Hoover Dike (HHD) is to reduce risk to public safety and health. Embankment seepage and stability have a direct effect on the capability of the Dike to provide the authorized protection. The Flood Control Act of 1948 authorized the U.S. Army Corps of Engineers (USACE) to operate and maintain the HHD and the Federal culverts. Replacement or removal as proposed is an immediate maintenance risk reduction strategy to ensure the HHD meets safety standards.

c. This EA was circulated with a Proposed Finding of No Significant Impact (FONSI) for public and agency review and coordination in compliance with the National Environmental Policy Act by letter dated 16 February 2011. Public meetings were held in Okeechobee (8 March 2011) and Clewiston (10 March 2011). All public and agency comments have been addressed in the revised EA upon completion of the public comment period.

d. Adverse impacts to protected species are not anticipated. Special measures will be incorporated during project construction to avoid or minimize adverse effects to any listed endangered, threatened, or species of special concern that may be present (see Environmental Compliance and Commitments in Section 5). Adjacent to the dike, in the southwestern littoral zone of Lake Okeechobee, there is designated Critical Habitat for the *Rosthrhamus sociabilis plumbeus* (Everglade snail kite), however, there will be no permanent adverse modification of this habitat as a result of this project. The USACE agrees to maintain an open and cooperative informal consultation process with the U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FFWCC) throughout the design, construction, and operation of this culvert replacement and removal project. The USACE received a concurrence letter with the USACE determination of may effect, not likely to adversely affect from the USFWS on February 10, 2011 (Appendix E).

e. Wetlands immediately adjacent to the culverts will be temporarily impacted through construction of a cofferdam during the replacement or removal process. Upon completion of the culvert removal or replacement process, emergent wetland vegetation would be restored to preconstruction conditions through planting of emergent vegetation and natural recruitment.

f. The USACE is coordinating a consistency determination under the guidelines of the Coastal Zone Management Act (CZMA) through the circulation of this EA. The USACE has determined that the proposed action is consistent with the State's CZMA programs. The Florida CZMA Evaluation can be referenced in Appendix D of this report.

g. The proposed action has been coordinated with the Florida State Historic Preservation Officer (SHPO) in accordance with the National Historic Preservation Act and the Archaeological and Historic Preservation Act. The USACE has determined that the removal and replacement of the culverts has been adequately mitigated by documentation in a cultural resources assessment report (available upon request) of the HHD. The USACE deems the documentation sufficient to mitigate the removal and replacement of the culverts. Consultation with the SHPO was initiated December 2010 for the proposed culvert removal and replacement and SHPO concurred on March 1, 2011. The project will not have an adverse effect on any historic properties included in, or potentially eligible for inclusion in, the National Register of Historic places. Conditions to protect undiscovered resources will be implemented as follows: language will be included in construction contract specifications outlining the steps to be taken in the event that undiscovered historical properties are encountered. An informational training session, developed by a professional archaeologist, will be conducted for the contractor's personnel to explain the types of archaeological/cultural materials that may be encountered during construction, and the steps to be taken in the event these materials are encountered. A professional archaeologist will conduct periodic monitoring of the project area during construction to determine if activities are impacting unanticipated cultural resources. The proposed action is consistent with both the National Historic Preservation Act and the Archaeological and Historic Preservation Act.

h. The project is in compliance with the Clean Water Act. A Water Quality Certificate for the replacement or removal of some of the Federal culverts will be acquired during plans and specifications phase from Florida Department of Environmental Protection (FDEP). All State water quality requirements will be followed. Refer to Section 1.7, Permits, Licenses, and Entitlements for a list of Water Quality Certificates obtained by the USACE.

In view of the above, and after consideration of public and agency comments received on the project, I have concluded that the proposed action for the rehabilitation of HHD will not result in a significant adverse effect on the human environment. This Finding incorporates by reference all discussions and conclusions contained in the EA attached hereto.

FOR BARKER, B.L.
LTC, EN
DEPUTY CDR

Alfred A. Pantano, Jr.
Colonel, U.S. Army
District Commander

13 MAY 11
Date

ENVIRONMENTAL ASSESSMENT ON HERBERT HOOVER DIKE CULVERT REPLACEMENT AND REMOVAL

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1 PROJECT PURPOSE AND NEED

The Herbert Hoover Dike (HHD) was constructed around Lake Okeechobee, a 724-square-mile freshwater lake in south central Florida, for the purposes of flood protection, navigation, agricultural and municipal water supply, prevention of saltwater intrusion, recreation, and the enhancement of environmental resources (Figure 1). The U.S. Army Corps of Engineers (USACE), Jacksonville District, has operated and maintained the dike for 75 years, its highest priority being the continued safety of the communities surrounding the dike.

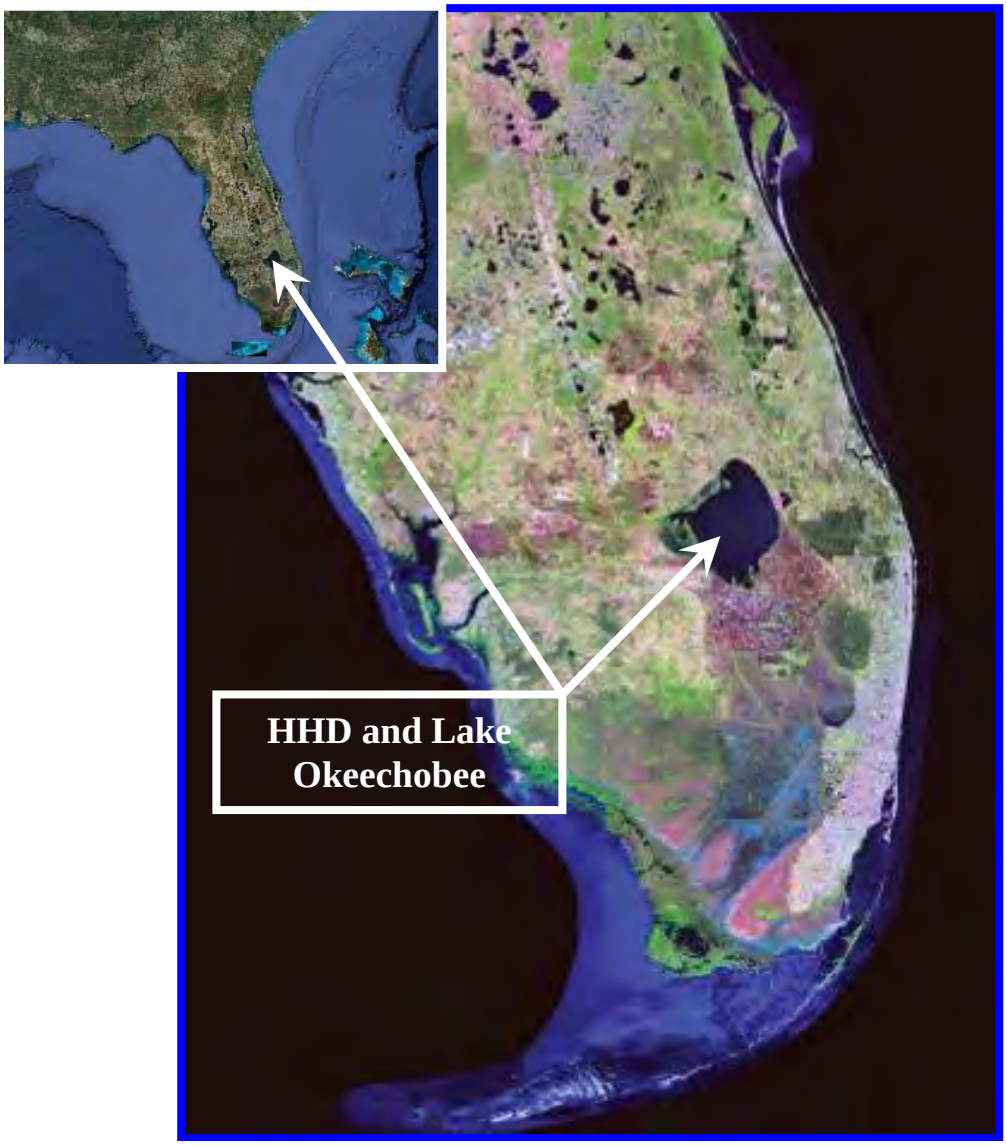

Figure 1. Project Location

Original construction of the HHD began in the 1930s and continued into the 1960s. USACE is responsible for the operation and maintenance of 32 culverts. Twenty eight culverts are currently in use and four are inactive due to changes in operations and local needs. The purpose of the culverts is for flood control and agricultural irrigation. The USACE is

committed to ensuring that continued drainage and irrigation capabilities will be provided to South Florida Water Management District (SFWMD) permitted users of the culverts. A systematic investigation of culvert usage is currently underway with participation from SFWMD's adjacent 298 Districts and SFWMD permitted users.

From a structural integrity perspective, the culverts present challenges to dike stability. The culverts within the HHD pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts. During a large storm event, concentrated seepage could begin to move large amounts of material through the embankment. Erosion would progress upstream, potentially leading to a progressive breach of the embankment. Action is required as an immediate risk reduction strategy, in conformance with dam safety requirements, to reduce the risk of catastrophic failure. According to USACE Dam Safety guidance, these risk reduction maintenance actions are required to reduce this unacceptable risk due to the high probability of culvert failure, and eventually dike failure with potential associated loss of life. The four inactive culverts will be removed and the twenty eight active culverts necessary for operations will be replaced.

This Environmental Assessment (EA) assesses the environmental effects of replacing or removing the Federal culverts within the existing Federal right-of-way. The replacement and removal of culverts, as discussed in this EA, are immediate risk reduction measures needed to be implemented within the Federal right-of-way. Additional real estate acquisition would not be required. Should a culvert fail, inducing breaching or failure of the dike, the level of flood protection would be compromised, resulting in a high risk to human safety and potential devastating economic and environmental damages.

1.1 PROJECT AUTHORITY

The HHD is a component of the Central and Southern Florida (C&SF) Project for Flood Control and Other Purposes. It is generally understood that the birth of the C&SF Project began with the Flood Control Act of 1948; however, Federal participation in local flood control efforts in the Lake Okeechobee area started much earlier in response to the disastrous hurricanes of 1926 and 1928. The Rivers and Harbors Act of 1930 authorized the construction of levees, for protection from storm surge-induced flooding, along the north and south shores of Lake Okeechobee. The 1948 Act created the C&SF Project and included authorization for enlargement of the existing levees and construction of additional levees along the northeast and northwest shores. The Flood Control Act of 1960 authorized the levees around the shore of Lake Okeechobee to be named "Herbert Hoover Dike", in honor of the former President and his role in implementing levee construction.

1.1.1 Rivers and Harbors Act of 1930

The Rivers and Harbors Act of 1930 authorized the construction of approximately 84 miles of levees along the north and south shores of Lake Okeechobee.

1.1.2 Rivers and Harbors Act of 1935

The Rivers and Harbors Act of 1935 authorized the construction and Federal payment for 21 culverts within the approximately 84 miles of levees. The act also authorized the USACE to

operate and maintain the levees and the 21 culverts. The purposes of these culverts included flood control (drainage) and irrigation of adjacent farm lands.

1.1.3 Flood Control Act of 1948

The Flood Control Act of 1948 created the C&SF Project and authorized the first phase of the C&SF project which included enlargement of the existing levees and construction of additional levees along the northeast and northwest shores.

1.1.4 Flood Control Act of 1954

The Flood Control Act of 1954 authorized the entire C&SF Project and specifically recognized that the plan of improvements would require additional refinements and modifications within the scope and purpose of the authorization which could be made at the discretion of the Chief of Engineers.

1.1.5 Flood Control Act of 1958

House Document 186, 85th Congress, 1st Session removed the monetary cap on local sponsor contributions set in the 1948 authorization. It established local share or project costs for 1954 construction and supervision and administration (S&A) costs plus Lands, Easements, Rights of Way, Relocations and Disposal (LERRD) plus Operations and Maintenance (O&M) responsibilities. The USACE is responsible for the O&M of Lake Okeechobee outlets.

1.1.6 Flood Control Act of 1960

The Flood Control Act of 1960 authorized the name of all levees around the shore of Lake Okeechobee to be “Herbert Hoover Dike”.

1.1.7 Flood Control Act of 1968

The Flood Control Act of 1968 modified the C&SF Project to include the water resources plan for central and southern Florida. This plan included raising the levee to provide an increase to the Lake Okeechobee regulation range either four feet above prior authorized levels or from 19.5 to 21.5 feet (National Geodetic Vertical Datum of 1929 (NGVD29)). Most of the features authorized by the Flood Control Act of 1968 were never constructed.

1.2 PROJECT LOCATION AND DESCRIPTION

The HHD is approximately 143 miles long and surrounds Lake Okeechobee. Lake Okeechobee and the HHD are located in south central Florida, in or adjacent to the counties of Okeechobee, Martin, Palm Beach, Hendry, and Glades (Figure 1). The 32 Federal culverts to be replaced or removed are within the HHD and the Federal right-of-way. Lake Okeechobee is a multi-purpose reservoir in the C&SF Project. The authorized project purposes for Lake Okeechobee include: flood protection, irrigation, agricultural and municipal water supply, enhancement of fish and wildlife, navigation, prevention of saltwater intrusion, recreation, and water supply to the Everglades National Park.

1.3 PROJECT NEED OR OPPORTUNITY

The purpose of this project is to improve dam safety along, around and within the HHD per external review recommendations and current dam safety regulations. The Federal culverts

pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts. During a large storm event, concentrated seepage could begin to move large amounts of material through the embankment. Erosion would progress upstream, eventually leading to a potential breach of the embankment. Action is required as an immediate maintenance risk reduction strategy, in conformance with dam safety requirements, to reduce the risk of catastrophic failure of the HHD system. These maintenance actions are required to reduce this unacceptable risk due to the high probability of failure and associated potential loss of life.

The HHD system includes 28 Federal culverts in the HHD system which are in critical need of replacement and four Federal culverts that will require removal (Figure 2). Of the culverts recommended for removal, three were previously abandoned and buried, while the fourth was determined to no longer be required. The HHD, the subject culverts, and the major outlets of Lake Okeechobee, are operated and maintained by the USACE, Jacksonville District. The SFWMD operates and maintains other inlet structures, pump stations and locks around Lake Okeechobee which also penetrate the HHD embankment.

Figure 2. HHD Culvert Locations

The HHD was originally constructed to provide local flood protection. Seepage and sand boils have been observed along levee designation (L-D) L-D1, L-D2, and L-D9 of the HHD. Due to the existing condition of the Federal HHD culverts, this seepage and boil process is suspected along and into the culverts themselves. During dewatering inspections of the deteriorated culverts, some boiling has been observed. These processes are known to compromise the integrity of the dike. Sand boils are indicators of the initiation of piping (underground flow paths for water caused by erosion), which can lead to dike instability or erosion of dike materials through internal channels as well as into and along culverts. Increased rate and magnitude of occurrences suggest that maintenance actions are necessary. The imperative objective is to reduce the probability of catastrophic failure and associated consequences to the extent reasonably possible.

Consistently, throughout the past 12 years, panels of internationally recognized experts in the field of dam safety have acknowledged unacceptably high project risk when the lake exceeds an elevation of 20 feet (NAVD88) approximately corresponding to a 1 in 100 year event. According to external review teams consisting of nationally recognized experts in the field of dam safety, HHD has passed the initiation phase on the seepage and piping failure continuum at certain locations, and is now in the continuation phase with erosion moving up-gradient toward the water source (USACE, 2010). The rate at which piping is primarily occurring is dependent on lake level. It is clear that the seepage volume and distress indicators in certain levee designations of the structure at reservoir levels above elevation 17.5 feet (NAVD88) are cause for concern. Failure is considered very likely when operating at or above these levels for any significant time. The higher the lake level, the shorter the time required for failure to occur. In this context, “failure” means an uncontrolled release of water resulting from a catastrophic breach of some portion of the HHD system.

An unreliable embankment system could result in failure of the system to contain lake waters. The condition, age, and prior construction methods of the culverts contributes to the risk of embankment failure. Some of the current defects within the culverts are a result of erosion, corrosion and weathering (Figure 3 and Figure 4). Such a failure could be devastating, resulting in human suffering, loss of life, immense property damage (including residential, commercial and agricultural) and destruction of the natural habitat (HHD, 2007).

Figure 3. Culvert 10A - Concrete Wing Wall Heavily Pitted with Exposed Rebar

Figure 4. Culvert FC-1 – Corrosion through Barrel, Exposing Cobble Layer of Embankment

1.4 AGENCY GOAL OR OBJECTIVE

The objective of this Environmental Assessment is to assess the environmental effects of removing or replacing Federal culverts within the existing Federal right-of-way. Removal and replacement of culverts will aid in achieving risk reductions by remediating the Federal culverts which are the highest contributors to risk in the HHD system. These culverts pose a high risk of failure to the embankment due to the piping of material into and around the culverts. These maintenance actions are required to reduce the unacceptable risks due to the high probability of failure and associated potential loss of life. This EA identifies the 32 Federal culverts in need of risk reduction actions, including the replacement of 28 culverts and the removal of four inactive or abandoned culverts (see Figure 2 above).

1.5 RELATED ENVIRONMENTAL DOCUMENTS

Several Categorical Exclusions have been completed to allow repair to other culverts and to remove trees and clear the toe ditch within the Federal right-of-way. These Categorical Exclusions include:

- Categorical Exclusion for Tree Removal and Ditch Clearing Within Right-of-way in Reach 2 of HHD, 07 March 2008
- Categorical Exclusion for Repair or Removal of Culvert 15 in Levee D-2 of the HHD, 04 April 2008
- Categorical Exclusion for Construction of Access Road within Existing Right-of-way of L-D1 and L-D2 of the HHD, 30 April 2008.
- Categorical Exclusion for Replacement of Culverts FC-1 and HP-7 in Reach 6 of the HHD, 05 November 2009
- Categorical Exclusion for Repair of Culverts 5 and 5A in Reach 4 of the HHD, 02 December 2009

The following table (Table 1) includes a complete list of related NEPA, design, and planning documents completed for the HHD Rehabilitation.

Table 1. Complete list of related NEPA, design and planning documents completed for HHD Rehabilitation to date

Type	Project	Title	Recommended Action	Decision
DEIS	Reach 1	DEIS for the Major Rehabilitation Report, HHD, Reach 1 (USACE, 2000)	Installation of a seepage berm with relief trench along the landward toe of the embankment.	Approved in 2000 contingent on economic revisions.
FSEIS	Reach 1	FSEIS for the HHD Major Rehabilitation Report, Reach 1 (USACE, 2005)	Installation of a seepage cutoff wall on the landward side of the dike slope and a relief trench and relief berm at the toe of the dike, all within the current right-of-way.	Record of Decision signed on September 23, 2005.
DEIS	Reaches 2 and 3	DEIS for the Major Rehabilitation Report, Phase 1, HHD Reaches 2 and 3 (USACE, 2006)	Installation of a partial cutoff wall at crest of dike and construction of a seepage berm within existing right-of-way.	The project was put on hold after it was coordinated with the public.
EA	Reaches 1, 2, and 3	EA of Modified Design in Reach 1 and Priority Toe Ditch Repairs in Reaches 1, 2, and 3 (USACE, 2007c)	(1) Installation of a cutoff wall at crest of dike, a partial seepage berm within existing right-of-way, and a drainage swale at toe of berm. (2) Backfill toe ditch for immediate repairs in the most critical areas. This document only assessed impacts within the existing right-of-way. A future NEPA document would assess impacts of the full seepage berm, which would extend outside of the existing right-of-way.	Finding of No Significant Impact, January 12, 2007.
EA	Reach 1 and Sub-reach 1A	EA of Reach 1 Seepage Berm and Reach 1A Test Cutoff Wall (USACE, 2007e)	Installation of a demonstration cutoff wall at the crest of the dike in Reach 1A and a partial seepage berm within the existing right-of-way. A future NEPA document would assess impacts of the full seepage berm.	Finding of No Significant Impact, May 3, 2007.
EA	Reach 1 and Sub-reaches 1B, C, and D	EA of Reach 1 Cutoff Wall with Addendum (Quarry) (USACE, 2008a)	Installation of a cutoff wall at crest of dike in Reach 1B, C, & D.	Finding of No Significant Impact, February 11, 2008.
EA	Reaches 1 and 2	EA for Partial Reach 1 and 2 Ditch Backfill and Culvert 14 Removal (USACE, 2008b)	In Reach 1, assesses the impacts of removing Culvert 14 and filling the toe ditch in Focus Areas 1 and 6. In Reach 2, assesses impacts of filling in 9.5 acres of toe ditch.	Finding of No Significant Impact, August 28, 2008.
EIS	Reach 1A	DSEIS for the Major Rehabilitation Project, HHD Reach 1A (USACE, 2010)	Installation of a seepage berm, drainage swale, and relief wells outside of the existing right-of-way. Removal of Culvert 11 and replacement of Culvert 16.	Pending.

1.6 DECISIONS TO BE MADE

The recommendations discussed in this document are compatible with the recommendations from the Quality Control and Consistency (QCC) review by the Risk Management Center (RMC) to reduce the risk of failure at the culverts in the HHD system. The RMC has identified the culverts as the highest single points of potential failure in the HHD system. Maintenance is required to reduce the unacceptable risks due to the high probability of failure and associated potential loss of life.

The recommendations of this Environmental Assessment are for the approval to proceed with immediate risk reduction measures to the culverts in the HHD system. The risk reduction measures recommended by this report include:

1) The replacement of the 28 Federal culverts, which have been identified as single points of high risk, with the highest probable mode of failure in the HHD system, at a 100% Federal approximate cost consistent with authorization. The culverts will continue to perform the current operational functions.
2) The removal of four Federal culverts that have been abandoned and no longer perform an operational function, at a 100% Federal cost consistent with authorization.

This EA will evaluate the environmental impacts of removing and/or replacing the Federal HHD culverts within the Federal right-of-way as a means of improving the structural integrity of the HHD.

1.7 PERMITS, LICENSES, AND ENTITLEMENTS

The proposed HHD culvert replacement and removal are subject to Section 401 of the Clean Water Act and could require Water Quality Certification (WQC) from the FDEP. The proposed work also requires a Coastal Zone Management Act (CZMA) consistency determination (Appendix D). The project may require dewatering permits and National Pollution Discharge Elimination System (NPDES) permits. These permits will be acquired prior to construction activities for each culvert replacement or removal as needed. Refer also to Section 5, Environmental Compliance and Commitments.

1.8 SCOPING

Numerous public meetings and information sessions have been held concerning the rehabilitation of the HHD. The Jacksonville District of USACE maintains a public outreach program meant to keep the public informed of rehabilitation activities. Public meetings were held on March 8, 2011 in Okeechobee and March 10, 2011 in Clewiston to talk about the culvert replacement and removal. Copies of presentations previously given to the communities surrounding the HHD and information fact sheets can be found on the Jacksonville District website:
http://www.saj.usace.army.mil/Divisions/Everglades/Branches/HHDProject/HHD.htm

2 ALTERNATIVES

This section describes in detail the no-action alternative, the proposed action, and other reasonable alternatives that were studied in detail for the HHD.

2.1 DESCRIPTION OF ALTERNATIVES

The USACE is presenting the replacement or removal of the Federal culverts in a single document within this EA. The proposed activity is considered a part of the operations and maintenance of an existing Federal project. The USACE considered several options for this maintenance plan as described below.

2.1.1 Alternative 1 - No Action Alternative

Evaluation of the No Action Alternative, also known as the future-without-project condition, is a requirement of NEPA regulations. The No Action Alternative is defined as not taking actions or making physical alterations to improve or repair the HHD. The No Action Alternative would not reduce risk of failure in the HHD system in accordance with current Tolerable Risk Guidelines to a level considered acceptable to the public, neither individual or societal risk acceptance. Under this alternative, the continued occurrence of seepage and piping with culverts in their current condition would pose an unacceptably high likelihood of culvert failure, leading to potential failure of the dike.

This alternative does not provide a long-term solution to the seepage and culvert stability problems within the HHD system. In addition, the No Action Alternative was eliminated as a viable option because of factors such as exceeding design life, unknown and unreliable construction practices when installed, and the high risk of being a source of breach.

2.1.2 Alternative 2 - Removal of All Culverts

This alternative is defined as the removal of all the Federal culverts that penetrate the dike. Thirty-two Federal culverts, including active and abandoned culverts, have been identified for consideration under this EA (Table 2). This alternative would remove all of the existing Federal culvert dike penetrations which are considered failure points for the dike that have the highest probability of occurring. This option would require construction of a temporary substitute flood protection system that would likely include an earthen or driven pile cofferdam. The project area would be dewatered to allow the culvert body and intake and discharge walls to be uncovered and removed. The embankment would then be restored with slopes matching the existing dike using select fill and compacted as required. Construction equipment would include standard material-handling and earthwork equipment. Recovered culvert materials (steel, concrete) would be disposed of locally. The expected concrete debris (headwalls and grout between the original culvert and the elliptical liner) is estimated to be 200 to 400 cubic yards per culvert.

Table 2. Thirty-two Federal Culverts Summary

Construction Feature	Location	Barrels	Size (ft)	Pipe Length (ft)	Original barrel type	Solution	Estimated Duration of Construction (in months)
Culvert 11	L-D9	1	10	95	CMP	Replace	10.5*
Culvert 16	L-D9	1	10	96	CMP	Replace	10.5*
Culvert 10A	L-D9	5	10	76	CMP	Replace	8.0
Culvert 13	L-D9	1	10	95	CMP	Replace	11.0
Culvert 10	L-D9	2	10	111	CMP	Replace	12.5
Culvert 12A	L-D2	1	7	86	Concrete	Replace	10.0
Culvert 12	L-D2	3	10	91	CMP	Replace	14.0
Culvert 4A	L-D2	1	10	177	CMP	Replace	11.0*
Culvert 3	L-D2	2	10	105	CMP	Replace	12.5*
Culvert 2	L-D2	6	10	105	CMP	Replace	16.0
Culvert 1A	L-D1	3	7	172	CMP	Replace	11.0*
Culvert 1	L-D1	2	10	115	CMP	Replace	12.5*
Culvert 5A	L-D3	3	10	160	CMP	Replace	14.0
Culvert 5	L-D3	3	10	160	CMP	Replace	14.0
Culvert 8	L-D4	3	10	151	CMP	Replace	14.0
Culvert FC-1	L-50	2	9	118	CMP	Replace	12.0
Culvert HP-1	L-50	1	2.5	94	CMP	Replace	10.0
Culvert HP-2	L-50	1	7	94	CMP	Replace	10.0
Culvert HP-3	L-50	1	9	94	CMP	Replace	11.0
Culvert HP-5	L-50	2	9	96	CMP	Replace	12.5
Culvert HP-6	L-49	2	7	94	CMP	Replace	10.0
Culvert HP-7	L-49	1	5	94	CMP	Replace	9.0
Culvert IP-1	L-49	1	5	94	CMP	Replace	9.0
Culvert IP-2	L-49	2	7	80	CMP	Replace	10.0
Culvert IP-3	L-48	2	6	80	CMP	Replace	10.0
Culvert KI-1	L-48	3	6	145	Concrete	Replace	11.0
Culvert KI-2	L-48	1	6	145	Concrete	Replace	9.0
Culvert 6	L-D4	1	10	151	CMP	Replace	11.0
Culvert 7	L-D4	3	10	151	CMP	Remove	8.0
Taylor Creek (TCC)	L-D4	8	10	71	CMP	Remove	10.0
Culvert 9	L-D4	-	-	151	CMP	Remove	11.0
Culvert 14**	L-D9	1	10	96	CMP	Remove	6.0*

Notes:

*An actual construction schedule was developed as preliminary design information was available. Estimated construction duration for the other culverts was estimated by interpolating and extrapolating information from existing design information. Actual site conditions may increase or decrease construction time by approximately 15 percent.

**Culvert 14 removal is covered in Partial Reach 1 and 2 Ditch Backfill and Culvert 14 Removal EA, July 2008.

This alternative provides an opportunity to reconstruct a portion of the HHD in concurrence with the current Dam Safety community of practice standards, with limited or no uncertainties. Concerns regarding potential seepage paths along the exterior of the culvert body would be eliminated, and future required maintenance of the culvert would be precluded. Though this alternative would remove many penetrations (i.e. culverts) from the HHD and thereby increase dike reliability, the HHD would not provide the same flood protection or water use functions that are currently in place for the surrounding communities.

Additionally the current users of these culverts would have to obtain agricultural irrigation and freeze protection from other sources.

2.1.3 Alternative 3 - Replacement of All Culverts

This alternative is defined as replacing all 32 of the Federal culverts penetrating the dike (Table 2 above). This alternative includes replacing the in use and abandoned or non functioning culverts. This process would provide a risk of failure reduction by bringing all of the existing Federal culverts up to existing design standards thereby reducing the risk of failure at these penetrations. This option would require construction of a temporary substitute flood protection system at each culvert that would likely include an earthen or driven pile cofferdam. The project area would be dewatered to allow the culvert barrel and intake and discharge walls to be uncovered, removed, and replaced with concrete cast-in-place box culverts. The embankment would then be restored with slopes similar to the existing dike using select fill and compacted as required. Construction equipment would include standard material-handling and earthwork equipment. Current operations will be maintained during replacement as justified on a temporary basis to prevent significant economic hardships. Periodic closings may occur during maintenance of the culverts but current operation of procedures would continue post construction.

2.1.4 Alternative 4 - Replace and Remove Culverts (Preferred Alternative)

This alternative is defined as the replacement of the 28 active Federal culverts and the removal of the four abandoned or not in use Federal culverts. This alternative would remove the risk of failure associated with the four Federal culverts that are presently abandoned or not in use in place within the dike. This alternative would also replace the 28 existing active culverts with structures designed of present day standards with materials to reduce the risk of failure associated with the existing Federal culvert structures. Current operations will be maintained during replacement as justified on a temporary basis to prevent significant economic hardships and construction is estimated to last an average of 12 months per culvert (Table 2 above). Periodic closings may occur during operations but current operation procedures would continue post construction.

This option would require construction of a temporary substitute flood protection system at each culvert that would likely include an earthen or driven pile cofferdam. The project area would be dewatered to allow the culvert barrel and intake and discharge walls to be uncovered, removed, and replaced with concrete cast-in-place box culverts (as described in Section 2.1.3). Culverts to be removed would be removed as described in Section 2.1.2. The embankment would then be restored with slopes matching the existing dike using select fill and compacted as required. Construction equipment would include standard material-handling and earthwork equipment.

It is estimated that the maximum 4 acres of wetlands may be impacted during the work associated with this alternative. Individual culvert location impacts should be much less than this acreage.

2.2 ISSUES AND BASIS FOR CHOICE

The replacement and removal of the culverts are needed to lower the unacceptable risk posed by these components in the system. This action is for immediate maintenance and risk reduction strategies that will be utilized in the rehabilitation of the dike system. A system wide Dam Safety Modification (DSM) Report will systematically address all components of the project.

Total rehabilitation objectives include eliminating as many defects in the HHD system as practical to achieve the overall goal of reducing the project risk due to the high probability of failure and associated potential life loss. Each replacement or removal of culverts with an operational function and removal of abandoned or already determined not in use culverts effectively reduces a high risk point in the HHD system.

2.3 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

Though preferred from a dam safety perspective, the complete removal of all culverts (Alt 2) has a high probability of not allowing for continued flood control and irrigation of current operations and therefore is not a viable option. To replace culverts that are currently abandoned (Alt 3) is not a reasonable financial option as it would incur extra cost to replace culverts that are currently abandoned and buried, rather than remove them. Replacing culverts currently abandoned would also not increase dike stability and will therefore not be considered. Therefore, the No Action (Alt 1) and Preferred Action (Alt 4) will be fully analyzed throughout this document.

2.4 PREFERRED ALTERNATIVE(S)

The Preferred Alternative is Alternative 4, Replace and Remove Culverts. Removing culverts already abandoned and not in use, as well as replacing needed culverts to current design standards, increases the stability of the embankment and allows continued use of culverts for irrigation and flood control. The No Action Alternative does not address the imminent need for public safety according to current dam safety standards.

2.5 ALTERNATIVE AND PREFERRED PLAN

Table **3** compares the impacts of the Preferred Plan (Alt 4) to the impacts of the No Action Alternative (Alt 1). Section 4, Environmental Effects, compares the impacts of the two alternatives in more detail.

Table 3. Summary of Direct and Indirect Impacts

ENVIRONMENTAL FACTOR	NO ACTION	REPLACE & REMOVE CULVERTS (PREFERRED ALT)
Vegetation	Vegetation (tree & shrub) will continue to be removed within 50 feet (ETL 1110-2-571) away from the toe of embankment (but within the Federal right-of-way) as directed by dam safety regulations as part of normal operations and maintenance.	Vegetation (tree & shrub) will be removed within 50 feet (ETL 1110-2-571) away from the toe of embankment (but within the Federal right-of-way) as directed by dam safety regulations. Grassy vegetation will be reseeded upon completion of culvert replacement or removal.
Threatened and Endangered Species	There would be no adverse effects on endangered species with No Action. If the dike failed, there would be adverse effects on species and habitats directly on the dike and within the path of water.	The USACE has determined that all threatened and endangered species are not likely to be adversely affected by the Preferred Alternative. Culvert construction activities would result in species needing to temporarily forage in abundant wetland areas adjacent to construction footprint.
Wetlands	A failure of the dike would result in negative impacts to wetlands landside of the HHD.	Construction activities would result in temporary impacts to wetlands; however, native emergent wetland vegetation will be restored to preconstruction condition through planting emergent vegetation and also through natural recruitment.
Essential fish habitat	There is no designated EFH within the project footprint.	There is no designated EFH within the project footprint.
Water use and hydrology	The capability to discharge floodwaters from the lake is currently constrained by current structural capacity. The No Action would retain this same capacity.	Current operations will be maintained during replacement as justified on a temporary basis to prevent significant economic hardships. Upon replacement, water use and hydrology capabilities will continue as originally authorized.
Hydraulics	The No Action Alternative would not change the hydraulics of the HHD culverts.	Culverts proposed to be removed are already abandoned and replacement culverts will function as currently authorized.

ENVIRONMENTAL FACTOR	NO ACTION	REPLACE & REMOVE CULVERTS (PREFERRED ALT)
Water quality	The No Action Alternative will have no effect of water quality. However, if a breach in the dike occurs, potential pollutants and sediment could be transported to nearby waterways.	Little to no impact on water quality is expected as the operational use of culverts would not be changed as a result of the preferred alternative.
Air quality	The No Action would not affect air quality.	Minor short-term air quality effects would be from dust or airborne particulates from earthwork, equipment exhaust and unpaved roads accessed for the project. This would only occur during construction.
Hazardous, toxic and radioactive waste	If there is a breach in the dike, some lands adjacent to the dike breach may be subject to HTRW contamination as a result of the dispersal of otherwise contained pollutants on private lands.	The removal or replacement of culverts is not expected to result in the discovery or generation of HTRW materials. If discovered, contractors will be instructed to rectify the situation in accordance with applicable state & Federal laws.
Noise	No changes to current noise levels would result.	Heavy machinery associated with construction would increase noise levels temporarily and would be limited to each culvert area under construction.
Aesthetics	Short-term impacts to aesthetics are anticipated, as patches and temporary emergency construction would be necessary to repair ongoing piping and boils.	Temporary, short-term impacts to localized areas would result from construction activities and the movement of construction equipment through lands designated for staging and construction. The LOST trail for viewing Lake Okeechobee from the top of the dike would be closed adjacent to the culverts during construction activities.
Socioeconomics	The No Action Alternative could have adverse effects to urban and agricultural areas if there is a breach in the dike. This could result in loss of property, life and businesses.	Temporary effects could include increased traffic congestion and some reduction of tourism during construction. However, local residents could benefit by creation of construction jobs during the project.

ENVIRONMENTAL FACTOR	NO ACTION	REPLACE & REMOVE CULVERTS (PREFERRED ALT)
Recreation resources	Short-term impacts to recreation are anticipated, as patches and temporary emergency construction would be necessary to repair ongoing piping and boils. Affected areas would be closed during construction.	There will be temporary impacts to the LOST trail during construction activities. However, there are multiple access points to enter and exit the trail and closings will be coordinated with the FDEP and the Office of Greenways and Trails.
Public safety	There is a high probability of failure at the culverts which could result in potential life loss should a catastrophic breach occur.	Public safety would be improved by the Preferred Alternative.
Historic properties	Adverse effects to the HHD and other historic properties in close proximity to the HHD could occur as a result of a breach in the dike.	Removal and replacement of culverts will not adversely affect the eligibility of Herbert Hoover Dike for listing on the National Register of Historic Places.

3 AFFECTED ENVIRONMENT

The Affected Environment section succinctly describes the existing environmental resources of the areas that would be affected on the HHD if any of the alternatives were implemented. This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that would affect or be affected by the alternatives if they were implemented. This section, in conjunction with the description of the No Action Alternative forms the base line conditions for determining the environmental impacts of the proposed action and reasonable alternatives. This report presents affected environments assuming all the culverts are the same, since they will either be replaced in-kind or removed due to current inactive or abandoned status.

3.1 GENERAL ENVIRONMENTAL SETTING

Water resources, wetlands, threatened and endangered species, state listed species, socio-economics, cultural resources, recreation, hazardous, toxic and radioactive wastes, noise, air quality and aesthetics are discussed in this section. It is anticipated that the project's impacts will be limited to these environmental resources.

3.2 VEGETATION

The vegetation within the Lake Okeechobee region has been greatly altered during the last century. Historically, the natural vegetation was a mix of freshwater marshes, hardwood swamps, cypress swamps, and pine flatwoods. Although some of these natural areas still exist, the introduction of controlled drainage for agriculture and land development has resulted in a significantly different set of cover types.

Landward of the HHD, sugar cane plantations, improved pasture, row crops, and urban lands now prevail. The exotic invasive plants melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina* sp.), and Brazilian pepper (*Schinus terebinthifolius)* are found throughout the area. In the toe ditch and the network of canals, nuisance vegetation exists, including species such as water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), hydrilla (*Hydrilla verticillata*), cattails (*Typha* sp.), and bamboo (*Arundinaria* sp.).

The major cover types lakeward of the HHD include open water and freshwater marshes. A 98,000-acre (154-square-mile) littoral zone is found along the lake's western edge and on the islands in its southern shore (Kraemer Island, Torry Island and Ritta Island, which together encompass 4,000 acres). The littoral zone supports more than 50 plant species and is composed of a mosaic of emergent and submergent plant species, along with floating-leaf plants. Emergent vegetation within the littoral zone is dominated by cattail, spike rush (*Eleocharis* sp.), and torpedo grass (*Panicum repens*). Submerged vegetation is abundant along the shores of Lake Okeechobee.

The HHD itself is covered with mixed grasses that are mowed on a regular basis with some shrubs, trees, and wetland vegetation on the southern and western edge of the project area at the toe of the embankment of the HHD.

3.3 THREATENED AND ENDANGERED SPECIES

The USFWS and the State of Florida have designated certain species of amphibians, invertebrates, reptiles, birds, mammals, gastropods, and plants and lichens in Glades, Hendry, Okeechobee, Palm Beach and Martin counties as threatened or endangered (Table 4). The 2001 Fish and Wildlife Coordination Act Report (FWCAR) for Reach 1 cites the following federally listed species as having been observed along the HHD: wood stork (*Mycteria americana*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), eastern indigo snake (*Drymarchon couperi*), Okeechobee gourd (*Cucurbita okeechobeensis)*, and Audubon's crested caracara (*Polyborus plancus audubonii).* Bald eagles and bald eagle nests were also cited in the report as having been observed near the HHD. Although no longer listed as threatened or endangered, bald eagles are protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. In addition, the FWCAR states the West Indian manatee is known to inhabit Lake Okeechobee.

Table 4. Federal and State Listed Land Plant and Animal Species Occurring in Glades, Hendry, Martin, Okeechobee, and Palm Beach Counties, Florida

Scientific Name	Common Name	Federal Status	State Status
Amphibians			
Rana capito	Gopher frog	Not listed	S*
Reptiles			
Alligator mississippiensis	American alligator	SAT**	S
Caretta caretta	Loggerhead sea turtle	Threatened	Threatened
Chelonia mydas	Green sea turtle	Endangered	Endangered
Crocodylus acutus	American crocodile	Threatened	Endangered
Drymarchon couperi	Eastern indigo snake	Threatened	Threatened
Eumeces egregius lividus	Bluetail mole skink	Threatened	Threatened
Gopherus polyphemus	Gopher tortoise	Not listed	Threatened
Pituophis melanoleucus mugitus	Florida pine snake	Not listed	S
Birds			
Ammodramus savannarum floridanus	Florida grasshopper sparrow	Endangered	Endangered
Aphelocoma coerulescens	Florida scrub jay	Threatened	Threatened
Aramus guarauna	Limpkin	Not listed	S
Athene cunicularia	Burrowing owl	Not listed	S
Calidris canutus rufus	Red knot-migrant	Candidate	Candidate
Campephilus principalis	Ivory-billed woodpecker	Endangered (Historic)	Endangered
Charadrius melodus	Piping plover	Threatened	Threatened
Egretta caerulea	Little blue heron	Not listed	S
Egretta thula	Snowy egret	Not listed	S
Egretta tricolor	Tricolored heron	Not listed	S
Eudocimus albus	White ibis	Not listed	S
Falco sparverius paulus	Southeastern American kestrel	Not listed	Threatened
Grus Americana	Whooping crane	Endangered	S
Grus canadensis pratensis	Florida sandhill crane	Not listed	Threatened

Scientific Name	Common Name	Federal Status	State Status
Haematopus palliates	American oystercatcher	Not listed	S
Haliaeetus leucocephalus	Bald eagle	PS***	Not listed
Mycteria americana	Wood stork	Endangered	Endangered
Pandion haliaetus	Osprey	Not listed	S
Pelecanus occidentalis	Brown pelican	Not listed	S
Picoides borealis	Red-cockaded woodpecker	Endangered	S
Platalea ajaja	Roseate spoonbill	Not listed	S
Polyborus plancus audubonii	Audubon's crested caracara	Threatened	Not listed
Rostrhamus sociabilis plumbeus	Snail kite	Endangered	Endangered
Rychops niger	Black skimmer	Not listed	S
Sterna antillarum	Least tern	Threatened	Threatened
Invertebrates			
Anaea troglodyte floridalis	Florida's leafwing butterfly	Candidate (historical)	Not listed
Strymon acis bartrami	Bartram's hairstreak butterfly	Candidate (1974)	Not listed
Mammals			
Podomys floridanus	Florida mouse	Not listed	S
Puma concolor coryi	Florida panther	Endangered	Endangered
Puma concolor	Puma	Threatened	Endangered
Sciurus niger shermani	Sherman's Fox Squirrel	Not Listed	S
Trichechus manatus	Manatee	Endangered	Endangered
Ursus americanus floridanus	Florida black bear	Not Listed	Threatened
Gastropods (Snails and Allies)			
Orthalicus reses reses	Stock Island tree snail	Threatened	Endangered
Plants and Lichens			
Acrostichum aureum	Golden leather fern	Not Listed	Threatened
Argusia gnaphalodes	Sea lavender	Not Listed	Endangered
Asimina tetramera	Four-petal pawpaw	Endangered	Endangered
Calopogon multiflorus	Many-flowered grasspink	Not Listed	Endangered
Chamaesyce cumulicola	Sand-dune spurge	Not Listed	Endangered
Cladonia perforata	Perforate reindeer lichen	Endangered	Endangered
Coccothrinax argentata	Silver palm	Not Listed	Threatened
Cucurbita okeechobeensis	Okeechobee gourd	Endangered	Endangered
Dalea carthagenensis floridana	Florida prairie cover	Candidtate (1918)	Endangered
Dicerandra immaculate	Lakela's mint	Endangered	Endangered
Glandularia maritima	Coastal vervain	Not Listed	Endangered
Halophila johnsonii	Johnson's seagrass	Threatened	Threatened
Hypericum edisonianum	Edison's ascyrum	Not Listed	Endangered
Jacquemontia reclinata	Beach jacquemontia	Endangered	Endangered
Lantana depressa var. *floridana*	Atlantic Coast Florida lantana	Not Listed	Endangered
Lantana depressa var.*sanibelensis*	Gulf Coast Florida lantana	Not Listed	Endangered
Lechea cernua	Nodding pinweed	Not Listed	Threatened
Lechea divaricata	Pine pinweed	Not Listed	Endangered
Liatrus ohlingerae	Scrub blazing star	Endangered	Endangered
Linum carteri var. *smallii*	Carter's large-flowered flax	Not Listed	Endangered

Scientific Name	Common Name	Federal Status	State Status
Nemastylis floridana	Celestial lily	Not Listed	Endangered
Okenia hypogaea	Burrowing four-o'clock	Not Listed	Endangered
Ophioglossum palmatum	Hand fern	Not Listed	Endangered
Panicum abscissum	Cutthroat grass	Not Listed	Endangered
Paronchia chartacea	Papery whitlow-wort	Threatened	Endangered
Polygala lewtonii	Lewton's polygala	Endangered	Endangered
Polygala smallii	Tiny polygala	Endangered	Endangered
Pteris bahamensis	Bahama brake	Not Listed	Threatened
Pteroglassaspis ecristata	Giant orchid	Not Listed	Threatened
Sacoila lanceolata var. *paludicola*	Fahkahatchee ladies' tresses	Not Listed	Threatened
Schizaea pennula	Ray fern	Not Listed	Endangered
Tephrosia angustissima var. *cutissii*	Coastal hoary-pea	Not Listed	Endangered
Thelypteris serrata	Toothed maiden fern	Not Listed	Endangered
Tillandsia flexuosa	Banded wild-pine	Not Listed	Threatened
Tolumnia bahamensis	Dancing-lady orchid	Not Listed	Endangered
Warea carteri	Carter's mustard	Endangered	Endangered
Critical Habitat			
Rostrahamus sociabilis plumbeus	Everglade snail kite	Endangered	Endangered
Trichechus manatus	West Indian Manatee	Endangered	Endangered
Chelonia mydas	Green sea turtle	Endangered	Endangered
Halophila johnsonii	Johnson's seagrass	Threatened	Threatened

* Species of Special Concern (S) is a species, subspecies, or isolated population that is facing a moderate risk of extinction in the future.
** The American alligator is currently federally designated as *Similarity of Appearance to a Threatened Taxon (SAT).*
***The bald eagle is federally listed as PS—Proposed for listing as Species of Special Concern.
Source: USFWS; Florida Natural Area Inventory, September 2009.

Federally threatened or endangered species known to occur in the project area are listed below and nesting bird activity and critical habitat onsite are shown in Appendix A.

Audubon's Crested Caracara: The crested caracara is a unique raptor scavenger in the family Falconidae that reaches the northern limit of its geographic range in the southern U.S. In Florida, this raptor occurs as an isolated population in the south-central region of the state. Changes in land use patterns throughout central Florida have resulted in this population becoming a subject of concern. This raptor apparently now occurs almost exclusively on privately owned cattle ranches in the south-central part of the state.

Available evidence suggests that the most serious threat to Florida's caracara population is loss or degradation of nesting and feeding habitat. Such loss is most commonly due to conversion of pasture and other grassland habitats and wetlands to citrus, sugar cane, other agriculture, and urban development. Adult caracaras exhibit high site- and mate-fidelity; therefore, extensive loss of habitat within the home range, particularly of the nesting site itself, may cause the pair to abandon that home range, or at least the nesting site (Morrison, 2001).

The Audubon's crested caracara is known to occur in the vicinity of the HHD (USFWS, 2001).

Eastern Indigo Snake: The eastern indigo snake has been classified as a threatened species by the USFWS since 1978 and by the state since 1971. It is the largest non-venomous snake in North America, sometimes growing to a length of more than six feet. The range of the eastern indigo snake historically extended from South Carolina through Georgia and Florida to the Keys, and west to southern Alabama and Mississippi. The snake is now known to occur only in Florida and the Coastal Plain of southern Georgia.

The eastern indigo snake prefers drier habitats, but it may be found in a variety of habitats. In southern Florida, the snake can be found in wet prairies, mangrove swamps, and hydric hardwood hammocks (Schaefer and Junkin, 1990). Farther north, in winter it is found almost exclusively in sandy habitats of the Florida scrub communities, typically in association with gopher tortoises. From spring to fall, they can also be found in pine-hardwood forests, mixed hardwood forests, creek bottoms, and agricultural fields (USFWS, 1999; Hallam *et al*., 1998).

The species needs relatively large areas of undeveloped land to maintain populations. The main reason for its decline is habitat loss, conversion, and degradation due to development. Further, as habitats become fragmented by roads, indigos become increasingly vulnerable to highway mortality (Schaefer and Junkin, 1990).

The Eastern indigo snake is known to occur in the vicinity of the HHD (USFWS, 2001).

Everglade Snail Kite: The snail kite is listed as an endangered species by both the USFWS and the State of Florida. Although previously located in freshwater marshes over a considerable area of peninsular Florida, the range of the snail kite is now limited to several impoundments on the headwaters of the St. John's River, the southwest side of Lake Okeechobee, the eastern and southern portions of Water Conservation Areas (WCAs) 1, 2A and 3, the southern portion of WCA 2B, the western edge of WCA 3B, and the northern portion of Everglades National Park (USFWS, 1996).

The kite inhabits relatively open freshwater marshes that support adequate populations of apple snail (*Pomacea* sp.), upon which this bird feeds almost exclusively. Favorable areas consist of extensive shallow, open water such as sloughs and flats, vegetated by sawgrass (*Cladium jamaicense*) and spike rush. The areas are often interspersed with tree islands or small groups of scattered shrubs and trees that serve as perching and nesting sites. The water level must be sufficiently stable to prevent loss of the food supply through drying out of the surface.

The snail kite is threatened primarily by habitat loss and destruction. Widespread drainage has permanently lowered the water table in some areas. This drainage permitted development in areas that were once kite habitat. In addition to loss of habitat through drainage, large areas of marsh are heavily infested with water hyacinth that inhibits the kite's ability to see its prey (USFWS, 1996).

Based on the description in the Federal Register (1977), snail kite critical habitat in Lake Okeechobee is located in the western parts of Glades and Hendry Counties, extending along the western shore to the east of the dike system and the undiked high ground at Fisheating Creek, and from the Hurricane Gate at Clewiston northward to the mouth of the Kissimmee River, including all the spike rush (*Eleocharis* sp.*)* flats of Moonshine Bay, Monkey Box, and Observation Shoal, but excluding the open water north and west of the northern tip of Observation Shoal north of Monkey Box and east of Fisheating Bay. Critical habitat for the snail kite includes the southwest and western shore of Lake Okeechobee from Clewiston to the Kissimmee River (excluding deep open water) (USFWS, 1996). In the project area, this critical habitat includes the area along the HHD in L-D1, L-D3, L-D50, L-49, and L-48 (Figure 5).

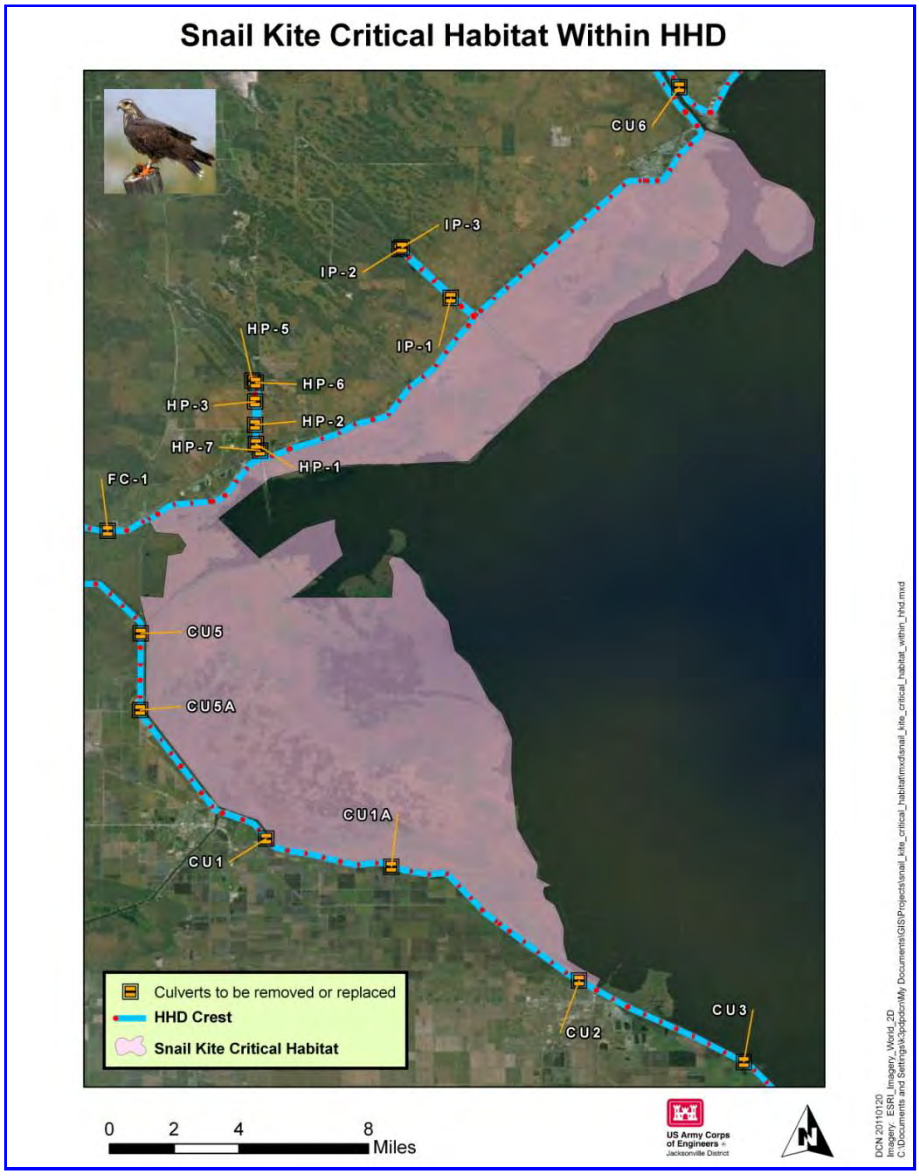

Figure 5. Snail Kite Critical Habitat

Okeechobee Gourd: The Okeechobee gourd is a vigorous annual vine, with a listed status of both federally and state endangered. Historically, this gourd was found on the southern shore of Lake Okeechobee, in Palm Beach County, and formerly in the Everglades. The Okeechobee gourd has been observed along the HHD.

West Indian Manatee: The manatee is currently listed as an endangered species by both the USFWS and the state. This large, plant-eating aquatic mammal can be found in the shallow coastal water, rivers, and springs of Florida. In general, Florida is the northern extent of the manatee's range, though manatees are occasionally reported farther north along the east coast and the Gulf of Mexico (FP&L, 1989). The manatee lives in freshwater, brackish, and marine habitats, and can move freely between salinity extremes. It can be found in both clear and muddy water. Water depths of at least three to seven feet are preferred, and flats and shallows are avoided unless adjacent to deeper water. During summer, manatees range throughout the coastal waters, estuaries, bays, and rivers of both coasts of Florida and are usually found in small groups. During winter, manatees tend to congregate in warm springs and outfall canals associated with electric generation facilities (FP&L, 1989).

In the past, the principal sources of manatee mortality have been opportunistic hunting and unusually cold winters. Today, poaching is rare, but high mortality rates from human-related sources threaten the future of the species. The largest single mortality factor is collision with boats and barges. Manatees also are killed in floodgates and canal locks, by entanglement or ingestion of fishing gear, and through loss of habitat and pollution (FP&L, 1989).

The manatee is known to inhabit Lake Okeechobee (USFWS, 2001).

Wood Stork: Wood storks are listed as an endangered species by both the USFWS and the State of Florida. It is the only stork occurring in the United States. In the U.S., the wood stork's range includes Alabama, Florida, Georgia, Louisiana, Mississippi, South Carolina, and Texas. However, the only states where this bird is known to nest are Florida, Georgia, and South Carolina (Mazzotti, 1990). Wood storks are wetland dwellers and use fresh, brackish and saltwater habitats for feeding and nesting. Feeding takes place in shallow ponds, tidal pools, swamps and marshes. Nesting occurs in cypress, hardwoods and mangrove swamps. The dependence of the wood stork on naturally functioning wetlands makes it an excellent indicator of the health of wetland ecosystems (Mazzotti, 1990).

Until the last half century, the wood stork was a common sight in Florida wetlands. However, between the 1930s and 1960s, there was a serious decline in this species. One reason for the decline in population has been the changes in the hydrologic regime of the Everglades, which affected its foraging habitat and food production (Mazzotti, 1990).

The wood stork is known to occasionally feed in the toe ditch wetlands of the HHD. However, the principal habitat in the area for the wood stork is within the littoral zone of Lake Okeechobee (USFWS, 2001).

3.4 WETLANDS

Wetlands occur in the toe ditches around the HHD. Typical vegetation in the toe ditch wetlands includes baby bluestem (*Andropogon* spp.), rush fuirena (*Fuirena scirpoidea*), bald cypress (*Taxodium distichum*), begger's tick (*Torilis arvensis*), matchhead (*Phyla* sp.), alligator weed (*Alternanthera philoxeroides*), Brazilian pepper, common reed (*Phragmities austalis*), common hackberry (*Celtis occidentalis*), elderberry (*Sambucus nigra* subsp. *canadensis*), smartweed (*Polygonum* sp.), southern willow (*Salix caroliniana*), cabbage palms (*Sabal palmetto*), sweetscent (*Pluchea odorata*), day flower (*Commelina* sp.), pennywort (*Hydrocotyle* sp.), Australian pine, water hyacinth, cattails, and water lettuce. Although wetlands present on the landward side of the HHD (toe ditch) may not be considered high quality ecosystems, they host small fishes and invertebrates and provide usable foraging habitat for wading birds, alligators, and turtles. High quality wetland habitat can be found in the extensive littoral zone covering the western side of Lake Okeechobee. This habitat is outside of the proposed project footprint.

3.5 ESSENTIAL FISH HABITAT

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) works with the regional fishery management councils to identify the essential habitat for every life stage of each federally managed species using the best available scientific information. Essential fish habitat has been described for approximately 1,000 managed species to date. There is no essential fish habitat, as designated by the NMFS, within the project area.

3.6 WATER USE AND HYDROLOGY

The Federal culverts that will be replaced range from one to six barrels. Each culvert will be evaluated prior to replacement or removal as to its function, need, and permitted use. The SFWMD manages the surface water management and water use permitting processes within its boundaries under authority of Chapter 373, State Statutes, 40E, Florida Administrative Code (F.A.C.). A surface water management permit allows a user to discharge a specified amount of water from a surface water system. A water use permit allows a user to withdraw a specified amount of water, either from the ground, a canal, a lake, or a river. The water can be used for public water supply, for industrial processes, or to irrigate crops, nursery plants or golf courses. The USACE recognizes that some culverts have permitted users and these permitted users will be contacted during the design phase of this process. Permitted discharge and water use will be considered during construction. Bypass pumping, use of existing water control structures and systems, and/or other means of providing drainage and water supply during construction will be investigated during the design phase of this process.

The purpose of this section is to describe the general watershed characteristics for the 32 Federal culverts within the HHD system.

Inflow to the lake for drainage purposes and outflow for agricultural water supply and other purposes such as Lake Okeechobee regulated releases are made through a series of Federal, state, and local drainage district culverts that penetrate the HHD. The majority of inflow enters Lake Okeechobee through several major canals and control structures, but for the purpose of this section, the focus is on the culvert inflow. In general, excess runoff from the drainage basins are gravity fed to the canals and structures on the north, east, and west shores of Lake Okeechobee and pumped to the canals and structures on the south shore of the lake. The Lake Okeechobee drainage area, including the lake, is approximately 5,600 square miles.

Inflow enters from the north, east, and west of Lake Okeechobee through the following watersheds: Kissimmee River, Taylor Creek-Nubbin Slough, Fisheating Creek, Nicodemus Slough, and Istokpoga. Inflow enters from the south of Lake Okeechobee through mostly local water control districts in the watershed designated the 'South Shore' below. These basin discharges are generally pumped back into the lake for flood control purposes and in some cases pumped back into the lake through the culvert penetrations. In general, the culverts along the south shore have both surface water management permits for drainage to the lake and agricultural irrigation purposes for water supply from the lake.

The largest outlets of the lake include the St. Lucie Canal (C-44) and the Caloosahatchee River (C-43). Four major agricultural canals (West Palm Beach, Hillsboro, North New River, and Miami) drain to the south into the Water Conservations Areas (WCAs).

Figure 6 shows the major Lake Okeechobee hydrologic features including the contributing watersheds to the north, east, and west, and the local water control districts along the south shore of the lake. The following paragraphs describe the watersheds that serve the 32 culverts.

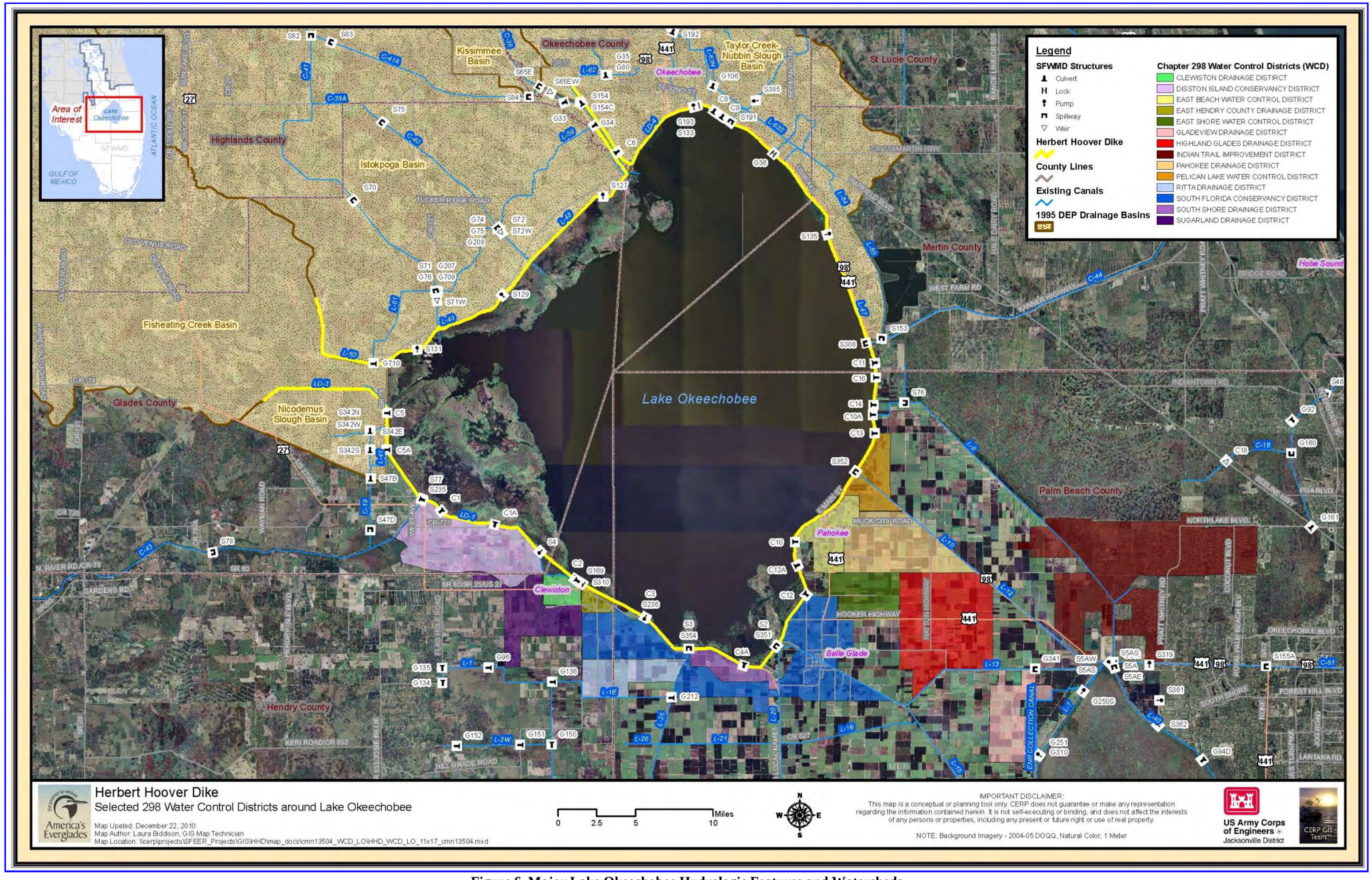

Figure 6. Major Lake Okeechobee Hydrologic Features and Watersheds

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Taylor Creek-Nubbin Slough

The Taylor Creek-Nubbin Slough drainage area bordering the north and northeast shores of Lake Okeechobee encompasses about 309 square miles and extends from the Kissimmee River (C-38) to the St. Lucie Canal (C-44). All inflow from this watershed is controlled. There are five culverts in the basin: 6, 7 (abandoned), 8, 9 (abandoned), and Taylor Creek Culvert (abandoned).

Kissimmee River

The Kissimmee River drainage basin encompasses about 2,260 square mile and extends from Orlando southward to Lake Okeechobee at the mouth of the Kissimmee River (C-38). The basin is the largest source of surface water flow to Lake Okeechobee with the inflow from C-38 controlled at SFWMD structure S-65E. There are two culverts that discharge into C-38 south of S-65E: KI-1 and KI-2.

Istokpoga

The Istokpoga drainage basin borders the northwest shore of Lake Okeechobee from C-38 to Fisheating Creek and encompasses about 1,070 square miles. Levees isolate the two main canals, Indian Prairie Canal (C-40) and Harney Pond Canal (C-41) from the watershed. There are three culverts that discharge into Indian Prairie Canal (C-40): IP-1, IP-2, and IP-3, six culverts that discharge into Harney Pond Canal (C-41): HP-1, HP-2, HP-3, HP-5, HP-6, and HP-7 and one culvert that discharges into the L-50 borrow canal (FC-1).

Nicodemus Slough

The Nicodemus Slough drainage basin borders the southwest shore of Lake Okeechobee extending from Fisheating Creek to Culvert 5A just north of the Caloosahatchee River watershed. The area encompasses about 39 square miles and normally drains to Lake Okeechobee. When lake levels are abnormally high, it is necessary to drain some of Nicodemus Slough south to the Caloosahatchee River. There are two culverts in the basin: 5 and 5A.

South Shore

The South shore of Lake Okeechobee extends from Moore Haven at the Caloosahatchee River to Port Mayaca at the St. Lucie Canal. The drainage areas associated with these culverts are local water control districts mostly contained within the Everglades Agricultural Area (EAA), but also include U.S. Sugar, Trucane, Lake Point and Five Smooth Stones. The EAA is divided into seven drainage basins and is comprised of a network of canals, structures, and levees that divide the area to provide for the removal of excess water to Lake Okeechobee and the WCAs to the south. The local drainage districts, also referred to as '298 Districts', have private pump stations that discharge to Lake Okeechobee or the EAA canals. There are 13 culverts in the basin: 1, 1A, 2, 3, 4A, 10, 10A, 11, 12, 12A, 13, 14, and 16.

3.7 WATER QUALITY

3.7.1 Surface Water

Lake Okeechobee has been designated by the FDEP as a Class I water body (drinking water supply). The surface water in the HHD toe ditch and nearby canals meets most Class III water quality standards (recreation and maintenance of healthy fish and wildlife populations).

However, the water in the lake and canals has elevated concentrations of nutrients (phosphorus and nitrogen). The Clean Water Act requires states to classify their surface waters according to designated uses and to develop water quality standards. If water bodies are not meeting the standards, states are required to develop Total Maximum Daily loads (TMDLs). TMDLs establish the maximum amount of a pollutant that a water body can assimilate without causing an exceedance of water quality standards. Nutrient loads within the Lake Okeechobee Basin are regulated under the Lake Okeechobee Protection Act (LOPA). Cooperating state agencies developed the Lake Okeechobee Protection Plan (LOPP) to outline strategies to reduce phosphorus loading to the lake and to meet the total phosphorus TMDL of 140 metric tons by 2015. The LOPP specifies the implementation of Best Management Practices and construction of large regional facilities to capture phosphorus. The plan contains a schedule for subsequent phases of phosphorus load reduction consistent with the TMDLs. A reduction in Lake Okeechobee phosphorus is desired, in part, to reduce the occurrence of blue-green algal blooms in the lake, and to reduce the adverse effects of phosphorus on downstream systems, including the Caloosahatchee River Basin and the St. Lucie River Basin. Because high lake stages during flood events compromise the integrity of the HHD, the lake level is reduced as rapidly as possible to make room for the next possible flood event. This requires harmful freshwater releases to the downstream estuaries.

3.7.2 Groundwater

The surficial groundwater aquifer in the vicinity of the eastern and southern portions of the HHD extends from the land surface (8.7 feet NAVD88) to a depth of -180 feet. The upper portion of this aquifer is potable to a depth of approximately -50 feet elevation. Rural houses and agricultural operations adjacent to the eastern and southern portions of Lake Okeechobee use shallow wells as a source of drinking and irrigation water. The groundwater below elevation -50 feet is not considered potable due to its high salt content.

3.8 AIR QUALITY

The U.S. Environmental Protection Agency's (EPA) AirData database contains measurements of air pollutant concentrations for the entire U.S. The measurements include both criteria air pollutants and hazardous air pollutants and are compared against the National Ambient Air Quality Standards (NAAQS) specified by the EPA. The AirData database was queried for air quality data between 2002 and 2006 within the project area. The data shows that Glades, Hendry, Martin, Okeechobee, and Palm Beach counties are currently in attainment for all six criteria air pollutants. The AirData database also provides annual summaries of Air Quality Index (AQI) values for counties or metropolitan areas. The AQI is an approximate indicator of overall air quality, because it takes into account all of the criteria air pollutants measured within a geographic area. The AQI summary values include both qualitative measures (i.e., days of the year having "good" air quality) and descriptive statistics (i.e., median AQI value). The AQI for Palm Beach County, the most developed portion of the study area indicates that air quality is generally good, with no periods when air quality is classified as unhealthy for sensitive groups. Of the six criteria air pollutants, ozone and particulate matter of 2.5 mm or less are most likely to occur within this county. However, the air quality is within NAAQS limits for these parameters.

3.9 HAZARDOUS, TOXIC AND RADIOACTIVE WASTES

Hazardous, toxic, and radioactive waste (HTRW) surveys have been conducted as part of EAs and EISs prepared as part of the prior HHD rehabilitation efforts. In December 2007, a HTRW survey of the HHD was conducted using aerial imagery and a contaminated site and petroleum storage site database compiled by the FDEP. A windshield survey was conducted to verify the findings of the desktop survey. The survey was updated in August 2009 for the Reach 1A SEIS (USACE 2010) and in February 2010 for L-D1 and L-D2. The purpose of the last two surveys was to preliminarily identify potential contamination sites within 500 feet of the HHD in L-D1, L-D2, and L-D9. The results of these surveys show that agricultural and rural residential development has resulted in HTRW contamination in areas adjacent to the HHD; however, no contaminated areas or materials were found within the Federal right-of-way.

3.10 NOISE

The predominant sources contributing to the overall ambient noise level include: vehicular traffic on road systems adjacent to the HHD, boat traffic along the rim canal, small industry (i.e., produce processing and distribution), urban activities in Moore Haven, Clewiston, and Belle Glade, agricultural equipment (tractors, trucks, etc.), and pumping stations.

Rural areas typically have noise levels of 35-55 decibels. Sound levels along transportation arteries are typically in the range of 70 decibels. According to the Florida Department of Transportation's (FDOT) State Environmental Management's Office, no known ambient noise monitoring has been conducted in the project area; consequently, no quantitative data on noise levels within the project area are available for analysis.

3.11 AESTHETIC RESOURCES

There are many public access points to view Lake Okeechobee from the elevated vantage point of the dike crest along the length of the HHD. In addition, the Lake Okeechobee Scenic Trail (LOST) runs atop the HHD around the entire lake, totaling approximately 110 miles.

The dike crest affords panoramic views of the flat agricultural (mostly sugarcane) fields and rim canal to the south, southwest, and southeast of the HHD. The extensive littoral zone on the west side of the lake's perimeter can be viewed from the HHD in L-D1.

There are several parks adjacent to the HHD. These parks include resources such as ponds, picnic areas, restrooms, grassy fields, boat ramps, and other amenities.

3.12 SOCIOECONOMICS

Agriculture, recreation and tourism all play an important role in the local economy. An estimated 742,668 acres of irrigated agricultural lands are located in the Lake Okeechobee Service Area and 447,000 acres in the Everglades Agricultural Area (EAA). These agricultural lands and associated activities employ hundreds of people and account for hundreds of millions of dollars in revenue annually.

The lake and its associated waterways, shoreline, and the LOST on top of the HHD provide a wide variety of water-based recreation activities for local residents and tourists, including: fishing, boating, picnicking, sightseeing, camping, swimming, birding, hunting, biking, horse-back-riding, rollerblading, air boating and hiking. Additionally, the lake supports an active commercial fishing industry. This includes several different types of commercial fishing operations and landside support activities, such as marinas and wholesale and retail distribution facilities. There are also commercial fisheries on Lake Okeechobee that harvest the American alligator. Alligators are harvested from the lake population to supplement the stock in alligator farming operations.

3.13 RECREATION RESOURCES

A variety of recreational resources are enjoyed year-round on Lake Okeechobee. Each year, more than six million people visit Lake Okeechobee and the Okeechobee Waterway. Recreational resources in close proximity to the HHD include the Lake Okeechobee Scenic Trail, fishing and boating opportunities, campgrounds, and park and recreation areas.

3.14 PUBLIC SAFETY

The HHD system is paramount to public safety. The dike provides flood protection not only to towns immediately adjacent to the dike, but to a vast agricultural area south of the lake. Due to signs of dike instability during high water stages in the lake after the 2004 and 2005 hurricanes in South Florida, the SFWMD contracted for an expert review panel of the stability and safety of the HHD. Particular emphasis was placed on the structural stability of the dike with regard to seepage and water pressures within the embankment and erosion and potential overtopping concerns during large storm events. The technical review concluded that the current condition of the HHD poses a high probability of risk to the people and the environment of South Florida (BCI, 2006).

The term “dike failure” implies a catastrophic breaching of some portion of the HHD system. This situation would result in widespread flooding as waters from Lake Okeechobee pass through the breach and onto adjacent lands. In the event of a total breach, significant effects to human life, agriculture, property, soils, vegetation, water resources, and habitat would result.

3.15 HISTORIC PROPERTIES

The Herbert Hoover Dike has been determined eligible for inclusion on the National Register of Historic Places. Consultation with the SHPO and other interested parties is in process as of January 2011. Consultation with the Florida SHPO and other interested parties will continue until completion of the project.

4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of alternatives for the HHD project. See Table **3** in Section 2, Alternatives, for a summary of impacts. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects. The duration of construction at each culvert installation is expected to last up to 12 months. Culvert replacement actions will begin in late 2011.

4.1 GENERAL ENVIRONMENTAL EFFECTS

Lake Okeechobee is a major hydrologic feature of south Florida and the Everglades ecosystem; therefore, its waters play a critical role in the protection and enhancement of environmental resources. Fish and wildlife species are numerous and utilize the many natural areas around the lake. Implementation of the proposed culvert removal and replacement would cause some temporary disturbances to, and displacement of, components of the human and natural environments. Minimal effects to existing water resources and foraging habitat for wading birds and listed species are expected as well.

4.2 VEGETATION

4.2.1 No Action Alternative

The No Action Alternative would not result in changes from current requirements. Per ongoing maintenance of dam features, removal of shrubs and trees is mandatory (ETL 1110-20571). Preconstruction surveys will be mandatory prior to any tree removal to assess nesting bird activity. The grassy vegetation would not be affected with the No Action Alternative, but if the dike were to fail, vegetation in the path of the water flow would be negatively impacted.

4.2.2 Replace and Remove Culverts (Preferred Alternative)

Vegetation such as trees and shrubs will be removed within 50 feet (ETL 1110-2-571) from the toe of the embankment of the HHD (within the Federal right-of-way) as directed by dam safety regulations. Preconstruction surveys will be mandatory prior to any tree removal to assess nesting bird activity. During the culvert removal or replacement process, grassy vegetation on the embankment of the HHD would be removed. Upon completion of the culvert removal or replacement, the embankment would be reseeded or sod would be used to replace grassy vegetation. Emergent wetland vegetation will be replanted and allowed to naturally recruit.

4.3 THREATENED AND ENDANGERED SPECIES

4.3.1 No Action Alternative

The No Action Alternative would not have adverse effects on protected species. If the dike were to fail, species and habitats directly on the dike and within the path of the water would be negatively impacted, and snail kite critical habitat could be negatively impacted due to lower lake levels.

4.3.2 Replace and Remove **Culverts** (Preferred Alternative)

The USACE has determined that the preferred alternative is not likely to adversely affect any of the federally listed species known to occur within the project area. USFWS concurred with the USACE determination in March 2011 (Appendix E for concurrence letter). Informal consultation with the USFWS began on 10 December 2010 and an initiation package has been reviewed. Because the construction of culverts will potentially span a 10-year period (see Table 2 for estimated construction durations), design plans have not currently been established for each culvert. Consultation will continue during the design phase for each set of culvert replacements or removals due to these design constraints. All monitoring and survey of endangered species onsite will be conducted in accordance with survey protocol from the USFWS South Florida Ecological Services Office and website. (http://www.fws.gov/verobeach/index.cfm?Method=programs&NavProgramCategoryID=3&programID=73&ProgramCategoryID=3)

<u>Audubon's Crested Caracara</u>
Audubon's crested caracara have been documented to nest near the project area, specifically nests have been reported south of Port Mayaca outside of the Federal right-of-way. Additionally, it is possible that nests could be found in other areas within the project area. Surveys will be conducted prior to the initiation of construction and during construction at each site to determine if caracara is present in the project area. Monitoring for caracara during the nesting season (January through April) and adaptively managing action activities within 985-4920 ft of the nests will ensure the action would not increase noise above ambient levels within nest protection areas of active caracara nests. If the project area is within a 4920 ft buffer of the consultation area, this would also be surveyed for nests because of the established buffer zone. The action may produce noise above ambient levels, however, mufflers and sound dampening equipment would be required during construction.

Conclusion: The Preferred Alternative may affect, but is not likely to adversely affect, the Audubon's crested caracara.

<u>Eastern Indigo Snake</u>
Eastern indigo snakes may be found along the embankment of the HHD. Preconstruction surveys would be completed in the project area, monitors would be on site during all phases of construction, and construction crews would be educated on identifying the indigo snake and the precautions to take to prevent impacts to the indigo snake. Eastern indigo snake Standard Protection Measures will be included in the environmental protection plan to provide guidance. Onsite gopher tortoise burrows would be protected to the extent possible to provide snake habitat during construction. The habitat that would be temporarily impacted would be seeded or replaced by sod and is expected to recover within a few months of project completion.

Conclusion: The Preferred Alternative may affect, but is not likely to adversely affect, the eastern indigo snake.

Everglade Snail Kite

Snail kites are known to nest near the project area (see Figure 7 for known nesting locations) but not directly near culverts 1, 1A, 2, 5 and 5A. These culverts are noted because they are adjacent to the critical habitat. In addition, snail kites forage within the southwestern Lake Okeechobee littoral zone. The action may produce noise above ambient levels, however, mufflers and sound dampening equipment would be required during construction. Preconstruction surveys would be completed prior to the initiation of construction activities. Monitoring kites during the nesting season (January through June) and adaptively managing action activities within 1640 ft of active snail kite nests will ensure the action will not increase noise above ambient levels within nest protection areas of active snail kite nests (Figure 7).

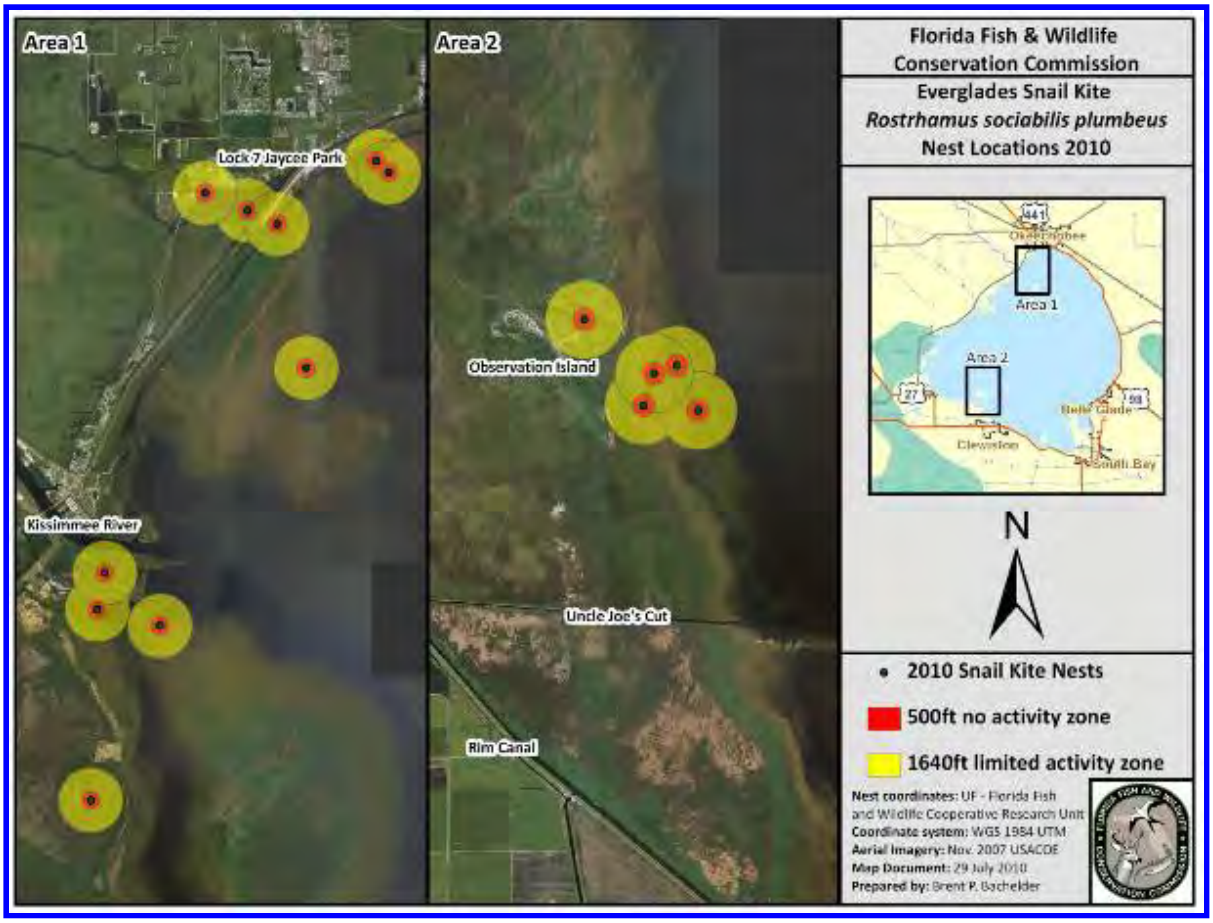

Figure 7. Everglade Snail Kite Nest Locations 2010

Portions of the toe ditch and the lake's edge within the cofferdam (the extent of construction) will be dewatered temporarily during construction, but foraging areas are available to the snail kite in other parts of Lake Okeechobee. In order to minimize impacts to the snail kite critical habitat, culverts within and adjacent (Culverts 1, 1A, 2, 5 and 5A) to the critical habitat (Appendix A) will use driven pile cofferdams which generally reduces the construction impact and footprint by approximately 50 percent. The construction footprint for Culverts 1 and 2 includes the grassy vegetation covering the HHD. The critical habitat (shapefile obtained from USFWS) is shown to extend onto the dike in this grassy vegetation. Upland grassy vegetation is not considered critical snail kite habitat. Therefore, the USACE does not expect the acreage amount of potential impact to be as large as depicted in Appendix A,

Figure 5. However, minimal temporary impacts may occur due to cofferdam placement and construction. The cofferdam will be removed upon completion of removal or replacement of the culverts. Disturbances to snail kite critical habitat will be temporary in nature due to construction activities, but would be restored to preconstruction conditions by replanting vegetation upon completion of construction to replenish the native seedbank. There would be no permanent loss of critical habitat.

Conclusion: The Preferred Alternative may affect, but is not likely to adversely affect, the Everglade snail kite.

Okeechobee Gourd

The Okeechobee gourd is known to occur on the HHD. Preconstruction surveys would be completed to locate any plants within the construction footprint. If plants are found, the USFWS will be contacted to determine an appropriate course of action for removal and relocation of plants.

Conclusion: The Preferred Alternative may affect, but is not likely to adversely affect the Okeechobee Gourd.

West Indian Manatee

Manatees are known to occur in Lake Okeechobee. The proposed action would produce noise above ambient levels. Preconstruction surveys would be completed to ensure that no manatees are harmed or harassed during construction. Surveys would also be conducted during construction of the cofferdam to determine if manatees are present in the area of construction. Manatee protection grates with openings no greater than eight inches by eight inches would be installed on all replacement culverts to prevent manatees from accessing culvert structures. The installation of cofferdams would prevent manatees from entering the construction zone and should prevent any disturbance to the manatees. No manatee critical habitat is adjacent or near the dike.

Conclusion: The Preferred Alternative may affect, but is not likely to adversely affect, the West Indian manatee.

Wood Stork

Wood storks are known to forage within the toe ditch and nest near the proposed project area. The last noted colony near culvert HP-3 was about 3,400 feet away from the culvert. The action may produce noise above ambient levels, however, mufflers and sound dampening equipment would be required during construction. Project activities near foraging wood storks could temporarily displace individuals to other foraging areas available within the southwest littoral zone of Lake Okeechobee while construction is occurring on the culverts. Construction activity should take place no closer than 500-1500 ft to active colonies. Possible temporary displacement is not expected to adversely affect wood stork foraging opportunities or efficiency.

Conclusion: The Preferred Alternative may affect, but is not likely to adversely affect the wood stork.

4.4 WETLANDS

4.4.1 No Action Alternative

A failure of the dike system would affect wetlands landward of the HHD. Surging waters would erode soils, uproot vegetation, and physically alter the physiography. On the lakeside of the HHD, wetland effects due to lower lake levels would be minimal.

4.4.2 Replace and Remove Culverts (Preferred Alternative)

Construction activities at each of the culverts would temporarily impact wetlands adjacent to the HHD due to the construction of the cofferdam and dewatering of the area. The current estimate of maximum acreage of construction impact to wetlands would be approximately 4 acres for all 32 culverts. Individual culvert location impacts should be much less than this acreage. The extension of the culverts to the full width of the dike cross-section will result in the backfill of less than one acre per culvert of open water area at the mouth and exit of the culverts. The USACE will work in coordination with FDEP, USFWS, and the FFWCC to minimize any potential permanent wetland impacts during the design phase of each culvert. As previously mentioned, upon completion of construction and removal of cofferdams, emergent wetland vegetation comparable with preconstruction conditions would be planted on the lake side of the HHD. Emergent wetland vegetation should reestablish within the toe ditch upon removal of the cofferdam structure.

4.5 ESSENTIAL FISH HABITAT ASSESSMENT

Essential fish habitat (EFH) would not be affected by any of the alternatives as there is no designated EFH within the project footprint.

4.6 WATER USE AND HYDROLOGY

4.6.1 No Action Alternative

Because Lake Okeechobee's outlet capacity is less than its inflow capacity, the capability to discharge floodwaters from the lake is limited. Downstream constraints also limit the discharge capacity. Thus, it is important that the HHD is capable of withstanding severe hydraulic loads for extended lengths of time so that lake stages can be reduced gradually. Due to problems related to piping and internal erosion, HHD does not possess that capability in its present state.

The No Action Alternative would not change the hydraulics of the HHD. However, as stated in the purpose for this project, the HHD is at high risk of failure and its integrity needs to be addressed. If a breach were to occur, agricultural lands could be flooded, potentially causing loss of homes and an economic downturn.

4.6.2 Replace and Remove Culverts (Preferred Alternative)

Lake Okeechobee receives water principally from rainfall and runoff from watersheds of the Kissimmee River, Taylor Creek/Nubbin Slough, Lake Istokopoga and Fisheating Creek, all of which enter the lake from the north.

The USACE recognizes that there are permittees for most of the culverts and these permittees will be contacted by engineering during the design phase of this process. Permitted discharge

and water use will be considered during construction. Bypass pumping, use of existing water control structures and systems, and/or other comparable alternatives of providing drainage and irrigation during construction will be investigated during the design phase of this process.

Replacement of culverts will require two barrel structures at a minimum where single barrel structures currently exist (Figure 8). The double barrel redundancy will allow for taking one of the culverts out of service for inspection and maintenance while the other remains in service for drainage and water supply operations. Preliminary plan views of two barrel designs and earthen cofferdams are represented in Figure 9. Design and plan view of typical earthen cofferdams are represented in Figure 10 and Figure 11. In some cases, a three-barrel, cast-in-place box culvert structure will be used to replace the originally authorized culvert structures (Figure 8). In general, the hydraulic design objective will be to match the originally authorized culvert capacity as close as possible while meeting the minimum size requirement and considering a standardized barrel size. To satisfy the minimum size requirement, each culvert barrel will have a minimum rise of seven feet and span of six feet to facilitate access for inspection and maintenance; however, a standardized barrel size of seven feet by seven feet was determined for design of most culverts. Consideration of replacing culverts with similar size and capacity will be given for the culverts that are currently much smaller than the standardized barrel size of seven feet by seven feet. The replacement culverts are intended to provide similar hydrologic and hydraulic flow characteristics when compared to the existing/authorized culverts; however, the installation of standard box culvert sizes means that at some locations, the replacement culverts will have an insignificant increase in flow capacity and at others the capacity will be insignificantly reduced. The culverts will function as authorized and as currently permitted. All appropriate hydraulic load conditions to include setup and wave height will be considered in the replacement design as well as all current design criteria and dam safety criteria. Hydraulic loads for structural design will be as required by EM 1110-2-2100, Stability Analysis for Concrete Structures.

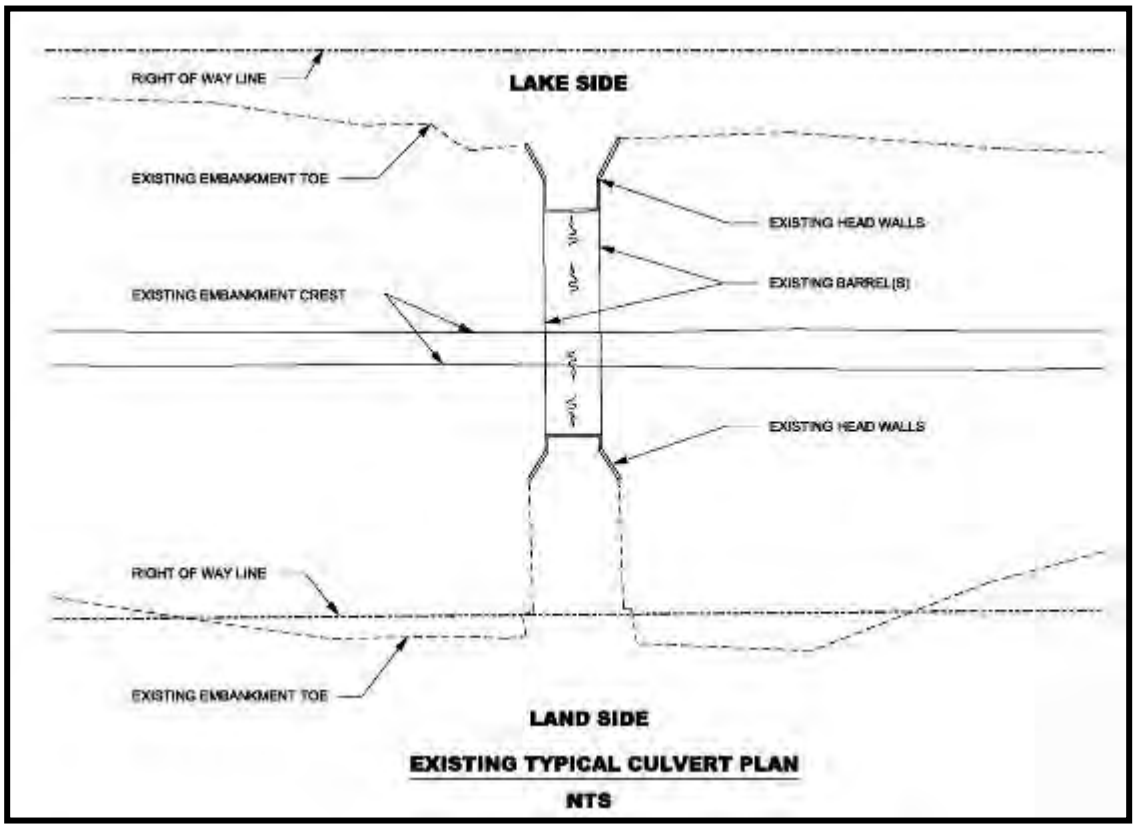

Figure 8. Typical Culvert Plan View

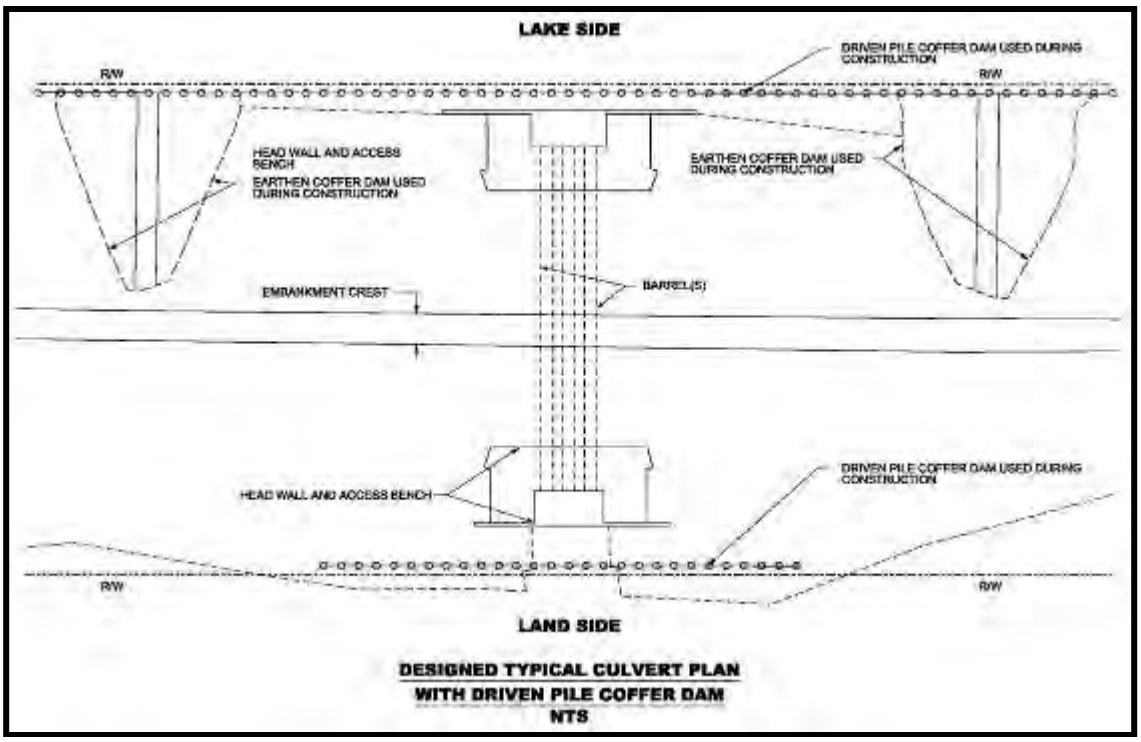

Figure 9. Typical Designed Culvert Plan View

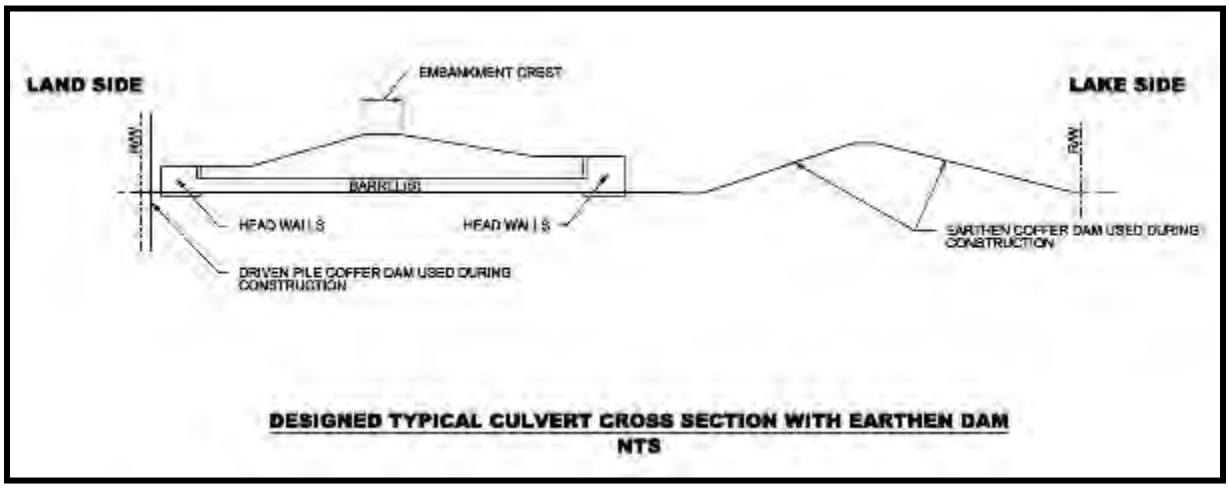

Figure 10. Typical Construction Footprint with Earthen Cofferdam

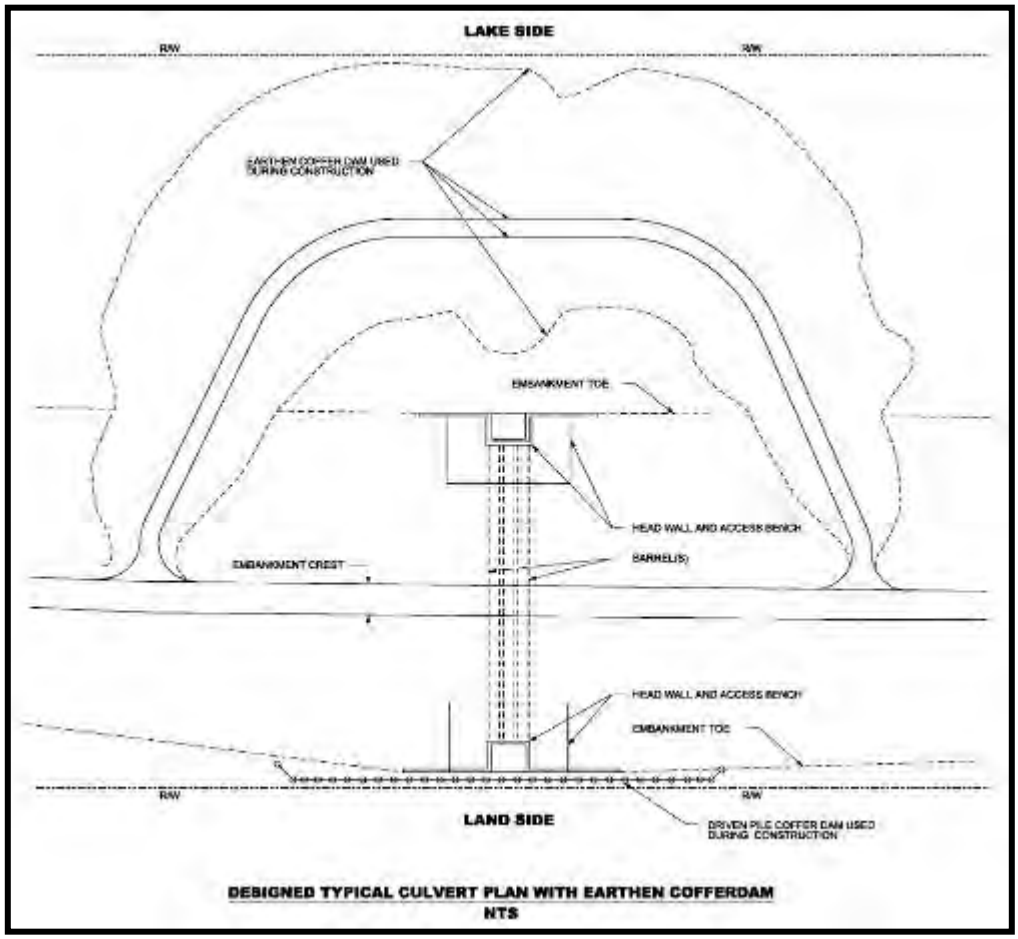

Figure 11. Typical Construction Footprint with Earthen Cofferdam – Plan View

4.7 WATER QUALITY

4.7.1 No Action Alternative

Regardless of the condition of the dike, the highly eutrophic condition of Lake Okeechobee is expected to persist for the foreseeable future due to past and future nutrient loading. If a

breach in the dike were to occur, mud sediments from Lake Okeechobee would be transported to nearby waterways, resulting in localized elevated total suspended solids and phosphorus concentrations. No significant effects outside the immediate area of the breach would be expected. Without dike rehabilitation and culvert replacement, the lake would be operated at lower stages, which may improve water quality conditions somewhat in the littoral zone of the lake. However, because of the dike's current lack of structural integrity, high-volume freshwater releases are required during flood events to avoid the possibility of a breach in the dike. These releases affect the lake's two primary outlets: the St. Lucie and Caloosahatchee rivers. Water released from the lake contains elevated nutrient concentrations that degrade the water quality of the St. Lucie and Caloosahatchee rivers and estuaries. No effects on groundwater quality would be expected. The operation of three of the 32 culverts is regulated by the LOPA. The No Action Alternative would not affect the LOPA permit for these three culverts (5, 5A, and 10A).

4.7.2 Replace and Remove Culverts (Preferred Alternative)

Renovating the existing culverts is expected to result in little to no significant change to surface water quality conditions in Lake Okeechobee and adjacent canals. During the construction of the replacement culverts there will be a temporary increase in surface water turbidity levels within the lake and in the adjacent dike toe ditch. After construction, the replaced culverts will be operated in a manner consistent with the existing operations of these culverts. Based on the Total Max Daily Load (TMDL) study done for the lake (FDEP, 2001), which identifies the largest sources of phosphorus to the lake, the 32 culverts are estimated to provide approximately five percent of the existing total phosphorus load to the lake. The replacement culverts are intended to provide similar hydrologic and hydraulic flow characteristics when compared to the existing/authorized culverts; however, the installation of standard box culvert sizes means that at some locations, the replacement culverts will have a higher flow capacity and at others the capacity may be somewhat reduced. Increased capacity is most likely to occur at the smaller culvert locations where one culvert is replaced with two culverts. At the larger culverts, the increase in capacity is likely to be negligible. The net change to lake nutrient load is expected to be negligible based upon the relatively small nutrient contribution attributed to the project culverts and because the replacement culverts will be designed and operated such that future flows closely match historic flows. The replacement of Culverts 5, 5A, and 10A is likely to require coordination with the FDEP to modify the existing Lake Okeechobee Protection Act permit which regulates nutrient flows into and out of the lake; however, this is not expected to result in project constraints or delays.

The replacement of the culverts will have no significant impact on groundwater quality. The USACE or its construction contractor will develop an Environmental Protection Plan (EPP) which will include stormwater pollution prevention measures such as hay bales, silt screens, and turbidity curtains.

4.8 AIR QUALITY

4.8.1 No Action Alternative

Selection of the No Action Alternative would not affect air quality.

4.8.2 Replace and Remove Culverts (Preferred Alternative)

The project area is not located in a non-attainment airshed. Emissions associated with the Preferred Alternative would be generated from heavy machinery operating in the area where construction occurs. Construction activities would cause minor short-term air quality effects in the form of fugitive dust or airborne particulate matter from earthwork and unpaved roads accessed for the project. Short-term loadings of internal-combustion engine exhaust gases would be negligible. To help minimize construction emissions, reduced idling practices, cleaner fuels, and emission retrofits for construction equipment would be used by USACE contractors whenever feasible. Any restrictions due to volatile organic compounds would be covered in Material Safety Data Sheets included in designs, plans, and specifications and the environmental protection plan for construction. Every federally funded project must be consistent with state plans for implementing the provisions of the Clean Air Act Amendments (State Implementation Plans). This project is in conformance with the State Implementation Plan because it would not cause violations of the National Ambient Air Quality Standards.

4.9 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

4.9.1 No Action Alternative

If there is a breach in the dike, some lands east of the dike may potentially be subjected to widespread HTRW contamination as a result of the dispersion of otherwise contained pollutants on private lands.

4.9.2 Replace and Remove Culverts (Preferred Alternative)

The removal and replacement of the culverts is not expected to result in the discovery or generation of HTRW materials. The culverts are not located adjacent to typical sources of HTRW materials such as fuel storage tanks and there have been no land use activities in the immediate vicinity of the culverts that would have potentially resulted in the deposition of HTRW substances. Construction debris from the removal and replacement activities will be disposed of locally in a licensed/authorized landfill or otherwise processed at a recycling facility. In the unlikely event that HTRW materials are discovered during the construction process, the contractor will be instructed to rectify the situation in accordance with applicable state/Federal laws.

4.10 NOISE

4.10.1 No Action Alternative

The No Action Alternative would not increase ambient noise levels near the HHD. Without reconstruction, emergency construction repairs would continue and some level of construction type noise would be present similar to current conditions. Therefore, no additional effects to noise are expected to result due to selection of this alternative.

4.10.2 Replace and Remove Culverts (Preferred Alternative)

Heavy machinery associated with construction of the Preferred Plan could result in increased noise. Although sound levels could exceed 70 dB in proximity to construction activities, attenuation with distance from the construction site would reduce the noise. Noise could disturb the residences located near the project area. Noise could also disturb people engaged in outdoor activities at such locations as the Port Mayaca Public Use Area. Construction

staging areas away from the dike also have a potential for increasing noise levels. All noise impacts would be temporary in nature and limited to each culvert construction area.

4.11 AESTHETICS

4.11.1 No Action Alternative

Short-term impacts to aesthetics are anticipated, as patches and temporary emergency construction are necessary to repair ongoing piping and boils. Without reconstruction, dust and noise from emergency construction would continue, portions of the dike would remain closed, and aesthetics and safety would be compromised.

4.11.2 Replace and Remove Culverts (Preferred Alternative)

Temporary, short term impacts to localized areas would result from construction activities and the movement of construction equipment through lands designated for staging and construction. The LOST trail for viewing Lake Okeechobee from the top of the dike would be closed adjacent to the culverts during construction activities. Grassy side slopes of the dike would be affected, but would be revegetated following construction.

4.12 SOCIO-ECONOMIC

4.12.1 No action alternative

The No Action Alternative could have adverse effects on the surrounding agriculture and urban areas if a breach were to occur in the HHD system. Flooding could result in loss of property, life, and potentially cause businesses to close and displacement of people from their homes. Damages resulting from a dike failure would occur to residential structures, non-residential structures, agricultural resources, roadways, the Florida East Coast railroad, and public utilities.

4.12.2 Replace and Remove Culverts (Preferred Alternative)

Long-term adverse socioeconomic effects are not expected as a result of implementing the Preferred Plan. Temporary adverse effects that might be experienced include increased traffic congestion and possibly reduced tourism during project construction within the project footprint for each culvert. Construction jobs may be created during construction of the Preferred Plan. This would be a potential benefit to workers and contractors in the project area seeking work.

4.13 RECREATION RESOURCES

4.13.1 No action alternative

Moderate adverse impacts to recreational resources are anticipated without repairs to the dike. Piping and boils would continue, requiring emergency repairs for frequent breaches in the dike. Affected areas would be closed during emergency construction for safety reasons. Recreational resources would be adversely impacted by significant flooding if a breach in the dike would occur, including loss of the LOST in the area of the breach. Emergency repairs would cause temporary inaccessibility to the LOST and/or boat ramps.

4.13.2 Replace and Remove Culverts (Preferred Alternative)

There would be temporary impacts to the LOST during construction activities. However, there are multiple access points to enter and exit the trail and closings would be coordinated with FDEP and the Office of Greenways and Trails. There would be temporary impacts to Lake Okeechobee Jaycee Recreation Area, operated by the Okeechobee County, during removal of Culvert 7 and TCC.

4.14 PUBLIC SAFETY

4.14.1 No Action Alternative

A breach in the dike would result in widespread flooding as waters from Lake Okeechobee pass through the breach and onto adjacent lands. The risk to residents located within the vicinity of the dike is substantial. Inundation mapping and flood stage hydrographs indicate that flooding to the population would be severe. The culverts, in their current condition, are a recognized weak point in the structural integrity of the HHD.

4.14.2 Replace and Remove Culverts (Preferred Alternative)

Replacing and removing culverts would significantly improve safety in the areas surrounding the HHD at and around the culverts. The culverts pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts which could lead to a breach of the embankment. Replacing and removing the culverts are considered maintenance actions that are required to reduce this unacceptable risk due to the high probability of failure and associated potential loss of life. The recommendation provided in this document is designed to provide reliable flood protection for the communities surrounding the HHD.

4.15 HISTORIC PROPERTIES

4.15.1 No Action Alternative

Failure of the HHD would result in damage to the HHD itself, a site determined to be eligible for inclusion on the National Register of Historic Places. Depending on the location and severity of a failure in the dike, other recorded properties eligible for listing or listed on the National Register, as well as unrecorded properties adjacent to the dike may also be adversely affected.

4.15.2 Replace and Remove Culverts (Preferred Alternative)

While recommended as contributing elements to the HHD's National Register of Historic Places eligibility, USACE has determined that the removal and replacement of the culverts has been adequately mitigated by documentation in a cultural resources assessment report of the HHD (HHD, 2010) and that removal and replacement of the culverts will not adversely affect the National Register eligibility of the HHD. In a letter dated 17 March 2011, the Florida SHPO concurred with the USACE determination.

4.16 CUMULATIVE IMPACTS

Cumulative effects are defined in 40 CFR 1508.7 as those effects that result from:

> *...the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

Cumulative environmental effects for the proposed project were assessed in accordance with guidance provided by the President's Council on Environmental Quality (CEQ).

Table 5 summarizes the impact of such cumulative actions by identifying the past, present, and reasonably foreseeable future condition of the various resources which are directly or indirectly impacted by the proposed action and its alternatives. Also illustrated is the future condition with any reasonable alternatives (or range of alternatives).

Table 5. Summary of Cumulative Impacts

Resources/Issues	Past Actions & Their Effects	Preferred Alternative Effects	Other Present and Reasonably Foreseeable Future Actions & Their Effects	Cumulative Effects of All Actions
Water Quality	The C&SF Project has greatly altered the natural hydrology of the project area. Construction methods implemented in the 1930s and 1940s created a dike unable to withstand lake stages higher than 18 feet (NGVD). As a result, rapid, high-volume releases of lake water are required during storm events that stress downstream estuaries.	There are no anticipated changes to water quality. Functions will be replaced in-kind. Public safety would be increased due to the rehabilitation of the HHD to the current dam safety regulations.	To avoid stressing the structural integrity of the HHD, the current operating schedule for the lake (LORS) operates a lower lake regulation schedule, which helps to avoid adverse impacts to water quality in downstream estuaries. The LORS operating plan will be re-evaluated once the HHD has been rehabilitated. Modifications may include increased water storage in the lake, which would benefit estuaries by reducing high volume freshwater releases. CERP projects and other initiatives would improve the water quality in Lake Okeechobee, reduce undesirable freshwater releases from the lake, and reduce watershed runoff to the estuaries.	Rehabilitation of the HHD, along with other current and reasonably foreseeable actions, would improve water quality in Lake Okeechobee and provide improvements in water deliveries to the coastal estuaries.

Resources/Issues	Past Actions & Their Effects	Preferred Alternative Effects	Other Present and Reasonably Foreseeable Future Actions & Their Effects	Cumulative Effects of All Actions
Protected Species	Fish and wildlife habitat has been greatly altered as a result of the C&SF Project. Most land has been converted to agricultural, commercial, or residential use.	Minor temporary impacts to foraging and loafing habitat are expected from the maintenance operations for construction of the Preferred Alternative. Since each culvert will not be concurrently constructed, an abundance of alternative foraging and loafing habitats are available in areas of no construction.	An abundance of alternative foraging and loafing habitats are available around the lake and on Kreamer and Torry islands.	HHD rehabilitation as a whole is not expected to significantly affect protected species. Coordination with USFWS is ongoing.
Wetlands	The C&SF Project has greatly altered the natural hydrology of the project area. Most land has been converted to agricultural, commercial, or residential use. Compensatory mitigation for implementing rehabilitation features in L-D9 has already been completed. The USACE removed 57 acres of the invasive species melaleuca adjacent to L-D1.	The Preferred Alternative would have temporary impacts to wetlands during construction. Upon completion of construction and removal of cofferdams, vegetation will be restored comparable to preconstruction conditions.	Rehabilitation of the remainder of L-D1, L-D2, and L-D9 is expected. The construction of rehabilitation features would likely include filling in the HHD toe ditch in these levee designations. New drainage swales in other reaches may be constructed, creating wetland habitat	Overall, there will probably be a net increase in wetland functionality in the area as a result of new drainage swale wetland habitat and functional gains in surrounding wetlands as a result of mitigation efforts of future rehabilitation efforts.

Resources/Issues	Past Actions & Their Effects	Preferred Alternative Effects	Other Present and Reasonably Foreseeable Future Actions & Their Effects	Cumulative Effects of All Actions
Public Safety	Construction methods implemented in the 1930s and 1940s created a dike unable to withstand lake stages higher than 18 feet (NGVD). As a result, communities near the HHD are at risk during storm events.	The Preferred Alternative would aid in improving public safety for the communities that exist near the dike. The plan is designed to prevent piping around the culverts within in the HHD.	To avoid stressing the structural integrity of the HHD, the current operating schedule for the lake (LORS) operates a lower lake regulation schedule than the previous operating schedule (WSE). CERP projects designed to store excess water would help managers to operate the lake at lower stages during flood events. Glades, Hendry and Palm Beach counties are finalizing Emergency Operations Plans for an HHD failure scenario. These plans will help avoid significant adverse effects on residents near the dike if a breach occurs.	Rehabilitation of the HHD, along with other current and reasonably foreseeable actions, would significantly improve the safety of the communities adjacent to the dike.

4.17 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Preferred Alternative would require irreversible and irretrievable commitments including the expenditure of funding, energy, labor, and materials. The project would not cause the permanent removal or consumption of any renewable resources. However, implementation would commit lands and resources for reconstruction of the HHD, fill material, and other project features.

4.18 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Both the Preferred Alternative and the No Action Alternative have unavoidable adverse direct and indirect environmental effects that are discussed in this document. The No Action Alternative would have significant adverse effects on public health and safety. Due to signs of dike instability during high water stages in the lake after the 2004 and 2005 hurricanes in South Florida, the SFWMD contracted for an expert review panel of the stability and safety of the HHD. Particular emphasis was placed on the structural stability of the dike with regard to seepage and water pressures within the embankment and erosion and potential overtopping concerns during large storm events. The technical review concluded that the current condition of the HHD poses a grave and imminent danger to the people and the environment of South Florida.

Inundation maps and flood stage hydrographs generated by the USACE indicate that flooding in the communities near the HHD would be severe and warning times would be limited if a breach in the dike were to occur. The location of the breach and the size of the storm event would determine the geographic extent of the flooding. Based on USACE analysis, the most significant flooding would occur if the dike were to breach along levee designations L-D9, L-D2, and L-D1 due to the topography and communities located in close proximity to the dike. A breach in the dike could cause significant adverse effects on not only public safety, but also on agriculture, recreational resources, transportation and communication infrastructure, real estate, and environmental and cultural resources.

As discussed under each resource subsection in Section 4, adverse effects associated with implementing the Preferred Alternative are expected to be minimal to moderate. Moderate impacts would be temporary and would mostly be on recreational resources due to temporary closings of the LOST.

Unavoidable adverse effects that would result from implementation of the Preferred Alternative would include the following:

<u>Vegetation</u>
No significant adverse effects to vegetation and cover types described are likely to occur during culvert removal and replacement. Minimal short-term impacts to vegetation as a result of construction and minor excavation for this alternative are expected. Grassy vegetation will be replaced on the slope of the HHD and emergent wetland vegetation will be planted lake side post construction and also reestablish through natural recruitment.

Threatened and Endangered Species
Adverse impacts to threatened and endangered species are not likely to occur due to culvert removal and replacement. Preconstruction surveys will be conducted prior to initiation of construction activities and monitoring will occur throughout construction.

No significant impacts to the foraging habitat for wading birds, reptiles and amphibians are likely to occur. Foraging habitat within toe ditches would be temporarily impacted as a result of construction and minor excavation for this alternative. However, the culverts will not all be replaced concurrently, thereby leaving foraging habitat available to species.

Wetlands
There will be temporary impacts to wetlands within the project footprint due to the installation of cofferdams and subsequent dewatering of the construction area. The USACE will work in coordination with FDEP, USFWS, and the FFWCC to minimize any potential permanent wetland impacts during the design phase of each culvert. Upon completion of construction activities and removal of cofferdams, vegetation similar to preconstruction conditions will be planted to aid in the restoration of the vegetation within the project footprint.

Water Use and Hydrology
The removal of abandoned culverts poses a temporary risk during construction when the lake is contained by an upstream cofferdam. In the event of a storm, the cofferdam could be considered a weak point in the dike and could have a higher probability of failure.

Water Quality
Water quality is not expected to be adversely affected by the Preferred Alternative.

Air Quality
Air quality is not expected to be impacted due to culvert removal and replacement.

HTRW
Hazardous, toxic and radioactive wastes are not expected to be a problem within the project footprint.

Noise
Minor localized noise related impacts during construction operations are expected to occur due to implementation of the culvert removal and replacement.

Aesthetic Resources
Limited, short-term adverse impacts associated with construction activities would be imposed on aesthetic resources within the project area.

Socioeconomics
Socioeconomics are not expected to be adversely impacted by the implementation of culvert removal and replacement, though tourism in areas immediately adjacent to culvert

construction may be reduced during construction. The construction activities resulting from culvert replacements and removals may provide jobs opportunities to local residents.

Recreational Resources

Temporary impacts to the LOST trail and possibly to some lakeside boat ramp areas as a result of construction activities and/or access of construction site, equipment, and staging areas are anticipated. Construction and staging would temporarily limit certain segments of the trail. Closings of the LOST would be coordinated FDEP and the Office of Greenways and Trails. There will be temporary impacts to Lake Okeechobee Jaycee Recreation Area, operated by the Okeechobee County, during removal of Culvert 7 and TCC.

Public Safety

Public safety levels at and around culverts are expected to significantly increase once construction is complete.

Historic Properties

The USACE and the Florida SHPO have determined that the replacement and removal of the culverts have been sufficiently mitigated by documentation in a cultural resources assessment report and will have no adverse effect on the National Register eligibility of the HHD. Consultation and coordination with the Florida SHPO, appropriate federally recognized tribes, and other interested parties is ongoing and will continue through project completion.

4.19 COMPATIBILITY WITH FEDERAL, STATE AND LOCAL OBJECTIVES

The objective of this project is implementation of risk reduction measures in order to reduce the probability of a breach due to seepage and boils around the Federal culverts. State and local objectives concur with the Federal objective and current operations would be maintained throughout the duration of the HHD culvert construction work as justified on a temporary basis to prevent significant hardships.

4.20 CONFLICTS AND CONTROVERSY

The Sugar Cane Growers Cooperative of Florida had concerns on previous HHD environmental documents regarding unique farmland, benefits of the dike system, and project segmentation. As previously stated, current operations will be maintained during replacement as justified on a temporary basis to prevent significant economic hardships. Current operation procedures would continue post construction. Impacts discussed within this document would all occur on lands currently owned by the Federal government.

5 ENVIRONMENTAL COMPLIANCE AND COMMITTMENTS

The Preferred Alternative of the HHD Project was considered in relation to compliance with Federal environmental review and consultation requirements. The following paragraphs document compliance with all applicable Federal statutes, executive orders, and policies.

Table 6 at the end of this section summarizes the level of compliance with those statutes, orders, and policies.

5.1 ENVIRONMENTAL COMMITMENTS

The USACE commits to mitigating effects of the Preferred Plan to the greatest extent possible in both the planning and construction phases of the project. According to the Council on Environmental Quality (40 CFR 1508.2), mitigation as it relates to the National Environmental Policy Act includes the following:

- Avoiding the effect altogether by not taking a certain action or parts of an action.
- Minimizing effects by limiting the degree or magnitude of the action and its implementation.
- Rectifying the effect by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the effect over time by preservation and maintenance operations during the life of the action.
- Compensating for the effect by replacing or providing substitute resources or environments.

5.2 AVOIDANCE

The Preferred Alternative was formulated to not only meet planning objectives and engineering criteria, but also to avoid significant effects on the natural and human environment wherever possible.

5.3 MINIMIZATION

Minimization of impacts will occur in areas of snail kite critical habitat by using driven pile cofferdams which generally have an approximately 50 percent smaller footprint than earthen cofferdams. Driven pile cofferdams, not earthen, would be constructed as close as possible to the construction area to avoid impacts to snail kite critical habitat in Culverts 1, 1A, 2, 5, and 5A.

Once the first set of culverts is completed, there would be discussion as how to best minimize impacts and better assess remaining culvert construction and replacement. This allows for adaptive management to produce better results once the first six have been replaced.

5.4 MITIGATION

The USACE and its contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

1) Standard protection measures regarding the eastern indigo snake shall be included in the environmental protection plan when the USACE proceeds to the plans and specifications phase of this project.

2) The USACE/contractor shall conduct a pre-construction survey to determine locations of bald eagle nests within the immediate vicinity of construction prior to issuance of any construction contracts. Results shall be coordinated with the USFWS, Vero Beach office. The USACE will conduct surveys to locate the nest trees ahead of construction and will avoid construction close to the nests during the nesting season. If the hatchlings fledge prior to May 15, activity within the 660-foot buffer would be allowed. In the event that construction within the interior of the buffer is unavoidable within nesting season, the Bald Eagle Monitor Guidelines will be implemented accordingly. The guidelines can be reviewed at the following web address: www.fws.gov/northflorida/BaldEagles/bald-eagles.htm.

3) The USACE shall conduct a survey for burrowing owls commensurate with that for bald eagle nests prior to issuance of any construction permits. The USACE shall consult with the FFWCC regarding adopting standardized protection measures should any owls be identified within the project construction footprint. Results shall be coordinated with the USFWS and FFWCC. If burrowing owls or active bald eagle nests are found to be present in the project area, effects shall be minimized by altering construction schedules to avoid the nesting season and/or burrows shall be cordoned off to avoid their direct destruction.

4) The USACE shall consult with the FFWCC regarding adopting standardized protection measures should any protected species nests be identified within the project construction zone. Results shall be coordinated with the USFWS and FFWCC.

5) Some culverts will require a Water Quality Certification under Section 401 of the Clean Water Act and some will be exempt. The USACE will work in correspondence with FDEP during the time of permit application**.**

6) Turbidity screening and diversion will be used to control effects to the drainage ditches and connected canals. Runoff from the construction site or storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, and any measures required by area wide plans approved under paragraph 208 of the Clean Water Act. Temporary and permanent erosion and sedimentation control features or screening will be installed. Temporary velocity dissipation devices shall be placed along drainage courses to provide for non-erosive flows. Temporary erosion and

sediment control measures such as berms, dikes, drains, sediment traps, sedimentation basins, grassing, mulching, straw, and silt fences shall be maintained until permanent drainage and erosion control facilities are completed and operative. For silt fences, the filter fabric is to be of nylon, polyester, propylene, or ethylene yarn of at least 50 lb/in strength and able to withstand a flow rate of at least 0.3 gal/ft sq/minute. It also would contain ultraviolet ray inhibitors and stabilizers and be a minimum of 36 inches in width.

7) In addition, during construction, the contractor will be responsible for keeping construction activities, including refueling and maintenance sites, under surveillance, management, and control to avoid pollution of surface, ground waters, and wetlands. The contractor is responsible for conducting all operations in a manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302, State of Florida, FDEP.

8) Project construction shall not destroy migratory birds, their active nests, their eggs, or their hatchlings. Monitoring for such would be required by the construction contractor. A buffer zone around active nests or nestling activity would be required during the nesting season.

5.5 CLEAN AIR ACT OF 1972, AS AMENDED

This project is being coordinated with the FDEP, Air Quality Division, and the Agency. No air quality permits are required, and no permanent sources of air emissions are part of the Preferred Plan. This project is in compliance with Sections 176 and 309 of the Clean Air Act.

5.6 CLEAN WATER ACT OF 1972, AS AMENDED

Full compliance will be achieved with issuance of Water Quality Certification under Section 401 from the State of Florida. All State water quality standards would be met. A Section 404(b)(1) Evaluation is included in this report in Appendix C.

Section 402(b)(2) requires that a NPDES construction activities permit be acquired for construction activities that disturb more than five acres of land. The FDEP issues these permits within 48 hours of application. This permit will be acquired prior to initiation of construction.

5.7 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that would be affected by this project. These Acts are not applicable.

5.8 COASTAL ZONE MANAGEMENT ACT OF 1972, AS AMENDED

A Federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Appendix D. State consistency review was performed during the public review period of this EA and the state has concurred with this determination.

5.9 ENDANGERED SPECIES ACT OF 1973, AS AMENDED

Consultation was initiated with the USFWS on 10 December 2010. A Complete Initiation Package (CIP) was sent to the USFWS for their concurrence on USACE effect determinations and their concurrence letter is in Appendix E. The EA was also sent to NMFS for their review and concurrence. This project has been coordinated under the Endangered Species Act and will therefore be in compliance. The USACE has and will continue to maintain continuous coordination with the USFWS through the replacement and removal of the federal culverts evaluated in this EA.

5.10 ESTUARY PROTECTION ACT OF 1968

No estuaries designated under the Act are in the project area. However, failure of the dike, a possibility under the No Action Alternative, could severely negatively impact estuaries downstream of Lake Okeechobee as large deliveries of fresh water dramatically change the estuarine water chemistry. This act is not applicable.

5.11 FARMLAND PROTECTION POLICY ACT OF 1981

The USDA-NRCS has determined that zero acres of Unique Farmland would be affected by the project, and a Form AD-1006 was provided. Their concurrence letter is in Appendix E. The project is in compliance.

5.12 FEDERAL WATER PROJECT RECREATION ACT OF 1965, AS AMENDED

The effects of the proposed action on outdoor recreation have been considered and are presented in this EA. Impacts to the Lake Okeechobee Scenic Trail located on top of the dike will require close coordination with FDOT and FDEP in order to return the trail to as-built conditions and limit trail closure time. The project is in compliance with the Act.

5.13 FISH AND WILDLIFE COORDINATION ACT OF 1958, AS AMENDED

This project has been coordinated with the USFWS. In response to the requirements of this Act, the USACE has and will continue to maintain continuous coordination with the USFWS and the FFWCC during all stages of planning and implementation of this project.

5.14 MAGNUSION-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

This Act is not applicable. Lake Okeechobee is a freshwater lake.

5.15 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT OF 1972, AS AMENDED

This Act is not applicable. Ocean disposal of dredged material is not proposed as a part of the culvert replacement and removal plan.

5.16 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

Under the Migratory Bird Treaty Act, project construction shall not destroy migratory birds, their active nests, their eggs, or their hatchlings. Monitoring for such would be required by the construction contractor. A buffer zone around active nests or nestling activity would be required during the nesting season. No migratory birds would be affected by project activities; however, several bald eagle nests have been identified adjacent to the HHD. The toe ditch provides very little quality habitat for migratory birds. Alternative and higher quality habitats are available along the Lake Okeechobee shoreline and in adjacent canals. This project is in compliance with these Acts.

5.17 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) OF 1969, AS AMENDED

Environmental information on the project has been compiled and this EA has been prepared in compliance with NEPA. A notice of availability of this EA was mailed describing the 30 day comment period. A public meeting was held 8 March 2011 in Okeechobee, Florida and on 10 March 2011 in Clewiston, Florida. This EA complies with all NEPA requirements through the public review process.

5.18 NATIONAL HISTORIC PRESERVATION ACT OF 1966, AS AMENDED

Coordination and consultation with the Florida SHPO, appropriate federally recognized tribes, and other interested parties has been initiated as of January, 2011, in accordance with the National Historic Preservation Act, as amended (PL89-665) the Archaeological and Historic Preservation Act, as amended (PL93-29); Executive Order 11593, and appropriate Florida Statutes. Their concurrence letter is in Appendix E.

5.19 RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), AS AMENDED BY THE HAZARDOUS AND SOLID WASTE AMENDMENTS (HSWA) OF 1984, COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA) AS AMENDED BY THE 5.26.21 SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) OF 1996, TOXIC SUBSTANCES CONTROL ACT (TSCA) OF 1976

Hazardous, toxic, and radioactive waste (HTRW) surveys have been conducted as part of environmental assessment and environmental impact statements prepared as part of the prior HHD rehabilitation efforts. In December 2007, a HTRW survey of the HHD was conducted using aerial imagery and a contaminated site and petroleum storage site database compiled by the FDEP. A windshield survey was conducted to verify the findings of the desktop survey. The survey was updated in August 2009 for the Reach 1A SEIS (USACE 2010) and in February of 2010 for L-D1 and L-D2. The purpose of the last two surveys was to preliminarily identify potential contamination sites within 500 feet of the HHD in L-D1, L-D2, and L-D9. The results of these surveys show that agricultural and rural residential development has resulted in HTRW contamination in areas adjacent to the HHD; however, no contaminated areas or materials were found within the Federal right-of-way. The project is in compliance with these Acts.

5.20 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The project is in compliance.

5.21 SAFE DRINKING WATER ACT (SDWA) OF 1974, AS AMENDED

Lake Okeechobee, as well as ground and surface waters, supply drinking water for several communities around the lake. Implementation of the project would not impact water quality of Lake Okeechobee, ground waters, or surface water used to supply drinking water. This project complies with the Act.

5.22 UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970 (PUBLIC LAW 91-646)

Acquisition of real estate is not required for the proposed project. All work will be completed within the current Federal right-of-way. This project is in compliance with this Act.

5.23 WILD AND SCENIC RIVER ACT OF 1968, AS AMENDED

No rivers designated under the Act are in the project area. The project is in compliance.

5.24 WATER RESOURCES DEVELOPMENT ACT (WRDA) OF 1986, SECTION 904

Section 904 of the 1986 WRDA requires that the plan formulation and evaluation process consider both quantifiable and unquantifiable benefits and costs of the quality of the total environment, and preservation of cultural and historical values. The engineering study and EA are in compliance.

5.25 WRDA OF 1990, SECTION 307

Section 307 of the 1990 WRDA establishes, as part of the water resources development program, an interim goal of no overall net loss of the Nation's remaining wetlands, and a long-term goal of increasing the quality and quantity of the Nation's wetlands. Construction of the Preferred Plan will result in temporary impacts to wetlands, and wetland conditions will be restored to pre-construction conditions. The Preferred Plan is in compliance.

5.26 EXECUTIVE ORDER (E.O.) 11990, PROTECTION OF WETLANDS

The Preferred Plan would result in temporary impacts to wetlands as a result of construction of the cofferdam during replacement or removal of culverts. Impacted areas would be restored to preconstruction conditions upon completion of the culvert removal or replacement action. The study is in compliance.

5.27 E.O. 11988, FLOODPLAIN MANAGEMENT

The Preferred Plan would directly support a reduction in hazards and risks associated with floods and would minimize the impact of floods on human safety, health and welfare. The Preferred Plan would have no impact on the restoration and preservation of the natural and beneficial values of the base floodplain. The project is in compliance.

5.28 E.O. 12898, ENVIRONMENTAL JUSTICE

Executive Order 12898 requires the Federal government to review the effects of their programs and actions on minorities and low-income communities. The Preferred Plan that was formulated for the HHD Federal culvert replacement would help to ensure the safety of those communities within the study area as well as residents living within the area anticipated to be impacted in the event of a dike failure. In addition to ensuring the safety and well-being of residents and their property, implementation of the Preferred Plan may have a significant beneficial effect on local communities through job creation, increased sale of construction material and other goods necessary to sustain a large construction force for the duration of the project. The study area is known to contain a significant percentage of low income and minority individuals. This project is not expected to have disproportionately high and adverse human health or environmental impacts on minority or low-income populations.

5.29 E.O. 13045, PROTECTION OF CHILDREN

Executive Order 13045, requires each Federal agency to "identify and assess environmental risks and safety risks [that] may disproportionately affect children" and ensure that its "policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This project has no environmental or safety risks that may disproportionately affect children. The project is in compliance.

5.30 E.O. 13112, INVASIVE SPECIES

Exotic and invasive plant species are within drainage swales, connecting canals, wetlands, and some uplands within the project area. However, the project will not contribute to nutrient loading that could favor invasive species. Further, some removal of invasives will be necessary within the project footprint. Ballast water organisms or terrestrial exotic wildlife species would not be affected. This project is in compliance.

5.31 E.O. 13186, MIGRATORY BIRDS

The HHD itself is not considered migratory bird habitat though it is adjacent to Lake Okeechobee, known for its abundance of migratory birds. A bird monitor will be required to be on site during construction to provide preconstruction surveys and monitor for migratory birds. The project is in compliance with this Executive Order.

Table 6. Compliance with Environmental Laws, Regulations and Executive Orders: Preferred Plan

Law, Regulation or Policy	Status	Comments
Clean Air Act	Complies	**Sec. 309:** EA has not yet been coordinated with the public and agencies. **Sec. 176:** No permanent sources of air emissions are part of the Preferred Plan.
Clean Water Act	Complies	Full compliance upon USACE approval of 404(b)(1), which is included in EA, issuance of water quality certification, and NPDES permits from the state.
Coastal Barrier Resources Act	Not applicable	The study area is not a designated Coastal Barrier Resources Act unit.
Coastal Zone Management Act	Complies	A Coastal Zone Management Consistency Evaluation is included in this EA. The project will be in full compliance when the evaluation is approved by the state.
Endangered Species Act	Complies	Consultation was initiated with the USFWS on 10 December 2010 and is ongoing. The EA will be sent to NMFS for their review and concurrence.
Estuary Protection Act	Not applicable	No estuaries designated under the act are in the project area.
Farmland Protection Policy Act	Not applicable	No prime and unique farmlands are present at the project site.
Federal Water Project Recreation Act	Complies	Impacts to the Lake Okeechobee Scenic Trail located on top of the dike will require close coordination with FDOT and FDEP in order to return the trail to as-built conditions and limit trail closure time.

Law, Regulation or Policy	Status	Comments
Fish and Wildlife Coordination Act	Complies	This project is being coordinated with the USFWS. In response to the requirements of this Act, the USACE has and will continue to maintain continuous coordination with the USFWS and the FFWC during all stages of planning and implementation of this project.
Magnuson-Stevens Fishery Conservation and Management Act	Not Applicable	Essential Fish Habitat (EFH) is not present within the project footprint.
Marine Protection, Research and Sanctuaries Act	Not applicable	Ocean disposal of dredged material is not part of the project.
Migratory Bird Treaty Act and Migratory Bird Conservation Act	Complies	No migratory birds would be affected by project activities. Monitoring would be required of the construction contractor.
National Environ-mental Policy Act	Complies	Environmental information on the project has been complied and this Environmental Assessment has been prepared.
National Historic Preservation Act	Complies	The HHD is historically significant for its engineering design and is eligible for listing on the National Register of Historic Places.
RCRA, CERCLA, Toxic Substances Control Act	Complies	An HTRW assessment has been performed to identify sites of concern in the project area and vicinity. The results of these surveys show that agricultural and rural residential development has resulted in HTRW contamination in areas adjacent to the HHD; however, no contaminated areas or materials were found within the Federal right-of-way.
Rivers and Harbors Act	Complies	The proposed work would not obstruct navigable waters of the United States.
Safe Drinking Water Act	Complies	The project would not impact water quality of Lake Okeechobee, groundwater, or surface water used to supply drinking water.
Uniform Relocation Assistance and Real Property Acquisition Policies Act	Complies	Acquisition of real estate is not required for the proposed project. All work will be completed within the current Federal right-of-way.
Wild and Scenic River Act	Not applicable	No designated Wild and Scenic Rivers would be affected by project related activities.
WRDA of 1986, Section 904	Complies	The plan formulation and evaluation process of the Preferred Plan considered quantifiable and unquantifiable benefits and costs of the quality of the total environment and preservation of cultural and historical values.
WRDA of 1990, Section 307	Complies	Construction of the Preferred Plan will result in only temporary impacts to wetlands, and wetland conditions will be restored to pre-construction conditions.
E.O. 11990 Protection of Wetlands	Complies	The project would result in temporary impacts to wetlands as a result of construction of the cofferdam during replacement or removal of culverts. Upon completion of the culvert removal or replacement action and removal of cofferdams, impacted areas would be restored to preconstruction conditions.
E.O. 11988 Floodplain Management	Complies	The project would directly support a reduction in hazards and risks associated with floods and would minimize the impact of floods on human safety, health and welfare.

Law, Regulation or Policy	Status	Comments
E.O. 12898 Environmental Justice	Complies	The study area is known to contain a significant percentage of low income and minority individuals. This project is not expected to have disproportionately high and adverse human health or environmental impacts on minority or low-income populations.
E.O. 13045, Protection of Children	Complies	Executive Order 13045, requires each Federal agency to "identify and assess environmental risks and safety risks [that] may disproportionately affect children" and ensure that its "policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This project has no environmental or safety risks that may disproportionately affect children.
E.O. 13112 Invasive Species	Complies	Exotic and invasive plant species are within drainage swales, connecting canals, wetlands, and some uplands within the project area. However, the project will not contribute to nutrient loading that could favor invasive species. Some exotic species may be removed.
E.O. 13186, Migratory Birds	Complies	The HHD itself is not considered migratory bird habitat though it is adjacent to Lake Okeechobee, known for its abundance of migratory birds. A bird monitor will be required to be on site during construction to provide preconstruction surveys and monitor for migratory birds.

6 MONITORING DURING CONSTRUCTION PHASE

Monitoring of listed species identified to occur within the HHD will be addressed with ongoing communication with the USFWS. Construction of culverts will span over multiple years (see Table 2 for estimated construction durations) and design plans have not currently been established for each culvert, therefore informal consultation with the USFWS will continue with replacement of each culvert.

The following link provides conservation guidelines for all threatened and endangered species in Florida:
http://www.fws.gov/verobeach/index.cfm?Method=programs&NavProgramCategoryID=3&programID=73&ProgramCategoryID=3

Before, during and post construction guidelines should be followed according to the accompanying documents for each respective specie (also refer to section 5.4 Mitigation During Construction):

Audubon's Crested Caracara

Conservation Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Caracara_Conservation_Guidelines.pdf

Nesting Protocol Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Caracara_Survey_Protocol.pdf

Eastern Indigo Snake

Species Conservation Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Eastern_Indigo_Snake_Conservation_Guidelines.pdf

Everglade Snail Kite

Management Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/20060221%20Snail%20Kite%20Management%20Guidelines2.pdf

Okeechobee Gourd

Species Information:
http://www.fws.gov/verobeach/images/pdflibrary/cuok.PDF

West Indian Manatee

Species Conservation Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Manatee%20_Conservation_Guidelines.pdf

Wood Stork

Habitat Management Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Management_Guidelines_Wood%20Stork.pdf

7 LIST OF PREPARERS

The people who were responsible for contributing to this Environmental Assessment for the Herbert Hoover Dike Culvert Replacement and Removal are listed in Table 7.

Table 7. List of Preparers and Reviewers

Name	Discipline/ Expertise	Organization	Role in Document Preparation
Stacie Auvenshine	Biologist	USACE	NEPA/Report Preparation
Angela Dunn	Biologist	USACE	NEPA & Environmental Technical Lead/Reviewer
Jason Spinning	Biologist	USACE	NEPA Compliance Reviewer
Timothy Willadsen	Civil Engineer	USACE	Project Management
Mike Christofidis	Civil Engineer	USACE	Engineering Technical Lead/Reviewer
John Kendal	Geotechnical Engineer	USACE	Geotechnical Lead/Reviewer
Crystal Markley	Civil Engineer	USACE	Reviewer
Thomas Crafton	Water Resources Engineer	USACE	Water Resources Engineering Lead/Reviewer
Matt Fischer	Hydraulic Engineer	USACE	Hydraulics & Hydrology/Reviewer
Mark Shafer	Environmental Engineer	USACE	Water Quality and HTRW Appendices/Reviewer
Wendy Weaver	Archeologist	USACE	Cultural & Historic Resources/Reviewer
Hansler Bealyer	Real Estate	USACE	Reviewer
Dan Peck	Socioeconomics	USACE	Economics Lead/Reviewer
Al Walker	Planning	USACE	Planning Technical Lead/Reviewer
Brent Trauger	Dam Safety	USACE	Reviewer
John Bretz	Civil Engineer	EPJV	Reviewer
Jennifer Bockman	Civil Engineer	EPJV	Reviewer

8 PUBLIC INVOLVEMENT

8.1 SCOPING AND EA

The EA and Proposed Finding of No Significant Impact (FONSI) were made available to the public, tribes, Federal and state agencies by Notice of Availability dated 16 February 2011 (see Appendix E).

Public meetings were held in Okeechobee (8 March 2011) and Clewiston (10 March 2011) during the public comment period. The meetings served as an update on the HHD rehabilitation project as well as to describe the path forward for replacing and removing the Federal culverts. Overall, the attendees supported the ongoing HHD rehabilitation efforts and comments at the Okeechobee meeting included the following: the need for real estate acquisition, future including timeframe, of seepage berm presented in the June 2010 draft SEIS, and clarifying the original purpose of culverts. In Clewiston, comments included: what are impacts to the rim canal (Okeechobee Waterway) and boating, request for coordination of Culvert 2 with SFWMD and S169, request for repaving of the LOST upon completion of the culvert replacement as well as upon completion of future rehabilitation work, request for clarification of culvert replacement and its affect to public safety, question to culvert usage and the need to replace all 28 in kind (why not remove more), and results of a cost analysis (if needed). HHD team members also attended the meetings and answered questions as they pertained to culvert replacement and removal.

8.2 AGENCY COORDINATION

Agency coordination letters are included in the final document in Appendix E.

8.3 LIST OF RECIPIENTS

Copies of the notice of availability and /or EA were mailed to the Federal and state agencies, and tribal representatives, as listed in Table 8. A complete mailing list, including the general public, is available upon request. The final EA is posted on the internet at the following address under Martin, Palm Beach, Okeechobee, Hendry, and Glades Counties: http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine.html

Table 8. List of Recipients

AGENCY	COMPANY / DIVISION
Federal	Advisory Council on Historic Preservation
Federal	Bureau of Indian Affairs
Federal	Council on Environmental Quality
Federal	Department of Energy, Office of Environmental Compliance
Federal	Department of the Interior, Office of Environmental Affairs
Federal	Everglades National Park
Federal	Federal Emergency Management Administration, Office of Federal Coordination
Federal	Federal Highway Administration
Federal	Federal Maritime Commission

AGENCY	COMPANY / DIVISION
Federal	FEMA Region IV
Federal	National Oceanic and Atmospheric Administration (NOAA), NEPA Coordinator, Strategic Planning
Federal	National Park Service, Regional Director
Federal	NOAA National Marine Fisheries Service, Habitat Conservation Division
Federal	NOAA National Marine Fisheries Service, Protected Resources Division
Federal	U.S. Department of Agriculture, Agricultural Research Service
Federal	U.S. Department of Agriculture, Forest Service, Southern Regional Forester
Federal	U.S. Department of Agriculture, Natural Resources Conservation Service
Federal	U.S. Department of HUD, Regional Environmental Clearance Officer
Federal	U.S. Department of Justice, Environmental & Natural Resources
Federal	U.S. Department of the Interior, Office of Environmental Policy and Compliance
Federal	U.S. Environmental Protection Agency
Federal	U.S. Environmental Protection Agency, Region 4
Federal	U.S. Fish and Wildlife Service, Regional Director
Federal	U.S. Fish and Wildlife Service, Vero Beach
Federal	U.S. Geological Survey
Federal	U.S. Geological Survey, Water Resources Division
Federal	U.S. House of Representatives, Alcee Hastings
Federal	U.S. House of Representatives, Allen West
Federal	U.S. House of Representatives, Thomas Rooney
Federal	U.S. Senate, Bill Nelson
Federal	U.S. Senate, Marco Rubio
Federal	U.S. Coast Guard District, 7th District
State	Central Florida Regional Planning Council
State	Division of Historic Resources, State Historic Preservation Officer
State	East Beach Water Control
State	FL Department of Environmental Protection
State	FL Department of Environmental Protection, Bureau of Invasive Plant Management
State	FL Department of Environmental Protection, Ecosystem Planning
State	FL Department of Environmental Protection, Florida State Clearinghouse
State	FL Department of Environmental Protection, Office of Intergovernmental Programs
State	FL Department of Environmental Protection, Watershed Management & Planning
State	FL Department of Transportation, District 4
State	FL Department of Transportation, Environmental Office
State	FL Dept of Agriculture & Consumer Services
State	FL Fish & Wildife Conservation Commission
State	FL Fish & Wildlife Conservation Commission, Everglades Protection & Restoration Program
State	FL Fish & Wildlife Conservation Commission, Office of Environmental Service
State	Florida Governor's Office
State	Florida Integrated Science Center
State	Florida Legislative Library
State	Florida Power and Light
State	Highlands Glades Drainage District

AGENCY	COMPANY / DIVISION
State	Pahokee Water Control District
State	South Florida Conservancy District
State	South Florida Water Management District
State	South Florida Water Management District, Okeechobee Field Station
State	University of Florida, Institute of Food & Agricultural Sciences Research Center
State	University of Florida, Institute of Food & Agricultural Sciences, Center for Aquatic Plants
Tribe	Miccosukee Tribe of Indians of Florida, Chairman
Tribe	Mucogee (Creek) Nation of Oklahoma
Tribe	Poarch Band of Creek Indians, Tribal Historic Preservation Officer
Tribe	Seminole Nation of Oklahoma
Tribe	Seminole Tribe of Florida, Executive Director
Tribe	Seminole Tribe of Florida, Tribal Historic Preservation Officer
Tribe	South Florida Restoration Task Force, Executive Director
County	Canal Point Community Development, Inc.
County	City of Belle Glade
County	City of Pahokee
County	City of Pahokee
County	City of South Bay
County	Economic Council of Okeechobee County, Inc.
County	Economic Council of Palm Beach County
County	Glades City Board of County Commissioners
County	Glades County Administration, County Coordinator
County	Hendry County Administration, County Administrator
County	Hendry County Board of County Commissioners
County	Hendry County Board of County Commissioners
County	Hendry County Building Department, Flood Plain Manager
County	Lee County Administration, Country Manager
County	Martin County Administration, County Administrator
County	Martin County Board of County Commissioners
County	Miami-Dade County, County Manager
County	Okeechobee Chamber of Commerce
County	Okeechobee County Administration, County Administrator
County	Okeechobee County Board of County Commissioners
County	Osceola County Administration, County Manager
County	Palm Beach Board of County Commissioners
County	Palm Beach County
County	Palm Beach County Administration, County Administrator
County	Palm Beach County Water Utilities
County	Palm Beach County, County Archaeologist
County	Palm Beach County, Economic Development Office
County	Palm Beach County, Water Utilities Department
County	Polk County Administration, County Manager
County	Polk County Board of County Commissioners
County	St. Lucie County Administration, County Administrator
County	St. Lucie River Initiative
County	Town of Palm Beach
Library	Barron Library
Library	Clewiston Public Library
Library	Loula V. York Branch Library
Library	Martin County Blake Library

AGENCY	COMPANY / DIVISION
Library	Okeechobee County Public Library
Library	Palm Beach County Library
Marina & Fish Camp	Angler's Guide Service
Marina & Fish Camp	Fast Break
Marina & Fish Camp	Garrard's Bait & Tackle
Marina & Fish Camp	Gulf Citrus Growers Association
Marina & Fish Camp	J & S Fish Camp
Marina & Fish Camp	Little Big Man's
Marina & Fish Camp	Martin's Marina & Resort
Marina & Fish Camp	Okee Tantie Bait & Tackle
Marina & Fish Camp	Taylor Creek Lodge
Marina & Fish Camp	Twin Palm Resort
Agricultural	Atlanta Sugar Association, Inc.
Agricultural	Berry Grove Corporation
Agricultural	Conservation Alliance of St. Lucie County
Agricultural	Dairy Farmers Inc.
Agricultural	Everglades Coordinating Council
Agricultural	Florida Citrus Mutual
Agricultural	Florida Sugar Cane League, Inc.
Agricultural	Frierson Farm
Agricultural	Gutwein Groves, Inc.
Agricultural	Larson Dairy, Inc.
Agricultural	Lykes Bros. Inc.
Agricultural	McArthur Farms Inc.
Agricultural	Okeelanta Corporation
Agricultural	South Central Florida Express, Inc.
Agricultural	South Florida Agricultural Council
Agricultural	Sugar Cane Growers Cooperative
Agricultural	U.S. Sugar Corporation
Association	Audubon Society of the Everglades
Association	Caloosahatchee River Citizens Association
Association	Florida Wildlife Federation
Association	Friends of Lake Okeechobee
Association	Friends of the Everglades
Association	Lake Region Audubon Society
Association	League of Women Voters, Broward County
Association	National Audubon Society
Association	National Resources Defense Council
Association	The Florida Biodiversity Project
Association	The Nature Conservancy
Association	Tropical Audubon Society
Association	Trust for Public Lands
Other	Bauer Foundation Corp.
Other	BC Property Investments
Other	BCI Engineers & Scientists Inc.
Other	Camp Dreser & McKee, Inc.
Other	Curtoom Companies
Other	Environmental Policy and Culture Program, Northwestern University
Other	Everglades Coordinating Council
Other	Five Smooth Stone Incorporated
Other	Florida Rural Area Construction Coop.
Other	Friends of Lake Okeechobee

AGENCY	COMPANY / DIVISION
Other	Ladies of the Lake, U.S.A.
Other	Lake Point Restoration
Other	Landers & Parsons
Other	Macvicar, Frederico & Lamb, Inc.
Other	Okeechobee Waterway Association
Other	South Florida Regional Planning Council
Other	South Florida Watershed Council Inc.
Other	Southwest Florida Regional Planning Council
Other	Southwest Florida Watershed Council
Other	St. Lucie River Initiative
Other	Treasure Coast Regional Planning Council
Other	Trucane Sugar Corporation
Media	National Public Radio
Media	Palm Beach County Public Affairs
Media	Palm Beach Post
Media	Orlando Sun Sentinel

8.4 COMMENTS RECEIVED AND RESPONSE

A table summarizing comments received and responses prepared is below. If changes were made as a result of a comment received, it is noted in the Corps response in the Table 9.

Table 9. Public Comment Matrix

Agency/Public	Comment	USACE Response
Florida Department of Transportation (FDOT) March 18, 2011	Numerous state roads occur within the proposed project vicinity. The USACE will be responsible for coordinating with the appropriate FDOT District personnel to obtain the necessary FDOT permits prior to conducting any project activities within or connecting to FDOT right of ways. Environmental permit applications associated with proposed activities on state rights-of-way will also require close coordination with FDOT staff.	The USACE will coordinate with FDOT as necessary throughout the culvert replacement/removal process.
FDOT - 2	If any impacts will occur to environmental resources located within the FDOT rights-of-way, please coordinate with the appropriate FDOT District Planning and Environmental Management Office.	The USACE will coordinate with FDOT as necessary throughout the culvert replacement/removal process.
FDOT – 3	If any FDOT rights-of-way or property will be used for the installation of facilities or the storage/staging of equipment, materials or vehicles, please notify the FDOT District Planning and Environmental Management Office with appropriate project-specific plan/details so the information can be distributed to the appropriate divisions for review.	The USACE will coordinate with FDOT as necessary throughout the culvert replacement/removal process.
FDOT – 4	Should the need for lane closures or traffic channeling on the state roadway system arise, Maintenance of Traffic Plans may be necessary and coordination with the FDOT Traffic Operations Office will be required.	All construction activities will take place in the Federal right-of-way and will not affect the state roadway system. If required, FDOT permits will be acquired by the construction contractor.
FDOT – 5	If any hazardous materials will need to be transported on FDOT roads, a hazardous spills response plan will need to be prepared and coordinated with the FDOT District Maintenance-Permits Office.	The Contractor shall ensure that hazardous wastes are packed, labeled, and transported in accordance with 49 CFR 173 and State and local regulations. Contractors Spill contingency planning shall be strictly in accordance with the criteria of 40 CFR, Part 109. All hazardous waste shall be transported by a licensed transporter in accordance with 40 CFR 263 and 49 CFR 171, Subchapter C.
FDOT – 6	It is imperative that any facilities owned, managed or maintained by the state that are damaged by construction activity on the Herbert Hoover Dike or Federal culverts associated with the HHD be restored to the condition that existed prior to construction.	The contractor will be responsible for repairing or replacing any damage associated with their construction activities.
Florida Department of Environmental Protection (FDEP) March 18, 2011	DEP notes that even though the EA indicates USACE commitment to ensuring continued drainage and irrigation capabilities for those permitted to use the subject culverts, it does not provide details clearly demonstrating how this will be accomplished.	The USACE will research the permitted users and permitted capacity for each culvert to be replaced prior to construction. Drainage and irrigation will be compensated at each culvert separately depending on the type and amount of water supply currently used and

		needed.
FDEP – 2	Ongoing coordination with the permitted users is critical, especially during construction, to minimize economic hardship and impacts on their operations.	The USACE is meeting with the permitted users for each culvert to be replaced and will continue coordination upon each culvert package.
FDEP - 3	Minor short-term impacts to vegetation, noise level, air quality and recreational resources are also expected during construction	Most impacts to vegetation, noise, air quality, and recreation will be temporary in nature. The slope of the dike will be reseeded upon completion of construction as discussed in Section 4.
FDEP – 4	Of particular concern are portions of the LOST that may be temporarily closed or removed. USACE has not committed to repaving impacted portions of the LOST that are currently paved. DEP staff requests that closures of the trail be limited to those required for safety reasons and that the time period of trail closures be reduced to the extent feasible while ensuring safety.	The LOST will be temporarily closed for the duration of culvert construction (approximately one year) directly around the culvert. Signs will be posted at the trailheads indicating where closures will occur.
FDEP - 5	Signs should be placed at the nearest trail entry points, from both directions of the closure, stating the trail is closed X number of miles (or feet) ahead. Signage should also identify whether the access point is the only one to or from the trail Greenways and Trails, as those impacts would not be addressed during the permitting process. Please contact Rick Halvorsen (850) 245-2052 to discuss this aspect of the project.	The USACE will coordinate with Rick Halvorsen as requested prior to and during construction.
FDEP -6	Please clarify whether the acreage for wetland impacts includes the temporary earthen cofferdams shown on Figure 11 and how the number of earthen dam vs sheet pile dewatering sites was determined. Impacts for the earthen dam sites appear to be greater.	Temporary wetland impacts estimated were based on the footprint for an earthen cofferdam typical construction methods. The temporary earthen dam impacts are greater than the sheet pile, which is why sheet pile cofferdams are required for culverts adjacent to the snail kite critical habitat areas and the navigation channel (Route 1).
FDEP – 7	Figure 2 shows all the subject culverts, but does not differentiate the ones that will be removed. Please consider revising this figure for clarity.	The distinguishment between removal and replacement are indicated in the text in Table 2 and is found on page 12 immediately following Figure 2.
FDEP – 8	Section 5.4 (6) mentions the use of "baled hay or straw" for erosion control. Note that these materials are no longer an acceptable BMP, and have been removed from the Florida Stormwater Erosion and Sedimentation Control Inspector's Manual, as there are newer products available that are more effective than straw or hay bale barriers. Please refer to the Inspector's Manual for additional products that offer better protection: http://www.dep.state.fl.us/water/nonpoint/docs/erosions/erosion-enspectors-manual.pdf	Hay bales will be not be a solely acceptable BMP within a contractor submitted Storm Water Pollution Prevention Plan (SWPPP). The contractors Environmental Protection Plan (EPP) and subsequent USACE approval will also provide assurance as to proper erosion control and protection of natural resources. Language was updated in Section 5.4(6) accordingly.
FDEP – 9	Appendix C mentions that the disposal of material removed at the culvert locations may be reused or spread over the levee. Has the sediment been tested	Soil borings have been taken at each culvert location. It will be the contractor's responsibility to dispose of

	at each of the sites or will this occur just prior to construction? This may impact the appropriate disposal for this material.	materials in a legal manner.
FDEP – 10	We strongly recommend that the Corps contact the Southeast District Office to schedule a pre-application meeting to ensure that permit requirements and milestones are reflected appropriately in the project management schedule. The Department has recently been asked to expedite permit reviews, as it appears that adequate time for permit processing was not provided to the Corps scheduling process.	The USACE has begun coordination with DEP and SFWMD for the first six culverts. Continued coordination will occur throughout the culvert replacement/removal process and schedules will reflect typical review periods.
FDEP – 11	On Feb 21, 2011, the Corps submitted an environmental resource permit application for the replacement of Culverts C4a, C11 and C16, which is currently being processed by DEP's Southeast District Office as DEP File NO. 0234604-011 and for C1, C1a, and C3 as DEP File No. 0234604-012.	Noted.
FDEP – 12	Coordination should be undertaken far enough in advance so as to avoid project constraints or delays. Please note that operation of these structures is currently regulated under the existing Lake Okeechobee Water Control Structure Operations Permit (LOPA Permit No. 0174552-007) issued to the SFWMD. The replacement of these structures should be discussed with both SFWMD and the Department's Restoration Planning and Permitting Section in Tallahassee.	Coordination with SFWMD and DEP has begun. A site visit to the first six culverts in the application package to be constructed has been completed. Communication with both agencies will continue as designs are developed for each culvert package.
South Florida Water Management District (SFWMD) April 1, 2011	It is unclear whether the Corps will agree to provide landowners with equivalent water supply and drainage capacity as the specific culvert replacement designs are developed…The Corps needs to ensure the designs and construction bypass structures provide equivalent capacity for drainage and irrigation both during and after construction and that the structures are sized to address future changes to the Lake Okeechobee regulation schedule.	The culvert replacements (size/capacity/inverts/etc.) will be based on the original authorization. The post-construction hydraulic design objective is to match the originally authorized culvert capacity as close as possible while meeting the minimum size for maintenance and inspection requirements and considering a standardized barrel size. The objective is to maintain the current operational function of the culverts which is drainage to Lake Okeechobee and water supply from Lake Okeechobee. Drainage and water supply bypass during construction will be addressed during the design phase for each culvert package to include coordination with SFWMD and the permitted users.
SFWMD – 2	The Corps needs to consider the effects of future planned and potential changes to the Central and Southern Florida Flood Control system that may impact culvert design such as new Stormwater Treatment Area capacity, the automation of north shore pumping stations, the lake forward pumps, and remote gate control capability.	The culvert replacements will be based on the original authorization. USACE will not be considering future uses and changes, however, remote gate control capabilities are being considered.
SFWMD – 3	The Corps should consider secondary and cumulative impacts to the ecological health of the Lake Okeechobee including water quality, submerged and emergent vegetation, wading birds, sport fish, and native apple snails that are	Cumulative impacts were discussed in Table 5. Native apple snails are not anticipated to be affected by the culvert replacement as all work is occurring adjacent to

	anticipated to occur as a result of the culvert replacement.	critical habitat. Habitat is outside of designated culvert areas does not support apple snails and consists of mainly riprap and cattail.
SFWMD – 4	…restocking of native apple snails should be required in addition to the proposed replanting of wetland vegetation.	Cumulative impacts were discussed in Table 5. Native apple snails are not anticipated to be affected by the culvert replacement as all work is occurring adjacent to critical habitat. Habitat is outside of designated culvert areas does not support apple snails and consists of mainly riprap and cattail.
SFWMD – 5	p. 36, section 4.3, under wood stork: include any information for the presence of active wood stork rookeries/colony since it is observed to be foraging in the area.	Appendix A, page A-10 has a map of observed wood stork colonies from 1970-2009. Text in Section 4.3 has been updated accordingly.
SFWMD – 6	p. 36, section 4.4.2, sentence 3: include a map showing where the 4 acre wetland impacts are proposed and briefly describe the quality and function of those wetlands. In addition, include details of wetland mitigation that is proposed for the 4 acre wetland impacts.	Wetland impacts will be assessed with interagency coordination prior to construction of each culvert. It will then be determined what the quality and function is and be decided at that point what types of native seed or planting needs to occur. The area of impact for all culverts is 4 acres and text in Section 4.2.2 has been updated accordingly.
SFWMD – 7	p. 48, section 4.18, under vegetation: please describe what the minimal short term impacts to wetland vegetation are and also elaborate on what vegetation will be planted to offset those impacts.	Minimal short term impacts include impact from the cofferdams. The cofferdams will be taken out post construction and most emergent wetland vegetation will grow back. If it is determined to replant any vegetation upon completion of construction, it will be replaced with in-kind native vegetation which will be dependent upon each culvert site.
SFWMD – 8	p. 51, section 5.3, minimization: only minimization of impacts to the snail kite was included in this paragraph. Include information on minimization of impacts to other T&E species such as Caracara, wood storks, gopher tortoise and Easter Indigo snake.	Snail kite critical habitat was the only impact noted in minimization because other species are not expected to be impacted. Preconstruction surveys will be completed to ensure no nesting activity is taking place as well as an onsite monitor for active bird activity during construction. Contractors will be required to have an EPP to protect all listed species.
SFWMD – 9	p. 52, section 5.4, mitigation: Include details of any preconstruction surveys that will be conducted for Caracara, wood storks, gopher tortoise, and Eastern Indigo snake.	Preconstruction surveys will be conducted for Caracara, wood storks, and Eastern Indigo snake. These are stated in Section 4.18 under Threatened and Endangered Species. The contractor will be required to do preconstruction surveys and each listed species will be described in the EPP.

SFWMD – 10	p. 52, section 5.4, mitigation: include details of wetland mitigation that is proposed for the 4 acre wetland impacts.	Minimal impacts to wetlands are expected to occur. Wetlands will be assessed through interagency coordination with DEP and FWS prior to construction of each culvert. Replanting of native wetland plants will be coordinated for each culvert during the permit application process because they will all have different compositions.
SFWMD -11	During low water levels, the L-8 canal stage cannot be raised above the lake even when there is water available from other sources such as WCA1 or L-8 reservoir. It will solve the problem if a slide gate can be installed on the canal side of the culverts. Since, this applies to other culverts around the lake, every culvert should be reviewed for the need for slide gates.	The culvert replacements (size/capacity/inverts/etc.) will be based on the original authorization. USACE will not be considering future uses and changes. Specific issues related to each culvert will be addressed during the design.
SFWMD – 12	Culvert 10A is unable to meet water supply needs during low lake stages. Unlike structures S-351, S-352, and S-354 where SFWMD has been able to install temporary horizontal pumps to continue water supply withdrawals from Lake Okeechobee down to lake stages of approximately 8 feet NGVD, Culvert 10A does not have features necessary for installation of pumps. These features should be a consideration at Culvert 10A.	The culvert replacements will be based on the original authorization. USACE will not be considering future uses and changes. Specific issues related to each culvert will be addressed during the design. Currently, Culvert 10A invert elevations and the ability to chain the lakeside flap gates open for water supply during low lake levels should allow for water supply down to lake stages of approximately 5.7 to 6.3 feet NGVD29.
SFWMD – 13	Culvert 8: slide gates instead of flap gates would be a better design to solve the water supply concerns at this structure when the Lake Okeechobee levels are low and canal levels cannot be maintained. If gate openings create erosive discharge from either direction, armoring of the canal banks to transition from culvert channel through 90 degree bends and additional canal bank protection is needed on canal banks running east and west.	The culvert replacements will be based on the original authorization. USACE will not be considering future uses and changes. Specific issues related to each culvert will be addressed during the design.
SFWMD – 14	SFWMD has no objection to the removal of Culverts 7, 9, 14 and TCC.	Noted. Thank you.
Closter Farms March 14, 2011	Pursuant to provisions of a long-terms lease with the State of Florida, Closter farms that lands adjacent to Culvert 12A of the HHD in accordance with existing state and water management district permits. Closter and other entities connected hydrologically to Culvert 12A, farm over 3,000 acreas in the basin. Closter supports the replacement of Culvert 12A by the USACOE.	Noted. Thank you.
Robert Notron March 5, 2011	…We also must remove all culverts from the dike that allow back pumping into lake Okeechobee…	The USACE has committed to replacing culverts currently in use and removing culverts that are abandoned.

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APPENDIX A – THREATENED AND ENDANGERED SPECIES MAPS

HERBERT HOOVER DIKE

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A. APPENDIX A – THREATENED AND ENDANGERED SPECIES MAPS

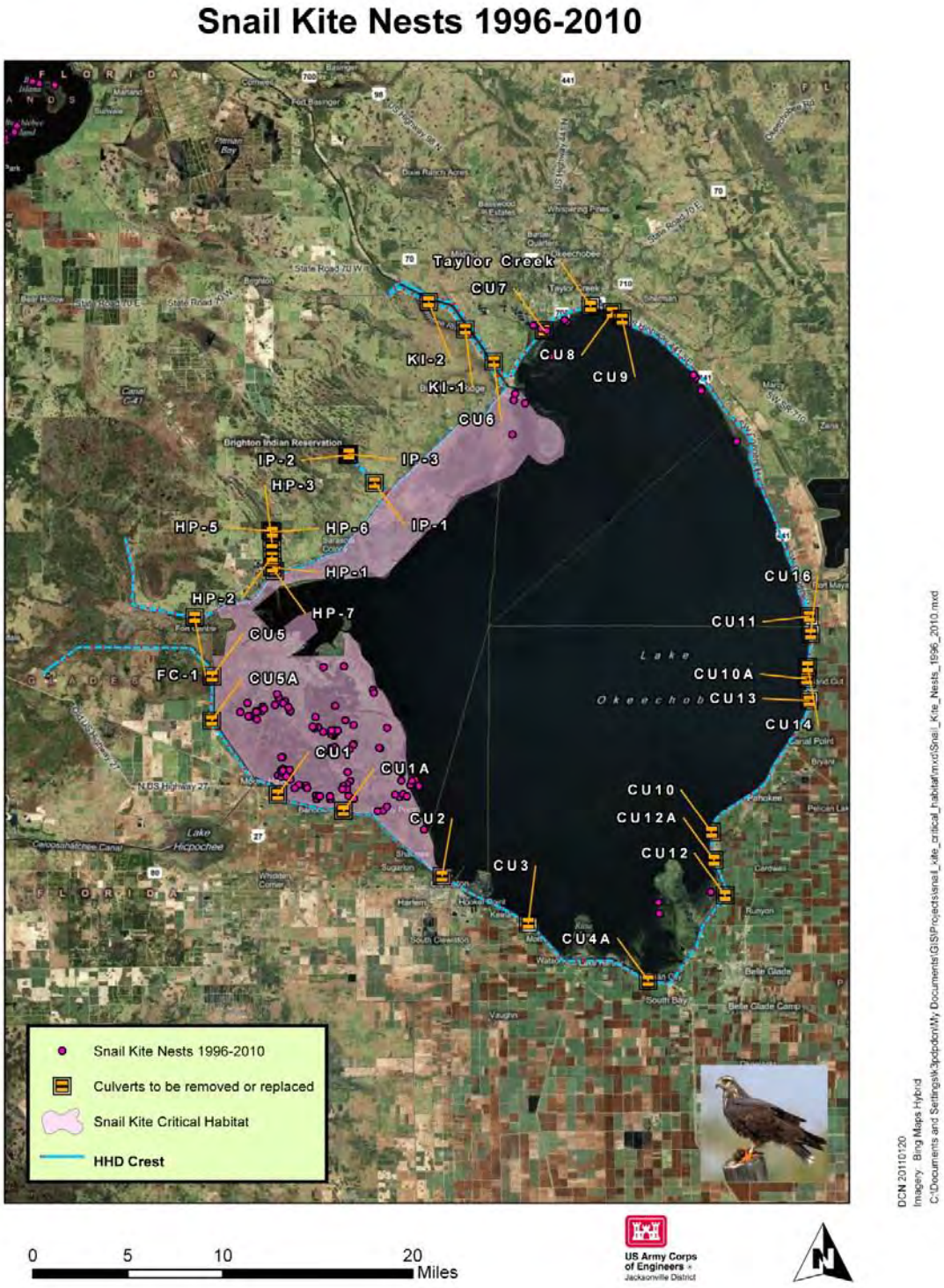

Figure 1. Snail Kite Nests 1996-2010

Based on the description in the Federal Register (1977), snail kite critical habitat in Lake Okeechobee is located in the western parts of Glades and Hendry Counties, extending along the western shore to the east of the levee system and the undiked high ground at Fisheating Creek, and from the Hurricane Gate at Clewiston northward to the mouth of the Kissimmee River, including all the spike rush (*Eleocharis sp.)* flats of Moonshine Bay, Monkey Box, and Observation Shoal, but excluding the open water north and west of the northern tip of Observation Shoal north of Monkey Box and east of Fisheating Bay.

The construction footprint for Culverts 1 and 2 includes the grassy vegetation covering the HHD. The critical habitat (shapefile obtained from USFWS) is shown to extend onto the levee and dike in this grassy vegetation. Upland grassy vegetation is not considered critical snail kite habitat. Therefore, the USACE does not expect the acreage amount of potential impact to be as large as depicted in Appendix A, Figure 5. However, minimal temporary impacts may occur due to cofferdam placement and construction. The cofferdam will be removed upon completion of removal or replacement of the culverts.

Figure 2. Snail Kite Critical Habitat Overview

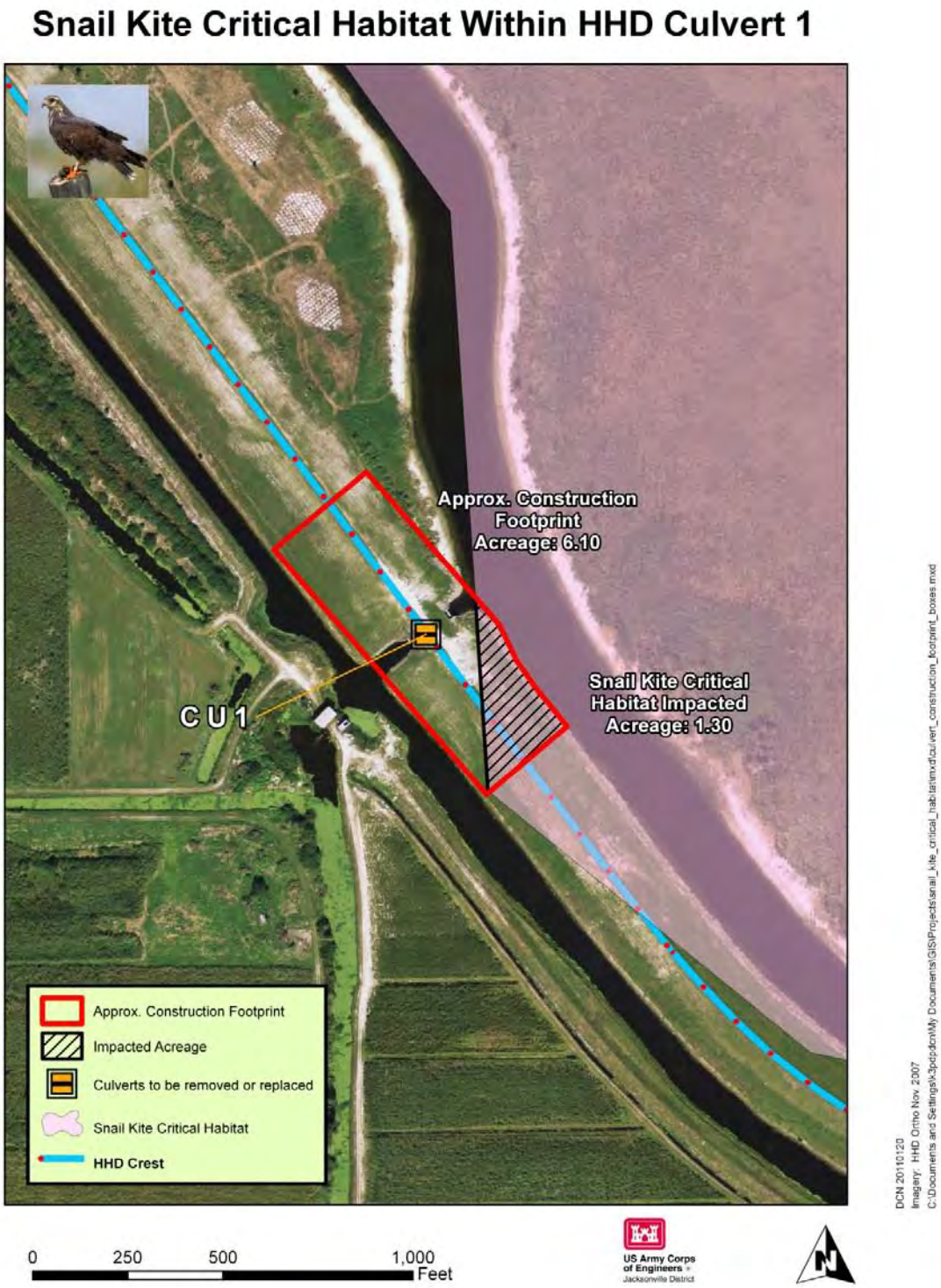

Figure 3. Snail Kite Critical Habitat Construction Footprint - HHD Culvert 1

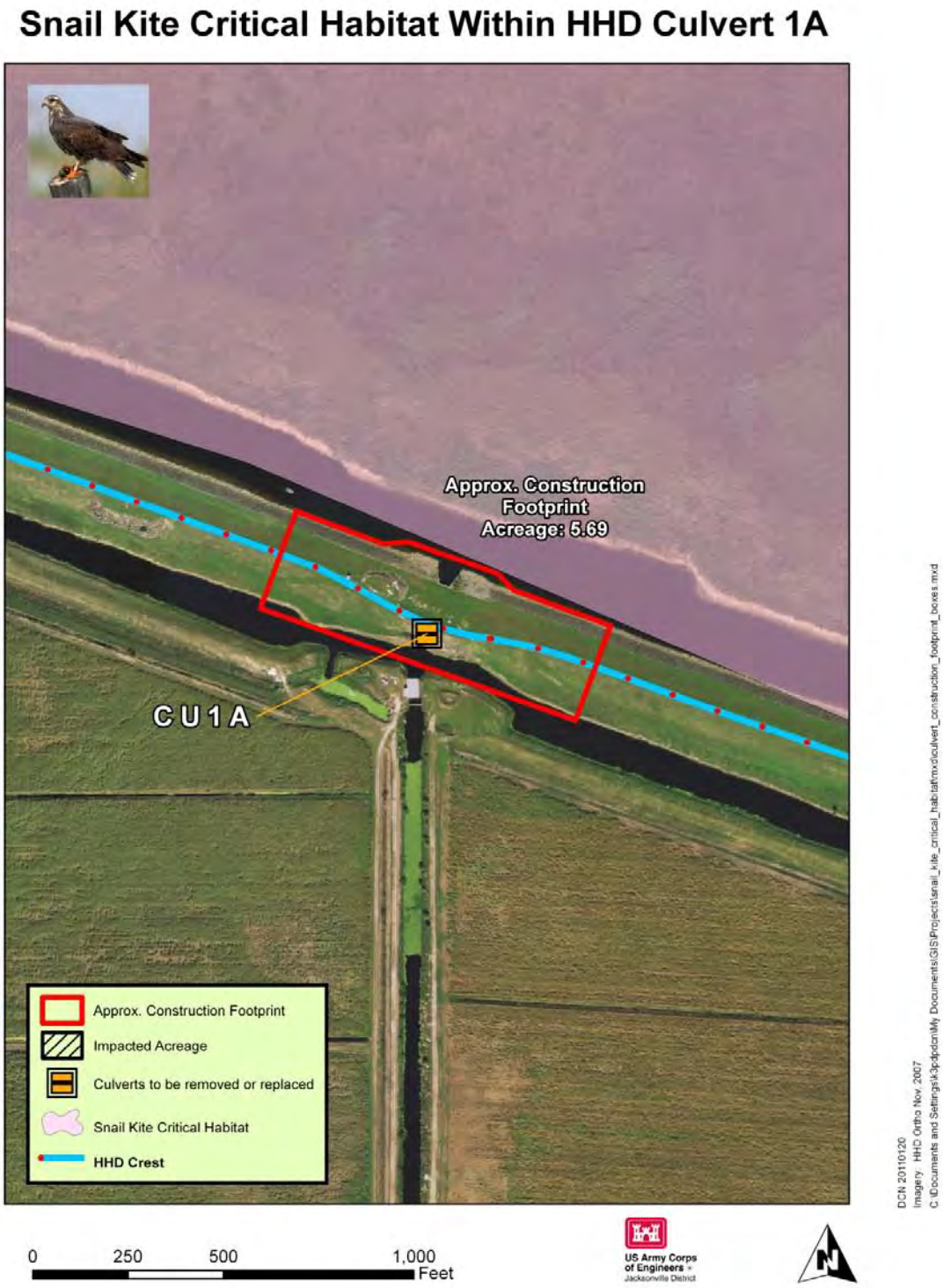

Figure 4. Snail Kite Critical Habitat Construction Footprint - HHD Culvert 1A

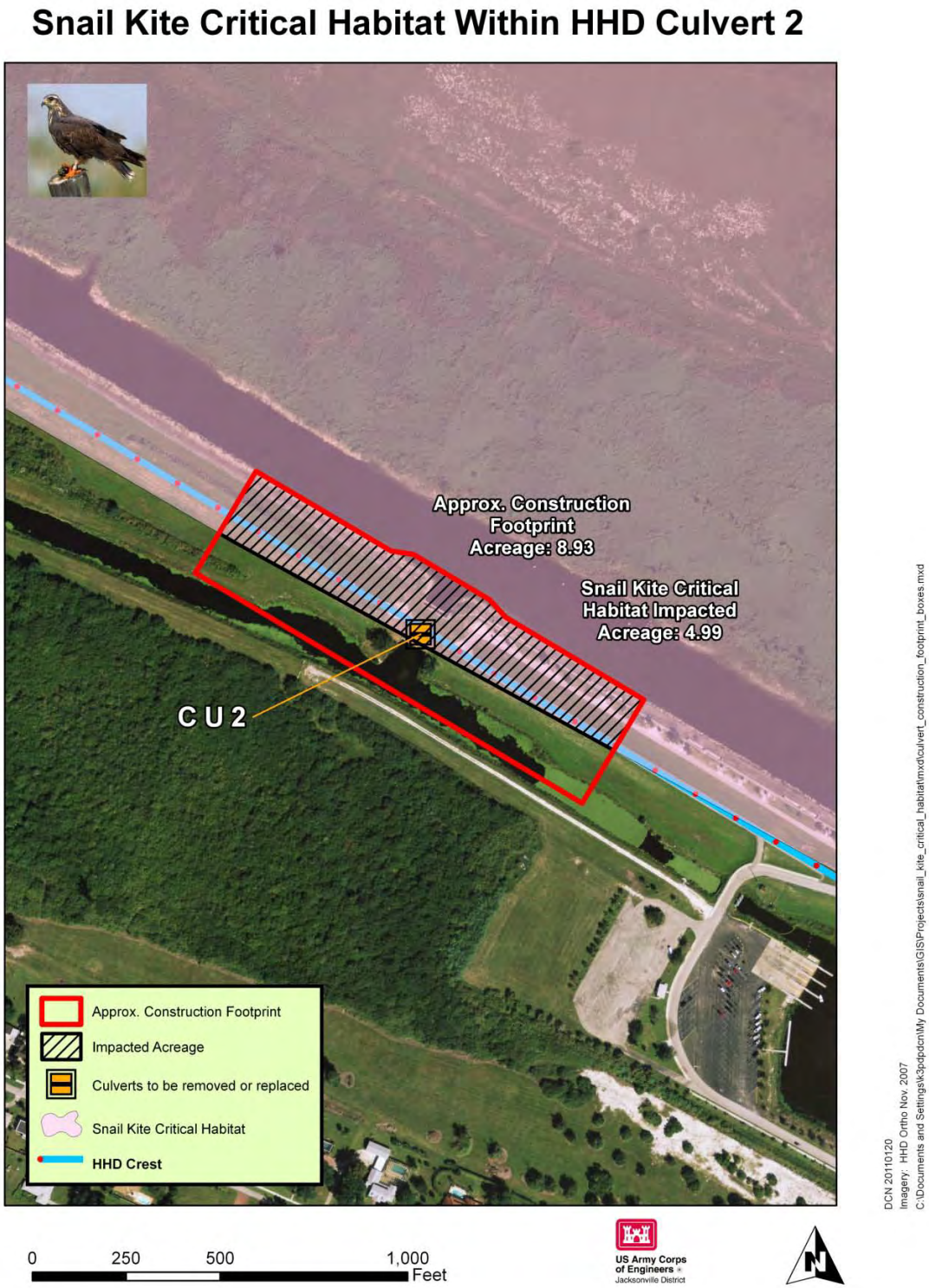

Figure 5. Snail Kite Critical Habitat Construction Footprint - HHD Culvert 2

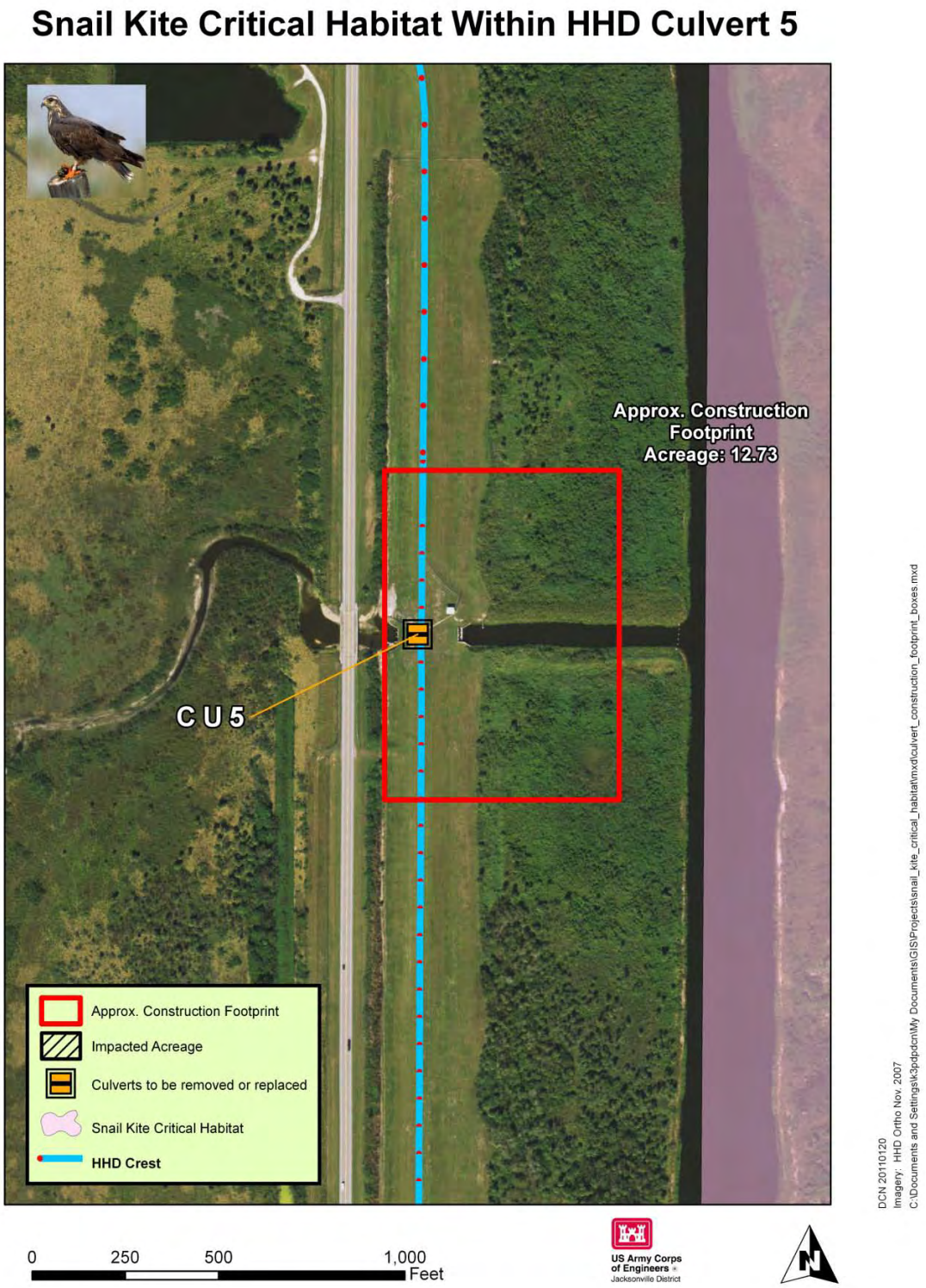

Figure 6. Snail Kite Critical Habitat Construction Footprint - HHD Culvert 5

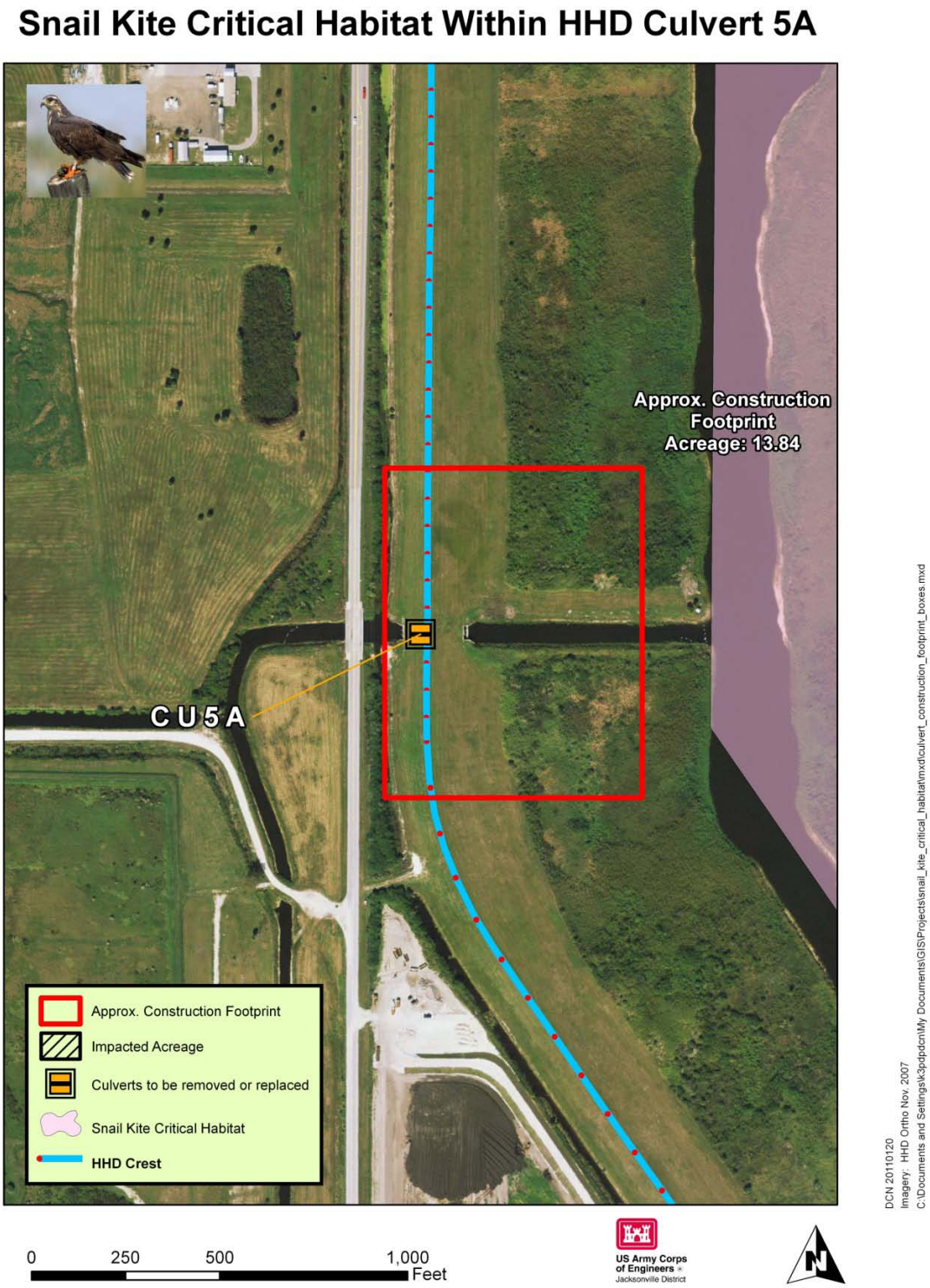

Figure 7. Snail Kite Critical Habitat Construction Footprint - HHD Culvert 5A

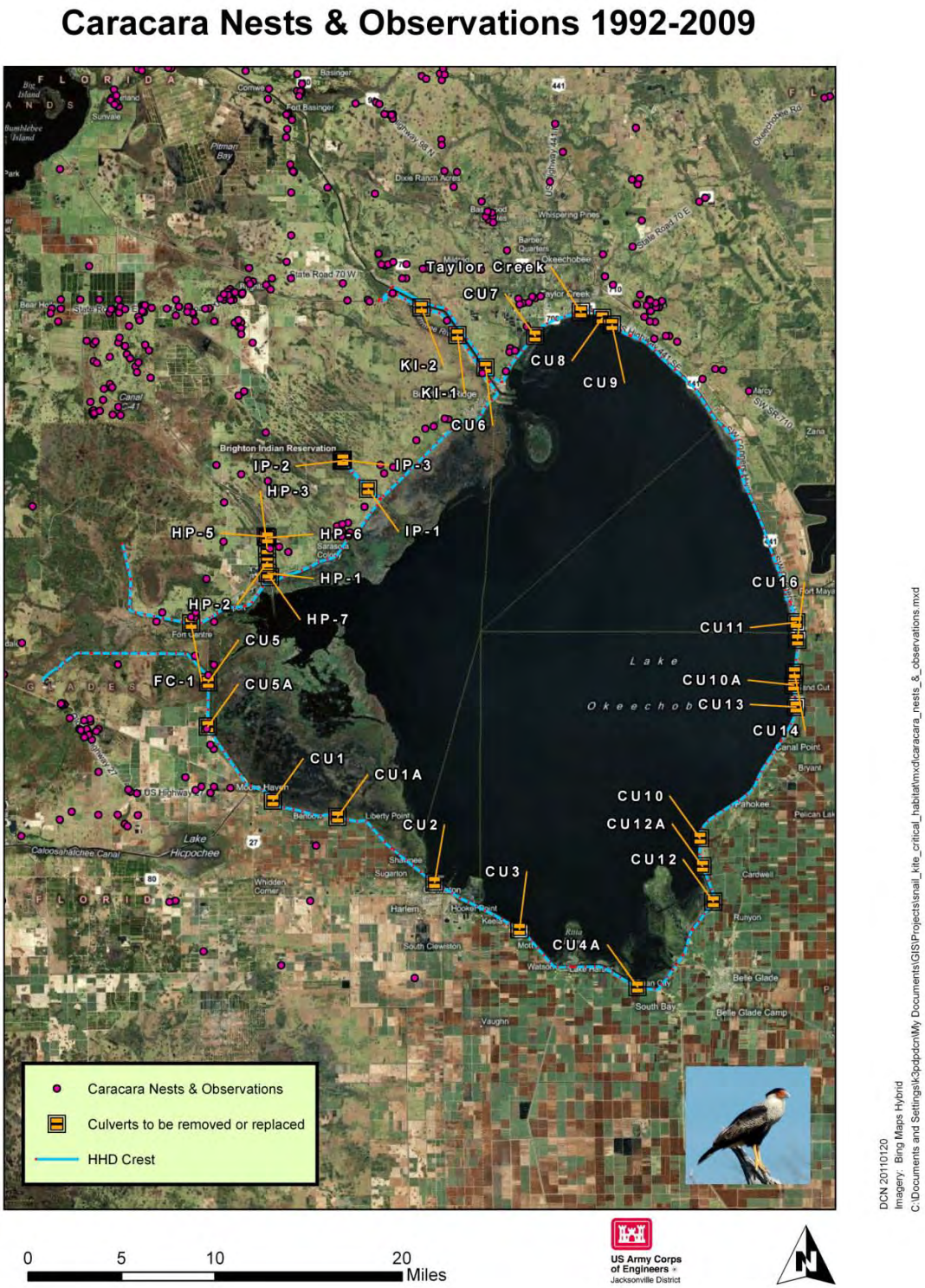

Figure 8. Caracara Nests and Observations 1992-2009

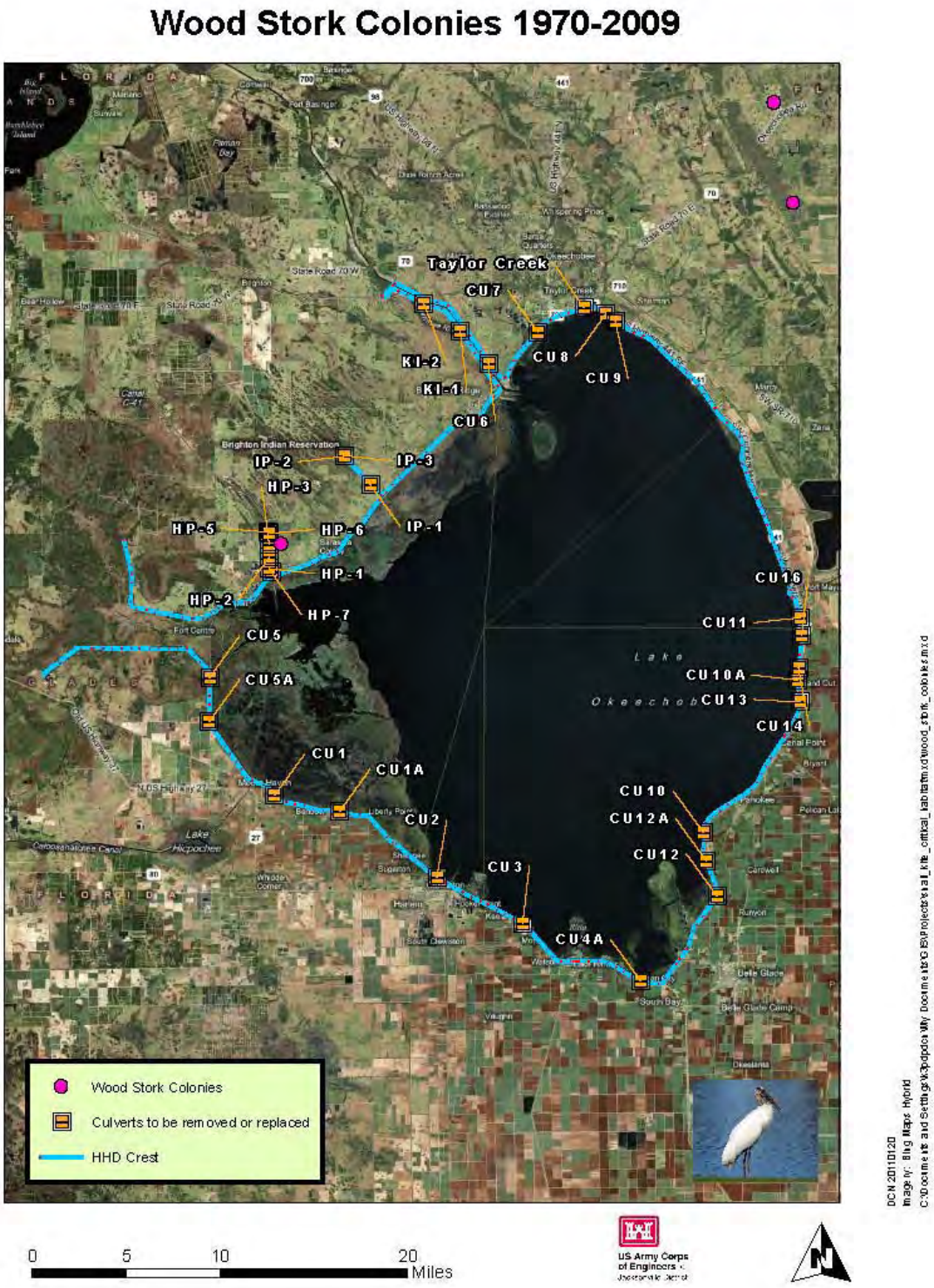

Figure 9. Wood Stork Colonies 1970-2009

APPENDIX B – PHOTOS

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B. APPENDIX B – PHOTOS

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Culvert 16

Culvert 14

Culvert 10A

Culvert 13

Culvert 10

Culvert 12A

Culvert 12

Culvert 4A

Culvert 3

Culvert 2

Culvert 1A

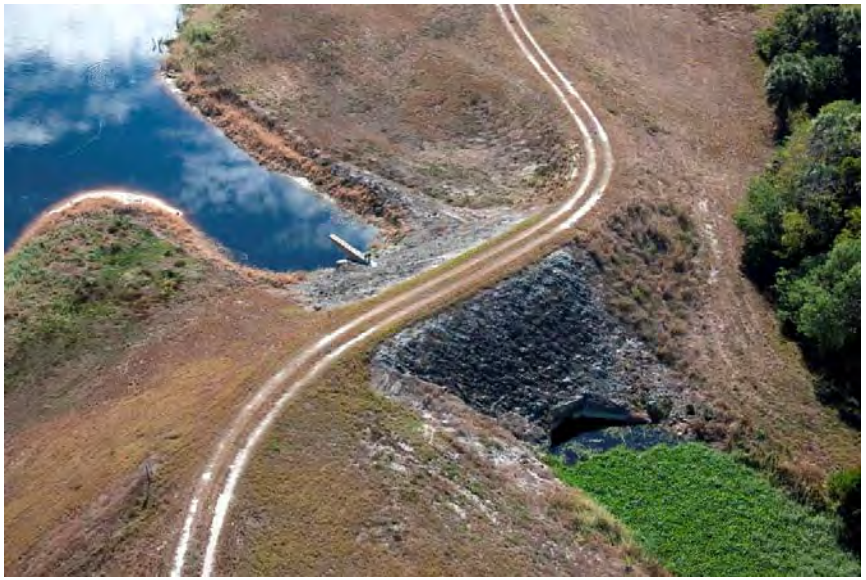
Culvert 1

Culvert 5A

Culvert 5

Culvert FC-1

Culvert HP-1



Culvert HP-2

Culvert HP-3

Culvert HP-5

Culvert HP-6

Culvert HP-7

Culvert IP-1

Culvert IP-2

Culvert IP-3

Culvert KI-1

Culvert KI-2

Culvert 6

Culvert 7- No photo (Culvert buried in the embankment)

TCC- No photo (Culvert buried in the embankment)

Culvert 8

Culvert 9- No photo (Culvert buried in the embankment)

MAY 2011

APPENDIX C – 404(b) EVALUATION

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APPENDIX C - SECTION 404(B) EVALUATION

HERBERT HOOVER DIKE
CULVERT REMOVAL AND REPLACEMENT
GLADES, HENDRY, MARTIN, OKEECHOBEE, AND PALM COUNTIES

I. PROJECT DESCRIPTION

A. Location

The Herbert Hoover Dike (HHD) is approximately 143 miles long and surrounds Lake Okeechobee. Lake Okeechobee and the HHD are located in south central Florida, in or adjacent to the counties of Okeechobee, Martin, Palm Beach, Hendry, and Glades. This project involves the replacement and or removal of 32 culverts that cross the HHD levee. All culverts to be replaced or removed are within the HHD and the federal right-of-way. Lake Okeechobee is a multi-purpose reservoir in the Central and Southern Florida (C&SF) Project. The authorized project purposes for Lake Okeechobee include: flood control, irrigation, urban water supply, enhancement of fish and wildlife, navigation, prevention of saltwater intrusion, recreation, and water supply to the Everglades National Park.

B. General Description

The proposed project includes removing or replacing 32 federal culverts within the HHD system. The base width of the levee will be extended by installing longer culverts at each culvert installation. This will result in the filling of approximately 2,000 to 4,000 square ft of surface water area with sporadic emergent vegetation at the inlet/outlet of each culvert. In total, less than 4 acres of fill will be placed during the replacement/removal of the 32 culverts.

C. Authority and Purpose

Authority:

The HHD is a component of the Central and Southern Florida (C&SF) Project for Flood Control and Other Purposes. It is generally understood that the birth of the C&SF Project began with the Flood Control Act of 1948; however, federal participation in local flood control efforts in the Lake Okeechobee area started much earlier in response to the disastrous hurricanes of 1926 and 1928. The Rivers and Harbors Act of 1930 authorized the construction of levees, for protection from storm surge-induced flooding, along the north and south shores of Lake Okeechobee. The 1948 Act created the C&SF Project and included authorization for enlargement of the existing levees and construction of additional levees along the northeast and northwest shores. The Flood Control Act of 1960 authorized the name of all levees around the shore of Lake Okeechobee to be “Herbert Hoover Dike”, in honor of the former President and his role in implementing levee construction.

Purpose:

The federal culverts pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts. During a large storm event, concentrated seepage could begin to move large amounts of material through the embankment. Erosion would progress upstream, eventually leading to a breach of the embankment. Action is required as an

immediate maintenance risk reduction strategy, in conformance with dam safety requirements, to reduce the risk of catastrophic failure of the project. These major maintenance actions are required to reduce this unacceptable risk due to the high probability of failure and associated loss of life.

D. General Description of Dredged or Fill Material

General Characteristics of Material:
Material at the culvert locations is composed of a mixture of sand, silts, and clays with varying content of organic matter. The select fill will be suitable for placement as levee fill and is likely to be classified in accordance with USCS as either SP-SM, SW-SM, SW or SP material with a maximum of no more than 12% material finer than the #200 sieve. Any fines passing the #200 shall be non-plastic.

Quantity of Material:
The final estimate of the quantity of fill will be determined during final design. Preliminary estimates indicate the placement of approximately 21,000 cubic yards.

Source of Material:
The select graded fill material will come from a commercially licensed sources likely located in Okeechobee, Martin, Palm Beach, Hendry, or Glades county depending upon the location of fill placement.

E. Description of the Proposed Discharge Site(s)

Location:
See Figure 2 in Section 1 of EA.

Size:
The replacement/removal of the existing 32 culverts will result in the filling of a total of less than four acres of surface water area with sporadic emergent vegetation. The fill extent will be the width of the levee at each culvert installation.

Type of Site:
The fill is to be placed in open water at the inlet and outlet of each culvert installation.

Type(s) of Habitat:
Open water with emergent wetland vegetation at some of the culverts.

Timing and Duration of Discharge:
Construction at each culvert installation is expected to last up to 12 months. Culvert replacement actions will begin in late 2011 and last up to 10 years.

F. Description of Disposal Method

Excavated materials will be segregated into soils and broken concrete. Soils may be reused on-site depending upon engineering suitability. Muck soils not suitable for placement in the levee

core will be spread out at a thickness of 6 to 12 inches on the adjacent levee embankment. Concrete would be disposed of locally by contractor, most likely through recycling or crushing

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations

Substrate Elevation and Slope:
Estimated existing elevation of entrance and exit area of culverts is 3 ft NAVD88. Width of fill area varies from 20 to 100 ft depending upon culvert size and number of barrels.

Sediment Type:
A mixture of sandy and organic sediments.

Dredged/Fill Material Movement:
The project does not involve the movement of dredged material. However, fill material will be placed as part of the project.

Physical Effects on Benthos:
The area of the fill placed in surface water (less than 4 acres in total) will result in the permanent burial of benthic organisms.

Other Effects:
None.

Actions Taken to Minimize Impacts:
Fill will be placed inside of work sites which will be surrounded by sheet piling.

B. Water Circulation. Fluctuation and Salinity Determinations

Water Column Effects:
Standing water and soils periodically inundated will be temporarily impacted during construction. Turbidity and erosion will be controlled during and post-construction.

Current Patterns and Circulation:
Removal and replacement of culverts and ditch filling should have minimal effect on current hydrologic circulation patterns.

Normal Water Level Fluctuations and Salinity Gradients:
Surface water levels will not be affected. Groundwater levels may be temporarily affected during construction but this impact will be limited to immediate area of the work site. No adjacent groundwater users will be impacted. Salinity levels will not be affected by the proposed project.

Salinity Gradients:
Lake Okeechobee is a freshwater lake. Not applicable.

Actions That Will Be Taken to Minimize Impacts:

Driven piles or earthen cofferdams will isolate fill area from lake and toe ditch waters. Turbidity controls will be used to limit water quality impacts.

C. Suspended Particulate/Turbidity Determinations

Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site:
There may be a temporary increase in turbidity levels in the project area during discharge. Turbidity will be short-term and localized and no significant adverse impacts are expected. State standards for turbidity will not be exceeded during construction.

Effects on the Chemical and Physical Properties of the Water Column:
There may be temporary impacts to the chemical and physical properties of nearby waters during construction activities. There are no acute or chronic chemical impacts anticipated as a result of construction. An environmental protection plan, prepared during detailed design, will address concerns regarding monitoring of equipment, maintenance and security of fuels, lubricants etc.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the construction area. This effect will be temporary, limited to the immediate area of construction, and will have no adverse impact on the environment.
(b) Dissolved Oxygen. Dissolved oxygen levels will not be altered by this project.
(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens are expected to be released by the project.
(d) Aesthetics. The aesthetic quality of the water in the immediate area of the project may be temporarily affected by turbidity during construction. This will be a short-term and localized condition.

Effects on Biota:

(a) Primary Productivity and Photosynthesis. The permanent filling of less than 4 acres of surface water area with sporadic emergent vegetation will eliminate the primary productivity and photosynthesis within this filled area.
(b) Suspension/Filter Feeders. The filling of the surface water area with sporatic emergent vegetation resulting from the extension of the culvert lengths will adversely impact burrowing invertebrate filter feeders located in the filled area.. However, the fill (< 4 acres) is minor in comparison to the available habitat of Lake Okeechobee.
(c) Sight Feeders. No significant impacts on these organisms are expected as the majority of sight feeders are highly motile and can move outside the project area.

D. Contaminant Determinations
Fill material to be placed at the culvert locations will not introduce, relocate, or increase contaminants at the fill area.

E. Aquatic Ecosystem and Organism Determinations.

Effects on Plankton:

Adverse impacts on autotrophic or heterotrophic organisms are anticipated due to filling surface water area with sporadic emergent vegetation that will result from extending the levee width at the culverts.

Effects on Benthos:
Adverse impacts to benthic organisms are expected in areas to be permanently filled.

Effects on Nekton:
Mostly small forage fish will be displaced by filling the inlet and outlet areas adjacent to the culverts. Minimal impact on fish population is expected from filling action.

Effects on the Aquatic Food Web:
There is expected to be a relatively minor effect on the aquatic food web due to construction activities, though the nearby Lake Okeechobee is able to support a more diverse aquatic food web.

Effects on Special Aquatic Sites:
Hard ground and Coral Reef Communities. There are no hard ground or coral reef communities located within the proposed project site. Less than one acre of emergent wetland vegetation exists at each culvert. Any wetlands temporarily impacted through culvert replacement and removal will be replaced or allowed to naturally recruit.

Endangered and Threatened Species:
There will be no significant adverse impacts on any threatened or endangered species or on critical habitat of any threatened or endangered species. Refer to Section 5 Environmental Compliance and Commitments and Section 6 Monitoring of the Draft EA for measures that will be implemented to protect endangered and threatened species.

Other Wildlife:
No adverse impacts to small foraging mammals, reptiles, or wading birds, or wildlife in general are expected.

Actions to Minimize Impacts:
All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions are discussed in the in the Draft EA under Section 5 Environmental Compliance and Commitments.

F. Proposed Disposal Site Determinations.

Mixing Zone Determination:
No mixing zone is needed for this project.

Determination of Compliance with Applicable Water Quality Standards:
Because of the inert nature of the material to be used as fill, Class III water quality standards will not be violated.

Potential Effects on Human Use Characteristics:

a) Municipal and Private Water Supplies. No municipal or private water supplies will be impacted by the implementation of the project.
b) Recreational and Commercial Fisheries. Recreational and commercial fisheries should not be impacted by the implementation of the project.
c) Water Related Recreation. No water recreation will be impacted.
d) Aesthetics. The existing environmental setting may be temporarily impacted, in the vicinity of the construction. Construction activities will cause a temporary increase in noise and air pollution caused by equipment as well as some temporary increase in turbidity. These impacts are not expected to adversely affect the aesthetic resources over the long term and once construction ends, conditions will return to pre-project levels.
e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. Some effects to the paved Lake Okeechobee Scenic Trail (LOST) atop the HHD may occur during project construction. Construction activities may limit access to certain parts of the trail. The Corps will continue, consistent with its authority and funding, to seek to reduce and minimize impacts to the Lake Okeechobee Scenic Trail through design refinement.

G. Determination of Cumulative Effects on the Aquatic Ecosystem.
There will be no cumulative impacts that result in a major impairment of water quality of the existing aquatic ecosystem as a result of the placement of fill at the project site.

H. Determination of Secondary Effects on the Aquatic Ecosystem.
There will be no secondary impacts on the aquatic ecosystem as a result of the construction.

III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE.

A. No significant adaptations of the guidelines were made relative to this evaluation.

B. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

C. The discharge of fill materials will not cause or contribute to, violations of any applicable State water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

D. The placement of fill materials for implementation of the proposed project will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

E. The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant

adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

F. Appropriate steps have been taken to minimize the adverse environmental impact of the proposed action. Turbidity will be monitored so that if levels exceed State water quality standards, the contractor will be required to cease work until conditions return to normal.

G. On the basis of the guidelines, the proposed disposal of dredged material and fill of wetlands are specified as complying with the requirements of these guidelines.

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MAY 2011

APPENDIX D – COASTAL ZONE MANAGEMENT ACT FEDERAL CONSISTENCY DETERMINATION

HERBERT HOOVER DIKE

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COASTAL ZONE MANAGEMENT ACT AND FLORIDA COASTAL MANAGEMENT PROGRAM FEDERAL CONSISTENCY DETERMINATION

Enforceable Policy. Florida State Statues considered "enforceable policy" under the Coastal Zone Management Act (www.dep.state.fl.us/cmp/federal/24_statutes.htm).

Applicability of the Coastal Zone Management Act.

The following summarizes the process and procedures under the Coastal Zone Management Act for Federal Actions and for non-Federal Applicants*.

Item	Non-Federal Applicant (15 CFR 930, subpart D)	Federal Action (15 CFR 930, subpart C)
Enforceable Policies	Reviewed and approved by NOAA (in FL www.dep.state.fl.us/cmp/federal/24_statutes.htm)	Same
Effects Test	Direct, Indirect (cumulative, secondary), adverse or beneficial	Same
Review Time	6 months from state receipt of Consistency Certification (30-days for completeness notice) Can be altered by written agreement between State and applicant	60 Days, extendable (or contractible) by mutual agreement
Consistency	Must be Fully Consistent	To Maximum Extent Practicable**
Procedure Initiation	Applicant provides Consistency Certification to State	Federal Agency provides "Consistency Statement" to State
Appealable	Yes, applicant can appeal to Secretary (NOAA)	No (NOAA can "mediate")
Activities	Listed activities with their geographic location (State can request additional listing within 30 days)	Listed or Unlisted Activities in State Program
Activities in Another State	Must have approval for interstate reviews from NOAA	Interstate review approval NOT required
Activities in Federal Waters	Yes, if activity affects state waters	Same

* There are separate requirements for activities on the Outer Continental Shelf (subpart E) and for "assistance to an applicant agency" (subpart F).

** Must be fully consistent except for items prohibited by applicable law (generally does not count lack of funding as prohibited by law, 15 CFR 930.32).

Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: The proposed work project is not seaward of the mean high water line and would not affect shorelines or shoreline processes.

Chapters 186 and 187, State and Regional Planning. These chapters establish the State Comprehensive Plan which sets goals that articulate a strategic vision of the State's future. Its purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for orderly social, economic and physical growth.

Response: The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the environment. The proposed work will be coordinated with the State through review of this document.

Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed project purpose is to strengthen and protect the existing HHD system, thereby ensuring adequate flood control for residents of the region. No action may result in conditions which enhance the possibility of the HHD failure, resulting in an emergency situation and potentially causing significant damage to people and property. Therefore, this work would be consistent with the efforts of Division of Emergency Management.

Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The existing habitat within the project area consists of wetlands, marshy areas, upland vegetation, and borders snail kite critical habitat. The Corps determination is that protected species are not likely to be adversely affected by, and no adverse modification to critical habitat will occur from, the project. Preconstruction surveys will be conducted to minimize any disturbance in compliance with the USFWS consultation. The Corps will work in coordination with the USFWS, DEP and FFWCC to minimize any potential permanent wetland impacts during the design phase of the culverts.

Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Lands will not be acquired by the federal government for the major maintenance actions of this project as all work will be completed on current federal lands.

Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: Portions of the LOST would be temporarily impacted by construction, however the unpaved areas of the trail would be returned to their pre-construction condition following completion of the project. Impacts will be avoided and minimized to the extent practicable throughout construction activities.

Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: The proposed action is being coordinated with the Florida State Historic Preservation Officer in accordance with the National Historic Preservation Act and the Archeology and Historic Preservation Act. Consultation with the State Historic Preservation Officer (SHPO) was initiated December 2010. The project will not have an adverse effect on any historic properties included in or potentially eligible for inclusion in the National Register of Historic places. Conditions to protect undiscovered resources will be implemented as follows: Language will be included in construction contract specifications outlining the steps to be taken in the event that undiscovered historical properties are encountered. An informational training session, developed by a professional archaeologist, will be conducted for the contractor's personnel to explain what kinds of archaeological/cultural materials might be encountered during construction of the impoundment, and the steps to be taken in the event these materials are encountered. A professional archaeologist will conduct periodic monitoring of the project area during construction to determine if activities are impacting unanticipated cultural resources. The proposed action is consistent with these Acts. Historic preservation compliance will be completed to meet all responsibilities under Chapter 267.

Chapter 288, Economic Development and Tourism. This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: Contribution of the project area to the State's tourism economy would not be compromised by project implementation. The project would be compatible with tourism for this area due to the phased implementation of culvert removals and replacements. Therefore, the project would be consistent with the goals of this chapter.

Chapters 334 and 339, Transportation. This chapter authorizes the planning and development of a safe, balanced, and efficient transportation system.

Response: The proposed project would not impact the existing public transportation system of the area and therefore would be consistent with the goals of this chapter.

Chapter 370, Saltwater Living Resources. This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect

and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

Response: The proposed HHD project is located completely inland and would have no affect on saltwater resources either directly or indirectly through discharge downstream. The proposed project is therefore not applicable to chapter 370.

Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: The proposed project does not include any significant changes to the withdrawal, diversion, storage, or consumption of water. When requested by DEP, environmental resource permits or exemptions from such, have been, or are obtained prior to construction.

Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: This work does not involve the transportation or discharging of pollutants. Conditions will be placed in the contract to handle any inadvertent spill of pollutants. Therefore, the project would comply with this chapter.

Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This work does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore does not apply.

Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The work does not involve land development as described by this chapter; therefore, this chapter is not applicable.

Chapter 388 (Mosquito/Arthropod Control). Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The work would not further the propagation of mosquitoes or other pest arthropods.

Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Protection.

Response: An Environmental Assessment has been prepared and will be reviewed by the appropriate resource agencies including the Department of Environmental Protection.

Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: Project implementation will include appropriate erosion control plans and measures to ensure compliance.

APPENDIX E – CORRESPONDENCE

HERBERT HOOVER DIKE

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Mr. Rick Robbins
Natural Resources Conservation Service
Soils Section
2614 NW 43rd Street
Gainesville, Florida 32606-6611

Dear Mr. Robbins,

The U.S. Army Corps of Engineers (USACE), Jacksonville District, is submitting the Farmland Conversion Impact Rating (From AD-1006) for the Herbert Hoover Dike Culvert Replacement or Removal. In order to initiate consultation and ensure compliance under the Farmland Protections Policy Act, the USACE is requesting an evaluation from the Natural Resources Conservation Service on prime and unique farmland impacts within in the proposed project area. Please note that the proposed project does not involve new construction; only existing Federal Culverts (within the Federal Right of Way) would be replaced or removed and impacts would be temporary.

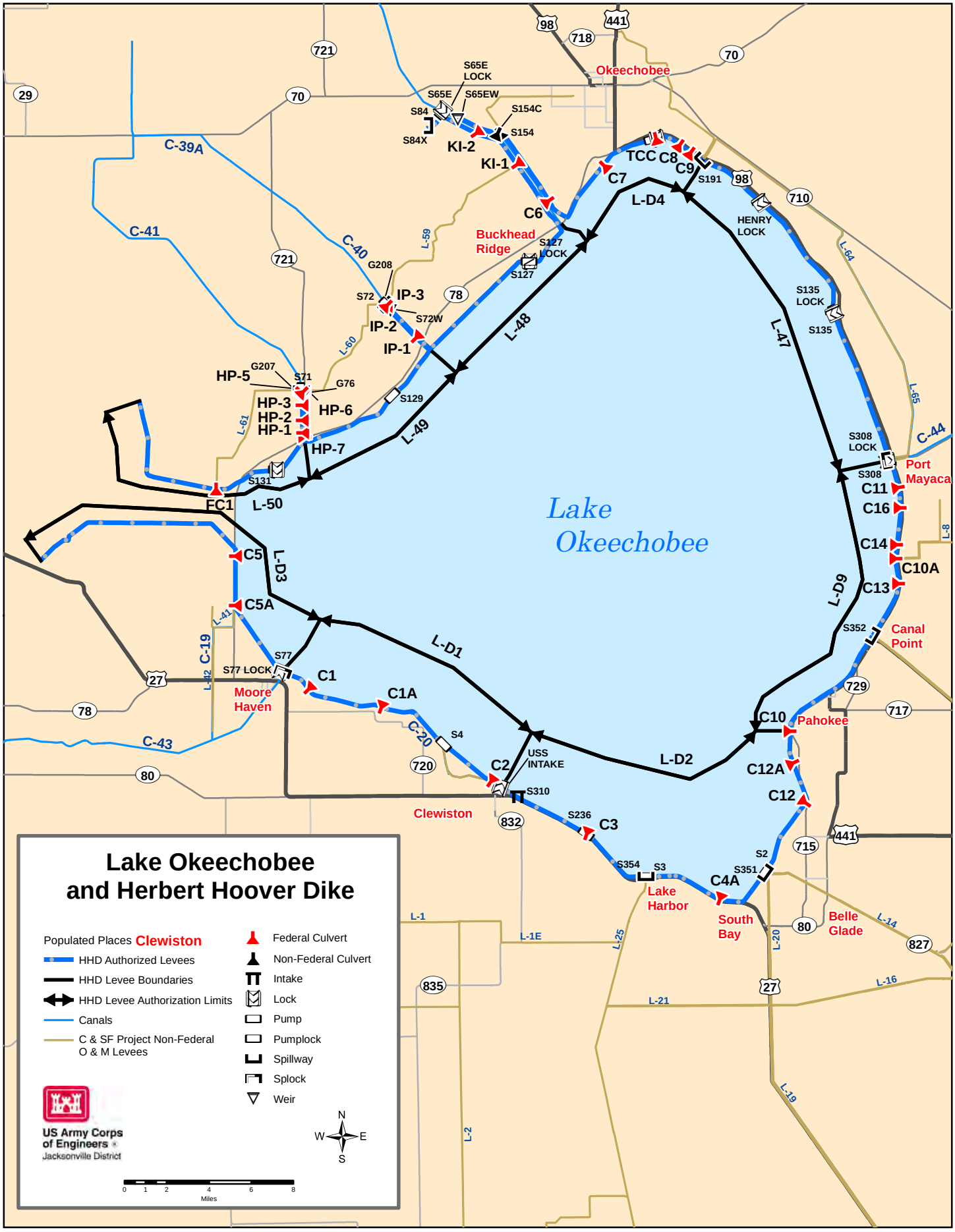
Enclosed is the Farmland Conversion Impact Rating System (Form AD-1006) with Parts I and III completed by the USACE and a project area map. We are asking your agency to provide information on the remaining portion of the form.

If you have any questions or require further assistance, please contact Stacie Auvenshine at 904-232-3694 or Stacie.J.Auvenshine@usace.army.mil.

Sincerely,

Eric Summa
Chief, Environmental Branch

Enclosures:
Project Area Map
Form AD-1006


Lake Okeechobee and Herbert Hoover Dike
Populated Places Clewiston
HHD Authorized Levees
HHD Levee Boundaries
HHD Levee Authorization Limits
Canals
C & SF Project Non-Federal O & M Levees
Federal Culvert
Non-Federal Culvert
Intake
Lock
Pump
Pumplock
Spillway
Splock
Weir
US Army Corps of Engineers
Jacksonville District
Miles
Lake Okeechobee
Okeechobee
Buckhead Ridge
Port Mayaca
Canal Point
Pahokee
Moore Haven
Clewiston
Lake Harbor
South Bay
Belle Glade
S65E LOCK
S65E
S65EW
S84
S84X
S154C
S154
KI-2
KI-1
TCC
C8
C9
C7
C6
L-D4
S191
HENRY LOCK
S127 LOCK
S127
G208
S72
IP-3
S72W
IP-2
IP-1
L-48
S135 LOCK
S135
L-47
G207
S71
G76
HP-5
HP-3
HP-2
HP-1
HP-6
HP-7
S129
L-49
S131
FC1
L-50
S308 LOCK
S308
C11
C16
C14
C10A
C13
L-D9
S352
C5
L-D3
C5A
L-D1
S77
S77 LOCK
C1
C1A
S4
USS INTAKE
C2
S310
L-D2
C10
C12A
C12
S236
C3
S354
S3
S2
S351
C4A

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
Florida State Office
2614 NW 43rd Street
Gainesville, FL 32606

PH 352-338-9500
FX 352-338-9574
www.fl.nrcs.usda.gov

January 25th, 2011

Stacie Auvenshine
US Army Corps of Engineers
Environmental Planning - South Florida Division

RE: Prime and Unique Farmland Assessment for Herbert Hoover Project (Culvert Replacement)

This letter is in response to your request on the Prime and Unique Farmland assessment of the Herbert Hoover Dike Rehabilitation Project in Glades, Hendry, Martin, Okeechobee, and Palm Beach Counties, Florida. Enclosed is the Important Farmlands map, Excel spreadsheet with the map unit at each culvert location, and the AD-1006 Farmland Conversion Impact Rating for the Project.

The Excel spreadsheet was developed by intersecting the culvert locations to the USDA-NRCS SSURGO (Soils Data), and exported from ArcGIS into Excel.

Briefly, the USDA-NRCS is responsible for monitoring the conversion of Prime and Unique Farmlands to urban uses. We have determined that all culverts for the project occupy map units identified as Arents, Aquents, or Undorthents. There is one map unit of native soil (Hallandale-Pople complex. None of the impacted map units qualify as Prime, Unique, or Locally Important Farmlands.

Additional information can be obtained at the USDA-NRCS Web Soil Survey website: http://websoilsurvey.nrcs.usda.gov/app/

Regards,

Rick

Rick Robbins
USDA-NRCS
Soil Scientist
Gainesville, Florida
Phone: 352.338.9536

w/ attachments

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 1/24/10
Name Of Project Herbert Hoover Dike Rehabilitation,Culvert Replac	Federal Agency Involved USACE, Jacksonville District
Proposed Land Use Federal rehabilitation of culverts on the dike	County And State Glades, Hendry, Martin, Okeechobee, and Palm Be
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 1/25/11

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☐	No ☑	Acres Irrigated / Average Farm Size
Major Crop*(s)*	Farmable Land In Govt. Jurisdiction Acres: %		Amount Of Farmland As Defined in FPPA Acres: %
Name Of Land Evaluation System Used	Name Of Local Site Assessment System		Date Land Evaluation Returned By NRCS 1/25/11

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	0.0			
B. Total Acres To Be Converted Indirectly	0.0			
C. Total Acres In Site	0.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	0	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side) **Form AD-1006 (10-83)**

This form was electronically produced by National Production Services Staff

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

FEB 01 2011

Mr. Paul Souza
U.S. Fish and Wildlife Service
1339 20th Street
Vero Beach, Florida 32960

Dear Mr. Souza:

In accordance with provisions of Section 7 of the Endangered Species Act, as amended, the U.S. Army Corps of Engineers (Corps) is hereby initiating consultation with the U.S. Fish and Wildlife Service (FWS) concerning the Herbert Hoover Dike (HHD). The Corps is preparing an Environmental Assessment (EA) for the replacement or removal of the 32 federal culverts as part of a major maintenance reduction strategy for the HHD system. All the culverts to be replaced or removed are within the HHD system and federal right of way on Lake Okeechobee, located in south central Florida, in the counties of Okeechobee, Martin, Palm Beach, Hendry and Glades Counties.

The preferred plan to be analyzed in the upcoming EA is the replacement of the 28 active federal culverts and the removal of the four abandoned federal culverts. The attached initiation package describes the proposed action.

The Corps has previously received a Final Fish and Wildlife Coordination Act (FWCA) Report dated December 20, 2001, and supplemental FWCA Reports dated March 4, 2003, and March 8, 2004 for previous HHD rehabilitation work. In the attached Complete Initiation Package (CIP), the Corps' determination for the culvert replacement and removal project is "not likely to adversely affect" the following species: Audubon's crested caracara (*Caracara cheriway*), Eastern indigo snake (*Drymarchon corais couperi*), wood stork (*Mycteria americana*), Everglade snail kite (*Rosthrhamus sociabilis plumbeus*) and its designated critical habitat, West Indian manatee (*Trichechus manatus*), and the Okeechobee gourd (*Curbita okeechobeensis*). The Corps will continue to implement the protective measures previously agreed upon to avoid adverse effects to these species. In addition, the proposed action will not affect the Regulation Schedule for Lake Okeechobee.

We request your concurrence with our determinations pursuant to the Endangered Species Act. If you have any questions regarding this initiation package or upcoming EA or need additional information, please contact Ms. Stacie Auvenshine at 904-232-3694 (Stacie.J.Auvenshine@usace.army.mil). Thank you for your continued attention and support to this matter.

Sincerely,

Eric P. Summa
Deputy Chief, Planning Division
Chief, Environmental Branch

HERBERT HOOVER DIKE MAJOR REHABILITATION GLADES, HENDRY, MARTIN, OKEECHOBEE AND PALM BEACH COUNTIES

COMPLETE INITIATION PACKAGE

HERBERT HOOVER DIKE
CULVERT REPLACEMENT AND REMOVAL

PROJECT DESCRIPTION

The proposed action, to be discussed in an upcoming Environmental Assessment (EA), is the replacement or removal of all federal culverts as part of a major maintenance reduction strategy for the Herbert Hoover Dike (HHD) system (see Figure 1) All the culverts to be replaced or removed are within the HHD system on Lake Okeechobee located in south central Florida, in the counties of Okeechobee, Martin, Palm Beach, Hendry and Glades. The subject culverts are all located within the federal right-of-way. Lake Okeechobee is a multi-purpose reservoir in the Central and Southern Florida Project. The authorized project purposes for Lake Okeechobee include: flood control, irrigation, enhancement of fish and wildlife, navigation, prevention of saltwater intrusion, recreation, and water supply to Everglades National Park.

The upcoming EA will only address the 32 federal culverts as shown in Figure 1. The non-federal culverts, federal structures and the non-federal structures will be evaluated in a subsequent detailed report. The HHD system includes 28 federal culverts in the HHD system which are in critical need of replacement and four federal culverts that will require removal (Appendix A for photos of culverts). Of the culverts recommended for removal, three were previously abandoned and buried, while the fourth was determined to no longer be required. The subject culverts, as well as the major outlets of Lake Okeechobee, are operated and maintained by the U.S. Army Corps of Engineers, Jacksonville District. The South Florida Water Management District (SFWMD) operates and maintains other inlet structures, pump stations and locks around Lake Okeechobee that also penetrate the HHD embankment. These and other risk reduction strategies are currently being evaluated in a subsequent detailed report.

Normal operations and routine maintenance activities, such as mowing and culvert inspections, will continue along the HHD during the culvert replacement and removal process. Cutoff wall construction (covered and coordinated under previous NEPA documents) will continue in Reach 1 (L-D9 and a portion of L-D2 on Figure 1) of the HHD.

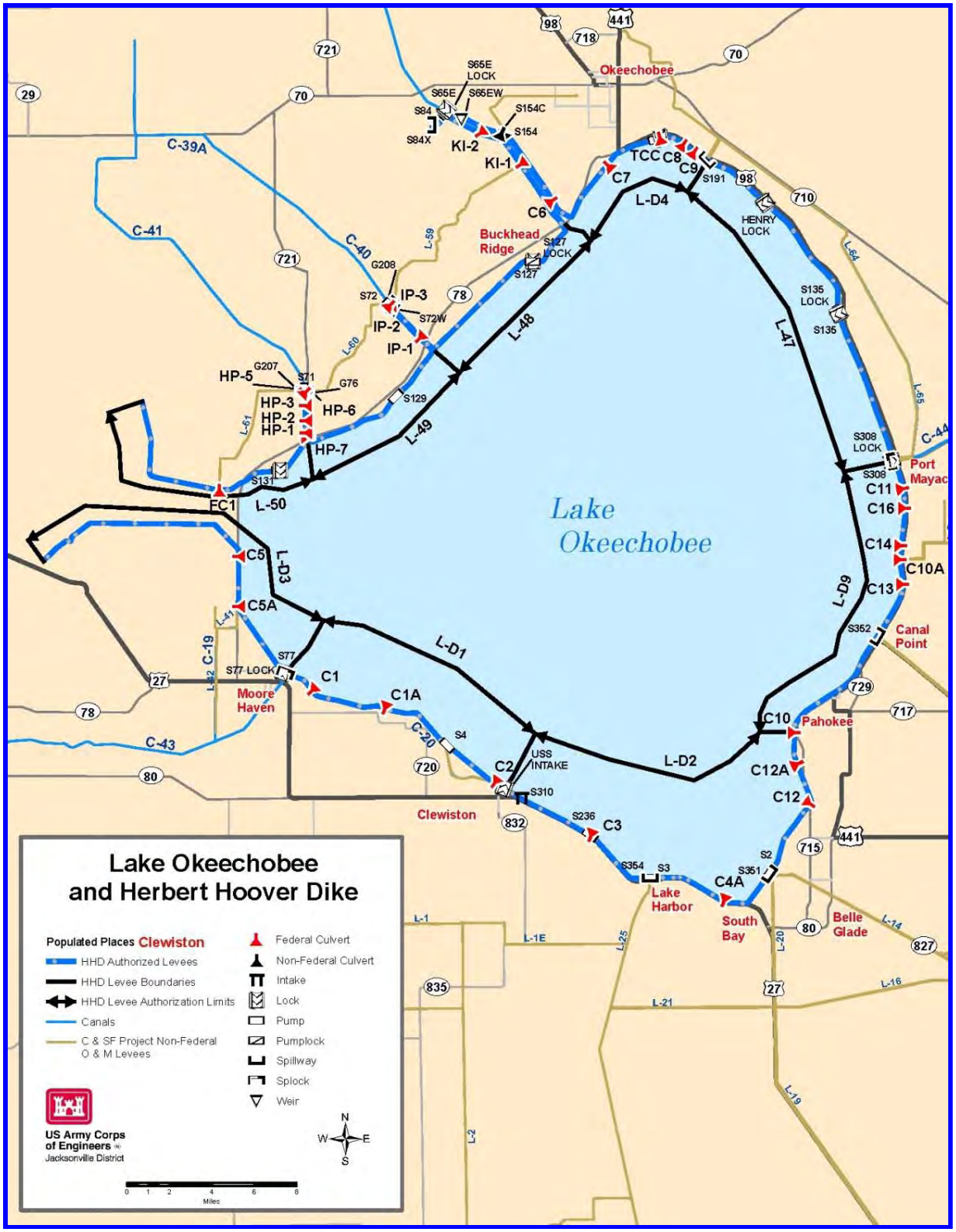


Figure 1: Herbert Hoover Dike Levee Designations

The purpose of this project is to improve dam safety along, around and within the HHD per external review recommendations and current dam safety regulations. The federal culverts pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts. During a large storm event, concentrated seepage could begin to move large amounts of material through the embankment at the culvert locations. Erosion would progress upstream, eventually leading to a breach of the embankment. Action is required as an immediate maintenance risk reduction strategy, in conformance with dam safety requirements, to reduce the risk of catastrophic failure of the project. These major maintenance actions are required to reduce this unacceptable risk due to the high probability of failure and associated potential loss of life.

The project is expected to take place over the next 60 months, with each culvert construction taking approximately one year on average (Table 1). The construction of culverts will potentially span a 10-year period and as a result, design plans have not currently been established for each culvert. Consultation with USFWS will continue during the design phase for each set of culvert replacements or removals due to these design constraints. Protection measures, such as sound dampening devices on trucks and other vehicles and species surveys prior to and during construction will be requested as part of contractor proposals and work plans. All monitoring and survey of protected species will be conducted in accordance with survey protocol from the USFWS South Florida Ecological Services Office and website. (http://www.fws.gov/verobeach/index.cfm?Method=programs&NavProgramCategoryID=3&programID=73&ProgramCategoryID=3)

Table 1. Thirty-two Federal Culverts Summary

Construction Feature	Location	Barrels	Size (ft)	Pipe Length (ft)	Original barrel type	Solution	Estimated Cost	Estimated Duration of Construction (in months)
Culvert 11	L-D9	1	10	95	CMP	Replace	$14,000,000	10.5*
Culvert 16	L-D9	1	10	96	CMP	Replace	$14,000,000	10.5*
Culvert 10A	L-D9	5	10	76	CMP	Replace	$16,000,000	8.0
Culvert 13	L-D9	1	10	95	CMP	Replace	$14,000,000	11.0
Culvert 10	L-D9	2	10	111	CMP	Replace	$15,000,000	12.5
Culvert 12A	L-D2	1	7	86	Concrete	Replace	$14,000,000	10.0
Culvert 12	L-D2	3	10	91	CMP	Replace	$15,000,000	14.0
Culvert 4A	L-D2	1	10	177	CMP	Replace	$14,000,000	11.0*
Culvert 3	L-D2	2	10	105	CMP	Replace	$15,000,000	12.5*
Culvert 2	L-D2	6	10	105	CMP	Replace	$16,000,000	16.0
Culvert 1A	L-D1	3	7	172	CMP	Replace	$12,000,000	11.0*
Culvert 1	L-D1	2	10	115	CMP	Replace	$15,000,000	12.5*
Culvert 5A	L-D3	3	10	160	CMP	Replace	$12,000,000	14.0
Culvert 5	L-D3	3	10	160	CMP	Replace	$12,000,000	14.0
Culvert 8	L-D4	3	10	151	CMP	Replace	$12,000,000	14.0
Culvert FC-1	L-50	2	9	118	CMP	Replace	$6,000,000	12.0
Culvert HP-1	L-50	1	2.5	94	CMP	Replace	$5,000,000	10.0
Culvert HP-2	L-50	1	7	94	CMP	Replace	$5,000,000	10.0
Culvert HP-3	L-50	1	9	94	CMP	Replace	$5,000,000	11.0
Culvert HP-5	L-50	2	9	96	CMP	Replace	$6,000,000	12.5
Culvert HP-6	L-49	2	7	94	CMP	Replace	$6,000,000	10.0
Culvert HP-7	L-49	1	5	94	CMP	Replace	$5,000,000	9.0
Culvert IP-1	L-49	1	5	94	CMP	Replace	$5,000,000	9.0
Culvert IP-2	L-49	2	7	80	CMP	Replace	$6,000,000	10.0
Culvert IP-3	L-48	2	6	80	CMP	Replace	$6,000,000	10.0
Culvert KI-1	L-48	3	6	145	Concrete	Replace	$7,000,000	11.0
Culvert KI-2	L-48	1	6	145	Concrete	Replace	$5,000,000	9.0
Culvert 6	L-D4	1	10	151	CMP	Replace	$11,000,000	11.0
Culvert 7	L-D4	3	10	151	CMP	Remove	$4,000,000	8.0
Taylor Creek (TCC)	L-D4	8	10	71	CMP	Remove	$8,000,000	10.0
Culvert 9	L-D4	-	-	151	CMP	Remove	$4,000,000	11.0
Culvert 14**	L-D9	1	10	96	CMP	Remove	$4,000,000	6.0*

Notes:

1. The "Estimated Cost" column represents a rough order of magnitude (ROM) cost estimate to remove or replace culverts in FY11 dollars with 20% contingency.
2. The replacement cost is based on estimates of the full construction effort to replace culverts in the same location, extending the culvert to the adjacent embankments, all within the federal right-of-way. These planning level detail cost estimates, developed for several culverts of various sizes on the Southern portion of HHD, were applied to the rest of culverts, considering size, location, existence of navigational channel and other considerations.
3. The removal cost is based on construction detail cost estimates, developed for one of the culverts (Culvert 14), and this cost was applied to the other four culverts to be removed.
4. *An actual construction schedule was developed as preliminary design information was available. Estimated construction duration for the other culverts was estimated by interpolating and extrapolating information from existing design information. Actual site conditions may increase or decrease construction time by approximately 15 percent.
5. **Culvert 14 removal is covered in Partial Reach 1 and 2 Ditch Backfill and Culvert 14 Removal EA, July 2008

SPECIES

The Corps is requesting concurrence for a not likely to adversely affect determination for the following species: Audubon's crested caracara (*Caracara cheriway*), Eastern indigo snake (*Drymarchon corais couperi*), wood stork (*Mycteria americana*), Everglade snail kite (*Rosthrhamus sociabilis plumbeus*) and its designated critical habitat, West Indian manatee (*Trichechus manatus*), and the Okeechobee gourd (*Curbita okeechobeensis*). Appendix B details the nest and critical habitat locations.

EFFECTS OF THE PROPOSED ACTION

The Corps has determined the preferred alternative is not likely to adversely affect any of the federally listed species known to occur within the project area that are listed below. Informal consultation with the USFWS began on 10 December 2010 and continues with this Complete Initiation Package (CIP). Conservation guidelines for protected species can be found on the FWS website at: http://www.fws.gov/verobeach/index.cfm?Method=programs&NavProgramCategoryID=3&programID=73&ProgramCategoryID=3. Individual links are provided in the Monitoring During Construction section of this document that include the conservation guidelines for appropriate timing and protocol of surveys and monitoring for each of the following species.

Audubon's Crested Caracara

Audubon's crested caracaras have been documented to nest near the project area. Specifically, nests have been reported south of Port Mayaca outside of the federal right of way. Additionally, it is possible that nests could be found in other areas within the project area. Surveys will be conducted prior to the initiation of construction and during construction at each site to determine if caracara is present in the project area. The action may produce noise above ambient levels, however, mufflers and sound dampening equipment would be required during construction. Monitoring for caracara during the nesting season (January through April) and adaptively managing action activities within 985-4,920 ft of the nests will ensure the action would not increase noise above ambient levels within nest protection areas of active caracara nests.

Conclusion: The Recommended Plan may affect, but is not likely to adversely affect, the Audubon's crested caracara.

Eastern Indigo Snake

Eastern indigo snakes may be found along the embankment of the HHD. Preconstruction surveys would be completed in the project area, monitors would be on site during all phases of construction, and construction crews would be educated on identifying the indigo snake and the precautions to take to prevent impacts to the indigo snake. Eastern indigo snake Standard Protection Measures will be included in the environmental protection plan for culvert construction work. Onsite gopher tortoise burrows would be protected to the extent possible to provide snake habitat during construction. The habitat that would be temporarily impacted would be seeded or replaced by sod and is expected to recover within a few months of project completion.

Conclusion: The Recommended Plan may affect, but is not likely to adversely affect, the eastern indigo snake.

Everglade Snail Kite

Everglade snail kites are known to nest near the project area (see Figure 2 for known listing locations) but not directly adjacent to the federal culverts. Culverts adjacent to the critical habitat include Culverts 1, 1A, 2, 5, and 5A. In addition, snail kites forage within the Lake Okeechobee southwestern littoral zone.

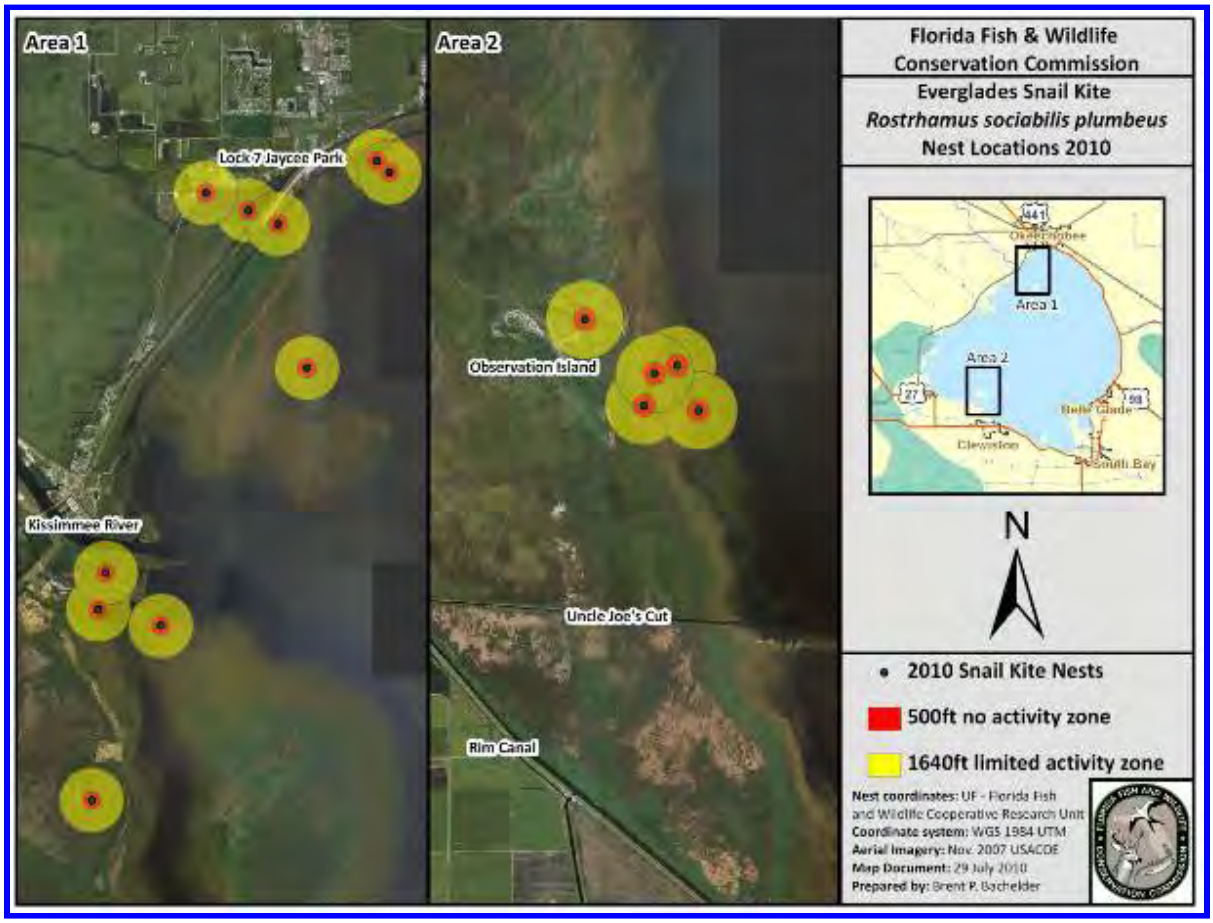


Figure 2. Everglade Snail Kite Nest Locations 2010

The proposed action may produce noise above ambient levels, however, mufflers and sound dampening equipment would be required during construction. Preconstruction surveys would be completed prior to the initiation of construction activities. Monitoring kites during the nesting season (January through June) and adaptively managing action activities within the 500 ft no activity zone of active snail kite nests will ensure the action will not increase noise above ambient levels within nest protection areas of active snail kite nests. A 1640 ft buffer (Secondary Priority Management Zone) will be established as necessary around active nests.

Snail Kite Critical Habitat

Based on the description in the Federal Register (1977), snail kite critical habitat in Lake Okeechobee is located in the western parts of Glades and Hendry Counties, extending along the western shore to the east of the levee system and the undiked high ground at Fisheating Creek, and from the Hurricane Gate at Clewiston northward to the mouth of the Kissimmee River,

including all the spike rush (*Eleocharis sp.)* flats of Moonshine Bay, Monkey Box, and Observation Shoal, but excluding the open water north and west of the northern tip of Observation Shoal north of Monkey Box and east of Fisheating Bay.

The construction footprint for Culvert 1 and 2 includes the grassy vegetation covering the HHD. The critical habitat (shapefile obtained from USFWS) is shown to extend onto the levee and dike in this grassy vegetation. Upland grassy vegetation is not considered critical snail kite habitat. Therefore, the USACE does not expect the acreage amount of potential impact to be as large as depicted in Appendix A, Figure 5. However, minimal temporary impacts may occur due to cofferdam placement and construction. The cofferdam will be removed upon completion of removal or replacement of the culverts.

Portions of the toe ditch and the lake's edge within the cofferdam (the extent of construction) will be dewatered temporarily during construction, but foraging areas are available to the snail kite in other parts of Lake Okeechobee. In order to minimize impacts to the snail kite critical habitat, Culverts (1, 1A, 2, 5, and 5A) within and adjacent to the critical habitat (Appendix B) will use driven pile cofferdams which generally reduces the construction impact and footprint by approximately 50 percent. Disturbances to snail kite critical habitat will be temporary in nature and vegetation would be allowed to reestablish through natural recruitment and restored to preconstruction conditions by replanting vegetation upon completion of construction. There would be no permanent loss of critical habitat.

Conclusion: The Recommended Plan may affect, but is not likely to adversely affect, the Everglade snail kite and its designated critical habitat.

<u>Okeechobee Gourd</u>
The Okeechobee gourd is known to occur on the HHD. Preconstruction surveys would be completed to locate any plants within the construction footprint. If plants are found, the USFWS would be contacted to determine an appropriate course of action for removal and relocation of plants. Flagging will be placed around the gourd for additional protection from pedestrian traffic if plants are sighted outside of, but adjacent to, the construction area.

Conclusion: The Recommended Plan may affect, but is not likely to adversely affect the Okeechobee Gourd.

<u>West Indian Manatee</u>
Manatees are known to occur in Lake Okeechobee. The proposed action would produce noise above ambient levels. Preconstruction surveys would be completed to ensure that no manatees are harmed or harassed during construction. Surveys would also be conducted during construction and installation of the cofferdams to determine if manatees are present in the area of construction. The installation of cofferdams would prevent manatees from entering the construction zone and should prevent any disturbance to the manatees. Manatee protection grates with openings no greater than eight inches by eight inches would be installed on all replacement culverts to prevent manatees from accessing culvert structures. No manatee critical habitat is adjacent to or near the dike.

Conclusion: The Recommended Plan may affect, but is not likely to adversely affect the West Indian manatee.

Wood Stork

Wood storks are known to forage within the toe ditch and nest near the proposed project area. Project activities near foraging wood storks could temporarily displace individuals to other foraging areas available within the southwest littoral zone of Lake Okeechobee while construction is occurring on the culverts. The action may produce noise above ambient levels, however, mufflers and sound dampening equipment would be required during construction. Preconstruction surveys would be completed prior to the initiation of construction activities. Monitoring of wood storks during the nesting season (January through June) and adaptively managing action activities within 1,000-1,500 ft of active wood stork nesting colonies will ensure the action will not increase noise above ambient levels within nest protection areas of active caracara nests. Human activity should not occur within a 300 ft buffer where there is a vegetation screen (dense vegetation), and 750ft when there is no vegetation present. A 2,500 ft buffer (Secondary Priority Management Zone) will be established as necessary around nesting colonies.

Conclusion: The Recommended Plan may affect, but is not likely to adversely affect the wood stork.

CONSERVATION MEASURES

The USACE commits to mitigating effects of the Recommended Plan to the greatest extent possible in both the planning and construction phases of the project. Minimization of impacts will occur in areas of snail kite critical habitat by using driven pile cofferdams which have approximately 50 percent less impacted footprint than earthen cofferdams. Driven pile cofferdams would be constructed as close as possible to the construction area to avoid impacts to snail kite critical habitat.

Once the first set of culverts is completed, there will be discussion as how to best minimize impacts and better assess remaining culvert construction and replacement throughout. This allows for adaptive management to produce better results once the first six have been replaced. The USACE will coordinate with the USFWS to determine how to best minimize impacts (if any) on future culvert removal and replacement plans.

MONITORING DURING CONSTRUCTION PHASE

Monitoring of listed species identified to occur within the HHD will be addressed with ongoing communication with the USFWS. Construction of culverts will span over multiple years (see Table 1 for estimated construction durations), and design plans have not currently been established for each culvert, therefore consultation with the USFWS will continue with replacement or removal of each culvert.

The following link provides conservation measures and guidelines for all threatened and endangered species in Florida:
http://www.fws.gov/verobeach/index.cfm?Method=programs&NavProgramCategoryID=3&programID=73&ProgramCategoryID=3

Before, during and post construction guidelines should be followed according to the accompanying documents provided by the USFWS for each respective species:

Audubon's Crested Caracara
Conservation Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Caracara_Conservation_Guidelines.pdf
Nesting survey protocol:
http://www.fws.gov/verobeach/images/pdflibrary/Caracara_Survey_Protocol.pdf

Eastern Indigo Snake
Species Conservation Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Eastern_Indigo_Snake_Conservation_Guidelines.pdf

Everglade Snail Kite
http://www.fws.gov/verobeach/images/pdflibrary/Snail_Kite_Conservation_Measures.pdf

Okeechobee Gourd
http://www.fws.gov/verobeach/images/pdflibrary/cuok.PDF

West Indian Manatee
http://www.fws.gov/verobeach/images/pdflibrary/Manatee%20_Conservation_Guidelines.pdf

Wood Stork
Habitat Management Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Management_Guidelines_Wood%20Stork.pdf

MITIGATION
The USACE and its contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

1) Standard protection measures regarding the eastern indigo snake shall be included in the environmental protection plan when the USACE proceeds to the plans and specifications phase of this project.

2) The USACE or its contractor shall conduct a pre-construction survey to determine locations of bald eagle nests within the immediate vicinity of construction prior to issuance of any construction contracts. Results shall be coordinated with the USFWS, Vero Beach office. The USACE will conduct surveys to locate the nest trees ahead of construction and will avoid construction close to the nests during the nesting season. If the hatchlings fledge prior to May 15, activity within the 660-foot buffer would be allowed. In the event that construction within the interior of the buffer is unavoidable within nesting season, the Bald Eagle Monitor Guidelines will be implemented accordingly. The guidelines can be reviewed at the following web address: www.fws.gov/northflorida/BaldEagles/bald-eagles.htm.

3) The USACE shall consult with the USFWS regarding adopting standardized protection measures should any caracara nests be identified within the project construction zone. Results shall be coordinated with the USFWS and FFWCC.

4) Turbidity screening and diversion will be used to control effects to the drainage ditches and connected canals. Runoff from the construction site or storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, and any measures required by area wide plans approved under paragraph 208 of the Clean Water Act. Temporary and permanent erosion and sedimentation control features or screening will be installed. Temporary velocity dissipation devices shall be placed along drainage courses to provide for non-erosive flows. Temporary erosion and sediment control measures such as berms, dikes, drains, sediment traps, sedimentation basins, grassing, mulching, baled hay or straw, and silt fences shall be maintained until permanent drainage and erosion control facilities are completed and operative. For silt fences, the filter fabric is to be of nylon, polyester, propylene, or ethylene yarn of at least 50 lb/in strength and able to withstand a flow rate of at least 0.3 gal/ft sq/minute. It also would contain ultraviolet ray inhibitors and stabilizers and be a minimum of 36 inches in width.

5) In addition, during construction, the Contractor will be responsible for keeping construction activities, including refueling and maintenance sites, under surveillance, management, and control to avoid pollution of surface, ground waters, and wetlands. The Contractor is responsible for conducting all operations in a manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302, State of Florida, FDEP.

6) Project construction shall not destroy migratory birds, their active nests, their eggs, or their hatchlings. Monitoring for such would be required by the construction contractor. A buffer zone around active nests or nestling activity would be required during the nesting season.

CONCLUSIONS

The Corps determination on all threatened and endangered species in this document is may affect, not likely to adversely affect. The purpose of this project is to prevent a major breach in the dike by replacing or removing existing federal culverts. All construction and impacts will be temporary in nature, resulting in preconstruction conditions upon completion of construction. In some cases, such as prime wetlands and snail kite critical habitat, vegetation will be replanted to help native plants repopulate more quickly. Appropriate conservation measures and survey protocol will be followed throughout the design phase and all stages of construction and will also be coordinated with USFWS. Adaptive management will be applied throughout construction of the culverts since the culverts will not be built concurrently, allowing for unforeseen issues to be addressed if they arise.

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Categorical Exclusion (CX) for Repair or Removal of Culvert 15 in Levee D-2 of the HHD, 04 April 2008.

Categorical Exclusion (CX) for Tree Removal and Ditch Clearing Within Right of Way in Reach 2 of the HHD, 07 March 2008.

Herbert Hoover Dike Consensus Report, External Peer Review of DSAC-1 Projects, October 30, 2007.

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Draft Herbert Hoover Dike Major Rehabilitation, Reaches 2 and 3, Environmental Impact Statement and Engineering Analysis, Palm Beach, Glades and Hendry Counties, Florida, December 2006.

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Report of Expert Review Panel, Technical Evaluation of Herbert Hoover Dike Lake Okeechobee, Florida prepared by BCI Engineers & Scientists, Inc., April 2006.

Draft and Final Herbert Hoover Dike Major Rehabilitation Evaluation Report, Reach One, Final Environmental Impact Statement, September 2005.

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Final Herbert Hoover Dike Major Rehabilitation Report, November 2000.

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Herbert Hoover Dike Major Rehabilitation Evaluation Report, Draft Environmental Impact Statement, July 1999.

LIST OF PREPARERS

Name	**Affiliation**	**Qualification/Role**
Angela Dunn	USACE	Biologist - Preparation
Stacie Auvenshine	USACE	Biologist - Preparation
Susan Conner	USACE	Biologist - Review

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
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February 10, 2011

Eric P. Summa
Deputy Chief, Planning Division
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Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Federal Activity Code: 41420-2011-CPA-0095
Service Consultation Code: 41420-2011-I-0081
Date Received: February 1, 2011
Project: Herbert Hoover Dike Culvert Replacement
Counties: Palm Beach, Martin, Okeechobee, Glades, and Hendry

Dear Mr. Summa:

Thank you for your letter, dated February 1, 2011, in which you described the Herbert Hoover Dike (HHD) culvert replacement and removal project and provided your determinations of effect on federally-listed species. This letter provides U.S. Fish and Wildlife Service (Service) concurrence pursuant to section 7 of the Endangered Species Act of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 *et seq.*) and our additional comments in accordance with the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978).

The U.S. Army Corps of Engineers (Corps) determined the proposed action is not likely to adversely affect the Audubon's crested caracara *(Polyborus plancus audubonii)*, eastern indigo snake *(Drymarchon corais couperi)*, wood stork *(Mycteria americana)*, Everglade snail kite *(Rostrhamus sociabilis plumbeus)* and Everglade snail kite designated critical habitat, West Indian manatee (*Trichechus manatus*), and Okeechobee gourd *(Cucurbita okeechobeensis* ssp. *okeechobeensis*).

PROJECT DESCRIPTION

The Corps plans to replace or remove 32 HHD system Federal culverts (Figure 1) as part of a major maintenance reduction strategy. All the culverts to be replaced or removed are within Federal right-of-way on Lake Okeechobee in south central Florida, in Okeechobee, Martin, Palm Beach, Hendry, and Glades Counties. The Corps will continue to implement previously agreed upon protective measures to avoid adverse effects to these species. The proposed action will not affect the Regulation Schedule for Lake Okeechobee.

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Figure 1. Herbert Hoover Dike Federal Culvert Locations.

This project will improve dam safety along, around, and within the HHD per external review recommendations and current dam safety regulations. The federal culverts pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts. During a large storm event, concentrated seepage could begin to move large amounts of material through the embankment at the culvert locations. Erosion would progress upstream, eventually leading to a breach of the embankment. Action is required as an immediate maintenance risk reduction strategy, in conformance with dam safety requirements, to reduce the risk of catastrophic failure of the project. These major maintenance actions are required to reduce this unacceptable risk due to the high probability of failure and associated potential loss of life.

The project is expected to take place over the next 60 months, with each culvert construction taking approximately 1 year on average. The construction of culverts will potentially span a 10-year period and as a result, design plans have not currently been established for each culvert. Consultation with the Service will continue during the design phase for each set of culvert replacements or removals due to these design constraints. Protection measures, such as sound dampening devices on trucks and other vehicles and species surveys prior to and during construction will be requested as part of contractor proposals and work plans. Monitoring and survey of federally-listed species will be conducted in accordance with survey protocols from the Service's South Florida Ecological Services Office (SFES0) and website http://www.fws.gov/verobeach/.

CONSERVATION MEASURES

The Corps developed conservation measures to avoid adverse effects and minimize and mitigate potential effects of the Recommended Plan to the greatest extent possible in both the planning and construction phases of the project. During the construction phase, the Corps will monitor or require contractors to monitor listed species that could occur on or around the HHD. The Corps will address potential effects during ongoing communication and adaptive management discussion with the Service throughout the construction phase. Construction of culverts will span over multiple years, and design plans have not currently been established for each culvert; therefore consultation with the Service will continue with replacement or removal of each culvert. The Corps will implement before, during and post construction guidelines from the following species Conservation Guidelines and Survey Protocols:

Audubon's Crested Caracara Conservation Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Caracara_Conservation_Guidelines.pdf

Audubon's Crested Caracara Nesting survey protocol:
http://www.fws.gov/verobeach/images/pdflibrary/Caracara_Survey_Protocol.pdf

Eastern Indigo Snake Species Conservation Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Eastern_Indigo_Snake_Conservation_Guidelines.pdf

Everglade Snail Kite:
http://www.fws.gov/verobeach/images/pdflibrary/Snail_Kite_Conservation_Measures.pdf

Okeechobee Gourd:
http://www.fws.gov/verobeach/images/pdflibrary/cuok.pdf

West Indian Manatee:
http://www.fws.gov/verobeach/images/pdflibrary/Manatee%20_Conservation_Guidelines.pdf

Wood Stork Habitat Management Guidelines:
http://www.fws.gov/verobeach/images/pdflibrary/Management_Guidelines_Wood%20Stork.pdf

The Corps will minimize effects in Everglade snail kite critical habitat by using driven pile cofferdams which have approximately 50 percent less impacted footprint than earthen cofferdams. Driven pile cofferdams would be constructed as close as possible to the construction area to avoid impacts to snail kite critical habitat.

Once the first set of culverts is completed, the Corps will discuss how to best minimize impacts and better assess remaining culvert construction and replacement throughout. This allows for adaptive management to produce better results once the first six have been replaced. The Corps will coordinate with the Service to determine how to best minimize impacts, if any, on future culvert removal and replacement plans.

The Corps and its contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

Eastern Indigo Snake Standard Protection Measures (enclosed) shall be included in the environmental protection plan and all contract plans and specifications.

The Corps or its contractor shall conduct a pre-construction survey to determine locations of bald eagle (*Haliaeetus leucocephalus*) nests within the immediate vicinity of construction prior to issuance of any construction contracts. Results shall be coordinated with the Service's SFESO. The Corps will conduct surveys to locate nest trees ahead of construction and will avoid construction close to the nests during the nesting season. If the hatchlings fledge prior to May 15, activity within the 660-foot buffer would be allowed. In the event that construction within the interior of the buffer is unavoidable within nesting season, the National Bald Eagle Management Guidelines will be implemented accordingly. The guidelines can be reviewed at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

The Corps shall consult with the Service regarding adopting standardized protection measures should any caracara nests be identified within the project construction zone. Results shall be coordinated with the Service and Florida Fish and Wildlife Conservation Commission (FWC).

Turbidity screening and diversion will be used to control effects to the drainage ditches and connected canals. Runoff from the construction site or storms shall be controlled, retarded, and diverted to protected drainage courses by means of diversion ditches, benches, and any measures

required by area wide plans approved under paragraph 208 of the Clean Water Act. Temporary and permanent erosion and sedimentation control features or screening will be installed. Temporary velocity dissipation devices shall be placed along drainage courses to provide for non-erosive flows. Temporary erosion and sediment control measures such as berms, dikes, drains, sediment traps, sedimentation basins, grassing, mulching, baled hay or straw, and silt fences shall be maintained until permanent drainage and erosion control facilities are completed and operative. For silt fences, the filter fabric is to be of nylon, polyester, propylene, or ethylene yarn of at least 50 lb/in strength and able to withstand a flow rate of at least 0.3 gal/ft sq/minute. It also will contain ultraviolet ray inhibitors and stabilizers and be a minimum of 36 inches in width.

During construction, the contractor will be responsible for keeping construction activities, including refueling and maintenance sites, under surveillance, management, and control to avoid pollution of surface, ground waters, and wetlands. The Contractor is responsible for conducting all operations in a manner to minimize turbidity and shall conform to all water quality standards as prescribed by Chapter 62-302, State of Florida, Florida Department of Environmental Protection.

Project construction shall not destroy migratory birds, their active nests, their eggs, or their hatchlings. Monitoring for such would be required by the construction contractor. A buffer zone around active nests or nestling activity would be required during the nesting season.

THREATENED AND ENDANGERED SPECIES

Audubon's crested caracaras have been documented nesting near the project area. Nests have been documented south of Port Mayaca outside of the federal right of way. Other nests could be identified within the project area during the 10-year life span of the project. Surveys will be conducted prior to the initiation of construction and during construction at each site to determine if caracaras are present in the construction area. The action may produce noise above ambient levels, however, mufflers and sound dampening equipment would be required during construction. Monitoring for caracara during the nesting season (January through April) and adaptively managing action activities within 985 to 4,920 feet of the nests will ensure the action would not increase noise above ambient levels within nest protection areas of active caracara nests. The Corps determined the Recommended Plan may affect, but is not likely to adversely affect the Audubon's crested caracara. The Service concurs with the Corps' determination.

Eastern indigo snakes may be found along the embankment of the HHD. Preconstruction surveys will be completed prior to construction. Monitors will be on site during all phases of construction, and construction crews would be educated on identifying the indigo snake and the precautions to take to prevent impacts to the indigo snake. Eastern indigo snake Standard Protection Measures (enclosed) will be included in the environmental protection plan for culvert construction work. Onsite gopher tortoise (*Gopherus polyphemus*) burrows would be protected to the extent possible to provide snake habitat during construction. The habitat that would be temporarily impacted would be seeded or replaced by sod and is expected to recover

within a few months of project completion. The Corps determined the Recommended Plan may affect, but is not likely to adversely affect the eastern indigo snake. The Service concurs with the Corps' determination.

Everglade snail kites are known to nest near the project area (Figure 2) but not directly adjacent to the federal culverts. Culverts adjacent to the critical habitat include Culverts 1, 1A, 2, 5, and 5A (Figure 3). Everglade snail kite critical habitat in Lake Okeechobee is located in the western parts of Glades and Hendry Counties (Figure 3), extending along the western shore to the east of the levee system and the undiked high ground at Fisheating Creek, and from the Hurricane Gate at Clewiston northward to the mouth of the Kissimmee River, including all the spike rush (*Eleocharis sp.)* flats of Moonshine Bay, Monkey Box, and Observation Shoal, but excluding the open water north and west of the northern tip of Observation Shoal north of Monkey Box and east of Fisheating Bay.

Figure 2. Everglade Snail Kite 2010 Nest Locations.

In addition, snail kites forage within the Lake Okeechobee southwestern littoral zone. Because the proposed action may produce noise above ambient levels, mufflers and sound dampening equipment would be required during construction. Preconstruction surveys

Figure 3. Everglade Snail Kite Critical Habitat adjacent to the Herbert Hoover Dike.

would be completed prior to the initiation of construction activities. Monitoring kites during the nesting season (January through June) and adaptively managing action activities within the 500 meter no activity zone of active snail kite nests will ensure the action will not increase noise above ambient levels within nest protection areas of active snail kite nests. A 1640 ft buffer (Secondary Priority Management Zone) will be established as necessary around active nests.

Temporary impacts may occur due to cofferdam placement and construction (Figure 3, Table 1). The cofferdam will be removed upon completion of removal or replacement of the culverts. Portions of the toe ditch and the lake's edge within the cofferdam (the extent of construction) will be dewatered temporarily during construction, but foraging areas are available to the snail kite in other parts of Lake Okeechobee. In order to minimize impacts to the snail kite critical habitat, Culverts (1, 1A, 2, 5, and 5A) within and adjacent to the critical habitat will use driven pile cofferdams which is expected to reduce the construction impact and footprint by approximately 50 percent. Disturbances to snail kite critical habitat will be temporary in nature and vegetation would be allowed to reestablish through natural recruitment and restored to preconstruction conditions by replanting vegetation upon completion of construction. There would be no permanent loss of critical habitat. The Corps determined the Recommended Plan may affect, but is not likely to adversely affect, the Everglade snail kite and its designated critical habitat. The Service concurs with the Corps' determination.

Table 1. Potential effects of Herbert Hoover Dike culvert replacement on Everglade snail kite critical habitat.

	Approximate Construction Footprint (acres)	Estimated Effects to Everglade Snail Kite Critical Habitat (acres)
Culvert 1	6.1	1.0
Culvert 1A	5.7	0.0
Culvert 2	8.9	5.0
Culvert 5	12.7	0.0
Culvert 5A	13.8	0.0

The Okeechobee gourd is known to be present on or adjacent to the HHD. Preconstruction surveys will be completed to locate any plants within the construction footprint. If plants are found, the Service would be contacted to determine an appropriate course of action for removal and relocation of plants. Flagging will be placed around the gourd for additional protection from pedestrian traffic if plants are sighted outside of, but adjacent to, the construction area. The Corps determined the Recommended Plan may affect, but is not likely to adversely affect the Okeechobee Gourd. The Service concurs with the Corps' determination.

West Indian manatees occur in Lake Okeechobee. The proposed action will produce noise above ambient levels. Preconstruction surveys would be completed to ensure that no manatees are harmed or harassed during construction. Surveys will also be conducted during construction and installation of the cofferdams to determine if manatees are present in the area of construction.

The installation of cofferdams would prevent manatees from entering the construction zone and should prevent any disturbance to the manatees. Manatee protection grates with openings no greater than eight inches by eight inches will be installed on all replacement culverts to prevent manatees from accessing culvert structures. No manatee critical habitat is adjacent to or near the dike. The Corps determined the Recommended Plan may affect, but is not likely to adversely affect the West Indian manatee. The Service concurs with the Corps' determination.

Wood storks forage within the toe ditch and nest near the proposed project area. Project activities near foraging wood storks could temporarily displace individuals to other foraging areas available within the southwest littoral zone of Lake Okeechobee while construction is occurring on the culverts. Because the action may produce noise above ambient levels, mufflers and sound dampening equipment would be required during construction. Preconstruction surveys would be completed prior to the initiation of construction activities. Monitoring of wood storks during the nesting season (January through June) and adaptively managing action activities within 1,000 to 1,500 feet of active wood stork nesting colonies will ensure the action will not increase noise above ambient levels within nest protection areas of active caracara nests. Human activity should not occur within a 300-foot buffer where there is a vegetation screen (dense vegetation), and 750 feet when there is no vegetation present. A 2,500-foot buffer (Secondary Priority Management Zone) will be established as necessary around nesting colonies. The Corps determined the Recommended Plan may affect, but is not likely to adversely affect the wood stork. The Service concurs.

FISH AND WILDLIFE RESOURCES

A bald eagle nest (FWC nest number PB-14) is located on the eastern edge of Lake Okeechobee within the Federal right-of-way within Reach 1D. Bald eagle are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978). The existing nest tree was retained during recent cut-off wall construction in the 2009 and 2010 winter-spring bald eagle nesting season. Every effort should be made to retain the nest tree and maintain ground integrity near the foot of the tree. The Corps should monitor the nest site if construction or other project activities are expected to occur within 660 feet of this nest or future nest locations along the HHD during the multiple years the work will occur, during the nest season (October 1 through May 15). The National Bald Eagle Management Guidelines (weblink provided above) describe the situations under which either a 660-foot or 330-foot buffer is recommended, based on the type of activity and its visibility from the nest. In addition, the Corps could consider coordinating with relevant agencies and organizations to plant native pines to support continued bald eagle nesting near the current nest site when the current nest tree, a scraggly Australian pine, falls over since there are limited large trees nearby that could replace the current nest tree. We would willingly work with the Corps to develop a long term vegetation management site plan to ensure long-term bald eagle productivity at this site.

SUMMARY

The HHD culvert replacement and removal project purpose is to prevent a major breach in the dike by replacing or removing existing federal culverts. The Corps determined this proposed project may affect, but is not likely to adversely affect Audubon's crested caracara, eastern indigo snake, wood stork, Everglade snail kite and Everglade snail kite designated critical habitat, West Indian manatee, and Okeechobee gourd. All construction and effects will be temporary in nature, returning to preconstruction conditions after completion of construction. In some cases, such as prime wetlands and snail kite critical habitat, vegetation will be replanted to help native plants repopulate more quickly. Applicable listed species conservation measures and survey protocol will be followed throughout the design phase and all stages of construction and will also be coordinated with Service. Monitoring and adaptive management procedures will be applied throughout construction of the culverts since the culverts will not be built concurrently, allowing for unforeseen issues to be addressed if they arise.

Thank you for your cooperation in the effort to protect federally-listed species. If you have any questions on this project, please contact Marilyn Stoll at 772-469-4229.

Sincerely yours,

Rob I. Pace
for

Paul Souza
Field Supervisor
South Florida Ecological Services Office

cc: electronic copy only
Corps, Jacksonville, Florida (Stacie Auvenshine)
DEP, West Palm Beach, Florida (Jerilyn Krug)
FWC, Tallahassee, Florida (Mary Ann Poole)
Service, Jacksonville, Florida (Miles Meyer)

Enclosure

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

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

FEB 16 2011

To Whom It May Concern:

Pursuant to the National Environmental Policy Act (NEPA) and the U.S. Army Corps of Engineers (Corps) Regulation (33 CFR 230.11), this letter constitutes the Notice of Availability of the Environmental Assessment (EA) for the Herbert Hoover Dike (HHD) Culvert Replacement and Removal. The culverts proposed to be replaced or removed are within the HHD system and Federal right-of-way on Lake Okeechobee, located in south central Florida, in the counties of Okeechobee, Martin, Palm Beach, Hendry and Glades Counties.

The Herbert Hoover Dike (HHD) rehabilitation team will provide a presentation on the HHD project status and the Environmental Assessment, followed by an open comment period. The meetings will be held in Okeechobee on March 8, 2011 and in Clewiston on March 10, 2011.

Any comments you may have must be submitted in writing to the letterhead address within 30 days of the date of this letter. Questions concerning the program can be submitted to Ms. Stacie Auvenshine at the letterhead address or to HHDEnvironment@usace.army.mil. Ms. Auvenshine may also be reached by telephone at 904-232-3694.

Sincerely,

Rebecca S. Griffith, Ph.D, PMP
Chief, Planning Division

Enclosure

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

FEB 16 2011

To Whom It May Concern:

Pursuant to the National Environmental Policy Act (NEPA) and the U.S. Army Corps of Engineers (Corps) Regulation (33 CFR 230.11), this letter constitutes the Notice of Availability of the Environmental Assessment (EA) for the Herbert Hoover Dike (HHD) Culvert Replacement and Removal. The culverts proposed to be replaced or removed are within the HHD system and Federal right-of-way on Lake Okeechobee, located in south central Florida, in the counties of Okeechobee, Martin, Palm Beach, Hendry and Glades Counties.

The EA is available for your review on the Corps Environmental planning website, under Okeechobee, Martin, Palm Beach, Hendry, and Glades Counties:

http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine.htm

A printed copy of the report is also available at the following libraries:

PALM BEACH COUNTY LIBRARY
3650 SUMMIT BLVD.
WEST PALM BEACH, FL 33406

BARRON LIBRARY
461 N. MAIN STREET
LABELLE, FL 33935

OKEECHOBEE COUNTY PUBLIC LIBRARY
206 S.W. 16TH STREET
OKEECHOBEE, FL 34974

ELISABETH LAHTI LIBRARY
15200 S.W. ADAMS AVENUE
INDIANTOWN, FLORIDA 34956

CLEWISTON PUBLIC LIBRARY
120 W. OSCEOLA AVE
CLEWISTON, FL 33440

MARTIN COUNTY BLAKE LIBRARY
2351 S.E. MONTEREY RD.
STUART, FL 34996

LOULA V. YORK BRANCH LIBRARY
525 BACOM POINT ROAD
PAHOKEE, FL 33476

The Herbert Hoover Dike (HHD) rehabilitation team will provide a presentation on the HHD project status and the Environmental Assessment, followed by an open comment period. The meetings will be held in Okeechobee on March 8, 2011 and in Clewiston on March 10, 2011.

Any comments you may have must be submitted in writing to the letterhead address within 30 days of the date of this letter. Questions concerning the program can be submitted to Ms. Stacie Auvenshine at the letterhead address or to HHDEnvironment@usace.army.mil. Ms. Auvenshine may also be reached by telephone at 904-232-3694.

Sincerely,

Rebecca S. Griffith, Ph.D, PMP
Chief, Planning Division

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

FEB 16 2011

Ms. Lauren P. Milligan
Florida Department of Environmental Protection
State Clearinghouse
3900 Commonwealth Boulevard, MS 47
Tallahassee, Florida 32399-3000

Dear Ms. Milligan:

Pursuant to the National Environmental Policy Act, enclosed for State agency review and comment are 12 CDs of the Environmental Assessment (EA) for the Herbert Hoover Dike (HHD) Culvert Replacement and Removal. The culverts proposed to be replaced or removed are within the HHD system and Federal right-of-way on Lake Okeechobee, located in south central Florida, in the counties of Okeechobee, Martin, Palm Beach, Hendry and Glades Counties.

Any comments you may have on the EA must be submitted in writing to the letterhead address within 30 days from the date of this letter. Any questions concerning the EA or requests for additional copies of the report should be directed to Ms. Stacie Auvenshine at 904-232-3694, or e-mail at: Stacie.J.Auvenshine@usace.army.mil.

Sincerely,

Rebecca S. Griffith, Ph.D, PMP
Chief, Planning Division

Enclosures

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

FEB 16 2011

Dear Librarian:

Enclosed is a copy of the Environmental Assessment for the Herbert Hoover Dike (HHD) Culvert Replacement and Removal. All the culverts discussed are within the HHD system and Federal right-of-way on Lake Okeechobee, located in south central Florida, in the counties of Okeechobee, Martin, Palm Beach, Hendry and Glades Counties.

This Environmental Assessment is being provided for public review pursuant to the National Environmental Policy Act. We request that you make the copy available for public viewing in the reference section of your library for a period of 45 days, after which it may be disposed.

Thank you for your assistance in this matter. If you have any questions or need further information, please contact Ms. Stacie Auvenshine at 904-232-3694.

Sincerely,

Rebecca S Griffith

Rebecca S. Griffith, Ph.D, PMP
Chief, Planning Division

Enclosure

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning Division
Environmental Branch

FEB 24 2011

To Whom It May Concern:

The U.S. Army Corps of Engineers (Corps) has received a comment from a reviewer correctly noting a mistake in Table 2 of the recent Culvert Replacement and Removal Environmental Assessment and Proposed Finding of No Significant Impact which was posted for public review on Friday, February 4, 2011.

An errata sheet showing the change in bold is available at: http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine.htm.

The original Table 2 (Thirty-two Federal Culverts Summary) listed Culvert 10A as removal; however, it should have been listed as a replacement. In addition, Culvert 9 was listed as a replacement, but should be listed as a removal. This difference is not a change in the scope of the document, but a mistake in the table itself.

We apologize for any inconvenience or confusion this may have caused. If you have any questions or concerns please submit them to Ms. Stacie Auvenshine at the letterhead address or to HHDEnvironment@usace.army.mil by March 18, 2011. Ms. Auvenshine may also be reached by telephone at 904-232-3694.

Sincerely,

Rebecca S. Griffith

Rebecca S. Griffith, Ph.D, PMP
Chief, Planning Division

Errata for the Herbert Hoover Dike Culvert Replacement and Removal Environmental Assessment and Proposed Finding of No Significant Impact

Table 2. Thirty-two Federal Culverts Summary

FEB 24 2011

Table 1. Thirty-two Federal Culverts Summary

Construction Feature	Location	Barrels	Size (ft)	Pipe Length (ft)	Original barrel type	Solution	Estimated Cost	Estimated Duration of Construction (in months)
Culvert 11	L-D9	1	10	95	CMP	Replace	$14,000,000	10.5*
Culvert 16	L-D9	1	10	96	CMP	Replace	$14,000,000	10.5*
Culvert 10A	L-D9	5	10	76	CMP	**Replace**	$16,000,000	8.0
Culvert 13	L-D9	1	10	95	CMP	Replace	$14,000,000	11.0
Culvert 10	L-D9	2	10	111	CMP	Replace	$15,000,000	12.5
Culvert 12A	L-D2	1	7	86	Concrete	Replace	$14,000,000	10.0
Culvert 12	L-D2	3	10	91	CMP	Replace	$15,000,000	14.0
Culvert 4A	L-D2	1	10	177	CMP	Replace	$14,000,000	11.0*
Culvert 3	L-D2	2	10	105	CMP	Replace	$15,000,000	12.5*
Culvert 2	L-D2	6	10	105	CMP	Replace	$16,000,000	16.0
Culvert 1A	L-D1	3	7	172	CMP	Replace	$12,000,000	11.0*
Culvert 1	L-D1	2	10	115	CMP	Replace	$15,000,000	12.5*
Culvert 5A	L-D3	3	10	160	CMP	Replace	$12,000,000	14.0
Culvert 5	L-D3	3	10	160	CMP	Replace	$12,000,000	14.0
Culvert 8	L-D4	3	10	151	CMP	Replace	$12,000,000	14.0
Culvert FC-1	L-50	2	9	118	CMP	Replace	$6,000,000	12.0
Culvert HP-1	L-50	1	2.5	94	CMP	Replace	$5,000,000	10.0
Culvert HP-2	L-50	1	7	94	CMP	Replace	$5,000,000	10.0
Culvert HP-3	L-50	1	9	94	CMP	Replace	$5,000,000	11.0
Culvert HP-5	L-50	2	9	96	CMP	Replace	$6,000,000	12.5
Culvert HP-6	L-49	2	7	94	CMP	Replace	$6,000,000	10.0
Culvert HP-7	L-49	1	5	94	CMP	Replace	$5,000,000	9.0
Culvert IP-1	L-49	1	5	94	CMP	Replace	$5,000,000	9.0
Culvert IP-2	L-49	2	7	80	CMP	Replace	$6,000,000	10.0
Culvert IP-3	L-48	2	6	80	CMP	Replace	$6,000,000	10.0
Culvert KI-1	L-48	3	6	145	Concrete	Replace	$7,000,000	11.0
Culvert KI-2	L-48	1	6	145	Concrete	Replace	$5,000,000	9.0
Culvert 6	L-D4	1	10	151	CMP	Replace	$11,000,000	11.0
Culvert 7	L-D4	3	10	151	CMP	Remove	$4,000,000	8.0
Taylor Creek (TCC)	L-D4	8	10	71	CMP	Remove	$8,000,000	10.0
Culvert 9	L-D4	-	-	151	CMP	**Remove**	$4,000,000	11.0
Culvert 14**	L-D9	1	10	96	CMP	Remove	$4,000,000	6.0*

Notes:

1. The "Estimated Cost" column represents a rough order of magnitude (ROM) cost estimate to remove or replace culverts in FY11 dollars with 20% contingency.
2. The replacement cost is based on estimates of the full construction effort to replace culverts in the same location, extending the culvert to the adjacent embankments, all within the Federal right-of-way. These planning level detail cost estimates, developed for several culverts of various sizes on the Southern portion of HHD, were applied to the rest of culverts, considering size, location, existence of navigational channel and other considerations.
3. The removal cost is based on construction detail cost estimates, developed for one of the culverts (Culvert 14), and this cost was applied to the other four culverts to be removed.
4. *An actual construction schedule was developed as preliminary design information was available. Estimated construction duration for the other culverts was estimated by interpolating and extrapolating information from existing design information. Actual site conditions may increase or decrease construction time by approximately 15 percent.
5. ****Culvert 14 removal is covered in Partial Reach 1 and 2 Ditch Backfill and Culvert 14 Removal EA, July 2008.**

U.S. Department of Homeland Security
United States Coast Guard

Commander
Seventh Coast Guard District

909 SE First Avenue
Miami, FL 33131-3028
Staff Symbol: (DPB)
Phone: (305) 415-6989
Fax: (305) 415-6763
Email: Evelyn.Smart@uscg.dhs.gov

16211/FL-NO JURIS
Serial: 1993
February 28, 2011

Ms. Rebecca S. Griffith, Ph.D, PMP
Chief, Planning Division
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

Dear Ms. Griffith:

We have reviewed your Notice of Availability of the Environmental Assessment for the Herbert Hoover Dike (HHD) Culvert Replacement and Removal within the HHD system and Federal right-of-way on Lake Okeechobee located in central Florida, in Okeechobee, Martin, Palm Beach, Hendry and Glades Counties.

The HHD system and federal right-of-way on Lake Okeechobee are not considered navigable waters of the United States for purposes of Coast Guard bridge permitting jurisdiction. Therefore, Coast Guard bridge permits will not be required for the proposed HHD culvert replacement and removal. We have made this determination because of our understanding that the HHD system at the proposed culvert sites:

1. Are not subject to tidal influence,

2. Are not used, either by itself or in connection with other waterways, for substantial interstate or foreign commerce; and

3. Are not susceptible to such use, either in their natural condition or by reasonable improvement.

If you have any questions regarding this jurisdictional determination feel free to call me at (305) 415-6989.

Sincerely,

Evelyn Smart

(Miss) EVELYN SMART
Environmental Protection Specialist
U.S. Coast Guard
By direction

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

MAR 0 1 2011

Planning Division
Environmental Branch

Mr. Scott Stroh, Director
Division of Historical Resources
State Historic Preservation Officer
500 South Bronough Street
Tallahassee, Florida 32399-0250

Dear Mr. Stroh:

As part of the Herbert Hoover Dike Major Rehabilitation, the U.S. Army Corps of Engineers, Jacksonville District is proposing to replace 28 federal culverts and remove five federal culverts in Okeechobee, Martin, Palm Beach, Hendry and Glades Counties as part of a risk reduction strategy for the Herbert Hoover Dike (HHD) system (Figure 1). The culverts to be replaced or removed are all located within the federal right-of-way. These culverts pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts. Action is required over the next 60 months as an immediate risk reduction measure, in conformance with dam safety requirements, to reduce the risk of catastrophic failure. These major maintenance actions are required to reduce this unacceptable risk due to the high probability of failure with associated loss of life.

The following 28 culverts will be replaced with new culverts: culvert 1, 1A, 2, 3, 4A, 5, 5A, 6, 8, 10, 10A, 11, 12, 12A, 13, 16, HP-1, HP-2, HP-3, HP-5, HP-6, HP-7, FC-1, IP-1, IP-2, IP-3, KI-1, and KI-2. Culverts 7, 9, 14, HP-4, and TCC (Taylor Creek Culvert) are proposed to be removed completely (Table 1).

Constructed from 1933 to 1936, the culverts in Herbert Hoover Dike (1,1A, 2, 3, 4A, 5, 5A, 6, 7, 8, 9, 10, 10A, 11, 12, 12A, 13, 14, 16, and Taylor Creek Culvert) have been recorded in an architectural survey titled "*Herbert Hoover Dike Documentation and Assessment, Lake Okeechobee, Hendry, Glades, Okeechobee, Martin, and Palm Beach Counties, Florida*" by New South Associates, Inc. This report recommended these culverts as contributing elements to the National Register of Historic Places (NRHP) eligibility of Herbert Hoover Dike for agricultural development; however, the culverts are not independently eligible. Additionally, New South Associates, Inc. deemed that recording the culverts adequately mitigated their loss and that their removal will have no adverse effect on the NRHP eligibility of Herbert Hoover Dike.

The Corps has determined no adverse effect on the NRHP eligibility of Herbert Hoover Dike for the removal and replacement of these culverts and that the aforementioned report has sufficiently recorded these culverts to mitigate their loss.

The tributary culverts (HP-1, HP-2, HP-3, HP-4, HP-5, HP-6, HP-7, FC-1, IP-1, IP-2, IP-3, KI-1, and KI-2), were constructed from 1962 to 1966 and are located outside the Herbert Hoover Dike on Canal 40, Canal 41, and the Kissimmee River. They are not associated with agricultural development but were constructed for drainage purposes only. The Corps does not wish to make a determination at this time on the significance of the tributary culverts and has determined that the removal and replacement of the tributary culverts will have no effect on the eligibility of the Herbert Hoover Dike.

I request your comments on these determinations. If there are any questions, please contact Ms. Wendy Weaver at 904-232-2137 or e-mail at wendy.weaver@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Weaver/CESAJ-PD-EP
Acosta/CESAJ-PD-EP
Summa/CESAJ-PD-E

Figure 1. Herbert Hoover Dike Culverts Project Area.

Culvert	Year Built	Barrel type	Solution	NRHPStatus
Culvert C-11	1934	CMP	Replace	Contributing
Culvert C-16	1935	CMP	Replace	Contributing
Culvert C-14	1935	CMP	Remove	Contributing
Culvert 10A	1934	CMP	Replace	Contributing
Culvert 13	1935	CMP	Replace	Contributing
Culvert 10	1934	CMP	Replace	Contributing
Culvert 12A	1933	Concrete	Replace	Contributing
Culvert C-12	1934	CMP	Replace	Contributing
Culvert C-4A	1933	CMP	Replace	Contributing
Culvert C-3	1933	CMP	Replace	Contributing
Culvert 2	1934	CMP	Replace	Contributing
Culvert C-1A	1933	CMP	Replace	Contributing
Culvert C-1	1934	CMP	Replace	Contributing
Culvert 5A	1933	CMP	Replace	Contributing
Culvert 5	1933	CMP	Replace	Contributing
Culvert C-6	1936	CMP	Replace	Contributing
Culvert 7	1936	CMP	Remove	Abandoned
Taylor Creek (TCC)	1936	CMP	Remove	Abandoned
Culvert 8	1936	CMP	Replace	Contributing
Culvert 9	1936	CMP	Remove	Abandoned
Tributary Culverts				
Culvert HP-4	1963	CMP	Remove	No determination
Culvert HP-5	1963	CMP	Replace	No determination
Culvert HP-6	1963	CMP	Replace	No determination
Culvert HP-7	1964	CMP	Replace	No determination
Culvert IP-1	1962	CMP	Replace	No determination
Culvert IP-2	1962	CMP	Replace	No determination
Culvert IP-3	1962	CMP	Replace	No determination
Culvert KI-1	1966	CMP	Replace	No determination
Culvert KI-2	1966	CMP	Replace	No determination

*CMP-Corrugated Metal Pipe

Table 1. Culverts to be removed and/or replaced.

5 MARCH 2011

DEAR SIR

MY PUBLIC WRITTEN COMMENTS ON HERBERT HOOVER DIKE PROJECT. COVERING THE REACH AREA 1A AND 1B PROJECT LOCATIONS. I SUPPORT THE CUTOFF WALL FEATURE. I LIKE THE IDEA OF LITTLE OR NO MAINTENANCE. I ALSO AGREE WITH THE SEEPAGE BERMS TO CONTROL INTERNAL EROSION. I ALSO AGREE WITH THE DRAINAGE SWALE AS NOTED BY MY YELLOW HIGH LIGHTER. I AGAIN AGREE, WE DO NOT NEED RELIEF WELLS, AS OTHER FEATURES, WILL DO THE JOB.

WE MUST STOP BACK PUMPING INTO LAKE OKEECHOBEE, WE ALSO MUST REMODE ALL COLVERTS FROM THE DIKE THAT ALLOW BACK PUMPING INTO LAKE OKEECHOBEE. OUR LOCKS NOW ACTIVE ON LAKE OKEECHOBEE, CAN HANDLE STORM SURGES WITH OUT AGRICULTURE CULVERTS ON DIKE SYSTEM.

OUR WATER PROBLEMS COME FROM AGRICULTURE POLLUTED WATER RUN-OFF TO LAKE OKEECHOBEE. NO ONE HAS EVER ENFORCED RULE 40E-61 OR ENFORCED TMDL TO LAKE OKEECHOBEE. NO ONE HAS ENFORCED THE CLEAN WATER ACT HERE IN OUR STATE.

Robert M Norton
ECOSYSTEM WATCH.

March 8 meeting planned on Herbert Hoover Dike project

The U.S. Army Corps of Engineers, Jacksonville District will host two public meetings to present and discuss an environmental assessment covering the removal or replacement of federal culverts as part of the Herbert Hoover Dike Major Rehabilitation Project.

These culverts are water control structures that provide irrigation and drainage to adjacent lands.

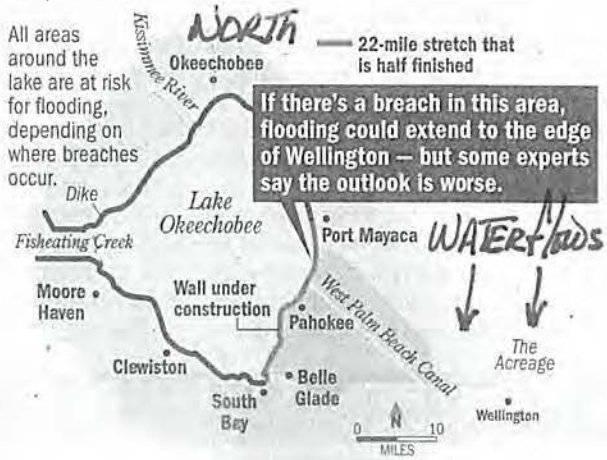
Replacement or removal of dike culverts in Glades, Hendry, Martin, Okeechobee and Palm Beach counties, will reduce risks to South Florida communities.

The local meeting will be at 7 p.m. March 8 in the Okeechobee County Health Department auditorium, 1728 Northwest Ninth Ave., Okeechobee. A second meeting will be in Clewiston.

TThe assessment also available at www.saj.usace.arm.mil, under Popular Pages at right, click Herbert Hoover Dike. The corps will accept written comments through March 18.

The HHD encircles Lake Okeechobee for the purpose of flood risk management and other water management benefits.

What happens if the dike fails?



High levels are dangerous

At 21 feet, the dike will fail, officials say. Anything above 18 feet is dangerous. The lake was at 18.5 feet in 1995 and 1998.

So why not keep it low?

It supplies all of South Florida with water (to drink, for lawns, etc.). If a hurricane approaches fast, lowering the lake is slow - about 0.4 inches a day

Why is it leaking?

Water pressure erodes the limestone, gravel and soil that make up the dike.

Cash-strapped corps to seek cheaper dike repair

Officials vow to meet safety concerns and protect the area from massive flooding.

By JOEL ENGELHARDT
Palm Beach Post Staff Writer

After Hurricane Katrina flooded New Orleans, engineers fearing a similar fate here declared the aging, leaking dike around Lake Okeechobee a "grave and imminent danger to the people and the environment of South Florida."

In a 2006 report that spurred a $1 billion repair job, they argued that the Herbert Hoover Dike "needs to be fixed now, and it needs to be fixed right."

As a result, the U.S. Army Corps of Engineers embarked on the gold standard of dike repair to erect a 2-foot-thick, 70-foot-deep wall in the center of the 80-year-old earthen berm.

After spending $200 million on a half-completed 22-mile section, corps officials plan to announce next week that they're not going to continue the Cadillac plan. Instead, they'll re-engineer, looking for less-costly alternatives that meet safety goals. The reason is the high cost of the wall construction — $10 million a mile — and competition for scarce federal

See DIKE, 6A ▶

BRANDON KRUSE/2009 Post File Photo

Dike among six in U.S. 'most likely to fail'

After saying it would 'spare no expense' following a 2006 report, the Army Corps of Engineers now wants to halt work on a 22-mile section that's half-finished and re-engineer repair work to save money.

How the Hoover Dike affects you

Retains drinking water: For the 6 million residents in South Florida.

Economy: Irrigation for the $1.5 billion farm industry.

Safety: Protects residents from flooding during storms. Thousands died in the 1928 hurricane before the dike was built.

What is being done to fix it?

A 70-foot wall – half-finished in the 22 miles between Port Mayaca and Belle Glade – would prevent the seepage, but it's pricey at about $10 million a mile. The cost of cutting through bedrock is especially high. The dike is 143 miles long.

NOTE ALL YELLOW HIGHLITED AREAS ARE APPROVED PUBLIC INPUT

- Redundancy: the use of multiple lines of defense against potential failure modes. For example, the cutoff wall feature of the Recommended Plan would provide standby redundancy as a piping barrier in case the landside rehabilitation features fail.

- Reliability: the probability that features of the Recommended Plan would adequately perform their intended purpose. Reliable features are those based on established design principles, require little or no maintenance, consist of multiple mechanisms for performing their functions, and provide a continuous solution.

- Resilience: the capacity of design features to withstand occasional overloads and recover to their original state and function. "Overloads" would be any lake elevation above 25 feet (NAVD88) or a combination of high water stages, wind, and wave forces that exceed design load combinations.

The national Dam Safety Risk Analysis program has recently added risk assessment requirements to the HHD project, post design authorization. The purpose of the program is to:

- Determine the existing risk that dam projects pose to communities and infrastructure
- Determine risk reductions that would occur through implementation of potential remedial measures, and
- Determine the remaining risk after remedial features are constructed.

This risk analysis is accomplished with risk assessment toolboxes and other programs. At the time of this document preparation, the Jacksonville District was in the process of completing the new risk analyses for Reaches 2 and 3. Once completed for Reaches 2 and 3, the district will implement the program for Reach 1.

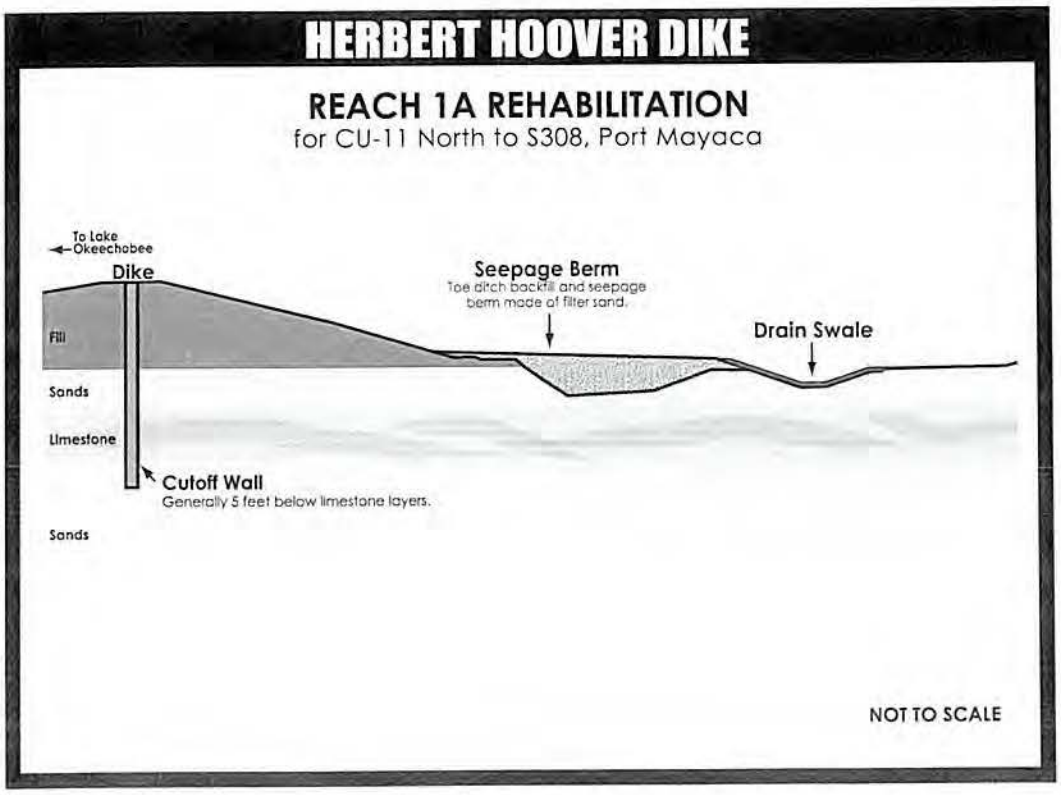
2.2.5 Analysis and Dismissal of Full Seepage Berm Design Alternative

The Jacksonville District evaluated modified rehabilitation features of the 2005 FEIS Recommended Plan not only for their ability to meet the above planning objectives and engineering criteria, but also for their ability to avoid significant impacts to the natural and human environment where possible. Modeling conducted by the district determined that a rehabilitation design consisting of a partially penetrating cutoff wall and a full seepage berm extending outside of the existing federal right of way would meet necessary safety and engineering criteria and would address the ITR recommendations.

avoiding significant impacts to adjacent real estate and transportation infrastructure.

- State Road 76 would not be altered, but the conveyance capacity of the roadside ditches would be improved through grading, re-routing, lining, and/or piping.
- Culvert 11 would be removed and Culvert 16 would be replaced using modern construction practices to meet dam safety criteria. Removing and replacing culverts 11 and 16, respectively, would prevent piping and seepage failure modes associated with aging culverts while providing flood protection and irrigation for adjacent lands.

The landside features of the Recommended Plan are shown in figures 2-3 and 2-4 and described below. The proposed actions and selection process for removing and replacing culverts 11 and 16 are included in the explanation.



Source: USACE.

Figure 2-3. Recommended Plan North of Culvert 11

features, the wall would have to extend down to the geologic confining unit, approximately 200 feet below the surface. Instead, a partially penetrating cutoff wall would be used in conjunction with other rehabilitation features such as the seepage berm to meet desired factors of safety. The wall would extend anywhere from -20 to -30 feet (NAVD88) in Reach 1A (five to 10 feet below the limestone layer), depending on specific geologic conditions. The wall would effectively "cut off" existing defects in the embankment and underlying limestone and provide redundancy by creating a barrier to the progression of new pipes.

Seepage berm: Seepage berms are a form of seepage control widely accepted by the geotechnical community and endorsed by industry experts familiar with the seepage and stability problems encountered in the project area. A seepage berm would control internal erosion caused by through-seepage and underseepage and add necessary slope stability to withstand forces from high lake stages associated with large storm events.

The seepage berm would be approximately four feet thick and would be constructed primarily of sand and silty sands. In Reach 1A, the typical seepage berm, drainage swale, and maintenance corridor combination would extend beyond the federal right of way to varying distances, with a minimum distance of approximately 30 feet and a maximum distance of about 75 feet. The required right of way would extend to a maximum distance of 280 feet beyond the existing federal right of way at culverts 11 and 16 for drainage improvements, maintenance access, and culvert construction activities. Lands outside of the existing federal right of way would be acquired for the rehabilitation features as well as for construction easements. The map book in Appendix A depicts the required right of way. Please refer to Section 2.2.4 above for an explanation of how the Jacksonville District selected the seepage berm design for Reach 1A.

Construction of the seepage berm would involve clearing the land surface and filling in the existing toe ditch within the area proposed to receive the seepage berm. Backfilling the toe ditch in Reach 1 has already been evaluated for compliance with NEPA in two previous EAs (USACE, 2007c and USACE, 2007e). Approximately 6,000 feet of toe ditch were backfilled north of Culvert 10A as an interim risk reduction measure (USACE, 2007c). A portion of the toe ditch (11,000 feet) in the northern half of Reach 1A was also backfilled as part of the construction of a partial seepage berm (USACE, 2007e). Work was halted to further analyze safety requirements and rehabilitation designs of the Recommended Plan. Figure 1-2 shows the previously backfilled portions of the toe ditch. Approximately 9,770 feet of the Reach 1A toe ditch would be filled as part of the Recommended Plan.

Herbert Hoover Dike Culvert Removal and Replacement Public Meetings March 8 and March 10, 2011 - Public Comments

Two public meetings were set up to discuss the culvert removal and replacement project for the Herbert Hoover Dike Major Rehabilitation efforts. Summarized below are comments related to the culvert EA, replacement or removal of Federal culverts, discussed during the two public meetings:

March 8, 2011 – Okeechobee

- Obtaining real estate for project
- Very supportive of the project because the lake levels can be higher, and held higher, with the replacement of culverts
- Wanted to know what the Corps is doing with the seepage berm
- Wanted to know the original purpose of the culverts
- Timeframe for the landside seepage berm

March 10, 2011 – Clewiston

- Wanted to see data/study on how culvert replacement will actually help public safety. Was there a cost analysis? Wanted to know why it's not going to make water quality better. What has been the usage of each culvert up until now and where's the data that shows that we need to put 28 culverts back in place in-kind (why not make bigger or take out)
- Culvert 2 should be coordinated with S169 with SFWMD; he wanted flows and calculations as needed for culverts; was upset because the top of the dike was paid for by taxpayers and now it will not be repaved, he said he can't believe with all our brains that we can't figure out how to repave it
- Is concerned over the lake not being used as it was intended; inaccurate species list (thought brown bear, panther and snails should be added, also bald eagle); concerned over the subsidence of soils in the area due to the rehabilitation of the dike
- Will this impact the rim canal, Okeechobee waterway or boating?
- When will the Corps say we're building a dam rather than calling it a levee?

CLOSTER FARMS, INC.
One North Clematis Street, Suite 200
West Palm Beach, Florida 33401

William F. Tarr
Telephone: 561-366-5157
Telecopier: 561-651-1280

Reply by mail to:
Post Office Box 3435
West Palm Beach, Florida 33402

March 14, 2011

VIA E-MAIL AND U.S. MAIL

Ms. Stacie Auvenshine
U.S. Army Corps of Engineers
Jacksonville District
Planning Division, Environmental Branch
701 San Marco Boulevard
Jacksonville, Florida 32207

Re: Herbert Hoover Dike Major Rehabilitation
EA for Removal and Replacement of Federal Culverts
Culvert 12-A

Dear Ms. Auvenshine:

We write to comment on the Herbert Hoover Dike Environmental Assessment for Removal and Replacement of Federal Culverts. Pursuant to provisions of a long-term lease with the State of Florida, Closter farms the lands adjacent to Culvert 12A of the Herbert Hoover Dike ("HHD") in accordance with existing state and water management district permits. Closter and other entities connected hydrologically to Culvert 12A, farm over 3,000 acres in the basin.

Closter supports the replacement of Culvert 12A by the USACOE. With kind regards, I am,

Yours sincerely,

William F. Tarr
Vice President

/jcd
Copy to Ingrid Bon

FLORIDA DEPARTMENT OF STATE
Kurt S. Browning
Secretary of State
DIVISION OF HISTORICAL RESOURCES

Mr. Eric Summa
Planning Division
Jacksonville Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

March 17, 2011

Re: DHR Project File No.: 2011-00816/ Received: March 6, 2011
Herbert Hoover Dike Culverts Project
Okeechobee, Martin, Palm Beach, Glades, Hendry Counties

Dear Mr. Summa:

Our office received and reviewed the project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended and 36 CFR Part 800. The State Historic Preservation Officer is to advise and assist federal agencies when identifying historic properties (archaeological, architectural, and historical resources) listed, or eligible for listing, in the National Register of Historic Places, assessing the project's effects, and considering alternatives to avoid or minimize adverse effects.

Because of the nature of the project, this office concurs that no historic properties eligible for listing in the National Register will be affected.

If you have any questions concerning our comments, please contact Michael Hart, Historic Sites Specialist, by phone at 850.245.6333, or by electronic mail at mrhart@dos.state.fl.us. Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

Laura A. Kammerer

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

Florida Department of
Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard, Jr.
Secretary

April 8, 2011

Ms. Stacie J. Auvenshine
Jacksonville District, Planning Division
U.S. Army Corps of Engineers
P.O. Box 4970
Jacksonville, FL 32232-0019

RE: Department of the Army, Jacksonville District Corps of Engineers (USACE) – Environmental Assessment for the Herbert Hoover Dike Major Rehabilitation, Culvert Replacement and Removal – Okeechobee, Martin, Palm Beach, Hendry and Glades Counties, Florida.
SAI # FL201102145651C

Dear Ms. Auvenshine:

The Florida State Clearinghouse has coordinated a review of the subject Environmental Assessment (EA) under the following authorities: Presidential Executive Order 12372; Section 403.061(42), *Florida Statutes*; the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act, 42 U.S.C. §§ 4321-4347, as amended.

The Florida Department of Environmental Protection (DEP) notes that, although the EA indicates the USACE's commitment to ensuring continued drainage and irrigation capabilities for those permitted to use the subject culverts, it does not provide details clearly demonstrating how this will be accomplished. Ongoing coordination with the permitted users is critical, especially during construction, to minimize economic hardship and impacts on their operations. Minor short-term impacts to vegetation, noise level, air quality and recreational resources are also expected during construction.

Of particular concern are portions of the Lake Okeechobee Scenic Trail (LOST) that may be temporarily closed or removed. The USACE has not committed to repaving impacted portions of the LOST that are currently paved. As DEP has commented previously, staff requests that closures of the trail be limited to those required for safety reasons and that the time period of trail closures be reduced to the extent feasible while ensuring safety. Signs should be placed at the nearest trail entry points, from both directions of the closure, stating the trail is closed X number of miles (or feet) ahead. Signage should also identify

Florida State Clearinghouse

whether the access point is the only one to or from the trail between there and the closure. All potential impacts to the LOST should be coordinated directly with the DEP's Office of Greenways and Trails, as those impacts would not be addressed during the permitting process. For additional specific comments and regulatory requirements, please refer to the enclosed DEP memorandum.

The South Florida Water Management District (SFWMD) has provided a number of comments on flood protection, water use and potential ecological effects for the USACE's consideration. Staff requests further information on the project's effects on adjacent landowners' historic water supply and drainage capacity rights. Potential effects on future Central and Southern Florida Flood Control system changes and the health of Lake Okeechobee's ecological systems should be considered as well. Please refer to the enclosed SFWMD letter for further detailed comments and specific culvert design recommendations.

The Florida Department of Transportation's (FDOT) District Four (covering Martin and Palm Beach Counties) and District One (covering Glades, Hendry and Okeechobee Counties) offer the following comments:

- Numerous state roads occur within the proposed project vicinity. The USACE will be responsible for coordinating with the appropriate FDOT District personnel to obtain the necessary FDOT permits prior to conducting any project activities within or connecting to FDOT rights-of-way. Environmental permit applications associated with proposed activities on state rights-of-way will also require close coordination with FDOT staff.

- If any impacts will occur to environmental resources (e.g., wetlands, threatened and endangered species, etc.) located within the FDOT rights-of-way, please coordinate with the appropriate FDOT District Planning and Environmental Management Office.

- If any FDOT rights-of-way or property will be used for the installation of facilities or the storage/staging of equipment, materials or vehicles, please notify the FDOT District Planning and Environmental Management Office with appropriate project-specific plans/details so the information can be distributed to the appropriate divisions for review.

- Should the need for lane closures or traffic channeling on the state roadway system arise, Maintenance of Traffic Plans may be necessary and coordination with the FDOT Traffic Operations Office will be required.

Florida State Clearinghouse

- If any hazardous materials will need to be transported on FDOT roads, a hazardous spills response plan will need to be prepared and coordinated with the FDOT District Maintenance-Permits Office.

- It is imperative that any facilities owned, managed or maintained by the state that are damaged by construction activity on the Herbert Hoover Dike (HHD) or federal culverts associated with the HHD be restored to the condition that existed prior to construction.

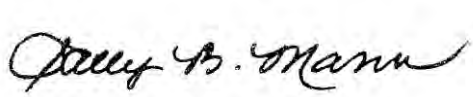
For further information, please contact Ms. Ann Broadwell, Environmental Administrator for FDOT District Four, at (954) 777-4325 or ann.broadwell@dot.state.fl.us.

Since the replacement and removal of the HHD culverts is needed to reduce risks to public safety and health, no adverse impacts to protected species are anticipated and wetland impacts will be mitigated, the Southwest Florida Regional Planning Council (SWFRPC) finds the proposal to be regionally significant and consistent with the Strategic Regional Policy Plan and State Comprehensive Plan. Please refer to the enclosed SWFRPC letter for further details.

Based on the information contained in the EA and the enclosed agency comments, the state has determined that, at this stage, the proposed activities are consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the concerns identified by our reviewing agencies must be addressed prior to project implementation. The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and the adequate resolution of issues identified during this and subsequent reviews. The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process in accordance with Section 373.428, *Florida Statutes*.

Thank you for the opportunity to review the proposed project. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,



Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm

Florida State Clearinghouse

Enclosures

cc: John Outland, DEP, OEP
Ernie Marks, DEP, RPPS
Dianne Hughes, DEP, Southeast District
Jim Wood, DEP, OGT
Jim Golden, SFWMD
Martin Markovich, FDOT
Nichole Gwinnett, SWFRPC

Florida State Clearinghouse

Project Information	
Project:	FL201102145651C
Comments Due:	03/18/2011
Letter Due:	04/15/2011
Description:	DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT CORPS OF ENGINEERS - ENVIRONMENTAL ASSESSMENT FOR THE HERBERT HOOVER DIKE MAJOR REHABILITATION, CULVERT REPLACEMENT AND REMOVAL - OKEECHOBEE, MARTIN, PALM BEACH, HENDRY AND GLADES COUNTIES, FLORIDA.
Keywords:	ACOE - HERBERT HOOVER DIKE REHAB, CULVERT REPLACEMENT & REMOVAL
CFDA #:	12.106

Agency Comments:

SW FLORIDA RPC - SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Since the replacement and removal of the HHD culverts is needed to reduce risks to public safety and health, no adverse impacts to protected species are anticipated and wetland impacts will be mitigated, the SWFRPC finds the proposal to be regionally significant and consistent with the Strategic Regional Policy Plan and State Comprehensive Plan.

TREASURE COAST RPC - TREASURE COAST REGIONAL PLANNING COUNCIL

The project is not inconsistent or in conflict with the Strategic Regional Policy Plan. It furthers Regional Goal 5.2 - reduced vulnerability to disasters.

FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

NO COMMENT BY JENNIFER GOFF ON 4/8/11.

STATE - FLORIDA DEPARTMENT OF STATE

No Comment/Consistent

TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION

The USACE will be responsible for coordinating with FDOT Districts 1 and 4 to obtain the necessary permits prior to conducting any project activities within or connecting to FDOT rights-of-way. Environmental permit applications associated with proposed activities within FDOT rights-of-way will also require further coordination with the Districts. If any impacts will occur to environmental resources (e.g., wetlands, threatened and endangered species, etc.) located within the FDOT rights-of-way, please coordinate with the appropriate FDOT District Planning and Environmental Management Office. If any FDOT rights-of-way or property will be used for the installation of facilities or the storage/staging of equipment, materials or vehicles, please notify the FDOT's Environmental offices with the appropriate project specific plans/details so the information can be distributed to the appropriate divisions. Should the need for lane closures or traffic channeling on the state road arise, maintenance of traffic plans may be necessary and coordination with the Traffic Operations Office will be required. If any hazardous materials will need to be transported on state roads, a hazardous spills response plan may need to be prepared and coordinated with the FDOT Maintenance-Permits Office. It is imperative that any facilities owned, managed or maintained by the state that are damaged by construction activity on the HHD or federal culverts associated with the HHD be restored to the condition that existed prior to construction.

ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

The DEP notes that, although the EA indicates the USACE's commitment to ensuring continued drainage and irrigation capabilities for those permitted to use the subject culverts, it does not provide details clearly demonstrating how this will be accomplished. Ongoing coordination with the permitted users is critical, especially during construction, to minimize economic hardship and impacts on their operations. Minor short-term impacts to vegetation, noise level, air quality and recreational resources are also expected during construction. Of particular concern are portions of the Lake Okeechobee Scenic Trail (LOST) that may be temporarily closed or removed. The USACE has not committed to repaving impacted portions of the LOST that are currently paved. As DEP has commented previously, staff requests that closures of the trail be limited to those required for safety reasons and that the time period of trail closures be reduced to the extent feasible while ensuring safety.

Signs should be placed at the nearest trail entry points, from both directions of the closure, stating the trail is closed X number of miles (or feet) ahead. Signage should also identify whether the access point is the only one to or from the trail between there and the closure. All potential impacts to the LOST should be coordinated directly with the DEP's Office of Greenways and Trails, as those impacts would not be addressed during the permitting process. For additional specific comments and regulatory requirements, please refer to the enclosed DEP memorandum.
SOUTH FLORIDA WMD - SOUTH FLORIDA WATER MANAGEMENT DISTRICT
The SFWMD has provided a number of comments on flood protection, water use and potential ecological effects for the USACE's consideration. Staff requests further information on the project's effects on adjacent landowners' historic water supply and drainage capacity rights. Potential effects on future C&SF flood control system changes and the health of Lake Okeechobee's ecological systems should be considered as well. Please refer to the enclosed SFWMD letter for further detailed comments and specific culvert design recommendations.

For more information or to submit comments, please contact the Clearinghouse Office at:

3900 COMMONWEALTH BOULEVARD, M.S. 47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
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Memorandum

TO: Florida State Clearinghouse

THROUGH: Ernie Marks, Environmental Administrator
Restoration Planning and Permitting Section

FROM: John Outland, Stan Ganthier and Tracy Robb

DATE: April 5, 2011

SUBJECT: USACE – Environmental Assessment for the Herbert Hoover Dike Major Rehabilitation, Culvert Replacement and Removal – Okeechobee, Martin, Palm Beach, Hendry and Glades Counties, Florida.

SAI #: FL11-5651C

Background:
In February 2011, the U.S. Army Corps of Engineers, Jacksonville District (Corps) published an Environmental Assessment (EA) for the Herbert Hoover Dike (HHD) Culvert Replacement and Renewal Project (Project). The Corps is responsible for the operation and maintenance of 32 culverts within the federal right-of-way in the HHD system. Twenty-eight of the culverts are in critical need of replacement, and the remaining four require removal. Of the culverts recommended for removal, three have previously been abandoned and buried, while the fourth was determined to no longer be required. In their present condition, the identified culverts pose a significant risk of failure due to the loss of embankment material into and along the culverts. The proposed maintenance actions are required to reduce the probability of failure and associated potential loss of life.

The HHD, the majority of the subject culverts and the major outlets of Lake Okeechobee are operated and maintained by the Corps. The South Florida Water Management District (SFWMD) operates and maintains other inlet structures, pump stations and locks around Lake Okeechobee that also penetrate the HHD embankment.

Comments:
The preferred alternative, No. 4, consists of replacing 28 culverts that are necessary for operations and removing four culverts that are either already abandoned or not needed. The 28 culverts to be replaced provide flood control and irrigation capabilities to SFWMD permitted users, including 298 Districts. The EA states that the Corps is

committed to ensuring continued drainage and irrigation capabilities for those permitted to use the culverts. However, the EA does not provide details clearly demonstrating how this will be accomplished. Ongoing coordination with the SFWMD permitted users is critical, especially during construction, to minimize economic hardship and impacts on their operations.

All proposed work is within the existing federal right-of-way. The total estimated area of wetlands that will be impacted by this project is four acres. The Corps will restore native wetland vegetation to preconstruction conditions either by planting emergent vegetation or through natural recruitment. The Department will evaluate temporary and/or permanent wetland impacts for each culvert during the permitting process.

The Corps has concluded that the project is not likely to adversely affect any threatened or endangered species. Critical habitat for the endangered Everglades snail kite includes the southwest and western shore of Lake Okeechobee from Clewiston to the Kissimmee River (excluding deep open water). To minimize impacts to snail kite critical habitat, the Corps will use driven pile cofferdams, instead of earthen cofferdams, for the replacement of Culverts C-1, C-1A, C-2, C-5 and C-5A. The EA presents the Corps' evaluation for the Audubon's crested caracara, eastern indigo snake, Everglades snail kite, Okeechobee gourd, West Indian manatee and wood stork. Impacts to listed species will be evaluated during the permitting process.

Minor short-term impacts to vegetation, noise level, air quality and recreational resources are expected during construction. In particular, portions of the Lake Okeechobee Scenic Trail (LOST) may be temporarily closed or removed. The Corps has not committed to repaving impacted portions of the LOST that are currently paved. As previously commented, please limit closures of the trail to only those required for safety reasons and shorten the time period of trail closures as much as feasible while ensuring safety. Signs should be placed at the nearest trail entry points, from both directions of the closure, stating the trail is closed X number of miles (or feet) ahead. Signage should also identify whether the access point is the only one to or from the trail between there and the closure. All potential impacts to the LOST should be coordinated directly with the Department's Office of Greenways and Trails, as those are not addressed during the permitting process. Please contact Mr. Rick Halvorsen at (850) 245-2052 to discuss this aspect of the project.

Specific Comments:

- Please clarify whether the acreage for wetland impacts includes the temporary earthen coffer dams shown on Figure 11 and how the number of earthen dam versus sheetpile dewatering sites was determined. Impacts for the earthen dam sites appear to be greater.

- Figure 2 shows all of the subject culverts, but does not differentiate the ones that will be removed. Please consider revising this figure for clarity.

- Section 5.4 (6) mentions the use of "baled hay or straw" for erosion control. Note that these materials are no longer an acceptable Best Management Practice, and have been removed from the Florida Stormwater Erosion and Sedimentation Control Inspector's Manual, as there are newer products available that are more effective than straw or hay bale barriers. Please refer to the Inspector's Manual for additional products that offer better protection: http://www.dep.state.fl.us/water/nonpoint/docs/erosion/erosion-inspectors-manual.pdf

- Appendix C mentions that the disposal of material removed at the culvert locations may be reused or spread over the levee. Has the sediment been tested at each of the sites or will this occur just prior to construction? This may impact the appropriate disposal for this material.

Regulatory Authorization:

The activities described in the EA will require regulatory authorizations from the Department. We strongly recommend that the Corps contact the Southeast District Office to schedule a pre-application meeting to ensure that permit requirements and milestones are reflected appropriately in the project management schedule. The Department has recently been asked to expedite permit reviews, as it appears that adequate time for permit processing was not provided in the Corps scheduling process.

The Department previously issued permits for activities described in the EA, including removal of Culvert 14, authorized by DEP Permit No. 0234604-008-ES on February 19, 2009. On February 2, 2011, the Corps submitted an environmental resource permit application for the replacement of Culverts C-4A, C-11 and C-16, which is currently being processed by DEP's Southeast District Office as DEP File No. 0234604-011. On February 21, 2011, the Corps submitted an environmental resource permit application

for the replacement of Culverts C-1, C-1A and C-3, currently being processed as DEP File No. 0234604-012.

Dewatering permits or authorizations will be needed to dewater the construction zone between the lake side and land side cofferdams. The Corps or its construction contractor will need to submit an Environmental Protection Plan (EPP) that includes stormwater pollution prevention measures such as silt screens and turbidity curtains.

The EA notes that the replacement of Culverts 5, 5A and 10A are likely to require coordination with the Department. Coordination should be undertaken far enough in advance so as to avoid project constraints or delays. Please note that operation of these structures is currently regulated under the existing Lake Okeechobee Water Control Structure Operations Permit (LOPA Permit No. 0174552-007) issued to the SFWMD. The replacement of these structures should be discussed with both the SFWMD and the Department's Restoration Planning and Permitting Section in Tallahassee.

The Department sincerely appreciates the opportunity to comment. We encourage the Corps to continue to communicate and work cooperatively with the Department to facilitate the Dike's rehabilitation while also protecting the environment. Should you have any questions on the comments provided, please feel free to contact Mr. Michael Willson at (850) 245-7534.

Electronic copies to:
John Outland
Rick Halvorsen
Dianne Hughes
Tracy Robb
Stan Ganthier
Stacey Feken
Michael Willson

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

April 1, 2011

Lauren P. Milligan, Environmental Manager
Florida State Clearinghouse
Florida Department of Environmental Projection
3900 Commonwealth Boulevard, MS 47
Tallahassee, FL 32399

Dear Ms. Milligan:

Subject: Department of the Army, Jacksonville District Corps of Engineers Environmental Assessment and Proposed Finding of No Significant Impact for Herbert Hoover Dike Major Rehabilitation, Culvert Replacement and Removal in Hendry, Martin, Okeechobee and Palm Beach Counties, Florida

In response to your request, the South Florida Water Management District (SFWMD) has reviewed the Environmental Assessment and Proposed Finding of No Significant Impact for the Herbert Hoover Dike Major Rehabilitation Culvert Replacement and Removal in Martin, Okeechobee, Hendry, Glades, and Palm Beach Counties, Florida. The SFWMD supports the U.S. Army Corps of Engineers (USACE) efforts toward rehabilitation of the Herbert Hoover Dike.

The Environmental Assessment has been reviewed by the SFWMD to assist the USACE in improving the completeness, accuracy and clarity of the document.

The specific comments provided by the SFWMD staff reviewers are attached.

If we can be of further assistance, please contact Larry Carter, Assistant Deputy Executive Director, Everglades Restoration and Capital Projects at (561) 682-6170 or via email lcarter@sfwmd.gov.

Sincerely,

Kenneth G. Ammon, P.E.
Deputy Executive Director
Everglades Restoration and Capital Projects

KGA/mcm
Attachment

c: Larry Carter, SFWMD

SFWMD Comments

Environmental Assessment and Finding of No Significant Impact (FONSI)

Herbert Hoover Dike Culvert Replacements and Removals

Flood Protection & Water Use Comments

1. The EA provides that the Corps will take into consideration the water supply and drainage rights of landowners who have received permits from the South Florida Water Management District (District). It is unclear whether the Corps will agree to provide landowners with equivalent water supply and drainage capacity as the specific culvert replacement designs are developed. In addition, the Corps should be aware that there are historic drainage rights which existed prior to establishment of the District's permitting program. The Corps needs to ensure the designs and construction bypass structures provide equivalent capacity for drainage and irrigation both during and after construction and that the structures are sized to address future changes to the Lake Okeechobee regulation schedule.

2. The Corps needs to consider the effects of future planned and potential changes to the Central and Southern Florida Flood Control system that may impact culvert design such as new Stormwater Treatment Area capacity, the automation of north shore pumping stations, the lake forward pumps, and remote gate control capability.

Ecological Comments

1. The Corps should consider secondary and cumulative impacts to the ecological health of Lake Okeechobee including water quality, submerged and emergent vegetation, wading birds, sport fish, and native apple snails that are anticipated to occur as a result of the culvert replacement.

2. In light of the importance of native apple snails in the diet of the endangered snail kite and the extremely slow rate at which apple snails re-colonize disturbed areas, where culvert replacements are planned in areas adjacent to snail kite critical habitat, restocking of native apple snails should be required in addition to the proposed replanting of wetland vegetation.

3. Specific comments for consideration related to permit action deriving from Environmental Assessment.

   a. **p. 36, Section 4.3, Under Wood Stork:** Include any information for the presence of active wood stork rookeries/colony since it is observed to be foraging in the area.
   b. **p. 36, Section 4.4.2, Sentence 3**: Include a map showing where the 4 acre wetland impacts are proposed and briefly describe the quality and function of those wetlands. In addition, include details of wetland mitigation that is proposed for the 4 acre wetland impacts.
   c. **p. 48, Section 4.18, Under Vegetation:** Please describe what the minimal short term impacts to wetland vegetation are and also elaborate on what vegetation will be planted to offset those impacts.

d. **p. 51, Section 5.3 Minimization:** Only minimization of impacts to Snail kite was included in this paragraph. Include information on minimization of impacts to other T & E species such as Caracara, wood storks, gopher tortoise and Eastern Indigo Snake.
e. **p. 52, Section 5.4 Mitigation:** Include details of any preconstruction surveys that will be conducted for Caracara, wood storks, gopher tortoise and Eastern Indigo Snake.
f. **p. 52, Section 5.4 Mitigation:** Include details of wetland mitigation that is proposed for the 4 acre wetland impacts.

Issues related to specific culverts:

1. There were initial concerns with the Table identifying removal of Culvert 10A, but with the errata correction, SFWMD concurs with Culvert 10A being replaced.

2. Currently when the Lake Okeechobee water levels are low, Culvert 10A causes the L-8 canal level to fluctuate with the lake due to the flap gates, not allowing the L-8 canal stage to be raised above the lake even when there is water available from other sources such as WCA1 or L-8 reservoir. It will solve the problem if a slide gate can be installed on the canal side of the culverts. Since, this applies to other culverts around the lake, every culvert should be reviewed for the need for slide gates.

3. Culvert 10A is unable to meet water supply needs during low lake stages. Unlike structures S-351, S-352 and S-354 where SFWMD has been able to install temporary horizontal pumps to continue water supply withdrawals from Lake Okeechobee down to lake stages of approximately 8 feet NGVD, Culvert 10A does not have features necessary for installation of pumps. These features should be a consideration at Culvert 10A.

4. Regarding Culvert 8 replacement, slide gates instead of the flap gates would be a better design to solve the water supply concerns at this structure when the Lake Okeechobee levels are low and canal levels cannot be maintained. If gate openings create erosive discharge from either direction, armoring of the canal banks to transition from culvert channel through 90 degree bends and additional canal bank protection is needed on canal banks running east and west.

5. SFWMD has no objection to the removal of Culverts 7, 9, 14 and the Taylor Creek culvert.

Southwest Florida Regional Planning Council
1926 Victoria Avenue, Fort Myers, Florida 33901-3414
(239)338-2550 FAX (239)338-2560 SUNCOM (239)748-2550

March 11, 2011

Ms. Lauren P. Milligan
FDEP - Florida State Clearinghouse
3900 Commonwealth Boulevard, M.S .47
Tallahassee, Florida 32399-3000

RE: SAI # FL201102145651C
IC&R: 2011-09
Department of the Army, Jacksonville District Corps of Engineers – Environmental Assessment for the Herbert Hoover Dike Major Rehabilitation, Culvert Replacement and Removal – Okeechobee, Martin, Palm Beach, Hendry and Glades Counties, Florida.

Dear Ms. Milligan:

The staff of the Southwest Florida Regional Planning Council reviews various proposals, Notifications of Intent, Pre-applications, permit applications, and Environmental Impact Statements for compliance with regional goals, objectives, and policies, as determined by the Strategic Regional Policy Plan. The staff reviews such items in accordance with the Florida Intergovernmental Coordination and Review Process (Chapter 291-5, F.A.C.), and adopted regional clearinghouse procedures.

These designations determine Council staff procedure in regards to the reviewed project. The four designations are:

Less Than Regionally Significant and Consistent- No further review of the project can be expected from Council.

Less Than Regionally Significant and Inconsistent- Council does not find

the project of regional importance, but will note certain concerns as part of its continued monitoring for cumulative impact within the noted goal area.

Regionally Significant and Consistent- Project is of regional importance, and appears to be consistent with Regional goals, objectives, and policies.

Regionally Significant and Inconsistent- Project is of regional importance and does not appear to be consistent with Regional goals, objectives, and policies. Council will oppose the project as submitted, but is willing to participate in any efforts to modify the project to mitigate the concerns.

The Southwest Florida Regional Planning Council (SWFRPC) has reviewed the Herbert Hoover Dike (HHD) Major Rehabilitation: Glades, Hendry, Martin, Okeechobee and Palm Beach Counties Environmental Assessment and Proposed Finding of No Significant Impact, dated February 2011 and has the following comments.

The Herbert Hoover Dike (HHD) was constructed around Lake Okeechobee, a 724-square-mile freshwater lake in south central Florida, for the purposes of flood protection, navigation, agricultural and municipal water supply, and recreation. The U.S. Army Corps of Engineers (USACE), Jacksonville District, has operated and maintained the dike for 75 years, its highest priority being the continued safety of the communities surrounding the dike.

Original construction of the portions of the HHD began in the 1930s and continuing into the 1960s. USACE is responsible for the operation and maintenance of 32 culverts, four of which are no longer operational. Use of these HHD culverts is being reviewed as part of the ongoing HHD rehabilitation efforts. However, changes in operations and local needs have resulted in some culverts no longer in use. From a structural integrity perspective, these culverts present challenges to dike stability through the addition for potential modes of failure. Twenty eight culverts necessary for operations will be replaced and four will be removed. The major purposes of the 28 culverts are for flood control and agricultural irrigation. Of the culverts recommended for removal, three were previously abandoned and buried, while the fourth was determined to no longer be required.

The culverts within the HHD pose an immediate and significant risk of failure due to the loss of embankment material into and along the culverts. During a large storm event, concentrated seepage could begin to move large amounts of material through the embankment. Erosion would progress upstream, potentially leading to a progressive breach of the embankment. Action is required as an immediate risk reduction strategy, in conformance with dam safety requirements, to reduce the risk of catastrophic failure. According to USACE Dam Safety guidance, these risk reduction maintenance actions are required to reduce this unacceptable risk due to the high probability of culvert failure, and eventually dike failure with potential associated loss of life. Should a culvert fail, inducing breaching or failure of the dike, the level of flood protection would be compromised, resulting in a high risk to human safety and potential devastating economic and environmental damages.

This Environmental Assessment (EA) assesses the environmental effects of removing or replacing the Federal culverts within the existing Federal right-of-way. The replacement and removal of culverts, as discussed in this EA, are immediate and risk reduction measures needed to be implemented within the Federal right-of-way. Additional real estate acquisition would not be required.

Based on the information analyzed and presented in this Environmental Assessment (EA), dated January 2011, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, The USACOE is concluding that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. The reasons for this conclusion are, in summary:

a. The proposed action would occur within the existing Federal right-of-way and is considered maintenance on an existing Federal project.

b. The Flood Control Act of1948 authorized the USACE to operate and maintain the HHD levees and the Federal culverts. The goal of the rehabilitation of the HHD is to reduce risk to public safety and health. Levee seepage and stability have a direct effect on the capability of the levee to provide the authorized protection. Replacement or removal as proposed is an immediate maintenance risk reduction strategy to insure the HHD meets safety standards.

c. The EA is being circulated with a proposed FONSI for public and agency review and coordination in compliance with the National Environmental Policy Act. All public and agency comments will be addressed in the revised EA upon completion of the public comment period

d. Adverse impacts to protected species are not anticipated. Special measures will be incorporated during project construction to avoid or minimize adverse effects to any listed endangered, threatened, or species of special concern that may be present. Adjacent to the dike, in the southwestern littoral zone of Lake Okeechobee, there is designated Critical Habitat for the Everglades snail kite, *Rostrahamus sociabilis plumbeus*, however, there will be no permanent adverse modification of this habitat as a result of this project. The USACE agrees to maintain an open and cooperative informal consultation process with the U.S. Fish and Wildlife Service (USFWS) and Florida Fish and Wildlife Conservation Commission (FWC) throughout the design, construction, and operation of this culvert replacement and removal project. The proposed action will be in compliance with the Endangered Species Act.

e. Temporary impacts to wetlands immediately adjacent to the culverts will occur through construction of a cofferdam during the replacement or removal process. Upon completion of the culvert removal or replacement process, wetland vegetation would be restored to preconstruction conditions through planting of emergent vegetation and natural recruitment.

f. The USACE is coordinating a consistency determination under the guidelines of the Coastal Zone Management Act (CZMA) through the circulation of this EA. The USACE has determined that the proposed action is consistent with the State's CZMA programs. The Florida CZMA Evaluation can be referenced in Appendix D of this report.

g. The proposed action has been coordinated with the Florida State Historic Preservation Officer in accordance with the National Historic Preservation Act and the Archaeological and Historic Preservation Act. The USACE has determined that the removal and replacement of the culverts has been adequately mitigated by documentation in a cultural resources assessment report available upon request of the HHD. The USACE deems the documentation sufficient to mitigate the removal and replacement of the culverts. Consultation with the State Historic Preservation Officer was initiated December 2010 for the proposed culvert removal and replacement. The project will not have an adverse effect on any historic properties included in, or potentially eligible for inclusion in, the National Register of Historic places. Conditions to protect undiscovered resources will be implemented as follows: language will be included in construction contract specifications outlining the steps to be taken in the event that undiscovered historical properties are encountered. An informational training session, developed by a professional archaeologist, will be conducted for the contractor's personnel to explain the types of archaeological/cultural materials that may be encountered during construction of the cutoff wall, and the steps to be taken in the event these materials are encountered. A professional archaeologist will conduct periodic monitoring of the project area during construction to determine if activities are impacting unanticipated cultural resources. The proposed action is consistent with both the National Historic Preservation Act and the Archaeological and Historic Preservation Act.

h. The project will be in compliance with the Clean Water Act. A Water Quality Certificate for the removal or replacement of some of the Federal culverts will be applied for as designs and specifications are developed and coordinated with the Florida Department of Environmental Protection (FDEP). All State water quality requirements will be followed.

The Southwest Florida Regional Planning Council finds the Environmental Assessment for the Herbert Hoover Dike Major Rehabilitation, Culvert Replacement and Removal to be **regionally significant and consistent** with the Strategic Regional Policy Plan and the State Comprehensive Plan.

If you have specific questions about the content of this letter, please contact Mr. Jim Beever directly at (239) 338-2550 ext 224, e-mail jbeever@swfrpc.org.

Sincerely,

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Ken Heatherington

Kenneth Heatherington
Executive Director

Cc: Ms. Rebecca S. Griffith
Chief, Planning Division
and
Ms. Stacie Auvenshine
US Army Corps of Engineers
South Florida Section
Environmental Branch, Planning Division
P.O. Box 4970
Jacksonville, Florida 32232-0019

COUNTY: ALL - Fla

DATE: 2/14/2011
COMMENTS DUE DATE: 3/18/2011
CLEARANCE DUE DATE: 4/1/2011
SAI#: FL201102145651C

MESSAGE: 2011-00735

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
ENVIRONMENTAL PROTECTION	SOUTH FLORIDA WMD		
FISH and WILDLIFE COMMISSION			
X STATE			
TRANSPORTATION			

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- _ **Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.**
- X **Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.**
- _ **Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.**
- _ **Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.**

Project Description:

DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT CORPS OF ENGINEERS - ENVIRONMENTAL ASSESSMENT FOR THE HERBERT HOOVER DIKE MAJOR REHABILITATION, CULVERT REPLACEMENT AND REMOVAL - OKEECHOBEE, MARTIN, PALM BEACH, HENDRY AND GLADES COUNTIES, FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA

- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency

- [x] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:

Division/Bureau: Historical Resources

Reviewer: Michael Hart

Date: 03/18/11

Laura A. Kammerer
Deputy SHPO
3.21.2011

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The Southwest Florida Regional Planning Council finds the Environmental Assessment for the Herbert Hoover Dike Major Rehabilitation, Culvert Replacement and Removal to be **regionally significant and consistent** with the Strategic Regional Policy Plan and the State Comprehensive Plan.

If you have specific questions about the content of this letter, please contact Mr. Jim Beever directly at (239) 338-2550 ext 224, e-mail jbeever@swfrpc.org.

Sincerely,

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Ken Heatherington

Kenneth Heatherington
Executive Director

Cc: Ms. Rebecca S. Griffith
Chief, Planning Division
and
Ms. Stacie Auvenshine
US Army Corps of Engineers
South Florida Section
Environmental Branch, Planning Division
P.O. Box 4970
Jacksonville, Florida 32232-0019

COUNTY: ALL - Fla

DATE: 2/14/2011
COMMENTS DUE DATE: 3/18/2011
CLEARANCE DUE DATE: 4/1/2011
SAI#: FL201102145651C

MESSAGE: 2011-00735

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
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DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT CORPS OF ENGINEERS - ENVIRONMENTAL ASSESSMENT FOR THE HERBERT HOOVER DIKE MAJOR REHABILITATION, CULVERT REPLACEMENT AND REMOVAL - OKEECHOBEE, MARTIN, PALM BEACH, HENDRY AND GLADES COUNTIES, FLORIDA.

To: Florida State Clearinghouse

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FAX: (850) 245-2190

EO. 12372/NEPA

- [x] No Comment
- [ ] Comment Attached
- [ ] Not Applicable

Federal Consistency

- [x] No Comment/Consistent
- [ ] Consistent/Comments Attached
- [ ] Inconsistent/Comments Attached
- [ ] Not Applicable

From:

Division/Bureau: Historical Resources

Reviewer: Michael Hart

Date: 03/18/11

Laura A. Kammerer
Deputy SHPO
3.21.2011

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MAR 22, 2011
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