



United States Department of the Interior



FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

July 30, 2007

Colonel Paul L. Grosskruger
District Commander
U.S. Army Corps of Engineers
701 San Marco Boulevard, Room 372
Jacksonville, Florida 32207-8175

Service Federal Activity Code: 41420-2006-FA-0027
Service Consultation Code: 41420-2006-F-0603
Date Received: June 1, 2007
Formal Consultation Initiation Date: June 6, 2007
Corps Application No.: SAJ-2005-6166 (IP-TKW)
Applicant: South Florida Water Management District
Project: C-44 Reservoir and Stormwater Treatment Area
County: Martin

Dear Colonel Grosskruger:

This document transmits the Fish and Wildlife Service's (Service) Biological Opinion based on our review of the South Florida Water Management District's (District) modifications to the proposed construction of the C-44 Reservoir and Stormwater Treatment Area (RASTA) in Martin County, Florida, and its adverse effects on the Audubon's crested caracara (*Polyborus plancus audubonii*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). Acronyms and abbreviations used throughout this Biological Opinion are outlined in a table located at the end of the document.

The C-44 RASTA is an Acceler8 component of the Indian River Lagoon South (IRL-S) Project Implementation Report (PIR) under the Comprehensive Everglades Restoration Plan (CERP). This component was designed to capture local basin stormwater runoff from the C-44 Canal and store it temporarily in a 3,400-acre (ac) reservoir prior to treating it with a 6,300-ac Stormwater Treatment Area (STA) before discharging it back into the C-44 Canal. This project, along with the other IRL-S components were designed to create a healthy estuarine salinity range in the St. Lucie Estuary (SLE) and remove nutrients, primarily phosphorus, from stormwater runoff.

This Biological Opinion is based on information provided in the U.S. Army Corps of Engineers (Corps) Permit Application No. SAJ-2005-6166(IP-TKW), a reinitiation notice dated June 1, 2007, construction drawings, and additional information. On August 1, 2006, the Corps initially provided a determination of "may affect, not likely to adversely affect" for the Audubon's crested caracara. This determination included adherence to conservation measures that limited construction activity within the secondary zone of a caracara nest tree during the breeding



season. The District has subsequently decided that restricting project construction activities in this area may present construction, engineering, and contractual challenges. Therefore, in an email dated June 1, 2007, the Corps reinitiated consultation and changed the effect determination to “may adversely affect” the Audubon’s crested caracara. The Service concurs with this determination. The Corps’ previous effect determinations for the wood stork (*Mycteria americana*), bald eagle (*Haliaeetus leucocephalus*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), eastern indigo snake (*Drymarchon corais couperi*), and West Indian manatee (*Trichechus manatus*) were not modified or addressed by this letter. A complete administrative record of this consultation is on file in the South Florida Ecological Services Office, Vero Beach, Florida.

The Use of Best Scientific and Commercial Information by the Service

The Service uses the most current and up-to-date scientific and commercial information available. The nature of the scientific process dictates that information is constantly changing and improving as new studies are completed. The scientific method is an iterative process that builds on previous information. As the Service becomes aware of new information, we will ensure it is fully considered in our decisions, evaluations, reviews, and analyses as it relates to the base of scientific knowledge and any publications cited in our documents.

Specifically, there is one such document cited in this Biological Opinion that the Service acknowledges has been affected in its cited form by new scientific information. The Service has taken these new sources of information into account when using this document to help guide our analysis and decisions. This document is the South Florida Multi-Species Recovery Plan (MSRP) of 1999 (Service 1999).

South Florida Multi-Species Recovery Plan

The MSRP was designed to be a flexible, living document to accommodate changes identified through research and to be compatible with adaptive management strategies. These principals are set forth in both the transmittal letter from the Secretary of the Interior and in the document itself. As predicted, changes have occurred in the intervening years since the MSRP was published. The Service uses the MSRP in the context that it still presents useful information when taken in conjunction with all the new scientific information developed subsequent to its publication.

Consultation History

On January 25, 2001, the Service received a request from the Corps for a threatened and endangered species list for the IRL-S Project area.

On February 9, 2001, a species list was sent to the Corps. The list included: West Indian manatee, Florida scrub-jay (*Aphelocoma coerulescens*), Audubon’s crested caracara, wood stork, red-cockaded woodpecker (*Picoides borealis*), Everglade snail kite, Florida panther (*Puma concolor coryi*), bald eagle, eastern indigo snake, tiny polygala (*Polygala smallii*), four-petal pawpaw (*Asimina tetramera*), fragrant prickly apple (*Cereus eriophorus* var. *fragrans*), and Florida perforate cladonia (*Cladonia perforata*).

On February 12, 2001, the Service received a letter from the Corps stating that Alternative 5 was the selected plan for the IRL-S Project. Later that week, it was decided by the Corps that Alternative 6 was the selected plan, but the Service determined that the changes to the selected plan did not alter the conclusions relative to effects on threatened or endangered species.

On February 22, 2001, the Service received a letter from the Corps in which they determined that the IRL-S Project, as described, was not likely to adversely affect any federally threatened or endangered species or to result in adverse modification of critical habitat. Furthermore, the letter stated that “the Corps believes that this IRL-S Project will enhance or restore habitats that these listed species occupy,” and that “standard protection methods for the bald eagle, [eastern] indigo snake and [West Indian] manatee will be utilized during project implementation when construction occurs in areas where these species could occur.”

On March 2, 2001, the Service responded with a letter concurring with the Corps’ determination for the entire IRL-S Project with the caveat that if modifications are made to the project or if additional information involving potential impacts on listed species becomes available, consultation may be reinitiated.

On May 3, 2001, the Service issued a draft Fish and Wildlife Coordination Act (FWCA) report for the IRL-S Project.

On or about October 15, 2001, the Service received the Corps’ Draft Integrated Feasibility Report and Supplemental Environmental Impact Statement (SEIS) for the IRL-S Project.

On February 7, 2002, the Service issued a final FWCA report for the IRL-S Project.

On or about October 15, 2002, the Service received the Corps’ Final Integrated Feasibility Report and SEIS for the IRL-S Project.

On May 13, 2003, the Service issued a Planning Aid Letter to reiterate the importance of including the full complement of components known as the Natural Storage and Water Quality Treatment Areas and to recommend that the integrity of these essential features of the plan not be compromised in the potential splitting of the IRL-S plan into several parts.

On or about December 15, 2003, the Service received the draft PIR and SEIS for the IRL-S Project from the Corps.

On January 7, 2004, the Service completed a National Environmental Policy Act review of the draft PIR and SEIS for the IRL-S Project.

On February 6, 2004, the Service issued a supplement to the final FWCA report for the IRL-S Project.

On or about March 16, 2004, the Service received the Final PIR and SEIS for the IRL-S Project from the Corps.

On or about December 15, 2004, the Service received the Phase I and II Environmental Site Assessment for the proposed C-44 RASTA.

On February 11, 2005, the Service conducted a site visit and coordination meeting at the C-44 RASTA with the District, Florida Fish and Wildlife Conservation Commission (FWC), Corps, and the District's environmental consultant for the project, HDR Engineering, Inc.

On March 10, 2005, the Service commented on HDR, Inc.'s *Draft Protocols for Threatened and Endangered Species Surveys and for General Fish and Wildlife Inventory*. One comment led to an increase of the baseline survey distance to 600 m from the northern C-44 project boundary to account for caracara sentinel birds that can occur up to 300 m from the nest tree.

On March 14, 2005, the Service participated in an interagency teleconference to discuss threatened and endangered species survey protocols for the C-44 Project.

On or about March 21, 2005, the protocols for "pre-construction" surveys were expanded to include suitable habitat within 1,000 m around the perimeter of the site. This would encompass the core area defended by nesting caracara and may also include potential nest trees.

During March 15-18, March 30-April 1, and April 26-29, 2005, baseline threatened and endangered wildlife surveys were conducted by HDR Engineering, Inc. at the C-44 Project site.

On May 27, 2005, the Service received a report entitled *Threatened and Endangered Species and General Fish and Wildlife Inventory Documentation* from HDR Engineering, Inc. The area of survey included the entire 12,000-ac project site and a buffer area surrounding the project boundary. An area of significance that was surveyed was a 1,000-m buffer along the northern periphery of the project area including the southern areas of the Allapattah Ranch Natural Area.

On or about July 12, 2005, the Service commented to the District on HDR Engineering, Inc.'s *Draft 2005 Threatened and Endangered Survey and General Fish and Wildlife Inventory Report*.

In August, 2005, the Service received HDR Engineering, Inc.'s *Final 2005 Threatened and Endangered Survey and General Fish and Wildlife Inventory Report*.

On October 14, 2005, the Service received HDR Engineering, Inc.'s *C-44 Reservoir Final Test Cell Gopher Tortoise (Gopherus polyphemus) Pre-construction Survey Report*.

On October 19, 2005, the Service received the Corps' effect determination letter on the construction and operation of the C-44 Project test cells.

On or about October 20, 2005, the Service received the Corps' and District's *Draft Operations and Monitoring Plan* for the proposed C-44 RASTA.

On November 10, 2005, the Service issued a section 7 concurrence letter on the test cells. The Service concurred with the Corps' determination that the project would have "no effect" on the bald eagle and Audubon's crested caracara. We concurred with the Corps' determination that the project "may affect, but is not likely to adversely affect" the wood stork and the eastern indigo snake.

On January 24, 2006, the Service provided comments on the District's *Draft Basis of Design Report* for the proposed C-44 RASTA.

On February 15, 2006, construction of the test cells started.

During February 14-17, March 6-9, and April 10-13, 2006, follow-up threatened and endangered wildlife surveys were conducted at the C-44 Project site.

On April 14, 2006, the Service received the District's *Final Basis of Design Report* for the proposed C-44 RASTA.

On May 30, 2006, the construction of Test Cell No. 1 was completed.

On or about June 16, 2006, the Service received HDR Engineering Inc.'s *2006 Wildlife Survey Results Tech Memo* which reported the results for the threatened and endangered species surveys.

On or about June 21, 2006, the pre-final design was issued for the Troop Indiantown Water Control District (TIWCD) reconfiguration.

On July 28, 2006, the Corps issued a Nationwide Permit for the TIWCD drainage system temporary reconfiguration project.

On August 1, 2006, the Service received a biological assessment and effect determination letter from the Corps on the entire proposed C-44 RASTA Project. The letter served to reinitiate consultation on six listed species that could be affected by the proposed project. The Corps provided determinations of "may affect, not likely to adversely affect" for the wood stork, Audubon's crested caracara, bald eagle, Everglade snail kite, and West Indian manatee. For the eastern indigo snake, the Corps determined the proposed project "may adversely affect" this species and requested reinitiation of formal consultation.

On August 14, 2006, the Corps issued a Public Notice for the receipt of an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344) for the C-44 RASTA project (permit application number 2006-6166 [IP-TKW]).

On August 16, 2006, the District and Corps stated during a conference call with the Service that tree clearing activities were anticipated to begin in October 2006, and not December 2006, as indicated in the August 1, 2006, letter.

On September 14, 2006, the Service issued a Biological Opinion for the eastern indigo snake. This letter also included informal consultation for the wood stork, Audubon's crested caracara, bald eagle, Everglade snail kite, and West Indian manatee. During consultation for the caracara, the Corps made a commitment that construction activity will not occur in the secondary zone (of a nest tree identified in 2004) during the caracara breeding season (November to April). Based on this permit condition, the Service was able to concur with the Corps "not likely to adversely affect" determination for the Audubon's crested caracara.

On January 11, 2007, the Corps requested reinitiation of consultation for the Everglade snail kite, wood stork, Audubon's crested caracara, and bald eagle based on a revised project description which included construction of a communications tower at the C-44 RASTA.

On February 20, 2007, the Service issued a letter concluding that construction of the communications tower was not likely to adversely affect Everglade snail kite, wood stork, Audubon's crested caracara, and bald eagle based on the implementation of two conservation measures for reducing potential impacts to migratory birds and federally listed species.

On February 20-23, March 6-9, and April 10-13, 2007, HDR Engineering, Inc. conducted the threatened and endangered wildlife surveys at the project site. These surveys included the visual examination of cabbage palms (*Sabal palmetto*) for signs of caracara nesting.

On May 8, 2007, the Service received HDR Engineering, Inc.'s *Spring 2007 Wildlife Survey Results* for the project. No caracara nests were reported, although several caracaras were observed in the project area foraging on newly cleared land. Caracaras were also observed feeding on road kill in the project area.

On May 21, 2007, the Service provided comments to the District on the *Spring 2007 Wildlife Survey Results*. We expressed concern that it was not clear whether or not the surveyors followed the standard caracara survey protocols. The typical reporting data sheets or any observation data for stationary observers were not included in the report.

Subsequently, on May 21, 2007, the District expressed concern, via email, regarding the previously accepted conservation measure for caracara, and requested additional discussion on the need to restrict construction in the northwest portion of the project area for the 6-month caracara nesting season each year.

On May 30, 2007, the Service held a teleconference with the Corps and SFWMD to discuss the need for construction in the caracara secondary zone during the breeding season. At that meeting, the District decided that, while they had agreed to the permit condition in 2006, that they could not now require the contractor to work in that area outside of the nesting season. The Corps would then need to change their effect determination for caracara to "may affect, likely to adversely affect" and formal consultation would be required before the end of June 2007 to meet the permitting and construction timelines.

On May 31, 2007, the Service conducted a site visit to the project site. The purpose was to examine the brush piles that resulted from tree clearing prior to burning, and to observe the area of the project site near the 2004 caracara nest. Two adult caracaras were observed immediately north of the northwest corner of the project site feeding on a dead cow. These birds were within the secondary zone of the 2004 nest tree. The citrus trees on the project site that were within the secondary zone of the 2004 caracara nest tree were still intact.

On June 1, 2007, the Service received, via email, a reinitiation notice from the Corps for caracaras potentially affected by modifications to the C-44 RASTA Project. The District had decided restricting project construction activities during the breeding season for the area of the project that overlaps the secondary zone of the documented caracara nest may present construction, engineering, and contractual challenges. The District requested this conservation measure be removed. Therefore, the Corps determined that with no restriction of construction activities during the breeding season, the project "may adversely affect" the Audubon's crested caracara. The Service concurs with that effect determination.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Proposed action

The Corps proposes to permit the District to construct and operate the C-44 RASTA in order to capture and treat stormwater runoff from the C-44 basin during the wet season so that it can be released during the dry season for water supply and environmental needs in the SLE and southern portion of the IRL. The project will also allow for recreational opportunities on at least some portions of the site. The project site is approximately 12,000 acres in size.

The key features of the C-44 Project include the following:

1. A 3,400-ac, 15-ft deep reservoir with a storage capacity of approximately 50,600 ac-ft.
2. A 6,300-ac STA configured as seven separate cells.
3. A total of 10.60 miles of perimeter levees around the reservoir.
4. A total of 15.53 miles of perimeter levees around the STA cells and 10.60 miles of interior levees.
5. An enlarged 20,000-ft intake canal that will convey water from the C-44 Canal to the reservoir.
6. A 1,100-cubic feet per second (cfs) pump station that will pump water from the new intake canal into the reservoir.
7. New perimeter roads, located at the crest of the embankment and at the outside toe of slope of the reservoir for access and maintenance.
8. A 7.45-mile reservoir seepage collection canal around the reservoir perimeter to collect and convey seepage from the reservoir to the intake canal.
9. A reservoir discharge structure to convey water from the reservoir to a distribution canal and to the individual STA cells.
10. Two new box culverts to convey flow from the reservoir to the STA cells.
11. A 600-cfs capacity distribution canal to discharge flow to an auxiliary spillway which bypasses flow to the seepage collection canal when all STA inlet structures are closed.
12. A connection to an existing broad-crested weir at the C-44 Canal to convey STA-treated water from the project to the C-44 Canal.
13. A new bridge across County Route (CR) 726 (Citrus Boulevard).
14. Modifications to the TIWCD irrigation system.

The approximately 12,000-ac project site was an active citrus grove up until 2007. A network of irrigation lines, drainage ditches, and canals served the grove. Although the site is highly altered, historic hydric soils underlie the groves and associated ditches and canals. These ditches and canals have been regularly maintained through mowing and herbicide treatment to ensure proper conveyance of irrigation and drainage water. The Corps has asserted jurisdiction over the ditches and canals where these features intersect hydric soils. A total of 614 acres are considered Waters of the United States and are expected to be impacted by the project. Of these, 44 acres are disturbed, remnant shrub swamp. The project proposes the construction of 6,300 acres of long-hydroperiod marsh in the form of STAs.

Construction phase

Tree clearing activities began in October 2006 and continue intermittently through 2007. Trees are knocked over with a backhoe or similar heavy equipment two rows at a time and allowed to

dry for approximately two weeks. Trees are then piled up and burned on-site. Due to the current drought, many brush piles have not been burned and have been in place for months. We anticipate that burning will be completed during the rainy season of 2007 (June to October).

Construction of the C-44 RASTA Project is scheduled to begin in October 2007 and continue through March 2010 (30 months). It is anticipated that construction would occur 6 days per week for approximately 10 hours per day. Construction activities for the reservoir will include seepage canal construction, drainage and irrigation canal filling, site grading, and embankment construction. The full embankment cross section from elevation 26.0 ft to elevation 54.5 ft North American Vertical Datum of 1988, or a height of approximately 28.5 above existing ground elevation, will be constructed as the project progresses to allow for placement of the upstream soil-cement and establishment of grass on the downstream slope of the embankment. This also includes constructing the internal drain system, borrow, and fill placement as the embankment is built. The embankment construction is an important element of the project and the quality of this work is critical to the District's dam safety program.

Large construction equipment, such as bulldozers with rakes and pans, will be utilized for embankment construction. This equipment works in a linear fashion around the site perimeter borrowing soil and then placing the borrow on the embankment in 6-inch vertical increments. The techniques and sequencing used are important to ensure the necessary quality of the work. For additional information on the various phases of construction for the project, see the Service's Biological Opinion for the eastern indigo snake (Service 2006).

Operation phase

The project operations and adaptive management strategy will be dependent upon a number of factors, including the stage in the C-44 Canal, the stage in Lake Okeechobee, the conditions at the S-80 structure, and the conditions in the SLE, all of which are controlled primarily by seasonal and short-term climatic conditions. Operating criteria for the project are designed to meet the project performance measures outlined in the IRL-S PIR (Corps 2004). The goals include storage, flow attenuation, water quality improvement, and meeting some of the irrigation demand of the basin. To meet the project goals, approximately 66 percent or more of the C-44 basin runoff will potentially be captured and treated prior to release back to the C-44 Canal. The operational criteria were designed to maximize the amount of water routed through the project system to maximize treatment, while regulating the discharge back into the C-44 Canal to provide flow attenuation to the estuary. In general, the C-44 RASTA facility will do the following:

1. Pump water from the C-44 Canal into the reservoir via the intake canal.
2. Store water in the reservoir to attenuate freshwater flows to the SLE, and as a secondary benefit, to allow partial treatment of the water to reduce nutrient concentrations.
3. Evenly distribute water to the STA cells where additional nutrient treatment occurs.
4. Discharge treated water back to the C-44 Canal (via the seepage collection and discharge canal).

The operational constraints are predominantly associated with the available reservoir and STA storage, the hydration of the STA cells, and the operation of S-308 and S-80 by the Corps, as minimum and maximum stages and flows are specified in Lake Okeechobee, the C-44 Canal, and at S-80 in the Lake Okeechobee Water Control Plan. In addition, ecological protection and saltwater management in the SLE will likely play a role in determining the amount of water that can be discharged from the project.

It should be noted the C-23 diversion canal is not part of the current project. However, the C-44 RASTA canals that may be receiving the C-23 diverted water and moving that water through the project have been sized for the additional anticipated flow. Everything within the project has been designed to accommodate additional flow if and when the C-23 diversion canal is constructed.

Site Description

Historically, the project area was a mix of pine flatwoods, wet prairie, and freshwater marsh. Pine flatwoods [Florida slash pine (*Pinus elliottii* var. *densa*), pond pine (*Pinus serotina*), and longleaf pine (*Pinus palustris*)] are characterized by level topography and poorly drained sandy soils. They range from open forests of scattered pines with little understory to dense pine stands with a rather dense undergrowth of grasses, particularly wiregrass (*Aristida stricta*), saw palmetto (*Serenoa repens*), and other low shrubs.

Wet prairie and freshwater marshes were once a prominent feature in the general project area (Davis 1943). The differences are based on hydroperiod. Wet prairies are flooded less than 6 months per year (short hydroperiod) and marshes can be flooded 6 to 12 months per year. As a result, wet prairies are more susceptible to fire and burn more frequently than marshes. These differences in hydroperiod and fire regime are reflected in the different vegetation communities.

More recently, the project site was a citrus grove. While this form of intensive agriculture is less desirable for wildlife than native ecological communities, there is usually some wildlife present as either residents or transients from native habitats. Mazotti et al. (1992) reported on wildlife usage in citrus groves southwest of Lake Okeechobee. They found 203 vertebrate species out of a possible total of 380 that were regionally present; however, 78 percent of those were observed not in the production area, but in associated agricultural reservoirs or wet detention areas.

Description of an Adjacent Project, the Allapattah Ranch Natural Area

The Allapattah Ranch Natural Area is also a component of the CERP's IRL-S Project. It is located on approximately 20,000 acres of former cattle ranch land. It was purchased in 2002 by the District with funding from Martin County and the U.S. Department of Agriculture's Natural Resource Conservation Service's (NRCS) Wetland Reserve Program (WRP). NRCS stipulated the maintenance of a small cattle population on the site to assist in the control of exotic pasture grasses until the site can be fully restored. Allapattah is approximately 15 miles west of the City of Stuart in north central Martin County, and is adjacent to the C-44 RASTA project, to the north.

Improved, unimproved, and woodland pasture with small isolated wetlands comprise the majority of the Allapattah Ranch. The predominant vegetative cover in improved pasture is very low-growing grasses and forbs, most commonly in monocultures of non-invasive, non-native species. Improved pastures are typically cleared, tilled, ditched, reseeded with specific grass types, and periodically improved with brush control and fertilizer application. Unimproved and woodland pastures have much less artificial drainage, and as a result better wetland habitat (although their water levels may be slightly to markedly depressed). Upland tree species commonly found in these pastures include cabbage palm, various oaks, and Florida slash pine.

The restoration of the Allapattah Ranch began in 2003. This process involves exotic plant control and the filling or plugging of drainage ditches to restore the hydrology of isolated wetlands. As of December 2006, the District has restored over 3,000 acres on the Allapattah Ranch.

Action area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate project area involved in the action. The action area for the proposed project includes, in part, the approximately 12,000-ac former citrus grove (and associated canals, ditches and roads) owned by the District. The surrounding and intersecting features in the action area include State Route (SR) 710, CR 609, CR 726 (Citrus Boulevard), Coca-Cola Road (along the northern project boundary), Minute Maid Road, the southern portion of the Allapattah Ranch Natural Area, the C-44 Canal, and additional adjacent wetlands and uplands that may be used by caracaras (Figure 1).

To identify this additional area around the project site that caracaras may utilize, and therefore, be affected by the project, we calculated the approximate radius of a typical caracara territory (about 3,000 acres or 1,200 ha). This equates to a distance of roughly 6,500 ft (1,970 m). This distance is slightly larger than the combined primary and secondary zones (a radius of 4,920 ft or 1,500 m) established for the protection of caracara nests. This distance provides an additional measure of protection for the species, because the nest tree may not be in the center of the territory. We assumed that any potential caracara nest tree would need to be at least 6,500 ft from the project site to be negligibly affected by the project. Therefore, the action area upon which this Biological Opinion is based is the approximately 33,400-ac polygon that includes a 6,500-ft buffer around the entire project site. Additionally, we included the perimeter roads (CR 609, CR 726, and SR 710) in the action area also, because they may convey vehicular traffic to the site (Figure 1). The District has not conducted a traffic study for the project, but anticipates that traffic will increase on perimeter roads. Internal roads should be completed within 9 months after start of construction. Given the suitable caracara habitat of the surrounding area, we have designated this action area to include other caracara territories and possibly nests, which would allow us to predict the magnitude of effects of the project on those birds and their territories. We anticipate that, after construction, the perimeter portions of the C-44 RASTA may become incorporated within caracara territories if prey items and suitable habitat are available.

STATUS OF THE SPECIES/CRITICAL HABITAT RANGEWIDE

The following discussion is based on the Audubon's crested caracara account provided in the South Florida Multi-Species Recovery Plan (MSRP) (Service 1999), augmented with more

recent updates from Morrison (1999, 2001, 2003), Morrison and Humphrey (2001), and Nemeth and Morrison (2002).

The caracara is a member of the Class Aves, Order Falconiformes, Family Falconidae. It was originally described by John James Audubon (1834), who discovered the caracara on November 21, 1831, and published an account under the name *Polyborus vulgaris*. John Cassin renamed it in 1865 to *Polyborus audubonii*. In 1999, Dove and Banks definitively renamed the species *Caracara cheriway* and eliminated all subspecies classifications. Dove and Banks (1999) conducted a taxonomic analysis of museum specimens of caracaras based on plumage and morphological characteristics and concluded there are three caracara species with no subspecific groupings. They refer to the North American caracara as *Caracara cheriway*, and this name was subsequently accepted by the American Ornithologists' Union. The list of threatened and endangered animals (50 CFR 17.11) continues to refer to the old scientific name *Polyborus plancus audubonii*, but this species is referred to in the remainder of this document as the caracara. It is a resident, diurnal, and non-migratory species that occurs in Florida as well as the southwestern United States and Central America. Florida's population of caracara is found in the prairie area of the south-central region of the State. Only the Florida population, which is isolated from other populations of the species in the southwestern United States and Central America, is listed under the Act.

Species Description

The caracara is a large raptor with a crest, naked face, heavy bill, elongated neck, and unusually long legs. It is about 50 to 64 centimeters (cm) long and has a wingspan of 120 cm. The adult is dark brownish black on the crown, wings, back, and lower abdomen. The lower part of the head, throat, upper abdomen, and under tail coverts are white, the breast and upper back are whitish, heavily barred with black. The tail is white with narrow, dark crossbars and a broad, dark terminal band. Prominent white patches are visible near the tips of the wings in flight. The large, white patches in the primaries and the white tail, broadly tipped with black, are both very conspicuous in flight and can be recognized at a long distance (Bent 1961).

Juveniles have a similar color pattern but are brownish and buffy, with the breast and upper back streaked instead of barred. Subadults resemble adults but are more brownish in color. Adults have yellow-orange facial skin and yellow legs. Facial skin of juveniles is pinkish in color, and the legs are gray (Layne 1978). Full adult plumage is obtained sometime after 3 years of age (Morrison 1997). There is no evidence of sexual dimorphism, the sexes being similar in color and size; however, gender can be determined surgically or through genetic analysis (Morrison and Maltbie 1999).

A caracara's feet and flight behavior are also notable. Their feet are clearly those of a raptor; however, their talons are flatter, enabling caracaras to run and walk more easily than other raptors. Caracaras are terrestrial and often forage by walking for extended periods on the ground (Morrison and Humphrey 2001). Bent (1938) noted the caracara's flight pattern resembles that of a northern harrier (*Circus cyaneus*), but caracaras fly faster and more gracefully. Caracaras are strong fliers and may reach speeds of 40 miles per hour. They have also been observed soaring in large circles at great heights (Howell 1932).

Critical Habitat Description

Critical habitat has not been designated for the Audubon's crested caracara.

Life History

Caracaras are resident, diurnal, and non-migratory. Adult caracaras may be found in their territory year-round. Territories average approximately 3,000 acres (approximately 1,200 ha), corresponding to a radius of 1.2 to 1.5 miles (2.0 to 2.5 kilometers) surrounding the nest site (Morrison and Humphrey 2001). Foraging typically occurs throughout the territory during nesting and non-nesting seasons.

The Florida caracara population historically inhabited native dry or wet prairie areas containing scattered cabbage palms, their preferred nesting tree. Scattered saw palmetto, and low-growing oaks (*Quercus minima*, *Q. pumila*), and cypress also occur within these native communities. Over the last century, many of the native prairie vegetation communities in central and south Florida have been converted to agricultural land uses, and frequently replaced by improved and unimproved pasture dominated by short-stature, non-native, sod-forming grasses. Morrison and Humphrey (2001) hypothesize that the vegetation structure of open grasslands (short-stature vegetation, scattered shrub cover, and nest trees) may be preferred by the caracara, due to its tendency to walk on the ground during foraging activities. The short vegetation stature and relatively simple vegetation structure may directly facilitate foraging by caracaras and provide less cover for predators. Consequently, caracaras appear to benefit from management actions such as prescribed burning that maintain habitat in a low stature and structurally simple condition. These activities reduce vegetation cover and may facilitate the observation and capture of prey. Within agricultural lands, regular mowing, burning, and high-density grazing may maintain low vegetative structure, an important habitat characteristic of the caracara's nest stand area (Morrison and Humphrey 2001). Regular prescribed burning maintains habitat in a favorable condition in native dry prairies. These field observations are consistent with the territory compositional analyses that indicate non-random selection of improved and semi-improved pasture land use.

Morrison and Humphrey (2001) characterized caracara distribution, reproductive activity, and land use patterns within a 21,000 km² area in south-central Florida. Comparisons of caracara territories to randomly selected areas and available habitat within the study area revealed caracara home ranges contained higher proportions of improved pasture and lower proportions of forest, woodland, oak scrub, and marsh. Territory size was inversely related to the proportion of improved pasture within the territory. In addition, breeding-area occupancy rate, breeding rates, and nesting success were consistently higher on private ranch lands during the study. Although it is unclear exactly which management activities best promote habitat utilization by caracaras, the mowing, burning, and grazing activities associated with improved pastures serve to maintain the short vegetation structure they appear to favor. The scattered cabbage palms that are often present within improved pastures to serve as shade for cattle provide nesting substrate for caracaras.

Additional investigations into habitat suitability for caracara (Morrison *et al.* 2006) indicate that maintaining heterogeneity which includes specific land cover types as well as small (less than 1 hectare or 2.47 ac) of freshwater wetlands, is critical in maintaining suitable habitat for the crested caracara in Florida. The proportion of six vegetation and land cover types (*i.e.*, cabbage palm-live oak hammock, grassland, improved pasture, unimproved pasture, hardwood hammocks and forest, and cypress/pine/cabbage palm) and 2 types of water (*i.e.*, lentic and lotic) were determined to be the most important criteria for predicting habitat suitability for caracara. Most known nest locations (72.9 percent) in the study were present on improved pasture although that habitat type only comprised 12.5 percent of the entire study area. Caracara appear to be exploiting pastures, ditches, and impounded wetlands that have replaced the historic land cover as shown by the high occurrence of improved and unimproved pastures and lotic waters in caracara home ranges (Morrison *et al.* 2006).

Caracaras are highly opportunistic in their feeding habits, eating carrion and capturing live prey. Their diets include insects and other invertebrates, fish, snakes, turtles, birds, and mammals (Layne 1978). Live prey also include rabbits, young opossums (*Didelphis marsupialis*), rats (*Rattus spp.*), mice, squirrels, frogs, lizards, young alligators, crabs, crayfish, fish, young birds, cattle egrets (*Bubulcus ibis*), beetles, grasshoppers, maggots, and worms (Bent 1961; Layne *et al.* 1977; Morrison 2001). Scavenging at urban dumps has also been observed (Morrison 2001). More recent information from Morrison (2005) indicates that wetland-dependent prey items comprise about 64 percent of the total diet. Mammals make up about 31 percent of the diet, with the majority of this being carrion.

The birds also closely follow mowers in pastures and tractors plowing fields, in order to capitalize on prey that may be exposed. Agricultural drainage ditches, cattle ponds, roadside ditches and other shallow water features also provide good foraging conditions for caracaras (Morrison 2001). Within native habitats, caracaras regularly scavenge in recently burned areas, and forage along the margins of wetlands within dry prairie communities.

These raptors hunt on the wing, from perches, and on the ground (Service 1989). They will also regularly patrol sections of highway in search of carrion (Palmer 1988). They may be seen feeding on road kills with vultures. However, caracaras are dominant over vultures and may occasionally chase the larger vultures from the road kill (Howell 1932).

Although adult caracaras are generally territorial, and therefore, primarily occupy their territories, large groups of individual caracaras are occasionally encountered (Layne 1978). Oberholser (1974) attributes this to the birds' carrion-feeding habit, although Morrison (2005) has noted that juvenile caracaras are nomadic. Caracaras are capable of moving long distances. Between the time when young birds leave the natal territory, and when subadults establish a territory, each individual may traverse a large portion of the species' range in Florida. Adults will also occasionally leave their territory and travel great distances, primarily outside of the breeding season. The caracara's movement capability and nomadic character during subadult years may be the cause of occasional observations of caracaras far outside their breeding range. Caracaras have been observed in the Florida Keys and into the panhandle of Florida (Bay County), as well as in other states, though some of these may have been escaped individuals (Layne 1996). There appears to be no migration or genetic exchange between the Florida population and other populations of the northern caracara.

Routine observation and radio-telemetry monitoring suggest there are several “gathering areas” in south-central Florida that may be important to caracaras during the first 3 years after leaving their natal territory, before first breeding (Morrison 2001). Relatively large numbers of caracaras (up to 50) have been observed along the Kissimmee River north of SR 98; south of Old Eagle Island Road in northern Okeechobee County; south of SR 70, west of Fort Pierce; and south of SR 70 in Highlands County, and on the Buck Island Ranch, for example. These gathering areas are regularly but not continually used by subadult and non-breeding caracaras and generally consist of large expanses of improved pasture; however, the particular habitat values of these areas have not yet been evaluated.

Morrison (1999) reported breeding pairs of caracaras seem to be monogamous, highly territorial, and exhibit fidelity to both their mate and the site. The age at first breeding has been documented as 3 years (Nemeth and Morrison 2002).

Details of breeding behavior in the caracara have been documented by Morrison (1998, 1999). The initiation of breeding is marked by several behavioral changes, including the pair perching together near the nesting site, preening and allopreening, and sharing food. Caracaras are one of the first of Florida’s raptors to begin nesting. Although breeding activity can occur from September through June, the primary breeding season is considered to be November through April. Nest initiation and egg-laying peak from December through February.

Caracaras construct new nests each nesting season, often in the same tree as the previous year. Both males and females participate in nest building. Nests are well concealed and most often found in the tops of cabbage palms (Morrison and Humphrey 2001) although nests have been found in live oaks (*Q. virginiana*), cypress (first record, Morrison et al. 1997), Australian pine (*Casuarina* spp.), saw palmetto, and black gum (*Nyssa sylvatica*). Caracaras usually construct their nests 4 to 18 m above the ground; their nests primarily consist of haphazardly woven vines trampled to form a depression (Bent 1938, Sprunt 1954, Humphrey and Morrison 1996). Caracaras vigorously defend their nesting territory during the breeding season (Morrison 2001).

Clutch size is two or three eggs, but most often two. Incubation lasts for about 31 to 33 days (Morrison 1999) and is shared by both sexes. Ordinarily only one brood is raised in a season, but around 10 percent of the population (annually) may raise a second brood. The young fledge at about 7 to 8 weeks of age, and post-fledgling dependency lasts approximately 8 weeks.

Population Dynamics

The great majority of caracara breeding territories occur on private lands in Florida, primarily within the ranchlands of central Florida. This fact makes monitoring the population and determining territory occupancy and nesting effort or success very difficult. Consequently, estimates of the caracara population in Florida have been based on counts of caracaras along roadsides (Heinzman 1970; Layne 1995). These roadside counts also have the potential be strongly affected by the presence of non-territorial juvenile and sub-adult birds during the period when they are nomadic. Because the occurrence and density of caracaras is not evenly distributed within the region they occupy (due to congregation and nomadic individuals), these roadside surveys are probably unreliable for estimating the overall population.

Status and Distribution

The caracara's perceived decline, as described in historic literature, is attributed primarily to habitat loss (Layne 1996). This perceived decline and the geographic isolation of the Florida population eventually resulted in the caracara's listing as threatened in 1987 (52 FR 25232). In particular, the caracara was listed as threatened because its primary habitat, dry prairie, had been greatly eliminated or modified for agriculture and residential development. It was also listed because existing regulatory mechanisms did not adequately prevent the destruction or modification of the caracara's habitat, which is mainly located on private land.

Morrison and Humphrey (2001) stated that no data are available on historic abundance, habitat use, or nest distribution by caracaras in Florida. The size of Florida's caracara population remains in question. Accurate counts become difficult because of limited access to areas of suitable habitat and because of the bird's behavior and limited detectability (Humphrey and Morrison 1997). Heinzman (1970) published the results of a 4-year road survey (1967-1970), which suggested fewer than 100 individual caracaras at 58 localities remained in Florida. Stevenson (1976) concurred with this estimate in 1974. Layne (1995) monitored caracara distribution and population status in Florida from 1972 to 1989. Based on roadside surveys, he estimated that the adult portion of the population was stable with a minimum of about 300 birds in 150 territories. The immature portion of the population was estimated to be between 100 and 200 individuals, bringing the total statewide population to between 400 and 500 birds. However, given continued landscape change in areas where caracaras have been known to occur, and the fact that not all the probable breeding range has been adequately surveyed for breeding pairs, estimating this population's size remains difficult.

In addition to presumed population declines related to habitat loss, direct human-caused mortality may also be a factor to be considered in the recovery of the species. In the past, large numbers of caracaras were killed in vulture traps (Service 1989). Individuals may also be caught in leg-hold traps used to control mammalian predators (Morrison 1996). Road mortalities are a significant cause of caracara decline. Morrison (2003) identifies highway mortalities as a major cause of juvenile mortalities with young birds especially vulnerable within the first 6 months after fledging.

The Florida population of caracaras is isolated and habitat-specific. Therefore, it may be susceptible to environmental catastrophes and potentially reduced reproductive rates because of demographic accidents such as skewed sex ratios or disproportionate age-related mortality. Low numbers may also reduce the genetic viability through loss of heterozygosity, thereby increasing vulnerability to environmental stresses. The location of many of the occupied territories on private land, and the inaccessibility of these territories to surveyors, makes it difficult to census the caracara and detect changes in its population size and distribution. This difficulty increases the possibility of not detecting a population decline that could result in extinction.

The major threat to this population remains habitat loss. Large areas of native prairie and pasture lands in south-central Florida have been converted to citrus operations, tree farms, other forms of agriculture, and real estate development and this loss has accelerated in the past few decades (Morrison and Humphrey 2001). However, historical conversion of forested habitats to pasture

has not been adequately documented as partially offsetting losses to caracara habitat, so a full accounting of historic habitat changes is lacking. The current threat of habitat loss persists as changes in land use continue. Florida's burgeoning human population has also increased the number of motor vehicles and the need for roads. The increase in traffic as well as the caracara's predisposition for feeding on road-killed animals has probably increased the number of caracaras killed or injured as a result of vehicle strikes.

Cattle ranching and extensive pastures appear to be compatible with caracara survival. Inadequate information is available to assess current caracara use of native wet and dry prairie communities, but these communities are likely the primary communities that caracaras occupied in the historic Florida landscape. The number of territories occurring in improved or unimproved pasture can be expected to increase if sufficiently large overgrown pastures are reclaimed and/or new pastures or restored native prairies are created from other agricultural land uses. The conversion of pasture to citrus (Cox et al. 1994), sugarcane, and residential development is also cause for concern. Recognizing the conservation value of cattle ranches and enlisting landowner cooperation in the preservation and management of these lands are critical elements in recovery of the caracara.

Lack of habitat management is also a potential threat to caracaras in some areas, and can result in habitat degradation to the point where it is no longer suitable for occupancy. In particular, encroachment of woody shrubs and trees into open dry prairies, pastures and similar habitats will result in some reduction in habitat suitability. Complete clearing of large areas that includes removal of cabbage palms and other trees may also reduce the suitability of habitat, but generally only when very large areas are completely cleared.

While there is inadequate evidence available to conclude that the caracara population in Florida has declined significantly, loss of habitat is threatening remaining caracara territories at an increasing rate. The limited distribution of caracaras and a lack of opportunities for expansion of the distribution make this species vulnerable to reductions in habitat quality and other increasing threats within its range.

ENVIRONMENTAL BASELINE

The environmental baseline includes the effects of past and present impacts of all Federal, State, or private actions and other human activities in the action area; the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation; and the impact of State or private actions, which are contemporaneous with the consultation in progress.

Status of the species within the action area

We have some information on the distribution and abundance of caracaras in and around the action area. In the spring of 2003, the Service and District conducted caracara surveys on Allapattah Ranch Natural Area. One nest was found just south of SR 714 (outside of the action area). Caracaras were also observed on the southern portion of the Allapattah Ranch within the

action area, but no nest trees were identified. Figure 2 shows those caracara observations, the nest tree, and observer locations from January 21 to 24, 2003. During surveys in 2004, the Service and District identified two nest trees – one near the northern end of the Allapattah Ranch near the C-23 canal, and one on southern end east of CR 609. The secondary zone of the southern 2004 nest overlaps the project area. On March 23, 2005, Joan Morrison (caracara researcher, Trinity College) and the Service identified another nest with two fledglings on the west side of CR 609 just south of SR 714 on Allapattah Ranch. Additionally, a fledgling and two adults were found at the 2003 nest and the territory around the southern 2004 nest was still occupied. A pair of adults on the eastern end of the Allapattah Ranch south of SR 714 was also observed. A nest was not found, but Dr. Morrison concluded that it was likely that another territory was nearby. In 2006, another nest tree was located by the District west of CR 609 and just south of Coca-Cola Road. Figure 3 shows the locations of these five nests with hypothetical 3,000-acre territories and Morrison's sixth possible 2005 territory. Note that these territories represent our best estimate and are approximate in shape and size. We cannot predict the actual areas used by these pairs without more regular observations over an entire year.

The consultant for the project, HDR Engineering, Inc., conducted caracara surveys in the project area and on the southern end of the Allapattah Ranch Natural Area in the spring of 2005, 2006, and 2007. They did not report finding any nest trees, but recorded observations of both adult and juvenile caracaras (Figures 4 and 5). Figure 4 shows the 2005 caracara observations with dates (where known) and locations (some locations are approximate because they were not included in HDR Engineering Inc.'s report). The data indicated that the 2004 territory was occupied in 2005, and that the suspected 2005 territory on the eastern side of Allapattah was also occupied. Additional caracaras were observed on CR 609 indicating an additional territory may be present west of the project site in 2005. The pasture habitat there could support another breeding pair of caracaras. Figure 5 shows the observations in 2006. Again, the 2004 territory was occupied in February and March 2006. Additional discussions with contractors on the project site in 2007 indicated that caracaras were occasionally seen flying over or foraging on the project site near tree clearing or soil disking activities. There was also at least one observation of a caracara along the eastern project boundary adjacent to the Bar-B Ranch. The Bar-B Ranch also has suitable caracara habitat and may be large enough to support a breeding caracara pair. In their 2007 wildlife survey report, HDR Engineering, Inc. (2007) stated that caracaras were observed on the edge of the citrus grove adjacent to Minute Maid Road (just west of the pump station), and eating road kill on CR 609 (south of Coca-Cola Road) on March 8, 2007. On May 31, 2007, two adult caracaras were observed by the Service foraging on a dead cow in a pasture just north of the project boundary and approximately 60 meters east of the FPL transmission lines (within the 2004 territory, but not depicted on any figure in this Biological Opinion).

Past and ongoing Federal actions which may have impacted caracaras within the action area include the construction, operation, and monitoring of two reservoir test cells and two STA test cells (totaling approximately 31 ac). Construction began in February 2006. Operation and monitoring occurred through June 2007, with a temporary stop in operations due to a drought (February to May 2007). The STA cells started being refilled on May 31, 2007, and the test cell reservoirs still held water, although they are to be decommissioned this year. Tree clearing and burning occurred on approximately 500 acres to accommodate the test cells. The Service informally consulted on the test cells in a letter dated November 10, 2005, and concurred with

the Corps' effect determination that the project "may affect, but is not likely to adversely affect" the caracara, eastern indigo snake, wood stork, or bald eagle.

Other actions or activities that have occurred to date in the action area include exotic plant control on the Allapattah Ranch Natural Area. Initiated in 2003, the District has cleared numerous acres of Brazilian pepper (*Schinus terebinthifolius*), melaleuca (*Melaleuca quinquenervia*), and other exotic and invasive plants. The WRP agreement for Allapattah between the NRCS and the District has dictated a low-density cattle management plan for control of exotic pasture grasses until such time that Allapattah can be restored as part of the CERP IRL-S Project. Wetland restoration through ditch filling or blocking began on the northern portions in 2004, and is anticipated to occur throughout Allapattah, but as yet has not occurred on the southern portion (part of the action area for this consultation).

Factors affecting species environment within the action area

With the exception of the test cells and the area previously cleared, the citrus grove, at least in part, was actively managed up until sometime in early 2007. Additional tree clearing activities continue and should be completed by September 2007. Caracaras were observed and reported by HDR Engineering, Inc. to be foraging in the project area on newly cleared land. They "competed with cattle egret for prey items unearthed by heavy tree-removing equipment" (HDR, Engineering Inc. 2007). Cleared areas are then disked and occasionally mowed, if necessary. Canal banks are also mowed as necessary. Maintenance and construction vehicles regularly travel on the dirt roads in the grove. These activities may attract or disturb caracaras, depending on where and when they occur.

Exotic plant control on the Allapattah Ranch Natural Area, including the maintenance of pasture habitat, has likely benefited caracaras. The lower density of cattle also likely provides a nutrient reduction benefit to wetlands on the Allapattah Ranch. As a result, these wetlands then may contain more prey items for caracaras. The area to the east of the Allapattah Ranch (known as the Cane Slough parcel) and Bar-B Ranch are currently managed as cattle ranches, but also have a high percentage of wetlands. We anticipate that all these areas, in addition to the pasture areas west of the project site, support caracaras and would serve as sources of birds that may utilize the project site.

Traffic within the action area is generally light. The major north south-route (CR 609) connects SR 714 to Indiantown. Traffic on SR 710 is heavier as it leads from Indiantown to Okeechobee to the west and to West Palm Beach and Jupiter to the south. SR 76 may also have heavy rush hour traffic as it connects Port Mayaca (west) to Stuart (east). Large commercial vehicles frequently travel at a high rate of speed (over 55 mph) on these roads, and so there is some risk to caracaras that may forage on or along these roads. This project is expected to increase the number of large construction vehicles in the action area for the three-year construction period.

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on caracaras, including beneficial effects, interrelated and interdependent actions, and species response to the proposed action.

Factors to be considered

Caracaras have been documented in the project area, to the north on the Allapattah Ranch Natural Area, and along adjacent roads (*e.g.*, CR 609 and Minute Maid Road). They have nested and foraged in the areas immediately around the project site. The secondary zone of the 2004 nest tree overlaps approximately 200 acres of the northwest corner of the project site. Because caracaras prefer pastures and prairies with wetlands, they are not likely to breed within the project site, but have been observed foraging within the project boundary. This action will take place when this species is likely to be present in the area. The remainder of the citrus tree clearing, burning, and disking (both within and outside of the 2004 territory) could continue until September 2007. Construction will occur from October 2007 to March 2010. The construction schedule is sufficiently flexible so that activities might occur within the secondary zone of the 2004 nest tree at any time following the issuance of this Biological Opinion until March 2010, including three nesting seasons. Other, as yet unknown nest trees, may also be affected by construction activities (primary or secondary zone intrusions). Potential impacts to caracara may occur due to citrus tree removal and burning, habitat modification and degradation, earthmoving, vehicular traffic, construction of the reservoir and STAs (including associated structures and canals), and the 50-year operation and maintenance of the project. These are the primary factors upon which this Biological Opinion is based. The action may cause caracaras to leave the area, abandon nest trees, and possibly miss foraging and mating opportunities. Caracaras attracted to earthmoving activities, or those disturbed enough to leave the area may be more vulnerable to intraspecific aggression. Potential direct impacts to the caracara include injury, disturbance, or death of individuals and loss of available habitat. Potential indirect impacts include: (1) future operation and maintenance associated with the RASTA that may result in disturbance, injury, or mortality from vehicular or pedestrian traffic, mowing, or pesticide usage; (2) mercury or other chemical contamination within the reservoir, STA, or seepage canals; and (3) potential benefits by the creation of foraging habitat in the STA cells.

Analyses for effects of the action

Direct effects

Direct effects are those effects that are caused by the proposed action. The direct impacts evaluated by the Service include direct injury or mortality including the loss or degradation of available habitat for foraging and breeding. The direct effects that this project may have on caracaras within the action area are discussed below.

Disturbance, injury, and mortality: Using the available data, we know that at least two adult caracaras use the action area. These adults occupy the 2004 territory that overlaps approximately 200 acres of the northwest corner of the project site. We suspect that additional adults use the action area, but we cannot quantify that amount at this time. We know that juveniles may also use the action area, but we cannot quantify that amount. Juveniles are more nomadic than adults and may forage within the citrus grove, or along nearby roads, or may simply fly over on route to and from their congregation areas. Juveniles are less wary of vehicular traffic, and consequently are more likely than adults to be killed when feeding on road kills. Therefore, we do anticipate

some disturbance and possibly injury or mortality of juveniles in the action area. Because adult caracaras are more wary of human activity, we do not anticipate that adults will be injured or killed by this action. We do expect that there may be some disturbance of nesting and foraging adults by pedestrian or vehicular traffic, as well as other possible construction activities.

Disturbance of adult caracaras during the nesting season may result in injury or mortality of eggs, chicks, or fledglings. Based on HDR Engineering Inc.'s survey data from 2005 to 2007, the 2004 nest tree does not seem to have been subsequently used for breeding by caracaras. However, that territory remained occupied every year from 2004 to 2007, therefore, we are assuming that another nest tree is nearby. Selection of a new nest tree may have resulted from a number of causes including: damage to the 2004 nest tree (three hurricanes have moved through that area since Spring 2004); replacement of one or both of the adult birds; or changes in the suitability of the habitat around the nest tree. If a new nest has been selected and it is closer to the project area, then these effects could be intensified. Therefore, we anticipate that up to two eggs, chicks, or fledglings could be affected each year from 2007 to 2010 by project construction.

Due to the nature of the proposed construction (*i.e.*, complete disturbance of the site by tree removal, canal filling or dredging, levee construction and then flooding of the site), and given the caracara's propensity to be easily disturbed during the breeding season by heavy equipment, additional traffic, or people, the Service estimates that up to two adult caracaras could be adversely affected by the project each year from 2007 to 2010. More adults may be affected, but we cannot predict the number of additional birds at this time.

Loss of habitat: In general, citrus groves are not considered optimal caracara habitat, but we must attempt to assess the potential loss of habitat in changing land use from a citrus grove to a reservoir and STA. The ditches, canals, and roads in the citrus grove provided prey and road kill for forage. The rows between the trees also provided some forage. Mowing or other activities that attract cattle egrets into citrus groves also likely attracted caracaras that would prey on the egrets. It has been reported that activities on the site such as earthmoving, grading, or disking also attracted caracaras from peripheral pasture areas. However, we cannot quantify the number or probability of birds that may have used any given area of the site while it was an active citrus grove. Therefore, we have assumed that the entire grove was potential foraging habitat for both adult and juvenile caracaras due to the number of caracara observations and the amount of caracara habitat (*i.e.*, pastures) around the site. Therefore, we have considered the conversion of citrus grove to reservoir and STA as degradation of 12,000 acres of potentially suitable caracara foraging habitat.

Indirect effects

Indirect effects are those that are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. The indirect impacts evaluated by the Service include: (1) post-construction maintenance of the roads, levees, pump stations, reservoirs, and STAs (including vegetation management methods such as mowing, herbicide application, and physical removal); (2) chemical contamination from either mercury or pesticide residues; and (3) potential benefits from created habitat in the STA cells. The indirect effects that the proposed action may have on caracaras within the action area are discussed below.

Operation and maintenance: Routine operation and maintenance may result in temporary and insignificant disturbance to caracaras. However, vehicular activity associated with maintenance may put some juvenile caracaras at risk if they forage along roads or levees on the site. Given the large size of the project site and the anticipated abundance of prey items that could become established in the STA, seepage canals, levees, and possibly in the reservoir, the Service anticipates caracaras may occupy the project area during operation and maintenance. It follows that these caracaras may be at risk from the operation of maintenance vehicles and equipment. We anticipate caracaras may be disturbed each year in the C-44 RASTA by vehicles and mowers; however, we cannot quantify this number of birds at this time. We do not anticipate injury or mortality of caracaras from operation and maintenance of this project.

Chemical contaminants: Recent sampling by the District has indicated that mosquitofish (*Gambusia* sp.) in some of the currently operating STAs south of the Everglades Agricultural Area (EAA) are contaminated with potentially problematic levels of mercury. Sulfate concentrations in the EAA discharges to these STAs facilitate the mercury methylation process and allow toxic methyl mercury to bioaccumulate. Since the source of mercury is atmospheric, it is assumed that this could become problematic in the C-44 STA if suitable sulfate concentrations exist. However, a CERP Guidance Memo and monitoring plan is in place that was designed to detect and remediate any problematic mercury or pesticide contamination that may be found in the biota of the STAs. Therefore, we anticipate there would be a low likelihood of caracara in the project area ingesting contaminated prey.

Habitat created in the STA cells: The loss of caracara foraging habitat when the citrus grove is cleared, may be offset somewhat after prey items for the caracara become available at sufficient densities. At that time, there could be foraging habitat suitable for caracaras on the STA levees and the edges of the seepage canals. Interior portions of the reservoir are anticipated to be a harder material (soil cement or concrete) and therefore, would not likely provide the necessary herbaceous plant cover or moisture level needed by prey items. Additionally, the hydroperiod of the reservoir (from dry to 15 ft deep annually) is not likely to be conducive to the persistence of aquatic prey items for caracara.

The width of the STA levees would be approximately 56 ft, including both side slopes and the road. For perimeter STA levees, this equals approximately 105 acres (82,000 ft of perimeter levees x 56 ft). For interior STA levees, this area would equal approximately 72 acres (56,000 ft of interior levees x 56 ft). The seepage canal is 90-ft wide but only the edges are anticipated to be suitable caracara foraging habitat. Therefore, we estimated that approximately 10 ft on each side would be suitable. The anticipated total acreage of caracara habitat along the seepage canal would be approximately 18 acres (39,330 ft x 10 ft x 2). The total potential caracara foraging habitat created by this project was estimated to be approximately 195 acres (105 + 72 +18). Since this habitat covers much of the perimeter of the site, and would be closer to existing caracara territories, we expect that caracaras from outside the project area will occasionally use this habitat, assuming prey are suitable. It is difficult to estimate how many caracaras will use the site following construction.

Interrelated and interdependent actions

An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no

independent utility apart from the action under consultation. At this time, there are no interrelated and interdependent actions. However, because the C-44 RASTA is part of the IRL-S Project, there may be some future interrelated and interdependent actions in the form of a diversion canal that was planned to connect the C-23 Canal to the C-44 basin. If this canal is constructed as part of the IRL-S Project, reinitiation of consultation may be necessary.

Species' response to the proposed action

Construction, operation, and maintenance of the project can result in actions that may disturb, injure, or kill individual caracara, and destroy or degrade occupied and potential nesting habitat and foraging areas. Due to the caracara's large territory size and relative low density, combined with the lower quality of on-site habitat and general wariness of human activity, risk of direct mortality would not normally be considered substantial. However, due to the large size of the project area, the potential for many birds to occupy nearby areas, and the likelihood that juvenile caracaras may forage on road kills along the roads within the action area, the likelihood of mortality or injury increases. Any clearing, burning, earthmoving, construction, operation, or maintenance activities may also adversely affect caracaras by causing them to leave the area, and possibly miss foraging opportunities. Caracaras that have their normal behavior patterns altered by the action may be more vulnerable to intraspecific aggression. The Service anticipates the caracara pairs on the Allapattah Ranch that may be affected by this project during construction, would be able to successfully reproduce following construction. We do not expect that the adult caracaras that occupy the 2004 territory will abandon that territory as a result of the project.

Some caracaras may utilize the STA levees and seepage canal banks following construction, especially as prey items become more abundant within the STA cells. We cannot estimate the number of caracaras that may move into the area – it would depend on the number of territories in future years that are established on adjacent lands that may extend into the area of the C-44 RASTA. These adult caracara, their offspring, or nomadic juveniles, may be disturbed (but not injured or killed) by on-going operation, maintenance, and management activities.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

A portion of the funding for the acquisition of the lands for the C-44 RASTA came from Martin County with the caveat that at least 100 acres of adjacent land be set aside for a county park. We believe that this is a cumulative effect in that the people using the park may be allowed to participate in recreational activities that may include fishing, hiking, horseback riding, and possibly duck hunting in the C-44 RASTA. The increase in human disturbance may result in disturbance to caracaras. It is not anticipated that vehicular traffic from the Martin County park would be allowed into the C-44 RASTA, and therefore, would not have an effect on caracaras in the project site.

SUMMARY OF EFFECTS

The Service anticipates approximately 12,000 acres of caracara habitat will be lost through conversion of citrus grove to reservoir, STA, and associated roads, levees, and canals. We also anticipate approximately 195 acres of caracara foraging habitat will be created on levees and canal banks after prey items become available (within a few years following construction). Furthermore, because this anticipated habitat would be linear in shape, we estimate it may be incorporated into the foraging areas of several future caracara territories, and may provide potential benefits to more than just one pair of adults and their offspring.

The Service anticipates disturbance of one nesting pair of adults, and disturbance, injury, or mortality of two eggs, chicks, or fledglings from that pair for each year of construction (a total of three years). We also anticipate that another juvenile may be disturbed, injured, or killed by vehicular traffic within the action area. We do not anticipate that adult caracaras will be killed by this action. Following construction, we expect that an unquantified number of foraging juvenile and adult caracaras may be disturbed each year through operation and maintenance of the project or by the public participating in recreational activities on the site.

CONCLUSION

We reviewed the status of the Audubon's crested caracara, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects. This project's primary effects (injury or mortality) are short-term (*i.e.*, only during the three-year period of construction), and are only anticipated for juvenile caracaras (including eggs, chicks, fledglings, and sub-adults). The project will not injure or kill adult caracaras, or permanently disturb nest site(s). Therefore, it is the Service's Biological Opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species. No critical habitat has been designated for the Audubon's crested caracara; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Sections 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are nondiscretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as

appropriate, for the exemption in action 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates the proposed action will incidentally take the federally listed Audubon's crested caracara, though the level of incidental take may be difficult to detect for the following reasons: (1) finding a live, dead, or impaired caracara may be difficult; (2) the species has a wide-ranging distribution; (3) the species may exhibit a patchy distribution within suitable habitat; and (4) seemingly suitable caracara habitat may not be occupied by caracaras. The incidental take is expected to be in the form of harassment, harm, or mortality. It is not expected this species will be permanently extirpated from the project site. The incidental take is expected due to tree clearing and burning, construction, and operation and maintenance of the project.

We expect harm to caracaras in the form of habitat loss. The 12,000-ac citrus grove (which is of relatively low-quality foraging habitat) will be replaced by approximately 195 acres of levees and shoreline foraging habitat.

At least six caracara territories are either known or suspected on the Allapattah Ranch Natural Area (mostly outside the action area). Caracaras have been documented around the perimeter of the project site, especially near the northern and western edges of the site. There was one nest tree recorded in 2004 (but not verified since) in the northwestern corner of the action area. Due to the general lack of knowledge about territories in the action area, and in conjunction with the wide-ranging activity and use of habitat types by caracaras, it is difficult to determine the exact number of caracaras that will be incidentally taken.

Based on the existence of the 2004 nest tree and subsequent observations that suggest the territory has been occupied every year since then, we assume a nest tree is still present in the general vicinity of the northwestern corner of the project area. As a result, up to two adults could be incidentally taken by the project in the form of harassment for each year of construction (3 years total).

If this harassment of adult caracaras occurs during the nesting season, then this could result in harassment or harm of that pairs' eggs, chicks, or fledglings. Based on the average clutch size per nest, we anticipate up to two additional juveniles (*i.e.*, eggs, chicks, or fledglings) may also be incidentally taken each year (for a subtotal of up to six juvenile caracaras over 3 years).

Based on HDR Engineering, Inc.'s survey data, we anticipate adult and juvenile caracaras will continue to forage on roads within the action area, and we anticipate these birds will also forage within the project site during construction. While we estimate take in the form of harassment of these foraging birds will occur during each year of construction, we cannot estimate the number of birds that will be affected. However, we anticipate incidental take in the form of injury or mortality may amount up to one juvenile caracara per year from vehicular traffic (for a subtotal of up to three juvenile caracaras). Therefore, the total amount of incidental take of juvenile caracaras from construction of the project over three years is up to nine birds.

Following construction, caracaras may forage along the reservoir, STA, seepage canals, and roads on the site, and therefore, may also be at risk. We expect these birds may be harassed by maintenance vehicles or pedestrian traffic (especially because we expect this site to be open to the public); however, we cannot quantify this level of take at this time.

The Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C §§ 703-712), if such take is in compliance with terms and conditions (including amount and/or number) specified herein.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of caracaras. Disturbance and injury to caracaras should be minimized during construction activities. Education of personnel on the site will facilitate minimization of impacts and conservation of the species. Caracara surveys should be conducted in all appropriate habitats around the site, by qualified biologists using the standard Service protocols, to assess the effects of potential take from January to March 2008. The District staff will coordinate with the Service and report on their activities to the Service to the greatest extent practical to minimize potential adverse effects on the species.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Corps shall ensure that the District complies with the following terms and conditions, which implement the reasonable and prudent measures described above and outline reporting and monitoring requirements.

These terms and conditions are non-discretionary.

1. Minimization of impacts

- a. To minimize impacts to foraging caracara, a speed limit of 35 miles per hour will be posted for all vehicular traffic on site. This does not apply to public roads with higher posted speed limits around the project site.
- b. Any road-killed animals (that may serve as caracara forage) will be removed daily from the roads within the project site in order to reduce the likelihood of foraging caracaras being hit by vehicular traffic.

2. Education of on-site personnel

- a. All vehicle and equipment operators will be notified to avoid all caracaras if at all possible. All on-site personnel will be educated to recognize caracaras. If any caracara is encountered, it will be avoided and allowed to leave the area on its own before vehicle or equipment use is resumed.
- b. Educational information on caracaras will be posted at the educational kiosks on the site.

3. Caracara Surveys

The District will conduct monthly caracara surveys from January 2008 to March 2008 using the standard Service protocols (Service 2004). Surveys must be conducted by biologists experienced in surveying for caracaras. Surveys will occur in any caracara habitat (*i.e.*, pastures) within the action area. Results of the surveys must be reported to the Service in accordance with Terms and Conditions No. 4.b.

4. Coordination with the Service

- a. The District shall provide the Service a one-week advanced notice of the survey dates so that we may participate in on-site observational activities.
- b. A written report of all observations associated with the monthly caracara surveys (as required in Terms and Conditions No. 3) shall be provided to the Service's C-44 Project biologist (Fish and Wildlife Service, South Florida Ecological Services Office; 1339 20th Street Vero Beach, Florida; 32960; 772-562-3909) by April 30, 2008. If a new caracara nest tree is found, its location must be reported to the Service within three working days.
- c. In the event that a caracara is injured or killed by construction, operation, or maintenance of the C-44 RASTA, immediate notification must be made to the Service's C-44 Project biologist (Fish and Wildlife Service, South Florida Ecological Services Office; 1339 20th Street; Vero Beach, Florida; 32960; 772-562-3909). A written report must also be submitted and should contain the location, dates, times and circumstances regarding the injury or mortality. Upon locating a dead, injured, or sick federally listed species, initial notification must be made to the nearest Service Law Enforcement Office (Fish and Wildlife Service; 1339 20th Street; Vero Beach, Florida 32960; 772-562-3909). Secondary notification should be made to the FWC, South Region; 8535 Northlake Boulevard; West Palm Beach, Florida; 33412-3303; (561) 625-5122; 1-888-404-3922.
- d. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or in the handling of dead specimens to preserve biological material in the best possible state for later analysis as to the cause of death. Dead caracaras should be placed on ice and frozen as soon as possible. In conjunction with the care of sick or injured specimens or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measure provided. The District must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following:

1. We expect caracara will occasionally use the project area after construction assuming prey are suitable; however, enumeration at this time is difficult. Therefore, we recommend regular surveys and recordings of caracara occurrences to better determine caracara usage at this site following construction.
2. Following construction, maintain an educational kiosk for the public on the listed species and other wildlife that may be observed in the reservoir and STA.
3. Provide long-term ecological monitoring of caracara and their habitats on the Allapattah Ranch Natural Area.

REINITIATION NOTICE

This concludes formal consultation on the proposed action. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, as defined by the action area measures provided in this project description; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Biological Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Biological Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Thank you for your cooperation and effort in protecting wildlife resources. If you have any questions regarding this project, please contact Steve Schubert at 772-562-3909, extension 249.

Sincerely yours,



Paul Souza
Field Supervisor
South Florida Ecological Services Office

cc:

Corps, Planning Division, Jacksonville, Florida (Mike Rogalski, Paul Stodola)
Corps/SFRPO, West Palm Beach, Florida (Tori White)
District, West Palm Beach, Florida (Susan Ray, John Mitnik)
FWC, Vero Beach, Florida, (Joe Walsh)
Service, Atlanta, Georgia (Noreen Walsh) electronic copy
Service, Atlanta, Georgia (Dave Horning)
Service, Jacksonville, Florida (Miles Meyer)

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Table of acronyms and abbreviations used in this Biological Opinion.

Acronym/Abbreviation	Definition
Act	Endangered Species Act of 1973, as amended
ac	acre(s)
CERP	Comprehensive Everglades Restoration Plan
cfs	cubic feet per second
Corps	United States Army Corps of Engineers
District	South Florida Water Management District
EAA	Everglades Agricultural Area
ft	feet
FWC	Florida Fish and Wildlife Conservation Commission
FWCA	Fish and Wildlife Conservation Act
ha	hectare
IRL-S	Indian River Lagoon - South
m	meter(s)
MSRP	Multi-Species Recovery Plan
PIR	Project Implementation Report
RASTA	Reservoir Assisted Stormwater Treatment Area
SEIS	Supplemental Environmental Impact Statement
Service	United States Fish and Wildlife Service
SLE	St. Lucie Estuary
STA	Stormwater Treatment Area
TIWCD	Troup Indiantown Water Control District

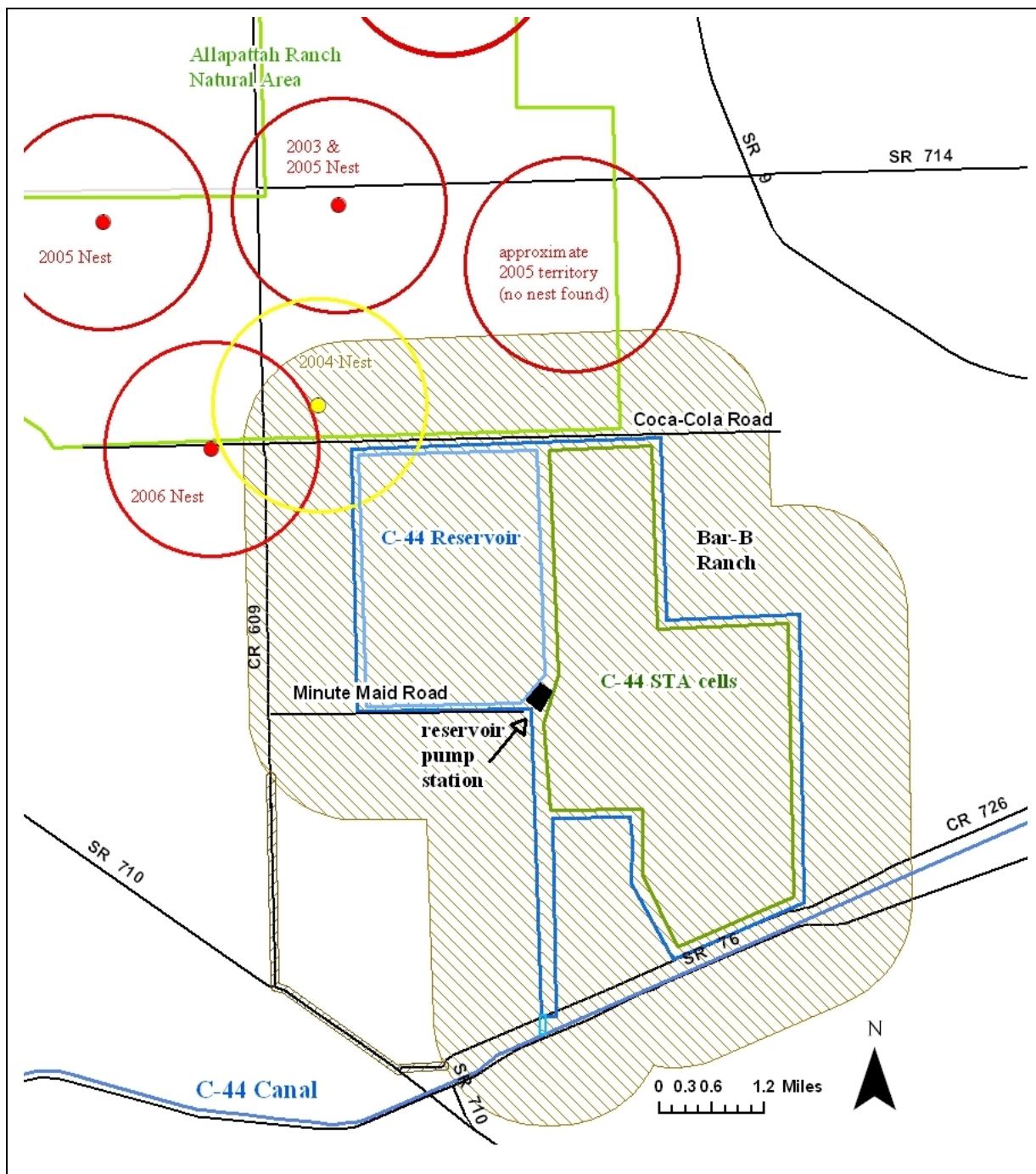


Figure 1. Action area (cross-hatched area) for the C-44 Reservoir and STA Project including local roads, C-44 Canal, the reservoir influent pump station, and known caracara nests with hypothetical territories.

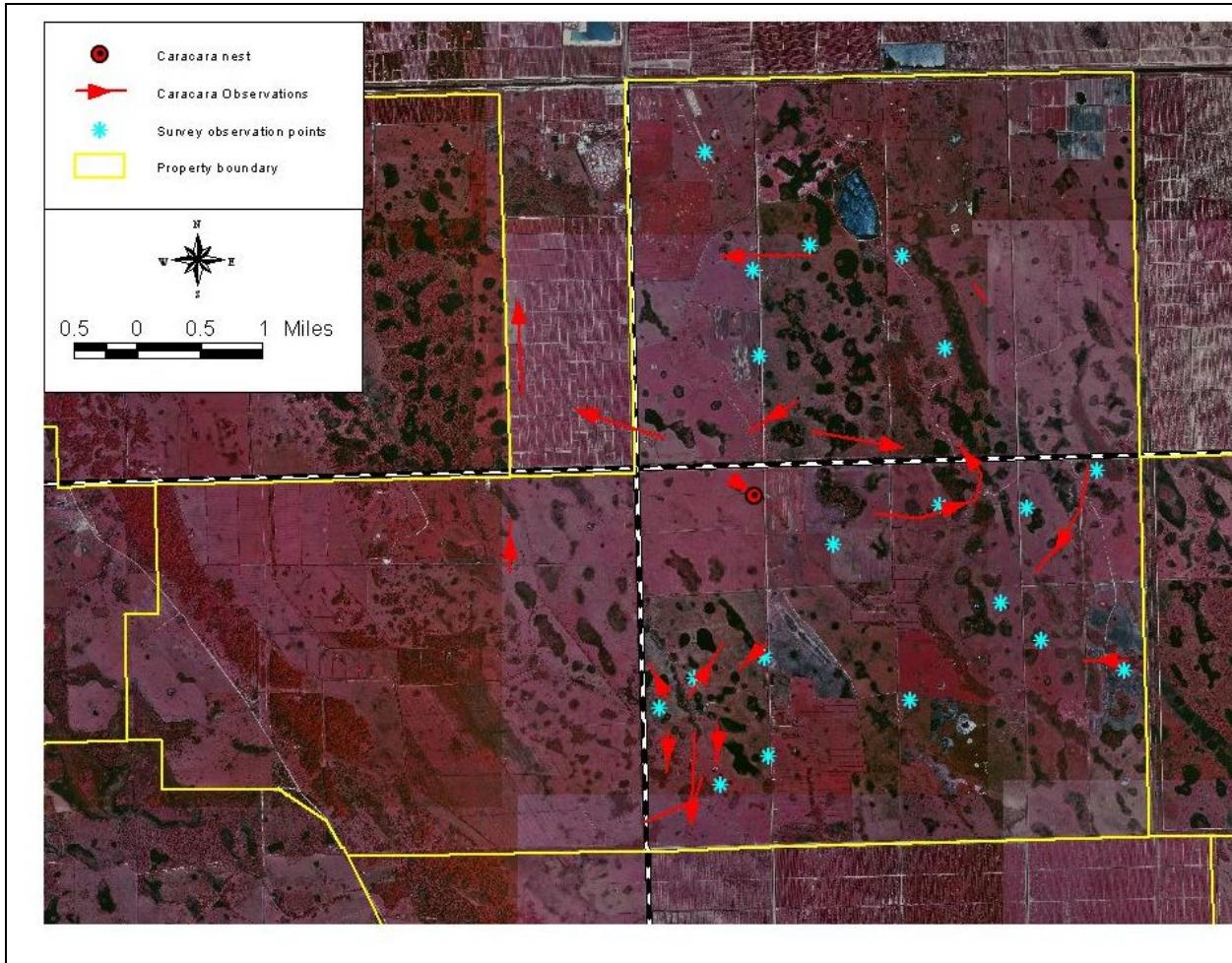


Figure 2. Caracara observations and one nest location from January 21 to 24, 2003 on the Allapattah Ranch Natural Area immediately north of the C-44 Reservoir and STA project site (as depicted on a 1999 infrared aerial photograph).

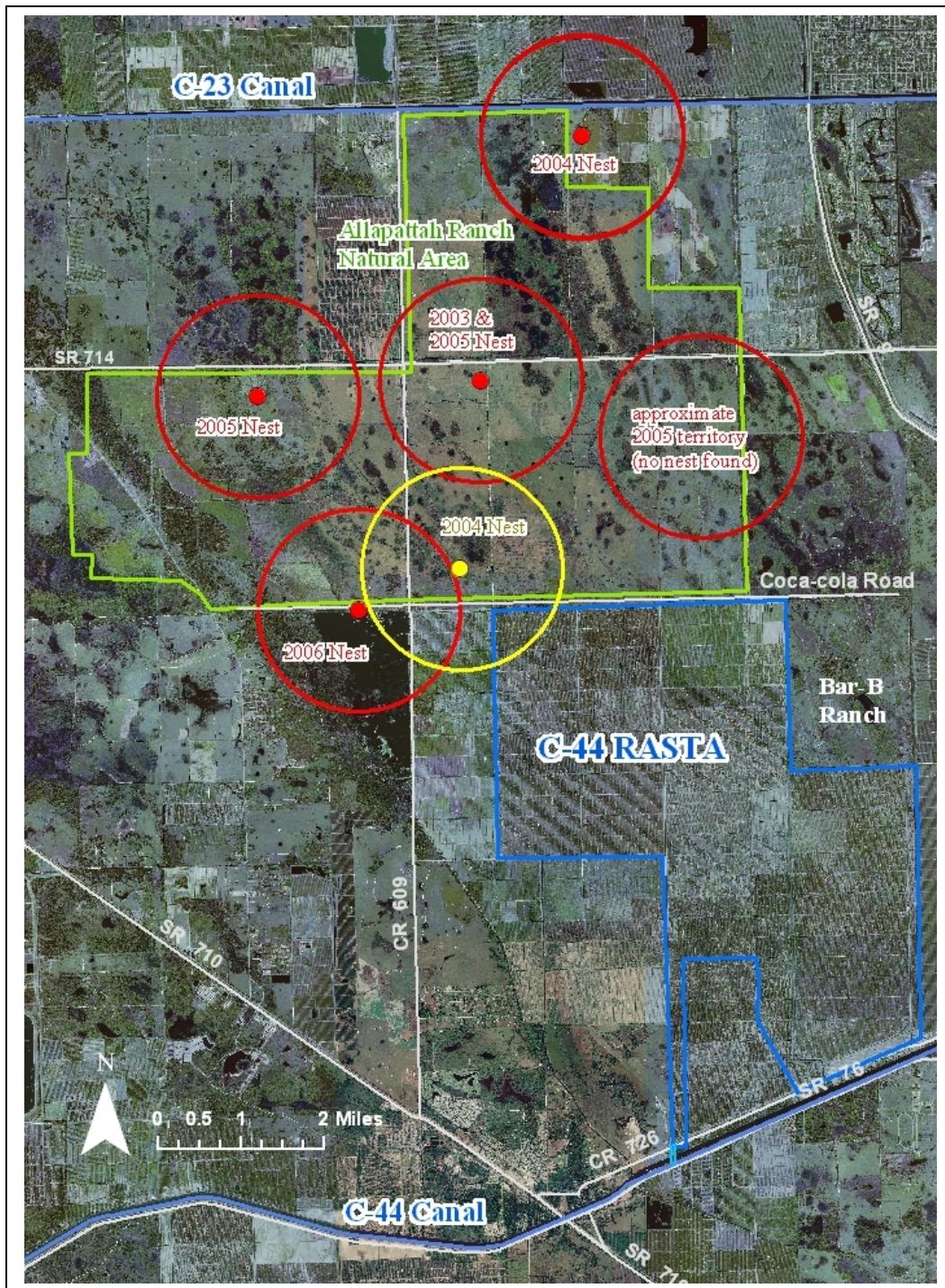


Figure 3. The locations of five known caracara nest trees and their hypothetical territories from 2003 to 2006 in relation to Allapattah Ranch and the project site. A sixth hypothetical territory (no nest tree found) based on observations in 2005 is also shown (as depicted on a 2004 natural-color aerial photograph).

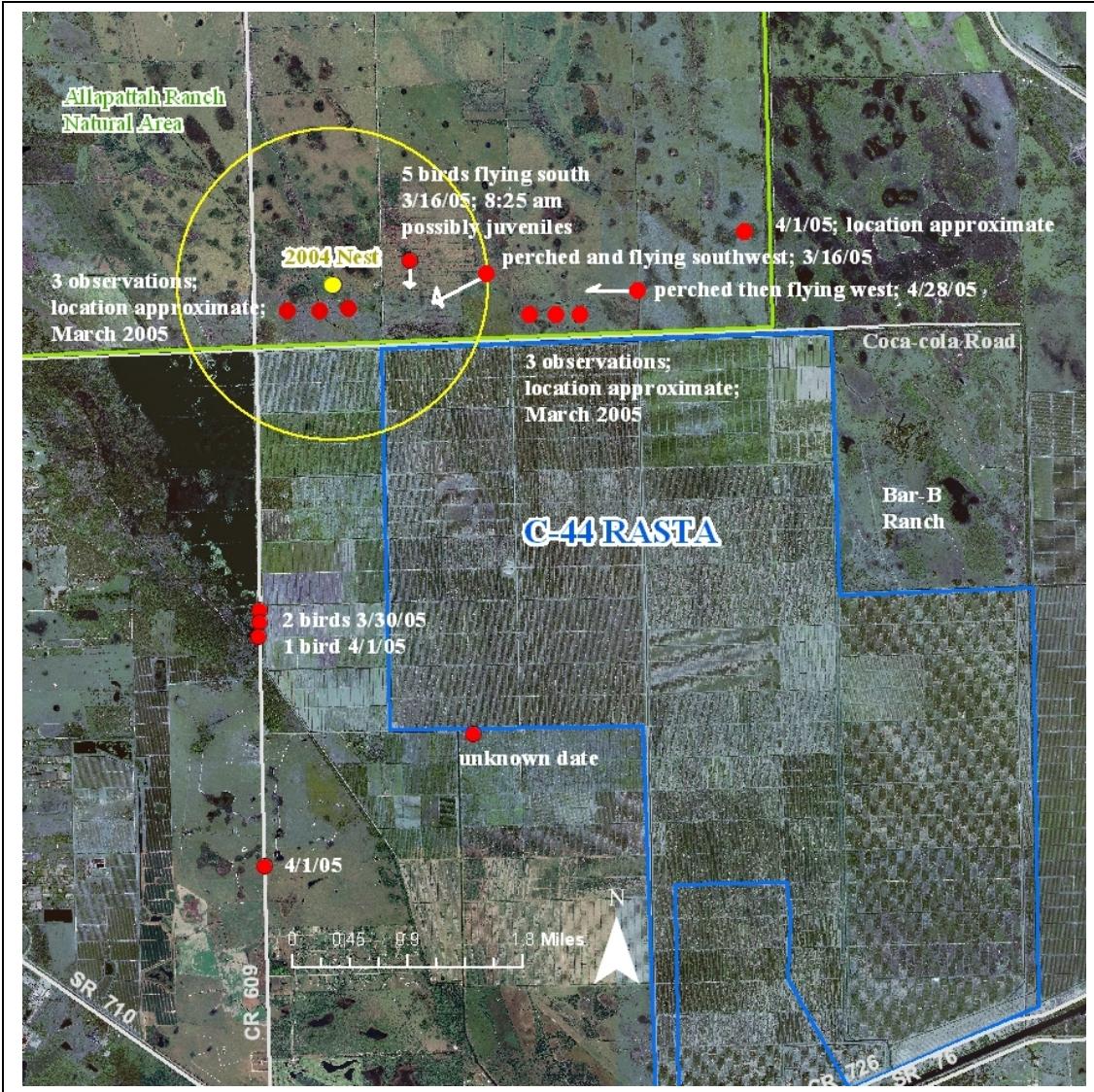


Figure 4. The locations of caracara observations in 2005 (red dots) in relation to the 2004 nest tree (and territory) and the C-44 Reservoir and STA project site (as depicted on a 2004 natural-color aerial photograph).

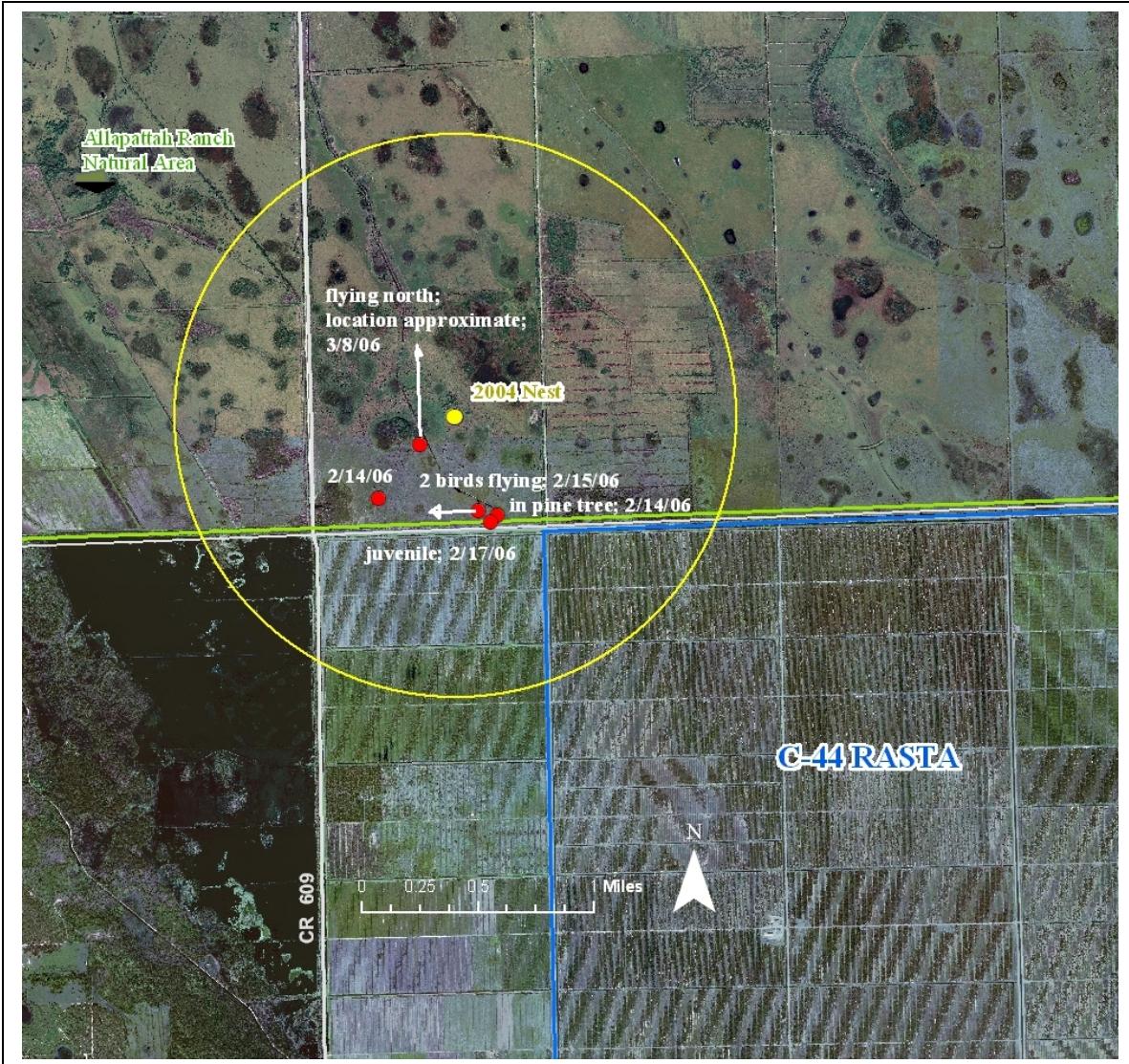


Figure 5. The locations of caracara observations in 2006 (red dots) in relation to the 2004 nest tree (and territory) and the C-44 Reservoir and STA project site (as depicted on a 2004 natural-color aerial photograph).