

Appendix C

ECOLOGICAL ASSESSMENT TECHNICAL MEMORANDUM

for the
***J.W. Corbett Wildlife Management Area
Proposed Land Transfer***

Palm Beach and Martin Counties, Florida

JULY 2005

Prepared For:



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Section 1.0

PURPOSE AND NEED

1.1 INTRODUCTION

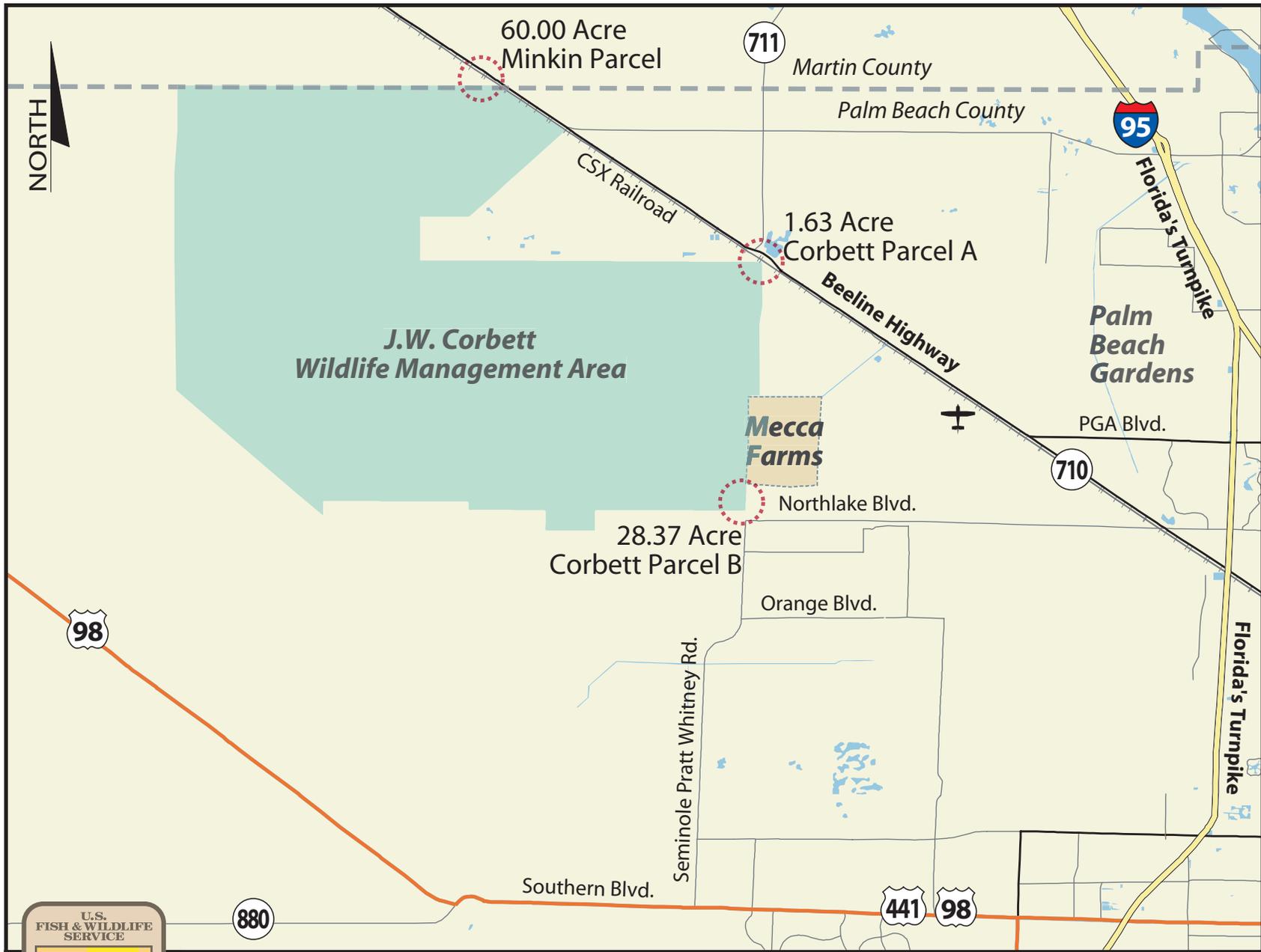
Palm Beach County, Florida (the County), in cooperation with the U.S. Fish and Wildlife Service (the Service, we, our), is preparing an Environmental Assessment (EA) to assess a proposed change in the use of lands within the J.W. Corbett Wildlife Management Area (JWCWMA) in Palm Beach County. Two tracts of JWCWMA land would be used for purposes other than which they were acquired with Federal funds. The proposed action is a transfer of easements, or rights of use, not a fee simple transfer of ownership, which is consistent with the Florida Fish and Wildlife Conservation Commission's (FWC) determination that no surplus lands exist on the JWCWMA. The wildlife-related values of those two tracts would be replaced by adding to the JWCWMA adjacent lands in Martin County, Florida.

This analysis considers the potential direct, indirect, and cumulative impacts associated with the proposed change in use of the JWCWMA lands, as well as the proposed mitigation for those impacts. A vicinity map of the study is depicted on **Figure 1-1**, Project Location Map.

The Service's need is to evaluate and respond to a request that we review for approval, the proposed change in use of the JWCWMA tracts and the replacement of those tracts. The Service's purpose is to maintain and enhance the ecological integrity and wildlife-related values of the JWCWMA and to respond to the request in a manner consistent with our mission, the goals of the Pittman-Robertson Wildlife Restoration Act of 1937, the Employment Act of 1946, the National Environmental Policy Act of 1969 (NEPA), and other statutes, regulations, and Executive Orders.

1.2 BACKGROUND

In a letter dated August 2, 2004, the FWC asked the Service to review for approval the application from the County to the FWC requesting five easement areas on the JWCWMA. The request was made to the Service because acquisition of the JWCWMA was partially funded through the Pittman-Robertson Wildlife Restoration Act (16 US Code [USC] Chapter 669 et seq.). Pittman-Robertson Wildlife Restoration Act funds are generated from excise taxes on certain sporting/hunting equipment and administered through the Service. Accordingly, the Service shares responsibility for authorizing the change in land use and transfer that are to be analyzed.



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PROJECT LOCATION MAP

Figure 1-1

The Scripps Research Institute (TSRI), based in La Jolla, California, has been considering the development of a new East Coast center for biomedical research, technology development, and drug design. The State of Florida (the State), desirous to cultivate a knowledge-based economy through the creation of a biomedical research institute and research cluster, has worked closely with TSRI on locating a potential facility site. After considering several potential locations statewide, a tract in Palm Beach County large enough to accommodate TSRI and any related businesses and support infrastructure that would be expected to follow has been selected and acquired.

The County purchased a 1,919.23-acre tract formerly called Mecca Farms in the north central portion of Palm Beach County, which entirely comprises the proposed future site of the Palm Beach County Biotechnology Research Park (PBCBRP). The site was chosen over other potential locations most significantly because of its size, amount of developable land, and proximity to the amenities offered in north Palm Beach County. The County has asserted, and the State has reviewed and accepted, that none of the other potential sites met the requirements of TSRI and the Palm Beach County Business Development Board.

It is the intention of the County to develop a sustainable and economically viable project by creating a master development plan that clusters land uses specifically to promote intellectual transfer between the researchers and scientists at TSRI and other related companies located nearby within the PBCBRP. Both the State and the County are providing economic stimulus packages to help establish the initial facility.

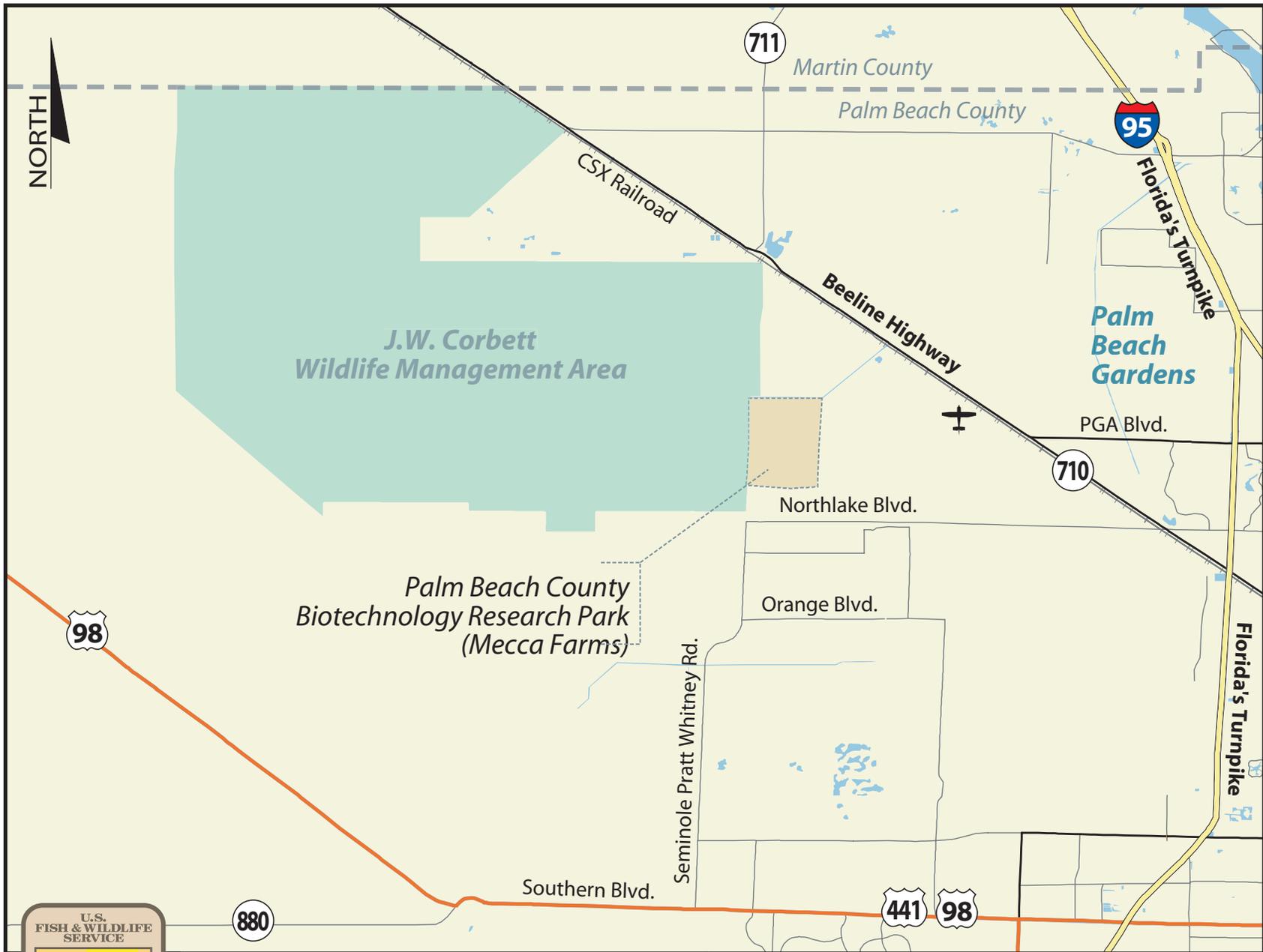
In May 2004, the County submitted a Development of Regional Impact (DRI) Application for Development Approval (ADA) for the PBCBRP project site (see **Figure 1-2**) to the State for subsequent approval. TSRI would occupy approximately 102.03 acres of the site.¹ Much of the remaining land would be made available to other biotechnology companies and related high technology industries and support infrastructure. The County also proposes to use a portion of the property to enhance surrounding environmentally-sensitive lands, meet regional water management goals, and to buffer nearby residents.

The County has determined that key infrastructure components of the proposed PBCBRP would occur off the PBCBRP project site. The County, with concurrence from FWC, has determined that there is no other reasonable alternative but to utilize parts of the JWCWMA, which adjoins the proposed PBCBRP, for these key infrastructure components.² The infrastructure plans call for the construction of a new Florida Power & Light (FP&L) substation and transmission poles/lines, modifications to the Corbett Canal, and the widening and extension of Seminole Pratt Whitney Road, all which are within the JWCWMA. The FWC also determined that the proposed change in use of the JWCWMA tracts is inconsistent with the purposes for which the tracts were acquired.³

¹ PBCBRP ADA, Part II, Question 10, Page 10-1, May 10, 2004.

² Palm Beach County Request for JWCWMA Easements, June 3, 2004.

³ FWC letter dated August 2, 2004.



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**PALM BEACH COUNTY
BIOTECHNOLOGY RESEARCH PARK
LOCATION MAP**

Figure 1-2

Plans to widen and extend Seminole Pratt Whitney Road and to modify the Corbett Canal existed as speculative plans before the PBCBRP proposal was developed. Widening and extending Seminole Pratt Whitney Road is included in the adopted 2030 Long Range Transportation Plan (LRTP) for Palm Beach County and the 2030 Adopted Cost Feasible Plan Map. The 2030 Thoroughfare Roadway Plan has also identified the widening and extension of Seminole Pratt Whitney Road as necessary to accommodate future growth in north central Palm Beach County. In addition, the Comprehensive Everglades Restoration Plan (CERP) calls for creating new waterway corridors to move water from the L-8 reservoir located south of the JWCWMA northward along the property to the existing C-18 canal and eventually to the Loxahatchee Slough and River. The proposed Master Plan for the PBCBRP shows a “flow way” to be constructed along its western boundary to accommodate the waterway corridor through its site. The proposed land transfer on the JWCWMA takes into account flow way alternative being considered by CERP to improve flows to the Loxahatchee River.

1.3 SUMMARY OF PUBLIC PARTICIPATION, ISSUES, AND CONCERNS

The scoping process indicates that there is broad public interest in a range of secondary and related cumulative effects of the proposal to transfer interests in approximately 30 acres of the JWCWMA to the County and receive a 60-acre tract of land as replacement land. That is, the public appears to view the proposed transfer of JWCWMA lands from the perspective of regional development trends. Furthermore, the public interest in development trends encompasses a wide range of factors, from traffic and pollution to infill of undeveloped areas.

This suggests that, to facilitate public involvement, our analysis should follow a presentation format that differs from the Service’s traditional approach. Typically, the Service separates anticipated effects into direct, indirect (or secondary), and cumulative analyses. Direct and indirect effects are the activity-specific effects on resource, ecosystem, and human community components of interest for the analysis (Components or Indicators). Cumulative effects, on the other hand, are Component-based. Cumulative effects analyses start with an understanding of the general status and trends of the Component and try to predict how the activity would affect those trends; the influence could be neutral, synergistic, countervailing, additive, or subtractive.

The presentation format suggested by our scoping process is incorporated into the Environmental Consequences section of this document. The Service and other stakeholders and coordinating agencies must consider some specific Components, such as those that indicate how the proposal would affect the ecological integrity and wildlife-related values of the JWCWMA, so the Environmental Consequences section blends the Service’s traditional presentation format with the public involvement format suggested in the scoping process. The scoping process also leads us to believe that this document successfully incorporates the planning, analytic, and public inputs, including public comments, that informed local, state, and Federal decisions related to various aspects of the PBCBRP proposal.

The Service, in conjunction with the FWC and the County, initiated an inclusive outreach program in conjunction with our analysis of the proposal. The Service provided opportunities for public comment and review of this EA and open house style public information meetings. The proposed land transfer is a small but related part of a larger development project that is controversial in the County.

Key elements of the project outreach program are discussed here. These outreach elements are comprehensive and form a framework to solicit and incorporate public involvement during our consideration of the proposed action.

1.3.1 EA ADVANCE NOTIFICATION PROCESS

The Service, through the Advance Notification Process, informed Federal, state, and local government agencies of the outline of this EA and its scope. The Service initiated project coordination on November 16, 2004, by distribution of an Advance Notification package to the Florida Department of Environmental Protection (DEP) - Florida State Clearinghouse. The Service and DEP will ensure that the County's request for permission to change the authorized use of certain tracts within the JWCWMA and the related environmental documents are reviewed in accordance with the intergovernmental coordination and review procedures administered by the State Clearinghouse. Appendix A of the EA contains a copy of the Advance Notification package and the cover letter with the agency mailing list.

1.3.2 EA NOTICE OF AVAILABILITY

The Service has advertised in the local Palm Beach Post newspaper the public availability of the EA. The Service has also noticed the public, media, elected officials, agencies, and special interest groups of the EA's availability through the use of individual notification letters, media packages, press releases, teleconferences, and creation of a dedicated internet web site (<http://southeast.fws.gov>).

1.3.3 EA PUBLIC INFORMATION MEETING

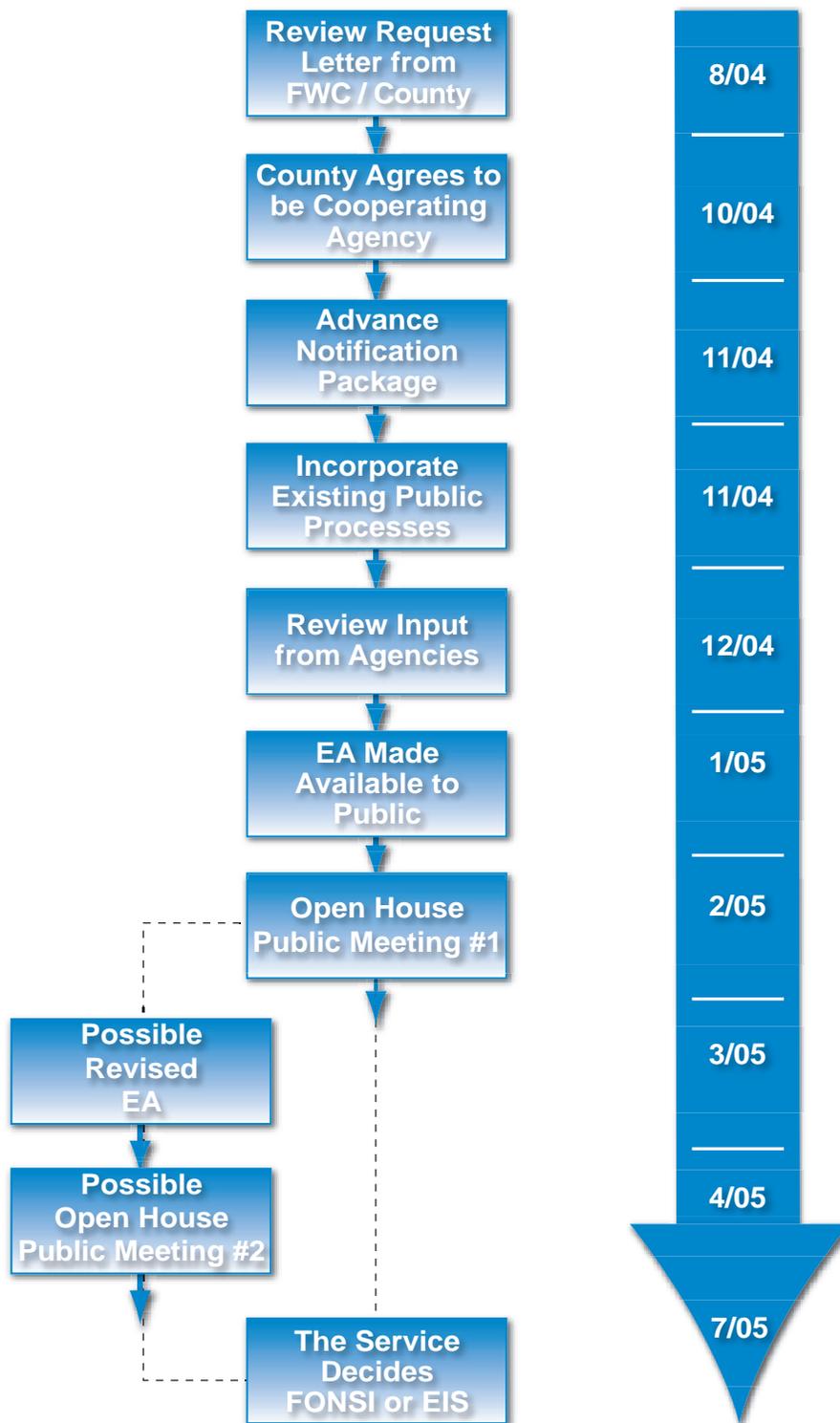
On February 2, 2005 (after 23 days of EA public availability), the Service conducted a Public Open House Meeting to allow the public to review and comment on the EA. The comment period for the EA remained open for 10 days after the Public Open House Meeting, with the comment period ending February 14, 2005 (public comment period was a total of 33 days). A total of 30 comments were received as a result of the Service's request for public comments. A summary of the meeting and copies of all comments are included in Appendix F. Appendix F also includes the Service's responses to the comments. The comments have been incorporated and text revised in the EA where appropriate.

1.3.4 REVISED EA PUBLIC NOTICE

The Service is committed and has revised all or parts of this document where public comments or our analysis raised new information or issues that warranted such actions.

Based on comments we received during the public comment period and our own analysis of information presented in the EA, the Service determined that additional public review and comment was not warranted.

The Service's NEPA process and milestones are shown on **Figure 1-3**. The Service has determined that the proposal is unlikely to have a significant impact. Therefore, we have published an associated Finding of No Significant Impact (FONSI) based on this EA.



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**US FISH AND WILDLIFE SERVICE
NEPA PROCESS AND MILESTONES**

Figure 1-3

Section 2.0

ALTERNATIVES

2.1 INTRODUCTION

As part of the EA process for analyzing the proposed JWCWMA land transfer, the following factors were taken into consideration:

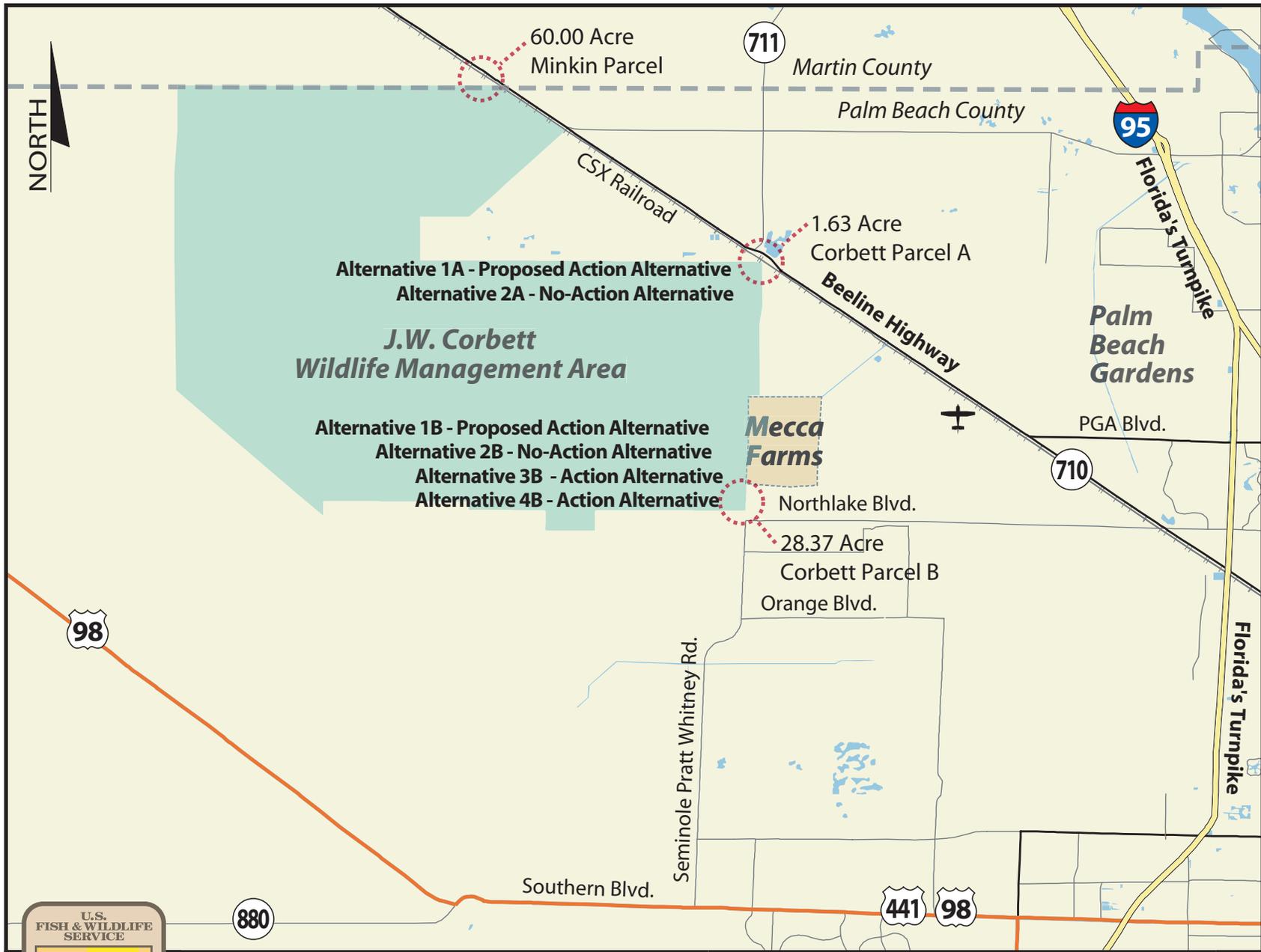
- **Engineering:** The design and location of the proposed improvement facilities;
- **Environmental:** Social, cultural, natural and physical factors; and
- **Public Involvement:** Needs and concerns of the local community.

The following sections describe the viable alternatives that were considered and could fulfill the purpose and need for the proposed action.

The proposed action includes a change in the use of lands within the JWCWMA. Two tracts of JWCWMA land (Corbett Parcel A and Corbett Parcel B) located in Palm Beach County, Florida, would be used for purposes other than those for which they were acquired; the wildlife-related values of those tracts would be replaced through the addition of lands adjoining the JWCWMA in Martin County, Florida (see Section 1.0, Purpose and Need, and Figure 1-1, Project Location Map). The change in land use within Corbett Parcels A and B and the associated replacement of wildlife-related values through the addition of Martin County lands would accommodate key infrastructure components of the proposed PBCBRP.

There are alternative actions for each of the JWCWMA parcels under evaluation in this EA. **Figure 2-1** shows the alternative actions for Corbett Parcels A and B. To enhance our analysis, we consider alternatives to the proposed Parcel A transfer independent of the proposed Parcel B transfer. Thus, we have two alternatives that comprise the proposed transfer (1A and 1B), two alternatives that comprise our no-action alternative (2A and 2B), and two alternative configurations of Parcel B that could address our need and partially address the County's goals (3B and 4B). Listed below are the alternatives discussed in this section:

- **Parcel A Alternative 1A:** This alternative is identified as the proposed action alternative and would require the transfer of 1.63 acres of JWCWMA land;
- **Parcel A Alternative 2A:** This alternative is identified as the no-action alternative and would not require any land from the JWCWMA;
- **Parcel B Alternative 1B:** This alternative is identified as the proposed action alternative and would require the transfer of 28.37 acres of JWCWMA land;



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ALTERNATIVE ACTION LOCATIONS

Figure 2-1

- **Parcel B Alternative 2B:** This alternative is identified as the no-action alternative and would not require any land from the JWCWMA;
- **Parcel B Alternative 3B:** This alternative is an optional action alternative and would require the transfer of 8.11 acres of JWCWMA land; and
- **Parcel B Alternative 4B:** This alternative is an optional action alternative and would require the transfer of 5.44 acres of JWCWMA land.

2.2 *ALTERNATIVES*

2.2.1 *CORBETT PARCEL A ALTERNATIVES*

2.2.1.1 *Alternative 1A*

The Service, in coordination with Palm Beach County and the Florida Department of Transportation (FDOT), has modified the size of the proposed Parcel A easement transfer as a result of discussions initiated through the Advanced Notification process. The total acreage believed necessary for the proposed realignment of the Seminole Pratt Whitney Road extension is 1.63 acres. The proposed transfer of Parcel A has been increased from the FWC's request of 1.25 acres to 1.63 acres. This modification would accommodate the typical section of a staged two-lane and four-lane roadway, and if ultimately necessary a six-lane roadway. The modified proposal takes advantage of the present process to ensure a holistic analysis instead of piece-mealing easement requests. The proposal would approve the FWC's current request, and would pre-approve FWC authorization of an additional easement transfer request, which is anticipated to coincide with the start of construction of the realignment of the Seminole Pratt Whitney Road extension. The FWC's original request to approve the transfer of easements on 1.25 acres at Parcel A will not be considered because of information gained during the Advanced Notification process.

Alternative 1A is the proposed action alternative for Corbett Parcel A (see **Figure 2-2**). Located at the northeast corner of the JWCWMA, this 1.63-acre parcel would accommodate the construction of a future two-lane, expandable to four- or six-lane divided, connection of Seminole Pratt Whitney Road to the Beeline Highway (State Road 710 [SR 710]). South of Parcel A, the County is proposing a four-lane roadway, expandable to six lanes, through the Mecca property to its south boundary, and from there continuing south as a six-lane roadway to Northlake Boulevard. In order for Seminole Pratt Whitney Road to connect to SR 710, it is necessary to cross existing CSX railroad tracks; the proposed action calls for utilizing the existing railroad crossing at the Pratt Whitney facility entrance. The CSX rail crossing would be upgraded as necessary to safely accommodate the additional lanes in accordance with the County, FDOT, and CSX rules and regulations. In order to make the westerly turn required to align with the existing crossing, it is necessary to cross a corner of the JWCWMA; this crossing results in the 1.63-acre impact.

2.2.1.2 *Alternative 2A*

Alternative 2A is the no-action alternative for Parcel A (see **Figure 2-3**) and would not involve an easement across the JWCWMA. This concept would place the new alignment for the Seminole Pratt Whitney Road extension entirely to the east of Parcel A on County-owned lands, cross the CSX railroad line above-grade, and interchange with SR 710 without any direct impact to the JWCWMA. Due to the close proximity of the potential new CSX crossing to the CSX spur track immediately to the east, and the existing Pratt-Whitney facility road crossing to the west, a grade-separated crossing of CSX would be required. This grade-separated crossing would require a minimum 23.5-foot clearance over the railroad. Approximately 19 to 20 trains per day use this section of CSX railroad line and it is also an AMTRAK route.

2.2.2 *CORBETT PARCEL B ALTERNATIVES*

2.2.2.1 *Alternative 1B*

Alternative 1B is the proposed action alternative for Corbett Parcel B (see **Figure 2-4**). This alternative would utilize an easement across the southeast corner of the JWCWMA. The easement would include 4.73 acres to accommodate the proposed 60-foot widening of Seminole Pratt Whitney Road including an underground power distribution line; 13.91 acres to allow for the construction of a 150-foot “canal/flow way” (i.e., Corbett Canal) by the South Florida Water Management District (SFWMD) as part of the CERP Project; 3.36 acres for the construction of a 40-foot canal maintenance area; and 6.37 acres to accommodate an electrical substation for FP&L adjacent to the existing power line transmission corridor. The canal maintenance area on the east side of the proposed Corbett Canal would also provide for a hiking/biking/equestrian trail (activities trail) to a proposed trailhead located immediately east of the JWCWMA South Entrance. The total acreage that would be impacted in the JWCWMA for this alternative is 28.37 acres. In addition to the JWCWMA impacts, the expansion of Seminole Pratt Whitney Road south of the JWCWMA to Northlake Boulevard would require the taking of land from six residential properties on the west side of Seminole Pratt Whitney Road.

2.2.2.2 *Alternative 2B*

Alternative 2B is the no-action alternative for Parcel B (see **Figure 2-5**). This alternative accepts County assertions that all of the right-of-way for the expansion of Seminole Pratt Whitney Road within a 60-foot right-of-way would be obtained from properties on the east side of the existing Seminole Pratt Whitney Road, including residential lots in the area known as “The Acreage” between Northlake Boulevard and the Mecca property.⁴ The electrical substation would be sited on 7.13 acres at the northeast corner of the intersection of the existing electrical transmission lines and Seminole Pratt Whitney Road. Underground power distribution lines would be run within a 60-foot additional FP&L easement north from the substation to the PBCBRP site. This alternative would have no involvement with the JWCWMA adjacent to and south of the PBCBRP site. This alternative does not include any accommodation for a canal/flow way or an activities trail.

⁴ Memorandum from Palm Beach County to U.S. Fish and Wildlife Service, December 28, 2004.

The Service accepts, for the purpose of this analysis, the County's assertion that condemnation of the 60-foot road right-of-way and 60-foot utility easement would be required from several residential properties fronting on the east side of the existing Seminole Pratt Whitney Road from Northlake Boulevard north to the Mecca property. County condemnation proceedings for approximately eight residential properties (whole takes) would be required for the substation and roadway right-of-way.⁵ A total of 20 residential properties would be directly impacted by condemnation under this alternative.

2.2.2.3 Alternative 3B

Alternative 3B would include the 60-foot expansion of Seminole Pratt Whitney Road on the east side of the existing roadway (requiring condemnation of right-of-way from 17 residential lots in The Acreage) and two new overhead power transmission lines in the JWCWMA to connect to a proposed utility pod in the PBCBRP (see **Figure 2-6**). One of the new overhead transmission lines would be a single circuit transmission line within a 30-foot easement (4.02 acres) that would run along the west side of Seminole Pratt Whitney Road north to an electric substation within the PBCBRP. The second proposed overhead transmission line within a 60-foot easement (4.09 acres) would be a single circuit from the existing transmission corridor in the JWCWMA east to the electric substation in the PBCBRP, a distance of approximately 3,000 feet, with an above-grade patrol road for maintenance purposes. This alternative does not include any accommodation for a canal/flow way or an activities trail. The total acreage that would be impacted in the JWCWMA for this alternative is 8.11 acres. In addition to the 8.11 acres directly impacted, this alternative creates, from a management perspective, a completely isolated 138-acre parcel of property within the JWCWMA bordered by the existing and proposed FP&L transmission line easements.

2.2.2.4 Alternative 4B

Alternative 4B would include the 60-foot expansion of Seminole Pratt Whitney Road on the east side of the existing roadway (requiring right-of-way taking from 17 residential lots in The Acreage) and a new power transmission line in the JWCWMA to connect to a proposed utility pod in the PBCBRP (see **Figure 2-7**). The new transmission line would run from the existing transmission corridor in the JWCWMA east to the substation in the PBCBRP, a distance of approximately 3,000 feet. The corridor for this transmission line would be 80 feet in width and requires 5.44 acres of land from the JWCWMA. This alternative does not include any accommodation for a canal/flow way or an activities trail. The total acreage that would be impacted in the JWCWMA for this alternative is 5.44 acres. In addition to the 5.44 acres directly impacted, this alternative creates, from a management perspective, a completely isolated 138-acre parcel of property within the JWCWMA bordered by the existing and proposed FP&L transmission line easements.

⁵ Chapter 361.01, Florida Statutes (F.S.), 2004.

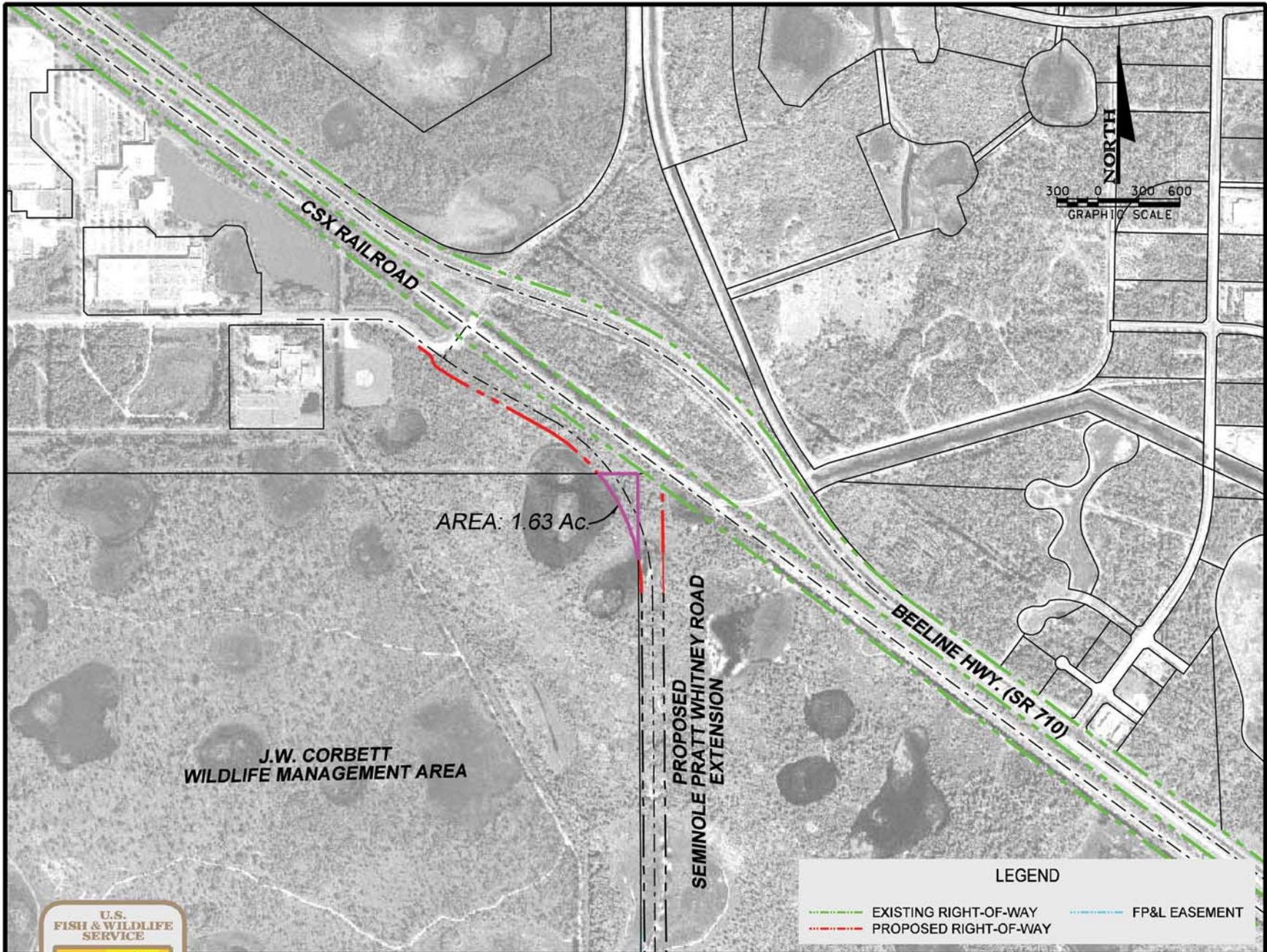
The direct, indirect (secondary), and cumulative impacts to the JWCWMA associated with the land transfer and easement actions are discussed in the Environmental Consequences section of this report.

Table 2-1 provides a summary of the alternatives.

**TABLE 2-1
SUMMARY OF ALTERNATIVES**

	Alternative 1A	Alternative 2A	Alternative 1B	Alternative 2B	Alternative 3B*	Alternative 4B*
Total Land (acres)	11.55	20.19	30.66	15.95	14.51	11.84
JWCWMA Land (acres)	1.63	0	28.37	0	8.11	5.44
Outside JWCWMA Land (acres)	9.92	20.19	2.29	15.95	6.40	6.40
Residential Relocations	0	0	0	8	5	5
Non-JWCWMA Parcels Impacted	2	4	6	20	17	17
CSX Crossing	At-Grade	Above-Grade	N/A	N/A	N/A	N/A

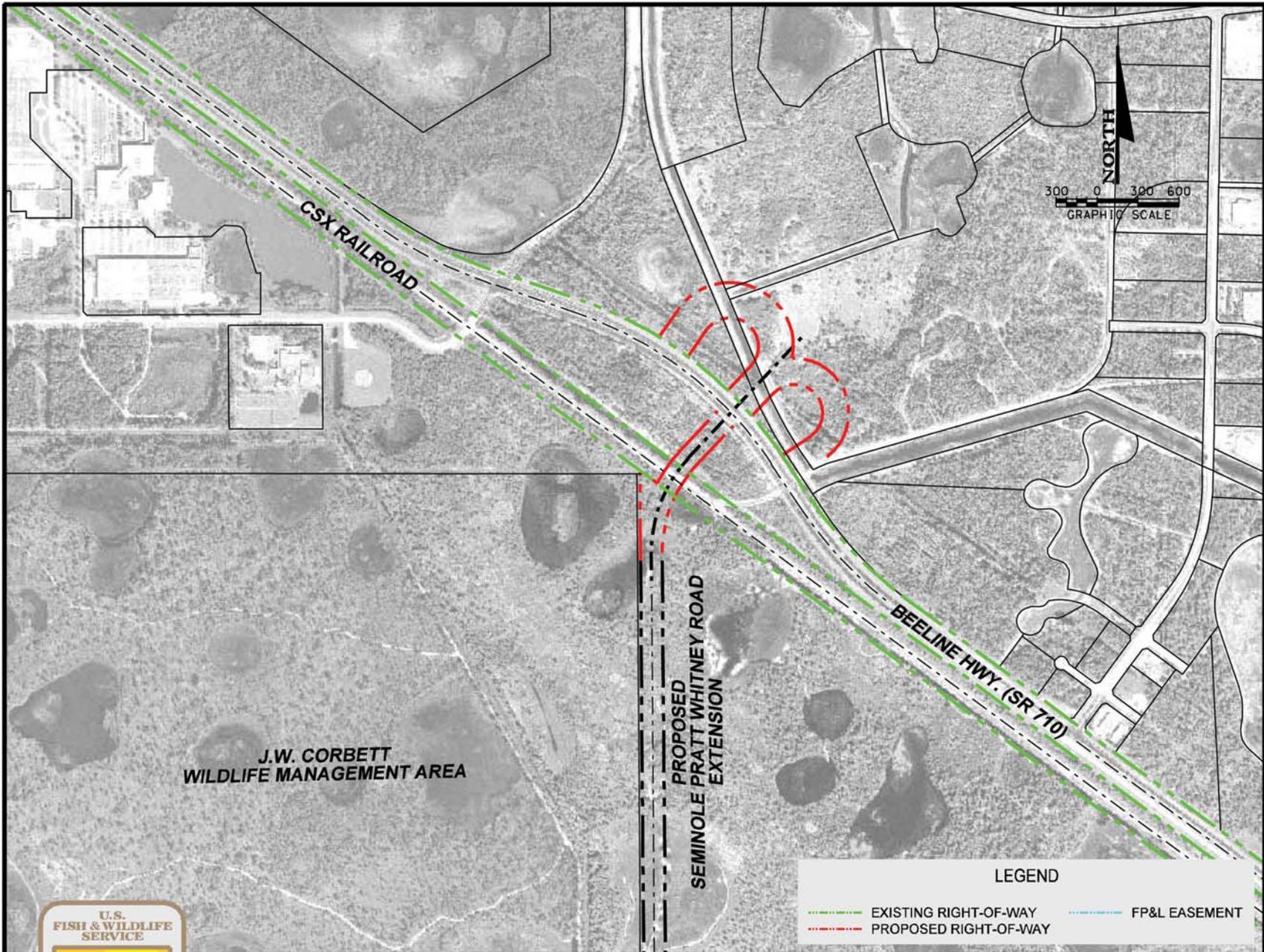
* Impacts associated with Alternatives 3B and 4B do not include the additional 138-acre parcel isolated within the JWCWMA.



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ALTERNATIVE 1-A

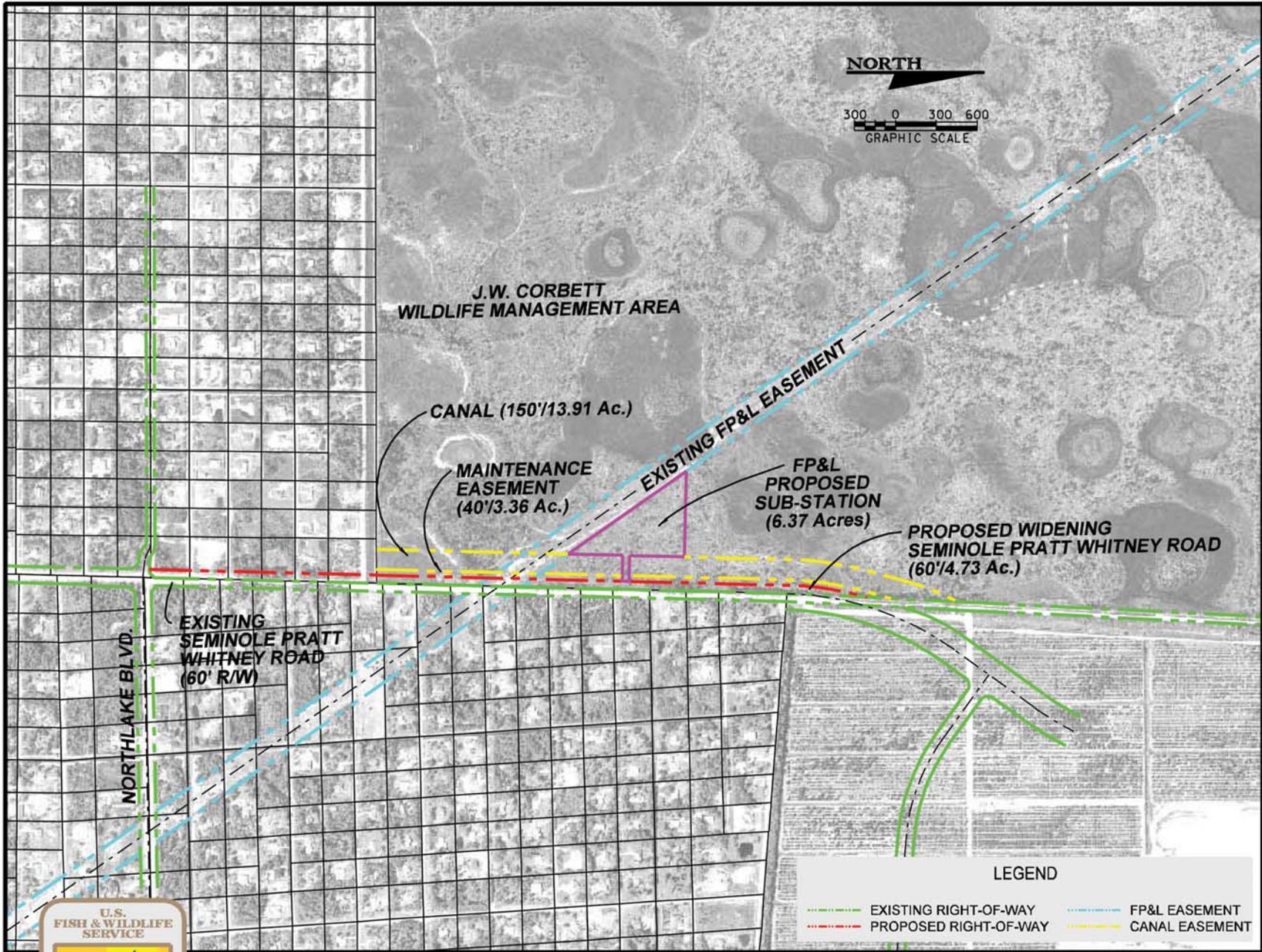
Figure 2-2



*J.W. Corbett Wildlife Management Area
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**ALTERNATIVE 2-A
(NO ACTION)**

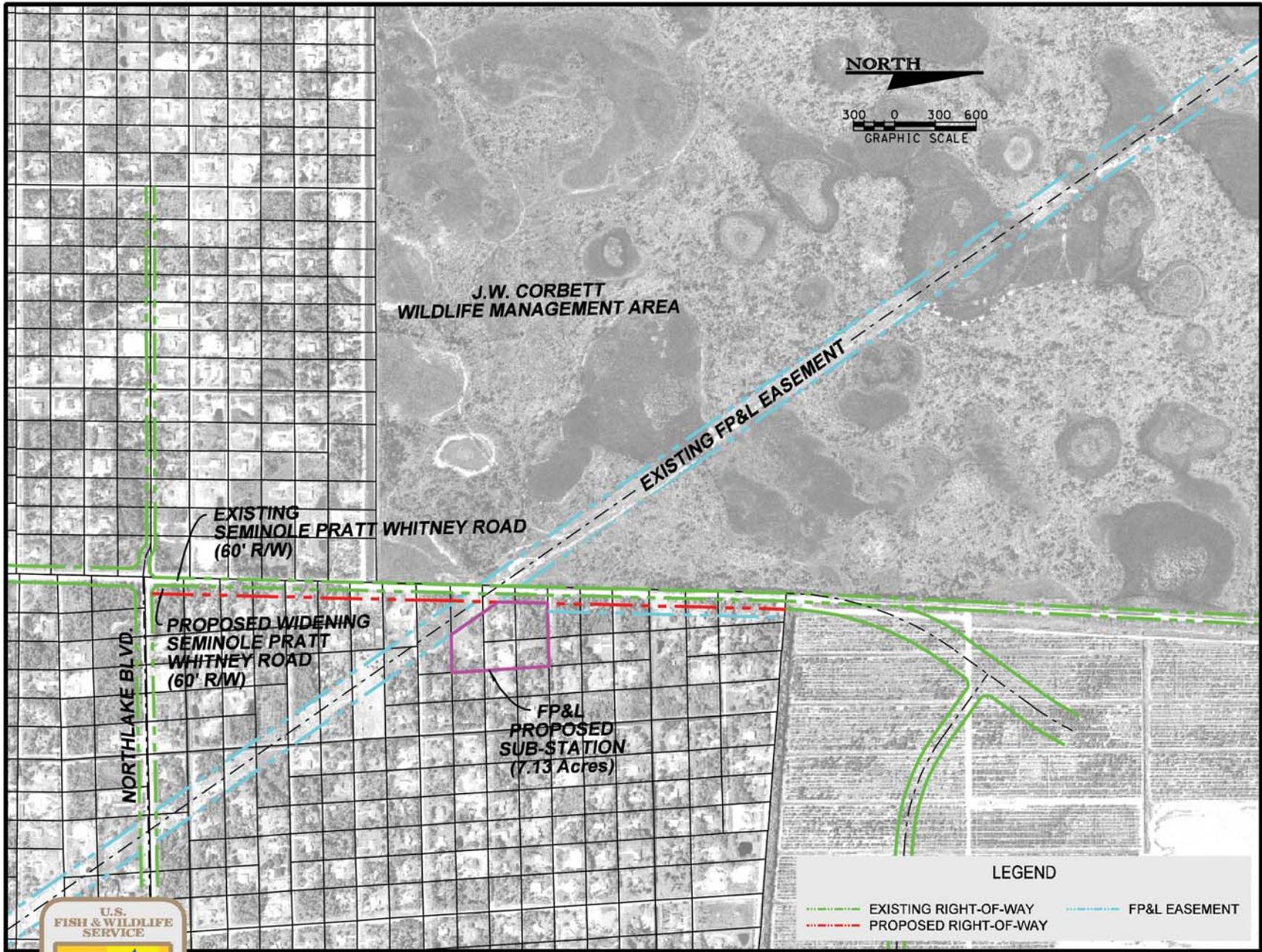
Figure 2-3



*J.W. Corbett Wildlife Management Area
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ALTERNATIVE 1-B

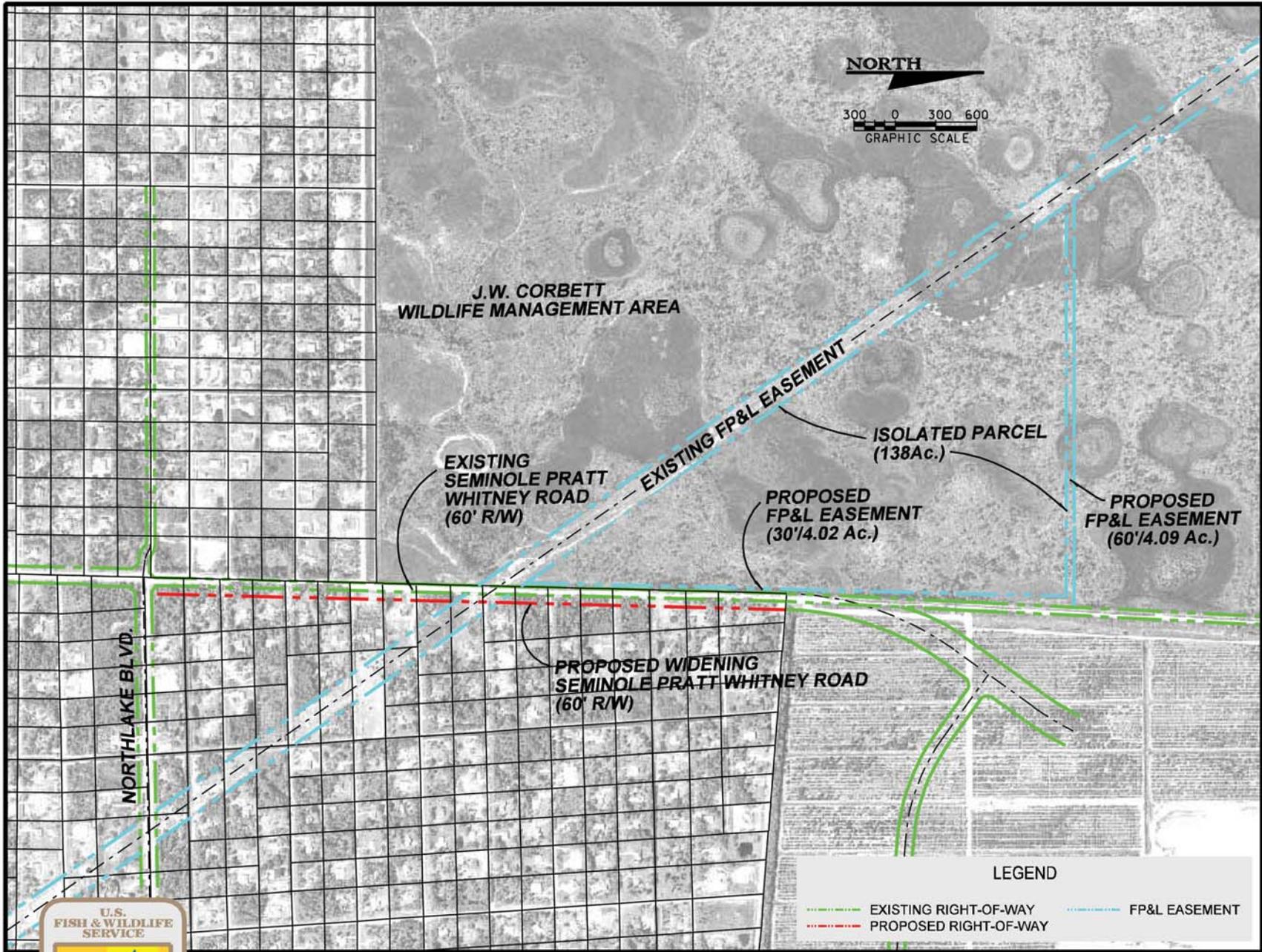
Figure 2-4



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**ALTERNATIVE 2-B
(NO ACTION)**

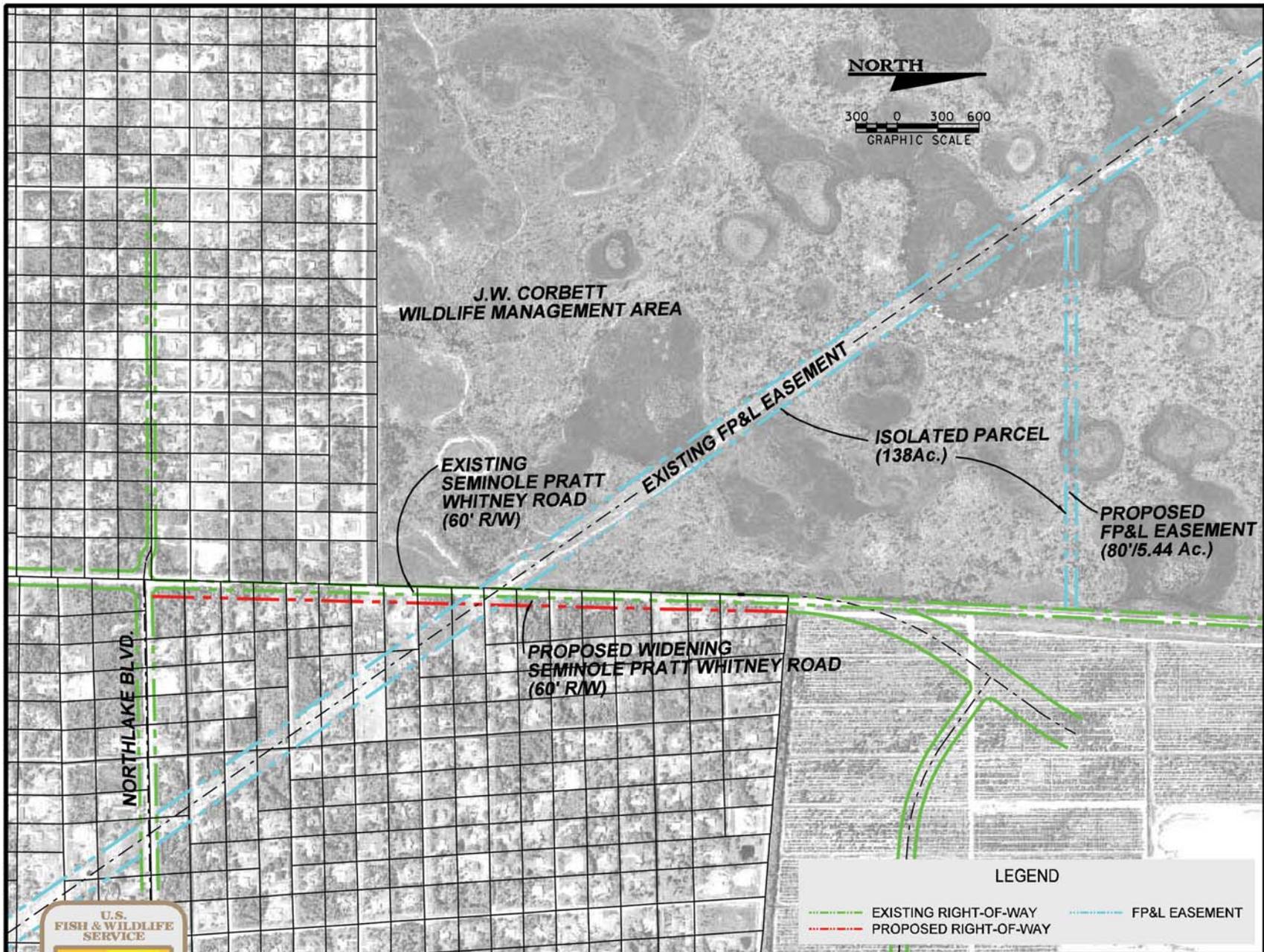
Figure 2-5



*J.W. Corbett Wildlife Management Area
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ALTERNATIVE 3-B

Figure 2-6



*J.W. Corbett Wildlife Management Area
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ALTERNATIVE 4-B

Figure 2-7

Section 3.0

METHODOLOGY AND FINDINGS

3.1 INTRODUCTION

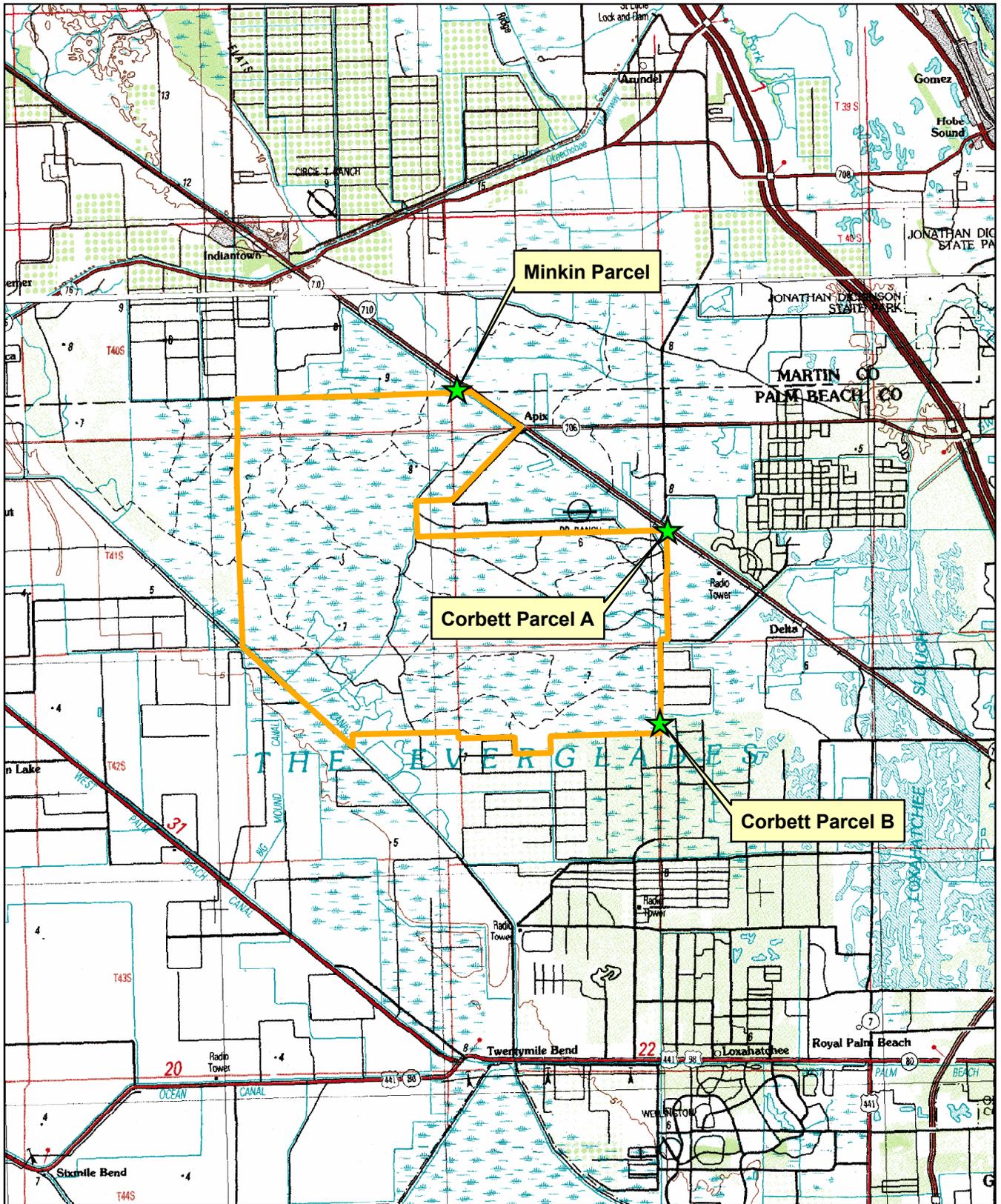
The purpose of this memorandum is to classify the upland and wetland community types associated with the above referenced project and to evaluate these existing communities for the potential occurrences of Federal and state listed threatened and endangered plant and animal species. To accomplish these tasks, site-specific information was first obtained and reviewed. Information reviewed included:

- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service, Soil Survey of Palm Beach County Area, Florida (1978) and Soil Survey of Martin County Area, Florida (1981);
- Florida Association of Professional Soil Classifiers, Hydric Soils of Florida Handbook (Carlisle, 1995);
- Blue-line and black-line aerial photographs of the study areas (scale and year varied);
- Florida Natural Areas Inventory (FNAI), Palm Beach County Endangered Species Occurrence Summary (January 2004), and Martin County Endangered Species Occurrence Summary (January 2004);
- FWC Eagle Nest Locator website;
- Florida Department of Transportation, Florida Land Use, Cover, and Forms Classification System Handbook (FLUCFCS) (3rd ed., 1999); and
- U.S. Fish and Wildlife Service, Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

The proposed action includes a change in the use of 30 acres of land within the JWCWMA. Two tracts of JWCWMA land (Corbett Parcel A and Corbett Parcel B) located in Palm Beach County, Florida, are proposed to be used for purposes other than those for which they were acquired. The wildlife-related values of these tracts would be replaced through the addition of approximately 60 acres of land in Martin County, Florida known as the Minkin Parcel. The location of the various parcels associated with this project is depicted on **Figure 3-1**.

On November 17 and 22 through 24, 2004, field reviews of the project study areas were conducted by URS biologists. The information contained within this memorandum was derived from those field reviews in conjunction with existing site specific data collected and reviewed as part of this assessment.

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 J.W. Corbett
Wildlife Management Area

Project Location Map



Basemap: 1:250000 West Palm Beach and
Fort Pierce Quadrangles, USGS

Figure 3-1

General descriptions of the upland and wetland habitat types found within the various action alternatives for Corbett Parcel A and Corbett Parcel B are provided below. In addition, descriptions of the habitats found within a 60-acre parcel located within Martin County, Florida and proposed as compensation for lost use of Corbett lands is also provided. Photographs of each habitat found within project alternatives are provided in Appendix A. All upland habitats were classified utilizing FLUCFCS (FDOT, 1999) and all wetlands were classified using FLUCFCS and the Service's Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979). Representative photos of each wetland and upland habitat type are provided in Appendix A.

3.2 JWCWMA LAND TRANSFER ALTERNATIVES

3.2.1 SOILS

Based upon the USDA - NRCS, Soil Survey for Palm Beach County, six soil types are mapped within the project study area (see **Figure 3-2**). According to the Hydric Soils of Florida Handbook (Carlisle, 1995) four of the soil types are considered hydric soil types and four are considered non-hydric soil types.

Listed below are the soil types found within the study area, their corresponding NRCS reference number for soils of Palm Beach County, Florida, and general descriptions of their characteristics.

Boca fine sand (10)

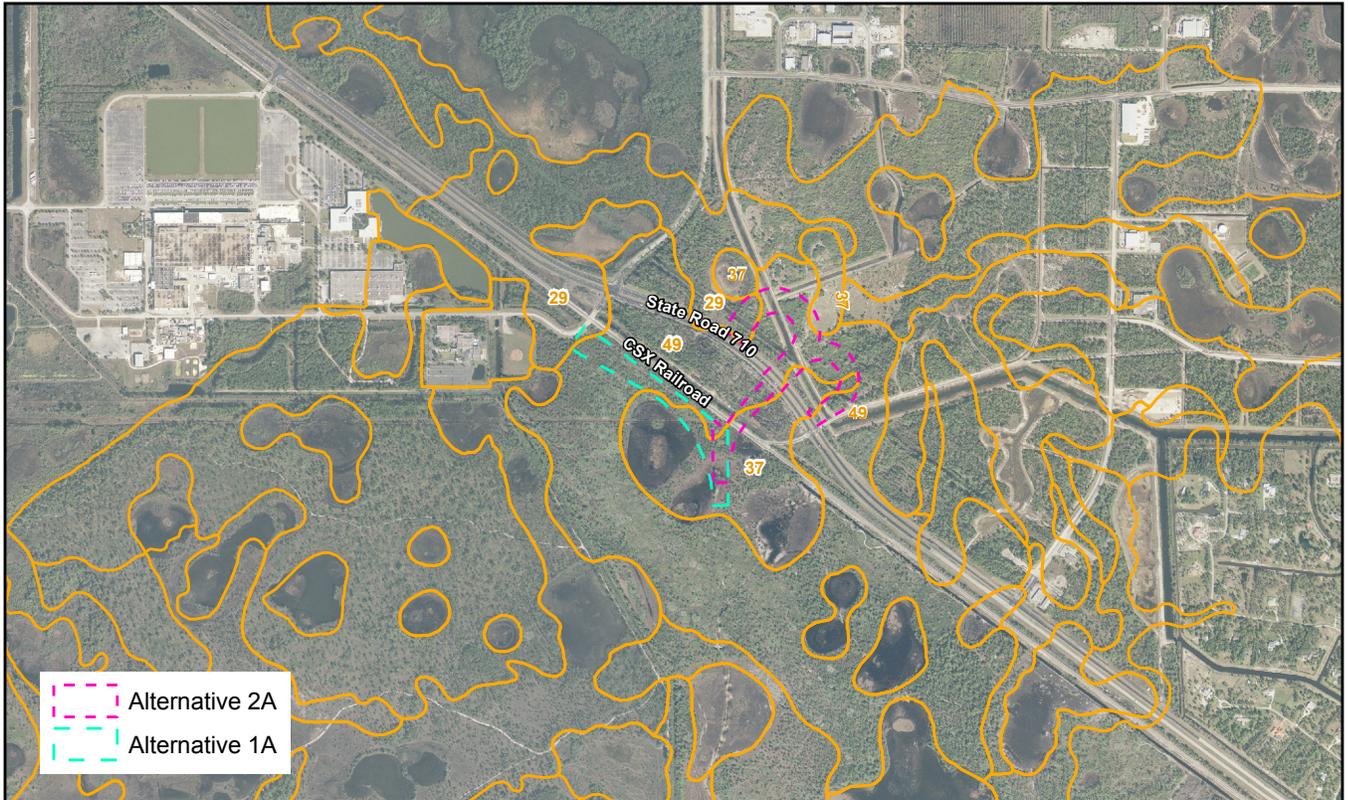
This is a nearly level, poorly drained soil that has a loamy subsoil that is underlain by fractured limestone at a depth of 24 to 40 inches. Under natural conditions, the water table is within 10 inches of the surface up to 2 to 4 months and is in the limestone during the dry periods. This soil is not classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

Pineda Fine Sand (29)

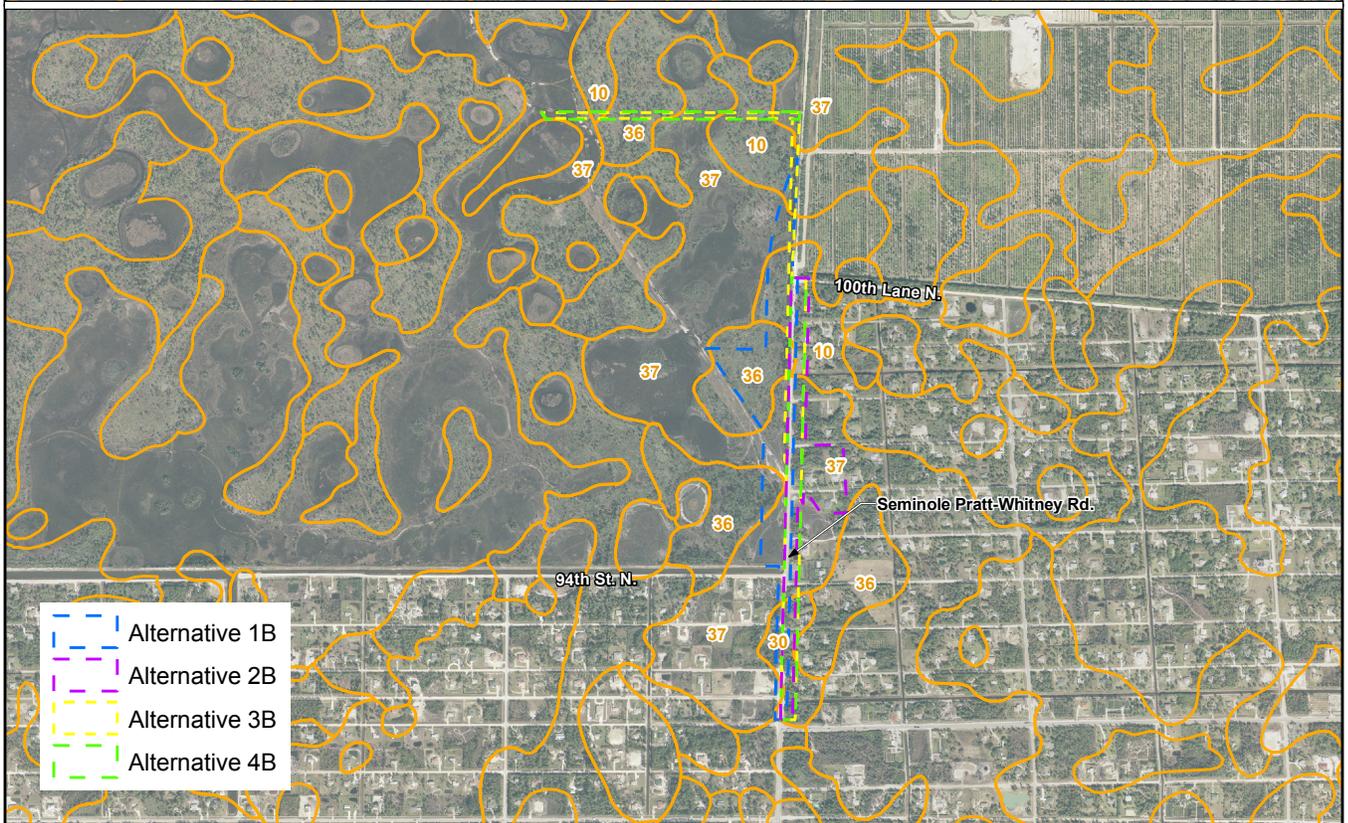
This soil is a nearly level, poorly drained, sandy soil over loamy material. Under normal conditions, the water table is within 10 inches of the surface for 1 to 6 months in most years and within 10 to 30 inches most of the remainder of each year, except during extended dry periods. Water typically covers depressions within this soil for 1 to 3 months. This soil is classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

Pinellas fine sand (30)

This is a nearly level, poorly drained soil that has a sandy, calcareous subsurface layer and a loamy subsoil. Under natural conditions, the water table is within 10 inches of the surface for 1 to 3 months and within 10 to 30 inches for 2 to 6 months for most years. This soil is not classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).



- Alternative 2A
- Alternative 1A



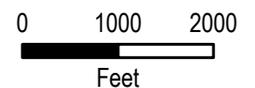
- Alternative 1B
- Alternative 2B
- Alternative 3B
- Alternative 4B

- 37 Soil w/Map Unit ID
- 10 - Boca Fine Sand
- 29 - Pineda Fine Sand
- 30 - Pinellas Fine Sand
- 36 - Riviera Fine Sand
- 37 - Riviera; Fine Sand Depressional
- 49 - Wabasso Fine Sand

J.W. Corbett W.M.A.
Land Transfer
Ecological Assessment

Palm Beach County Soils Map

Figure 3-2



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Riviera fine sand (36)

This is a nearly level, poorly drained soil that has a thick sandy subsurface layer that tongues into a loamy subsoil at a depth of 20 to 40 inches. Under natural conditions, the water table is within 10 inches of the surface for 2 to 4 months in most years and within 10 to 30 inches for most of the remaining year. This soil is not classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

Riviera fine sand, depressional (37)

This is a nearly level, poorly drained soil that has a loamy subsoil. This soil is in shallow, well defined depressions and is covered with up to 2 feet of water for more than 6 months each year. This soil is classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

Wabasso fine sand (49)

This is a nearly level, poorly drained, sandy soil that has a black weakly cemented sand layer over loamy material. Under natural conditions, the water table is within 10 inches of the surface for 1 to 4 months in most years and between 10 to 40 inches for most of the remaining year. This soil is classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

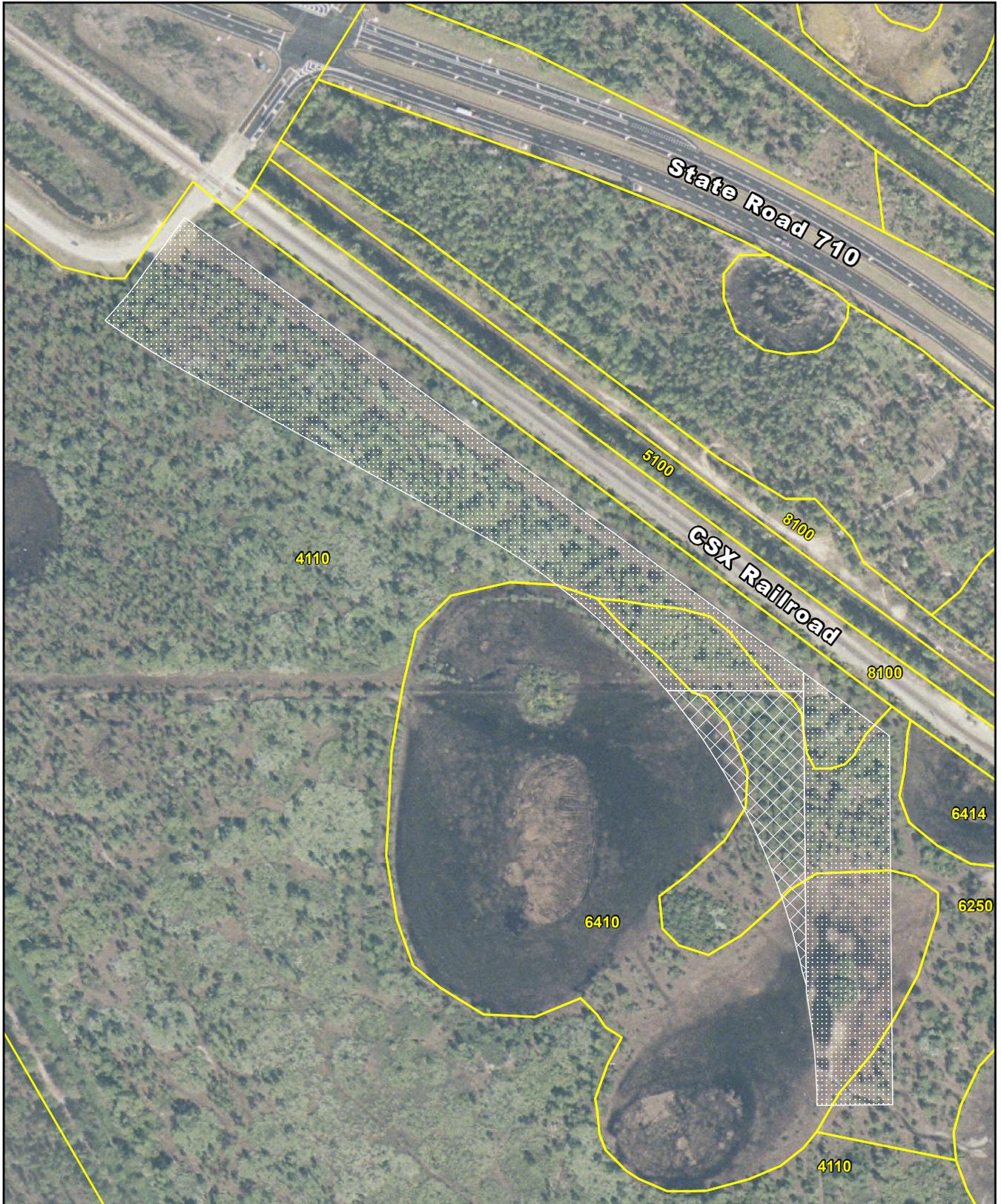
3.2.2 HABITAT DESCRIPTIONS**3.2.2.1 Corbett Parcel A Alternatives**

Corbett Parcel A has two alternatives: Alternative 1A, which is the proposed action alternative that encroaches into the JWCWMA; and Alternative 2A, which is the no-action alternative that does not encroach into the JWCWMA. Descriptions of each of these alternatives and the various upland and wetland habitats that are present within each are provided below.

Alternative 1A

Alternative 1A is the proposed action alternative for Corbett Parcel A (see **Figure 3-3**). Located at the northeast corner of the JWCWMA, this 1.63-acre parcel would accommodate the construction of a future two-lane, expandable to four-lane, roadway connection of Seminole Pratt Whitney Road to SR 710. South of Parcel A, the County is proposing a four-lane roadway, expandable to six lanes, through the Mecca property to its south boundary, and from there continuing south as a six-lane roadway to North Lake Boulevard. In order for Seminole Pratt Whitney Road to connect to SR 710, it is necessary to cross existing CSX railroad tracks. The proposed action calls for utilizing the existing railroad crossing at the Pratt Whitney facility entrance. In order to make the westerly turn required for the proposed roadway to align with the existing crossing, it is necessary to cross a corner of the JWCWMA. In addition, construction of this alternative would require an additional 9.92 acres of land that is located outside of the JWCWMA.

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4110 Land Use w/FLUCCS Code

Alternative 1A

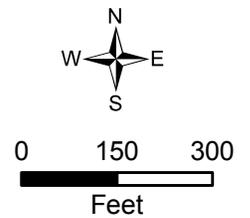
Ownership

 Corbett

 Other

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Alternative 1A Habitat Map



Sources: Land Use - URS Field Survey, 2004
Cadastral - Palm Beach County, 2004

Figure 3-3

Within the limits of this alternative, there are three separate habitat classifications. Of these habitat classifications, two would be considered wetlands and include hydric pine flatwoods and freshwater marsh, while one would be considered an upland habitat and includes pine flatwoods. Descriptions of each of the habitat classifications found within this alternative are provided below. Acreages of each classification are provided in **Table 3-1**.

Wetland Habitat Classifications

Hydric Pine Flatwoods

FLUCFCS: 625

USFWS: Palustrine, Forested, Needle-Leaved Evergreen, Saturated (PFO4B)

This land use class is common throughout south and central Florida, and is characterized by a canopy of either longleaf (*Pinus palustris*) or slash pine (*Pinus elliottii*). The major distinguishing feature that separates the hydric pine flatwoods from pine flatwoods is the presence of a thick underbrush of saw palmetto (*Serenoa repens*) within the pine flatwoods. Within the hydric pine flatwoods of Alternative 1A, saw palmetto is replaced with native vegetation such as: swamp bay (*Persea palustris*), gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera*), cocoplum (*Chrysobalanus icaco*), saltbush (*Baccharis halimifolia*) and myrsine (*Rapanea punctata*) in the sub-canopy and swamp fern (*Blechnum serrulatum*), hatpins (*Eriocaulon compressum*), bog buttons (*Lachnocaulon minus*), broom grass (*Andropogon virginicus*), false buttonweed (*Spermacoce* sp.), and grape vine (*Vitis rotundifolia*) in the understory.

Small amounts of melaleuca (*Melaleuca quinquenervia*) were also observed within the hydric pine flatwoods. The type of soil within this community type is Riviera fine sand, depressional.

Freshwater Marsh

FLUCFCS: 641

USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)

This land use class is characterized as non-forested areas that are dominated by herbaceous wetlands plant species with small amounts of shrubby vegetation usually along the perimeters. Within Alternative 1A, the herbaceous plant species that are present in this wetland type include: broom grass, maidencane (*Panicum hemitomon*), pickerelweed (*Pontederia cordata*), beakrush (*Rhynchospora* spp.), plume grass (*Erianthus giganteus*), water dropwort (*Oxypolis filiformis*), bog buttons and yellow-eyed grass (*Xyris* sp.). Shrub species concentrated around the perimeter of the marshes include St. John's wort (*Hypericum* spp.), corkwood (*Stillingia aquatica*), red bay (*Persea borbonia*), myrsine, dahoon holly (*Ilex cassine*), and wax myrtle.

Marshes within Alternative 1A are flooded throughout the year except during drought conditions. The type of soil within this community type is Riviera fine sand, depressional.

**TABLE 3-1
FLUCFCS CLASSIFICATIONS AND ACREAGES FOR ALTERNATIVE 1A**

Classification Type	Classification Name	FLUCFCS Classification*	USFWS Classification**	Acreage of Classification			Percent of Total Area
				Within JWCWMA	Outside JWCWMA	Total	
Wetlands	Hydric Pine Flatwoods	625	PFO4B	1.17	1.90	3.07	26.6%
	Freshwater Marsh	641	PEM1C	0.43	1.17	1.60	13.9%
Subtotal				1.60	3.07	4.67	40.5%
Uplands	Pine Flatwoods	411	N/A	0.03	6.85	6.88	59.5%
Subtotal				0.03	6.85	6.88	59.5%
Total				1.63	9.92	11.55	100%

* Based on the FLUCFCS (3rd ed.) (FDOT, 1999).

** Based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

Upland Habitat Classifications

Pine Flatwoods

FLUCFCS: 411

This land use class is characterized by a canopy of either longleaf or slash pine. Within Alternative 2A, the pine flatwoods community is dominated by slash pine. Native vegetation also observed within the pine flatwoods sub-canopy include: gallberry, wax myrtle, cocoplum, saltbush and myrsine. Saw palmetto in some instances dominated the midstory. The understory components consist of saw palmetto but also include swamp fern, hatpins, bog buttons, soft rush (*Juncus effusus*), false buttonweed, yellow-eyed grass, and grape vine. The type of soil within this community type is Wabasso fine sand.

Alternative 2A

Alternative 2A is the no-action alternative for Parcel A (see **Figure 3-4**) and would not involve an easement across the JWCWMA. This alternative would place the new alignment for the Seminole Pratt Whitney Road extension to the east of Parcel A on County-owned lands, cross the CSX railroad line above-grade, and intersect with SR 710 without any direct impact to the JWCWMA. Due to close proximity of SR 710 to the potential CSX crossing, a grade separated crossing of Seminole Pratt Whitney Road at CSX is required. A minimum of 23.5 feet clearance over the railroad will be required for the Seminole Pratt Whitney Road extension. Immediately to the east of the Alternative 2A grade separated rail crossing location is an active rail spur line, which would cause a conflict in highway/railroad operations if a grade separated crossing is not provided.

Within the limits of this alternative, there are ten habitat classifications and one land use classification. These classifications include exotic wetland hardwoods, hydric pine flatwoods, freshwater marsh, maidencane marsh, streams and waterways, pine flatwoods, and transportation. Of the ten habitat classifications, six would be considered wetlands and four would be considered upland habitats. Descriptions of these classifications are as follows. Acreages of each classification are provided in **Table 3-2**.

Wetland Habitat Classifications

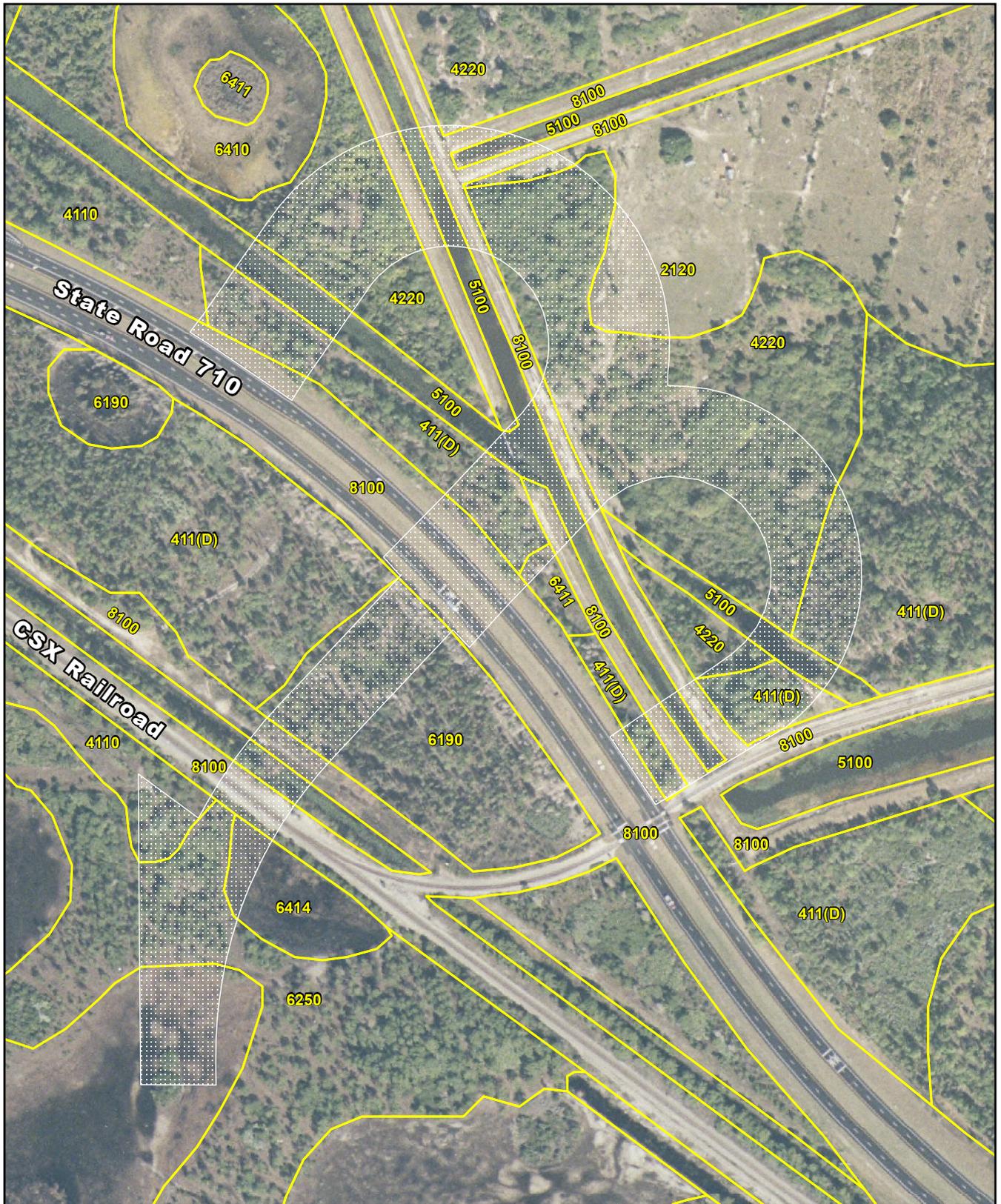
Streams and Waterways

FLUCFCS: 510

USFWS: Palustrine, Unconsolidated bottom, Mud, Permanently Flooded (PUB3H)

This habitat category includes rivers, creeks, canals, and other linear water bodies. Within Alternative 2A, this habitat type consists of a man-made drainage canals with slopes that are vegetated with cocoplum, slash pine, and napier grass (*Pennisetum purpureum*). The edges of the drainage canal are vegetated with spike rush (*Eleocharis cellulosa*) and torpedo grass (*Panicum repens*). The central portions of the canals are 3 to 4 feet in depth and vegetated with spatter-dock (*Nuphar lutea*). These linear canals run east-west along either side of the existing CSX railway line. The types of soils within this community type consist of Wabasso fine sand and Riviera fine sand, depressional.

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4110 Land Use w/FLUCCS Code

Alternative 2A

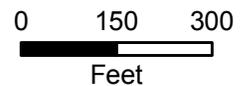
Ownership

Corbett

Other

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Alternative 2A Habitat Map



Sources: Land Use - URS Field Survey, 2004
Cadastral - Palm Beach County, 2004

Figure 3-4

**TABLE 3-2
FLUCFCS CLASSIFICATIONS AND ACREAGES FOR ALTERNATIVE 2A**

Classification Type	Classification Name	FLUCFCS Classification*	USFWS Classification**	Acreage of Classification			Percent of Total Area
				Within JWCWMA	Outside JWCWMA	Total	
Wetlands	Streams and Waterways	510	PUB3H	----	1.94	1.94	9.6%
	Exotic Wetland Hardwoods	619	PFO3C	----	1.45	1.45	7.2%
	Hydric Pine Flatwoods	625	PFO4B	----	1.22	1.22	6.0%
	Freshwater Marsh	641	PEM1C	----	0.96	0.96	4.8%
	Sawgrass Marsh	6411	PEM1C	----	0.07	0.07	0.3%
	Maidencane Marsh	6414	PEM1C	----	0.26	0.26	1.3%
Subtotal					5.90	5.90	29.2%
Uplands	Unimproved Pastures	212	N/A	----	0.85	0.85	4.2%
	Pine Flatwoods	411	N/A	----	0.35	0.35	1.7%
	Pine Flatwoods (disturbed)	411(d)	N/A	----	2.77	2.77	13.7%
	Brazilian Pepper	422	N/A	----	7.03	7.03	34.8%
Subtotal					11.00	11.00	54.5%
Land Uses	Transportation	810	N/A	----	3.29	3.29	16.3%
Subtotal					3.29	3.29	16.3%
Total				----	20.19	20.19	100%

* Based on the FLUCFCS (3rd ed.) (FDOT, 1999).

** Based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

Exotic Wetland Hardwoods (Melaleuca)**FLUCFCS: 619****USFWS: Palustrine, Forested, Broad-Leaved Evergreen, Seasonally Flooded (PFO3C)**

This land use category is characterized as a wetland dominated with an exotic species. The exotic wetland hardwoods found within the Alternative 2A study area have slash pine interspersed throughout the canopy but appear to be transitioning into complete monocultures of melaleuca. The understory is dominated by saw palmetto and spikerush. The types of soils within this community type consist of Wabasso fine sand and Riviera fine sand, depressional.

Hydric Pine Flatwoods**FLUCFCS: 625****USFWS: Palustrine, Forested, Needle-Leaved Evergreen, Saturated (PFO4B)**

This land use class is characterized by a canopy of slash pine. Within Alternative 2A, the native vegetation observed within the sub-canopy include gallberry, wax myrtle, cocoplum, cabbage palm (*Sabal palmetto*), and dahoon holly. The understory components include swamp fern, broom grass, beakrush, false buttonweed, red-root (*Lachnanthes caroliana*), tickseed (*Coreopsis* sp.), and wire grass (*Aristida stricta*). Saw palmetto is also sparsely dispersed throughout this habitat types.

Pine trees throughout this community type were damaged by recent storm events. The type of soil within this community type is Riviera fine sand, depressional. These areas were most likely burned within the last 5 years.

Freshwater Marsh**FLUCFCS: 641****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

The freshwater marsh class is characterized as non-forested areas that are dominated by herbaceous wetland plant species. Within the Alternative 2A study area, this habitat type contained large amounts of shrub species such as St. John's wort and corkwood along its perimeters. These shrubby perimeters may comprise up to half of the wetland area in some instances. The herbaceous plant species that are present in this wetland type include broom grass, maidencane, pickerelweed, beakrush, bladderwort (*Utricularia* sp.), bog buttons, and yellow-eyed grass.

The interior portions of these marshes are flooded throughout the year except during drought conditions, while the surrounding St. John's wort perimeters exhibited less inundation. The type of soil within this community type is Riviera fine sand, depressional.

Sawgrass Marsh**FLUCFCS: 6411****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

This land use class is characterized as a non-forested area that is dominated by sawgrass. Within Alternative 2A, this habitat occurs as a pure stand of sawgrass located in the center of the maidencane marsh (see FLUCFCS 6414, below).

The type of soil within this community type is Riviera fine sand, depressional.

Maidencane Marsh**FLUCFCS: 6414****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

This land use class is characterized as non-forested areas that are dominated by maidencane. Within Alternative 2A, additional herbaceous plant species include pickerelweed, cattails (*Typha* sp.), arrowhead (*Sagittaria lancifolia*), dog fennel (*Eupatorium* sp.), and beakrush.

This marsh category is saturated throughout the year except during drought conditions. The type of soil within this community type is Riviera fine sand, depressional.

Upland Habitat Classifications**Unimproved Pastures****FLUCFCS: 212**

This land use class is characterized as cleared land with no major stands of trees and brush and where native grasses have been allowed to develop. Within Alternative 2A, unimproved pasture is dominated with false buttonweed, dogfennel, and bahia grass. Brazilian pepper is also present as a shrub within this habitat.

The type of soil found within this community is Pineda fine sand.

Pine Flatwoods**FLUCFCS: 411**

This land use class is characterized by a canopy of either longleaf or slash pine. Within Alternative 2A, the pine flatwoods community is dominated by slash pine. Native vegetation also observed within the pine flatwoods sub-canopy include: gallberry, wax myrtle, cocoplum, saltbush and myrsine. Saw palmetto in some instances dominated the midstory. The understory components consist of saw palmetto but also include swamp fern, hatpins, bog buttons, soft rush, false buttonweed, yellow-eyed grass and grape vine. The type of soil within this community type is Wabasso fine sand.

Pine Flatwoods (Disturbed)**FLUCFCS: 411(d)**

This land use class is characterized by a canopy of slash pine. Within Alternative 2A, native species within the sub-canopy and shrub layer include cocoplum, saw palmetto, and wax myrtle. The herbaceous groundcover includes ruderal grasses and false buttonweed. Also present within this habitat type are exotic species such as Brazilian pepper and melaleuca.

This community type can be characterized as a remnant flatwood with limited amounts of human disturbance in the understory. The soils in this community type are Riviera fine sand and Pinellas fine sand.

Brazilian Pepper
FLUCFCS: 422

This land use category is characterized as disturbed land dominated by Brazilian pepper. Within Alternative 2A, these forested areas also have small amounts of slash pine, sabal palmetto and laurel oaks within the canopy and wax myrtle, dogfennel, Boston fern (*Nephrolepis* sp.), giant flatsedge (*Cyperus giganteus*) and saltbush present within the sub-canopy/groundcover.

The type of soil within this community type is Pineda Fine Sand and Riviera fine sand, depressional.

Land Use Classifications**Transportation**
FLUCFCS: 810

The transportation classification is defined as those facilities used for the movement of people and goods. Within Alternative 2A, transportation facilities consist of both rail and road facilities.

3.2.2.2 Corbett Parcel B Alternatives

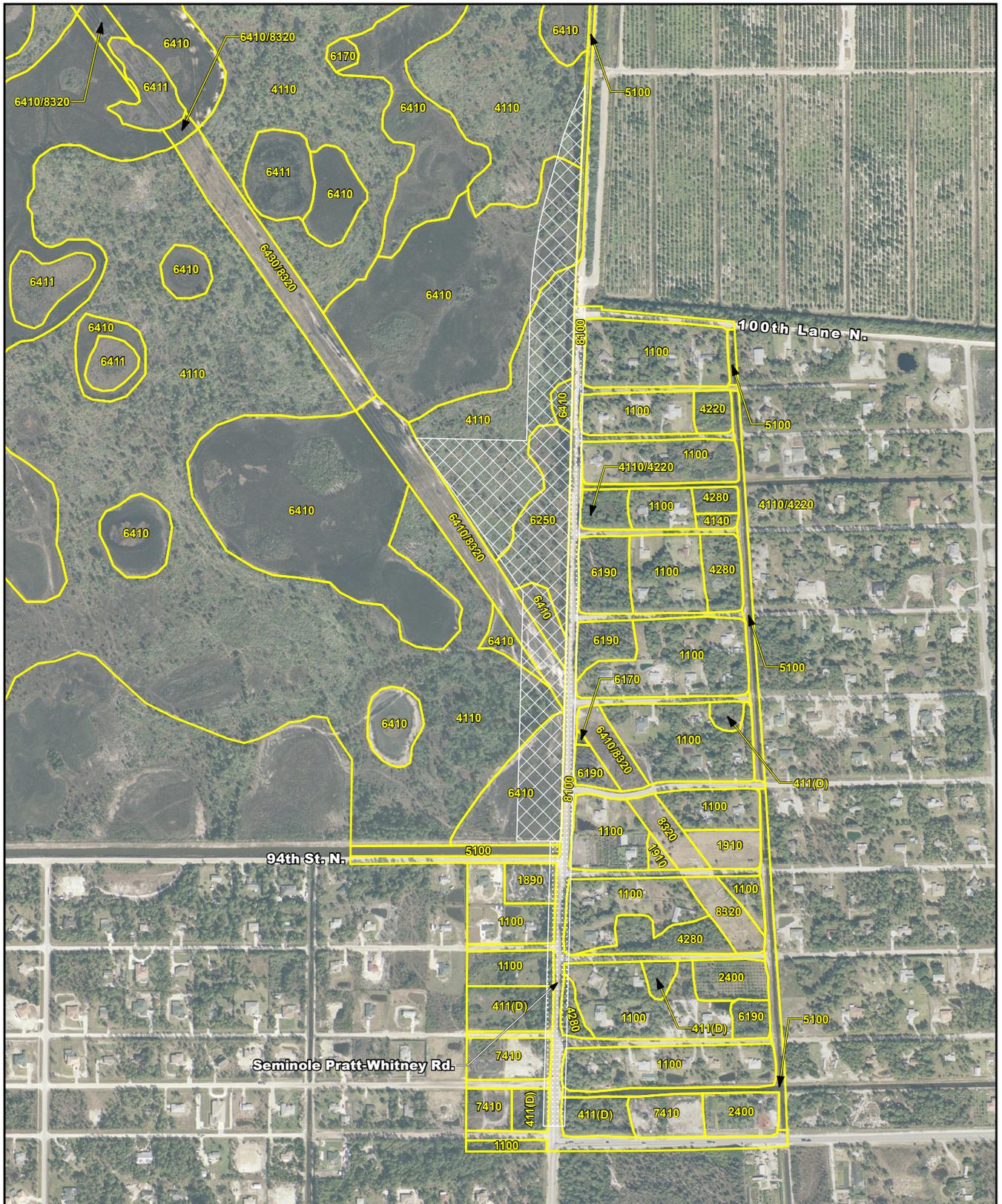
Corbett Parcel B has four alternatives: Alternatives 1B, 2B, 3B, and 4B. Alternatives 1B, 3B, and 4B include encroachment into the JWCWMA, while Alternative 2B is the no-action alternative, which would result in no encroachments into the JWCWMA.

Alternative 1B

Alternative 1B is the proposed action alternative. This alternative would utilize an easement across the southeast corner of the JWCWMA, Corbett Parcel B. The easement would include 4.73 acres to accommodate the proposed 60-foot widening of Seminole Pratt Whitney Road, 13.91 acres to allow for the construction of a 150-foot “canal/flow way” (i.e., Corbett Canal) by SFWMD, 3.36 acres for the construction of a 40-foot canal maintenance area, and 6.37 acres to accommodate an electrical substation for FP&L adjacent to the existing power line transmission corridor. The canal maintenance area on the east side of the proposed Corbett Canal will also provide for an activities trail to a proposed trailhead located immediately east of the JWCWMA South Entrance. The total acreage that would be impacted in the JWCWMA for this alternative is 28.37 acres. The extension of Seminole Pratt Whitney Road south of the JWCWMA to North Lake Boulevard would require an additional 8.58 acres of land not located within the JWCWMA. This land would be taken from six residential properties on the west side of Seminole Pratt Whitney Road. Alternative 1B is depicted on **Figure 3-5**.

Within the limits of this alternative, there are 10 FLUCFCS classifications; of which, seven are habitat classifications and three are land use classifications. Of the seven habitat classifications, four would be considered wetland habitats and three would be considered upland habitats. Descriptions of each of the FLUCFCS classifications within Alternative 1B are provided below. Acreages of each classification are provided in **Table 3-3**.

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4110 Land Use w/FLUCCS Code

Alternative 1B

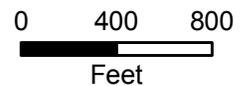
Ownership

 Corbett

 Other

J.W. Corbett W.M.A. Land Transfer Ecological Assessment

Alternative 1B Habitat Map



Sources: Land Use - URS Field Survey, 2004
Cadastral - Palm Beach County, 2004

Figure 3-5

**TABLE 3-3
FLUCFCS CLASSIFICATIONS AND ACREAGES FOR ALTERNATIVE 1B**

Classification Type	Classification Name	FLUCFCS Classification*	USFWS Classification**	Acreage of Classification			Percent of Total Area
				Within JWCWMA	Outside JWCWMA	Total	
Wetlands	Streams and Waterways	510	PUB3H	----	0.08	0.08	0.3%
	Hydric Pine Flatwoods	625	PFO4B	5.80	----	5.80	18.9%
	Freshwater Marsh	641	PEM1C	8.97	0.03	9.00	29.4%
	Freshwater Marsh/ Electric Power Transmission Line	641/832	PEM1C	1.33	----	1.33	4.3%
Subtotal				16.10	0.11	16.21	52.9%
Uplands	Pine Flatwoods	411	N/A	12.27	0.00	12.27	40.0%
	Pine Flatwoods (disturbed)	411(d)	N/A	----	0.37	0.37	1.2%
	Disturbed Land	741	N/A	----	0.18	0.18	0.6%
Subtotal				12.27	0.55	12.82	41.8%
Land Uses	Residential, Low Density	110	N/A	----	0.34	0.34	1.1%
	Other Recreational	189	N/A	----	0.19	0.19	0.6%
	Transportation			----	1.10	1.10	3.6%
Subtotal				----	1.63	1.63	5.3%
Total				28.37	2.29	30.66	100%

* Based on the FLUCFCS (3rd ed.) (FDOT, 1999).

** Based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

Wetland Habitat Classifications

Streams and Waterways

FLUCFCS: 510

USFWS: Palustrine, Unconsolidated bottom, Mud, Permanently Flooded (PUB3H)

This habitat category includes rivers, creeks, canals, and other linear water bodies. Within Alternative 1B, this habitat type consists of drainage canals with steep slopes that are vegetated with ruderal species such as false buttonweed, sandmat (*Chamaesyce hirta*), and ragweed (*Ambrosia artemisiifolia*). The edges of the canals are vegetated with emergent vegetation such as arrowhead, spatter-dock, red ludwigia (*Ludwigia repens*), and torpedo grass. The central portions of the canals are unvegetated open water.

There are two linear drainage canals located along the east and south perimeter of the JWCWMA. The eastern perimeter canal has a smaller width (~20 feet compared to ~40 feet) than the south canal, is not continuous for the entire length of the study area, and is more heavily vegetated. The type of soil within this community type is Riviera fine sand, depressional.

Hydric Pine Flatwoods

FLUCFCS: 625

USFWS: Palustrine, Forested, Needle-Leaved Evergreen, Saturated (PFO4B)

Within Alternative 1B, this land use class is characterized by a canopy of slash pine with a sub-canopy and shrub layer consisting of gallberry, wax myrtle, cocoplum, cabbage palm, and dahoon holly. The herbaceous layer within this habitat type includes swamp fern, broom grass, beakrush, false buttonweed, red root, tickseed, and wire grass. Saw palmetto is also found intermittently throughout this habitat type. Melaleuca was observed within this community type.

Pine trees throughout this community type were damaged by recent storm events. The type of soil within this community type is Riviera fine sand, depressional. These areas were most likely burn managed within the last 5 years.

Freshwater Marsh

FLUCFCS: 641

USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)

This land use class is characterized as non-forested areas that are dominated by herbaceous plant species with small amounts of shrubby vegetation usually along the perimeters. Within Alternative 1B, the herbaceous and shrub plant species that are present in this wetland type include maidencane, beakrush, corkwood, St. John's wort, water hyssops (*Bacopa monnieri*), water dropwort, and yellow-eyed grass. Shrub species that are concentrated around the perimeter of the marshes include primrose willow (*Ludwigia peruviana*), buttonbush (*Cephalanthus occidentalis*), wax myrtle, Carolina willow (*Salix caroliniana*), and cabbage palm. Located within the transition zones of these wetlands are broomsedge, false buttonweed, and the exotic species creeping oxeye (*Wedelia trilobata*).

These marsh areas are flooded throughout the year except during drought conditions. The type of soil within this community type is Riviera fine sand, depressional.

Freshwater Marsh/Electric Power Transmission Lines

FLUCFCS: 641/832

USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)

This land use category consists of freshwater marsh located within an existing electric transmission line corridor. The open land within this corridor is dominated by freshwater marsh. Within Alternative 1B, these marshes' dominant vegetation includes maidencane and spikerush, with rattlesnake master, swamp fern, bladderwort, water dropwort, arrowhead, buttonweed (*Diodia virginiana*), and primrose willow comprising minor components of the vegetative stratum.

This habitat most likely was hydric pine flatwoods, which were cleared during the construction of the transmission lines. The type of soil within this community type is Riviera fine sand, depressional.

Upland Habitat Classifications

Pine Flatwoods

FLUCFCS: 411

This land use class is common throughout northern and central Florida, and is characterized by a canopy of either longleaf or slash pine. Within Alternative 1B, the canopy is dominated by slash pine. Native vegetation observed within the pine flatwoods sub-canopy and shrub layers include gallberry, wax myrtle, and American beautyberry (*Callicarpa americana*). The understory components include swamp fern, broom grass, false buttonweed, red root, tickseed, wire grass, and grape vine. Also present in this community type are small amounts of melaleuca and Brazilian pepper (*Schinus terebinthifolius*).

Pine trees throughout this community type were damaged by recent storm events. The type of soil within this community type is Riviera fine sand. These areas appeared to have been burn managed within the last 5 years.

Pine Flatwoods (Disturbed)

FLUCFCS: 411(d)

This land use classification is characterized by a canopy of slash pine. However, within Alternative 1B, the canopy also has large numbers of cabbage palm. Additional native tree species observed includes myrsine, cocoplum, red bay, wax myrtle, and American beautyberry. The sub-canopy and groundcover is dominated by swamp fern, false buttonweed, goldenrod (*Solidago* sp.), and grape vine as understory components. Also present throughout this habitat type are exotic species such as Brazilian pepper, lantana (*Lantana camera*), and old world climbing fern (*Lygodium microphyllum*).

This community type, which is found within the residential areas adjacent to the JWCWMA, can be characterized as a remnant pine flatwood with limited amounts of human disturbance in the understory. The soils in this community type are Pinellas fine sand.

Disturbed Land**FLUCFCS: 741**

This land use category includes lands that have been changed due to human activity. The disturbed lands within Alternative 1B consist of vacant land with fill piles. This habitat is dominated by early colonizing species and its intended use is unknown.

This community type, which is found within the residential areas adjacent to the JWCWMA, was likely a remnant flatwood that underwent large amounts of human disturbance in the understory. The type of soil within this community type is Riviera fine sand.

Land Use Classifications**Residential, Low Density****FLUCFCS: 110**

This land use category is defined as having less than two dwelling units per acre. Within Alternative 1B, this land use classification consists of residential areas located south of the JWCWMA. The type of soil within this land use type is Riviera fine sand and Pineda sand.

Other Recreational**FLUCFCS: 189**

This land use category includes those areas whose physical structure indicates that active user-orientated recreation is or could be occurring within the given physical area. Within Alternative 1B, this land use consists of an area utilized by go-carts, all-terrain vehicles (ATVs), or similar recreational-type vehicles. A recreational vehicle track traverses the majority of the site. The type of soil within this community type is Riviera fine sand.

Transportation**FLUCFCS: 810**

The transportation classification is defined as those facilities used for the movement of people and goods. Within Alternative 1B, transportation facilities consist of road facilities including Seminole Pratt Whitney Road and adjacent residential roadways.

Alternative 2B

Alternative 2B is the no-action alternative for Parcel B. This alternative would obtain all of the right-of-way for the expansion of Seminole Pratt Whitney Road within a 60-foot right-of-way to be obtained from properties on the east side of the existing Seminole Pratt Whitney Road, including residential lots in The Acreage between North Lake Boulevard and the Mecca property. The electrical substation would be sited on 7.13 acres at the northeast corner of the intersection of the existing electrical transmission lines and Seminole Pratt Whitney Road. Underground power distribution lines would be run within the 60-foot additional road right-of-way north from the substation to the PBCBRP site. This alternative would have no involvement with the JWCWMA adjacent to and south of the PBCBRP site. This alternative does not include any accommodation for a canal/flow way or an activities trail. Right-of-way will be required

from residential properties fronting on existing Seminole Pratt Whitney Road from North Lake Boulevard north to the Mecca property. Eight residential properties (whole takes) will be required for the substation and road right-of-way. A total of 20 residential properties would be directly impacted by condemnation under this alternative. This alternative is depicted on **Figure 3-6**.

The general area within this alternative can be characterized as low density residential with homes spaced at approximately one to two per acre. Remaining natural areas have evidence of human disturbance and the presence or dominance of exotic plant species. This alternative includes nine FLUCFCS classifications; of which seven would be natural habitats and two would be considered land use classifications. Of the seven natural habitats, four would be considered wetlands and three would be considered upland habitats. Descriptions of each of the habitat and land use classifications within Alternative 2B are provided below. Acreages of each classification are provided in **Table 3-4**.

Wetland Habitat Classifications

Streams and Waterways

FLUCFCS: 510

USFWS: Palustrine, Unconsolidated bottom, Mud, Permanently Flooded (PUB3H)

This habitat classification includes rivers, creeks, canals, and other linear water bodies. Within Alternative 2B, this classification is represented by canals with steep 2:1 slopes that are sparsely vegetated by ruderal species such as false buttonweed, sandmat, and ragweed. The edges of the water bodies are typically unvegetated; however, hydrophytic emergent vegetation such as red ludwigia and torpedo grass were observed sporadically along the edges. The central portions of the canals are 3 to 4 feet in depth and are not vegetated.

There is one linear drainage canal located along the western perimeter (running north-south) of Alternative 2B and two east-west canals that intersect the north-south canal. The type of soil found within this community is Riviera fine sand, depressional.

Mixed Wetland Hardwoods

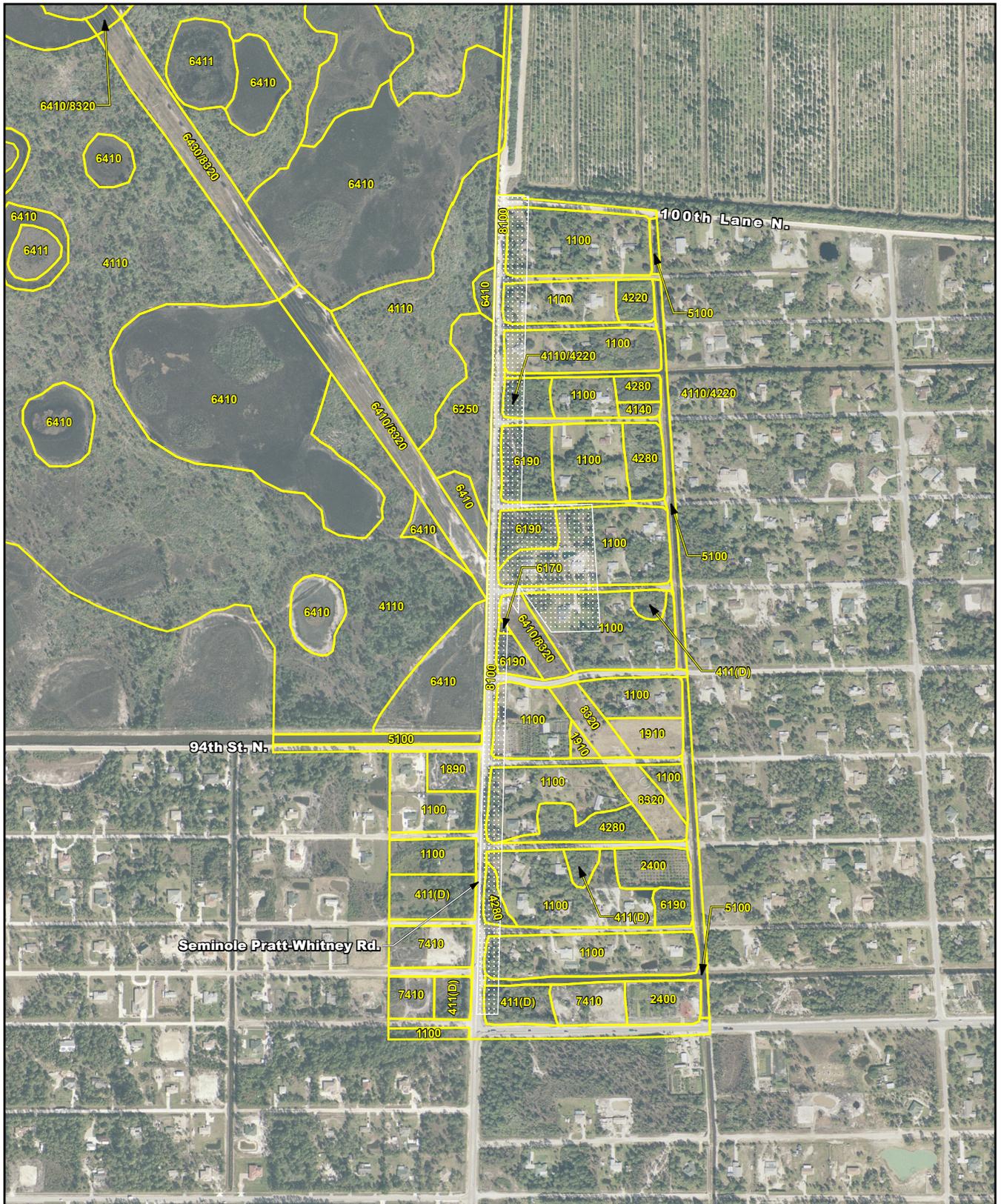
FLUCFCS: 617

USFWS: Palustrine, Forested, Broad-Leaved Evergreen, Seasonally Flooded (PFO3C)

This land use category is characterized as a wetland dominated by a variety of hardwood species, none of which comprise a 66 percent dominance of the canopy. Within Alternative 2B, this habitat type is represented by a forested wetland with a low shrubby canopy consisting of dahoon holly, wax myrtle, Carolina willow, and saltbush. The understory is dominated by swamp fern, sawgrass, arrowhead, flat sedge (*Cyperus* spp.), broom grass, and false buttonweed.

The type of soil found within this community is Riviera fine sand, depressional.

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4110 Land Use w/FLUCCS Code

Alternative 2B

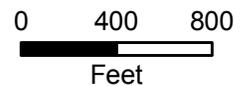
Ownership

 Corbett

 Other

J.W. Corbett W.M.A.
Land Transfer
Ecological Assessment

Alternative 2B Habitat Map



Sources: Land Use - URS Field Survey, 2004
Cadastral - Palm Beach County, 2004

Figure 3-6

**TABLE 3-4
FLUCFCS CLASSIFICATIONS AND ACREAGES FOR ALTERNATIVE 2B**

Classification Type	Classification Name	FLUCFCS Classification*	USFWS Classification**	Acreage of Classification			Percent of Total Area
				Within JWCWMA	Outside JWCWMA	Total	
Wetlands	Streams and Waterways	510	PUB3H	----	0.14	0.14	0.9%
	Mixed Wetland Hardwoods	617	PFO3C	----	0.07	0.07	0.4%
	Exotic Wetland Hardwoods	619	PFO3C	----	3.28	3.28	20.6%
	Freshwater Marsh/ Electric Power Transmission Line	641/832	PEM1C	----	0.16	0.16	1.0%
Subtotal				----	3.65	3.65	22.9%
Uplands	Pine Flatwoods (disturbed)	411(d)	N/A	----	0.26	0.26	1.6%
	Exotic Flatwoods	411/422	N/A	----	0.59	0.59	3.7%
	Cabbage Palm	428	N/A	----	0.37	0.37	2.3%
Subtotal				----	1.22	1.22	7.6%
Land Uses	Residential, Low Density	110	N/A	----	9.26	9.26	58.1%
	Transportation	810	N/A	----	1.82	1.82	11.4%
Subtotal				----	11.08	11.08	69.5%
Total				----	15.95	15.95	100%

* Based on the FLUCFCS (3rd ed.) (FDOT, 1999).

** Based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

Exotic Wetland Hardwoods (Melaleuca)**FLUCFCS: 619****USFWS: Palustrine, Forested, Broad-Leaved Evergreen, Seasonally Flooded (PFO3C)**

This land use category is characterized as a wetland dominated with an exotic species. The exotic wetland hardwoods found within Alternative 2B are transitioning into complete monocultures of melaleuca. These forested areas have slash pine, cabbage palm, wax myrtle, and dahoon holly in the sub-canopy. The following herbaceous plant species are present in the understory: false buttonweed, swamp fern, sawgrass, maidencane, button snakeroot, and arrowhead.

The type soils found within this community are Riviera fine sand, depressional.

Freshwater Marsh/Electric Power Transmission Lines**FLUCFCS: 641/832****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

This land use category consists of freshwater marsh located within an existing electric transmission line corridor. Within Alternative 2B, these marshes are dominated by maidencane, pickerelweed, torpedo grass, water dropwort, arrowhead, buttonweed, broom grass, flat sedge, button snakeroot, St. John's wort, and yellow-eyed grass.

This habitat most likely was hydric pine flatwoods, which were cleared during the construction of the transmission lines. The type of soil within this community type is Riviera fine sand, depressional.

Upland Habitat Classifications**Pine Flatwoods (Disturbed)****FLUCFCS: 411(d)**

This land use class is characterized by a canopy of slash pine. Within Alternative 2B, the canopy also has large numbers of cabbage palm. Additional native species within the sub-canopy and shrub layer include myrsine, cocoplum, red bay, wax myrtle, and American beautyberry. The herbaceous groundcover includes swamp fern, false buttonweed, goldenrod and grape vine. Also present within this habitat type are exotic species such as Brazilian pepper, lantana, and old world climbing fern.

This community type can be characterized as a remnant flatwood with limited amounts of human disturbance in the understory. The soils in this community type are Riviera fine sand and Pinellas fine sand.

Exotic Flatwoods**FLUCFCS: 411/422**

This land use category is characterized as a disturbed pine flatwoods with large amounts of Brazilian pepper. Within Alternative 2B, these forested areas also have small amounts saw palmetto and myrsine present within the sub-canopy. Exotic old world climbing fern was also observed within this habitat type. However, dense pine needle leaf-litter restricts groundcover within this habitat.

The type of soil within this community type is Riviera fine sand, depressional.

Cabbage Palm**FLUCFCS: 428**

The canopy of this forest community type is dominated by cabbage palm. The cabbage palm communities within Alternative 2B include a wide variety of hardwoods such as American beautyberry, myrsine, cocoplum, saw palmetto, and wild coffee. Large patches of saw palmetto are also present within some areas of this habitat type. Other areas have a ruderal understory as a result of past clearing activities. Sparse stands of slash pine were also observed within this habitat type.

The soils found within this community are Pinellas fine sand.

Land Use Classifications**Residential, Low Density****FLUCFCS: 110**

This land use category is defined as having less than two dwelling units per acre. Within Alternative 2B, this land use classification consists of residential areas located south and east of the JWCWMA. The type of soil within this land use type is Riviera fine sand and Pineda sand.

Transportation**FLUCFCS: 810**

The transportation classification is defined as those facilities used for the movement of people and goods. Within Alternative 2B, transportation facilities consist of road facilities including Seminole Pratt Whitney Road and adjacent residential roadways.

Alternative 3B

Alternative 3B would include the 60-foot expansion of Seminole Pratt Whitney Road on the east side of the existing roadway (requiring right-of-way taking from 17 residential lots in The Acreage) and two new power transmission lines in the JWCWMA to connect to a proposed utility pod in the PBCBRP. One of the new transmission lines would be a single circuit transmission line within a 30-foot easement (3.3 acres) that would run along the west side of Seminole Pratt Whitney Road north to an electric substation within the PBCBRP. The second proposed transmission line within a 60-foot easement (3.7 acres) would be a single circuit transmission line from the existing transmission corridor in the JWCWMA east to the electric substation in the PBCBRP, a distance of approximately 3,000 feet. This alternative is depicted in **Figure 3-7** and does not include any accommodation for a canal/flow way or an activities trail.

This alternative includes twelve FLUCFCS classifications, of which ten are habitat classifications and two are land use classifications. Of the ten habitat classifications, six are wetland habitat and four are upland habitat types. Descriptions of each of the FLUCFCS classifications found within Alternative 3B are provided below. Acreages of each classification are provided in **Table 3-5**.

**TABLE 3-5
FLUCFCS CLASSIFICATIONS AND ACREAGES FOR ALTERNATIVE 3B**

Classification Type	Classification Name	FLUCFCS Classification*	USFWS Classification**	Acreage of Classification			Percent of Total Area
				Within JWCWMA	Outside JWCWMA	Total	
Wetlands	Streams and Waterways	510	PUB3H	----	0.10	0.10	0.7%
	Mixed Wetland Hardwoods	617	PFO3C	----	0.07	0.07	0.5%
	Exotic Wetland Hardwoods	619	PFO3C	----	1.26	1.26	8.7%
	Hydric Pine Flatwoods	625	PFO4B	0.78	----	0.78	5.4%
	Freshwater Marsh	641	PEMIC	3.33	----	3.33	22.9%
	Sawgrass Marsh	6411	PEMIC	0.05	---	0.05	0.3%
	Freshwater Marsh/ Electric Power Transmission Line	641/832	PEMIC	----	0.16	0.16	1.1%
Subtotal				4.16	1.59	5.75	39.61%
Uplands	Pine Flatwoods	411	N/A	3.95	----	3.95	27.2%
	Pine Flatwoods (disturbed)	411(d)	N/A	----	0.26	0.26	1.8%
	Exotic Flatwoods	411/422	N/A	----	0.27	0.27	1.9%
	Cabbage Palm	428	N/A	----	0.37	0.37	2.5%
Subtotal				3.95	0.90	4.85	33.4%
Land Uses	Residential, Low Density	110	N/A	----	2.92	2.92	20.1%
	Transportation	810	N/A	----	0.99	0.99	6.8%
Subtotal				----	3.91	3.91	26.9%
Total				8.11	6.40	14.51	100%

* Based on the FLUCFCS (3rd ed.) (FDOT, 1999).

** Based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

Wetland Habitat Classifications

Streams and Waterways

FLUCFCS: 510

USFWS: Palustrine, Unconsolidated bottom, Mud, Permanently Flooded (PUB3H)

This habitat classification includes rivers, creeks, canals, and other linear water bodies. Within Alternative 3B, this classification is represented by a canal with steep 2:1 slopes that are sparsely vegetated by ruderal species such as false buttonweed, sandmat, and ragweed. The edges of the water bodies are typically unvegetated; however, hydrophytic emergent vegetation such as red ludwigia and torpedo grass were observed sporadically along the edges. The central portions of the canal are 3 to 4 feet in depth and are not vegetated.

This linear drainage canal runs north south and is located between Seminole Pratt Whitney and the JWCWMA. The type of soil found within this community is Riviera fine sand, depressionnal and Boca fine sand.

Mixed Wetland Hardwoods

FLUCFCS: 617

USFWS: Palustrine, Forested, Broad-Leaved Evergreen, Seasonally Flooded (PFO3C)

This land use category is characterized as a wetland dominated by a variety of hardwood species tolerant of hydric conditions. Within Alternative 3B, this habitat type has a shrubby canopy dominated comprised of pond apple (*Annona glabra*), wax myrtle, Carolina willow, buttonbush, and saltbush as the low growing, shrubby canopy. The understory is dominated by sawgrass, arrowhead, flat sedge, broom grass, and Virginia chain fern (*Woodwardia virginica*). The exotic old world climbing fern was also observed as sporadically occurring within this habitat type.

The soil type present within this community is Riviera fine sand, depressionnal.

Exotic Wetland Hardwoods (Melaleuca)

FLUCFCS: 619

USFWS: Palustrine, Forested, Broad-Leaved Evergreen, Seasonally Flooded (PFO3C)

This land use category is characterized as a wetland dominated with an exotic species. The exotic wetland hardwoods found within Alternative 3B are transitioning into complete monocultures of melaleuca. These forested areas have slash pine, cabbage palm, wax myrtle, and dahoon holly in the sub-canopy. The following herbaceous plant species are present in the understory: false buttonweed, swamp fern, sawgrass, maidencane, button snakeroot, and arrowhead.

The type soils found within this community are Riviera fine sand, depressionnal.

Hydric Pine Flatwoods**FLUCFCS: 625****USFWS: Palustrine, Forested, Needle-Leaved Evergreen, Saturated (PFO4B)**

Within Alternative 3B, this land use class is characterized by a canopy of slash pine, with a sub-canopy and shrub layer consisting of gallberry, wax myrtle, cocoplum, cabbage palm, and dahoon holly. The herbaceous lay within this habitat type includes swamp fern, broom grass, beakrush, false buttonweed, red root, tickseed, and wire grass. Saw palmetto is also found intermittently throughout this habitat type. Melaleuca was observed within this community type.

Pine trees throughout this community type were damaged by recent storm events. The type of soil within this community type is Riviera fine sand, depressional. These areas were most likely burn managed within the last 5 years.

Freshwater Marsh**FLUCFCS: 641****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

This land use classification is characterized as non-forested areas that are dominated by herbaceous plant species with small amounts of shrubby vegetation usually occurring along the perimeters. Within Alternative 3B, the herbaceous and shrub plant species that are present within this community type include maidencane, beakrush, arrowhead, swamp fern, buttonweed, corkwood, St. John's wort, water hyssops, and spikerush. Shrub species that are concentrated around the perimeter of the marshes include wax myrtle and Carolina willow.

These marshes have small amounts (1 to 5 inches) of standing water throughout most of the year except during drought conditions. The type of soil found within this community is Riviera fine sand, depressional.

Sawgrass Marsh**FLUCFCS: 6411****USFWS: Palustrine, Emergent, Persistent, Seasonally Flooded (PEM1C)**

This habitat is a non-forested wetland dominated by sawgrass. Within Alternative 3B, this marsh is inundated for extended periods during the year. The types of soil found within this community are Riviera fine sand, depressional and Okeelanta muck.

Freshwater Marsh/Electric Power Transmission Lines**FLUCFCS: 641/832****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

This land use category consists of freshwater marsh located within an existing electric transmission line corridor. Within Alternative 3B, these marshes are dominated by maidencane, pickerelweed, torpedo grass, water dropwort, arrowhead, buttonweed, broom grass, flat sedge, button snakeroot, St. John's wort, and yellow-eyed grass.

This habitat most likely was hydric pine flatwoods, which were cleared during the construction of the transmission lines. The type of soil within this community type is Riviera fine sand, depressional.

Upland Habitat Classifications

Pine Flatwoods

FLUCFCS: 411

This land use class is common throughout northern and central Florida and is characterized by a canopy of either longleaf or slash pine. Within Alternative 3B, this pine flatwoods community is dominated by slash pine with a thick understory of saw palmetto. Native vegetation present within this community type's sub-canopy includes gallberry, wax myrtle, and American beautyberry. Swamp fern, broom grass, false buttonweed, red root, tickseed, wire grass, and grape vine are present within the habitat's understory.

Pine trees throughout this community type were damaged by recent storm events. The type of soils found within this community are Riviera fine sand and Boca fine sand. These areas were most likely burn managed within the last 5 years.

Pine Flatwoods (Disturbed)

FLUCFCS: 411(d)

This land use class is characterized by a canopy of slash pine. Within Alternative 3B, the canopy also has large numbers of cabbage palm. Additional native species within the sub-canopy and shrub layer include myrsine, cocoplum, red bay, wax myrtle, and beautyberry. The herbaceous groundcover includes swamp fern, false buttonweed, goldenrod, and grape vine. Also present within this habitat type are exotic species such as Brazilian pepper, lantana, and old world climbing fern.

This community type can be characterized as a remnant flatwood with limited amounts of human disturbance in the understory. The soils in this community type are Riviera fine sand and Pinellas fine sand.

Exotic Flatwoods

FLUCFCS: 411/422

This land use category is characterized as a disturbed pine flatwoods with large amounts of Brazilian pepper. Within Alternative 3B, these forested areas also have small amounts saw palmetto and myrsine present within the sub-canopy. Exotic old world climbing fern was also observed within this habitat type. However, dense pine needle leaf-litter restricts groundcover within this habitat.

The type of soil within this community type is Riviera fine sand, depressional.

Cabbage Palm**FLUCFCS: 428**

The canopy of this forest community type is dominated by cabbage palm. The cabbage palm communities within Alternative 3B include a wide variety of hardwoods such as American beautyberry, myrsine, cocoplum, saw palmetto, and wild coffee. Large patches of saw palmetto are also present within some areas of this habitat type. Other areas have a ruderal understory as a result of past clearing activities. Sparse stands of slash pine were also observed within this habitat type.

The soil type found within this community is Pinellas fine sand.

Land Use Classifications**Residential, Low Density****FLUCFCS: 110**

This land use category is defined as having less than two dwelling units per acre. Within Alternative 3B, this land use classification consists of residential areas located south and east of the JWCWMA. The type of soils within this land use type are Riviera fine sand and Pineda sand.

Transportation**FLUCFCS: 810**

The transportation classification is defined as those facilities used for the movement of people and goods. Within Alternative 3B, transportation facilities consist of road facilities including Seminole Pratt Whitney Road and adjacent residential roadways.

Alternative 4B

Alternative 4B would include the 60-foot expansion of Seminole Pratt Whitney Road on the east side of the existing roadway (requiring right-of-way taking from 17 residential lots in The Acreage) and a new power transmission lines in the JWCWMA to connect to a proposed utility pod in the PBCBRP. The new transmission lines would be a new east-west power transmission line from the existing transmission corridor in the JWCWMA east to the substation in the PBCBRP, a distance of approximately 3,000 feet. The corridor for this transmission line would be 80 feet in width and require land from the JWCWMA. This alternative is depicted on **Figure 3-8** and does not include any accommodation for a canal/flow way or an activities trail.

This alternative includes eleven FLUCFCS classifications, of which nine are habitat classifications and two are land use classifications. Of the nine habitat classifications, five are wetland habitat and four are upland habitat types. Descriptions of each of the FLUCFCS classifications found within Alternative 4B are provided below. Acreages of each classification are provided in **Table 3-6**.

**TABLE 3-6
FLUCFCS CLASSIFICATIONS AND ACREAGES FOR ALTERNATIVE 4B**

Classification Type	Classification Name	FLUCFCS Classification*	USFWS Classification**	Acreage of Classification			Percent of Total Area
				Within JWCWMA	Outside JWCWMA	Total	
Wetlands	Streams and Waterways	510	PUB3H	----	0.10	0.10	0.8%
	Mixed Wetland Hardwoods	617	PFO3C	----	0.07	0.07	0.6%
	Exotic Wetland Hardwoods	619	PFO3C	----	1.26	1.26	10.6%
	Freshwater Marsh	641	PEM1C	1.95	----	1.95	16.5%
	Sawgrass Marsh	6411	PEM1C	0.05	---	0.05	0.4%
	Freshwater Marsh/ Electric Power Transmission Line	641/832	PEM1C	----	0.16	0.16	1.4%
Subtotal				2.00	1.59	3.59	30.3%
Uplands	Pine Flatwoods	411	N/A	3.44	----	3.44	29.1%
	Pine Flatwoods (disturbed)	411(d)	N/A	----	0.26	0.26	2.2%
	Exotic Flatwoods	411/422	N/A	----	0.27	0.27	2.3%
	Cabbage Palm	428	N/A	----	0.37	0.37	3.1%
Subtotal				3.44	0.90	4.34	36.7%
Land Uses	Residential, Low Density	110	N/A	----	2.92	2.92	24.7%
	Transportation	810	N/A	----	0.99	0.99	8.4%
Subtotal				----	3.91	3.91	33.0%
Total				5.44	6.40	11.84	100%

* Based on the FLUCFCS (3rd ed.) (FDOT, 1999).

** Based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

Wetland Habitat Classifications

Streams and Waterways

FLUCFCS: 510

USFWS: Palustrine, Unconsolidated bottom, Mud, Permanently Flooded (PUB3H)

This habitat classification includes rivers, creeks, canals, and other linear water bodies. Within Alternative 4B, this classification is represented by a canal with steep 2:1 slopes that are sparsely vegetated by ruderal species such as false buttonweed, sandmat, and ragweed. The edges of the water bodies are typically unvegetated; however, hydrophytic emergent vegetation such as red ludwigia and torpedo grass were observed sporadically along the edges. The central portions of the canal are 3 to 4 feet in depth and are not vegetated.

This linear drainage canal runs north south and is located between Seminole Pratt Whitney and the JWCWMA. The type of soil found within this community is Riviera fine sand, depressional and Boca fine sand.

Mixed Wetland Hardwoods

FLUCFCS: 617

USFWS: Palustrine, Forested, Broad-Leaved Evergreen, Seasonally Flooded (PFO3C)

This land use category is characterized as a wetland dominated by a variety of hardwood species tolerant of hydric conditions. Within Alternative 4B, this habitat type has a shrubby canopy dominated comprised of pond apple, wax myrtle, Carolina willow, buttonbush, and saltbush as the low growing, shrubby canopy. The understory is dominated by sawgrass, arrowhead, flat sedge, broom grass, and Virginia chain fern. The exotic old world climbing fern was also observed as sporadically occurring within this habitat type.

The soil type present within this community is Riviera fine sand, depressional.

Exotic Wetland Hardwoods (Melaleuca)

FLUCFCS: 619

USFWS: Palustrine, Forested, Broad-Leaved Evergreen, Seasonally Flooded (PFO1C)

This land use category is characterized as a wetland dominated with an exotic species. The exotic wetland hardwoods found within Alternative 4B are transitioning into complete monocultures of melaleuca. These forested areas have slash pine, cabbage palm, wax myrtle, and dahoon holly in the sub-canopy. The following herbaceous plant species are present in the understory: false buttonweed, swamp fern, sawgrass, maidencane, button snakeroot and arrowhead.

The type soils found within this community are Riviera fine sand, depressional.

Freshwater Marsh**FLUCFCS: 641****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

This land use classification is characterized as non-forested areas that are dominated by herbaceous plant species with small amounts of shrubby vegetation usually occurring along the perimeters. Within Alternative 4B, the herbaceous and shrub plant species that are present within this community type include maidencane, beakrush, arrowhead, swamp fern, buttonweed, corkwood, St. John's wort, water hyssops, and spikerush. Shrub species that are concentrated around the perimeter of the marshes include wax myrtle and Carolina willow.

These marshes have small amounts (1 to 5 inches) of standing water throughout most of the year except during drought conditions. The type of soil found within this community is Riviera fine sand, depressional.

Sawgrass Marsh**FLUCFCS: 6411****USFWS: Palustrine, Emergent, Persistent, Seasonally Flooded (PEM1C)**

This habitat consists of herbaceous marsh comprised almost exclusively by sawgrass. Within Alternative 4B, this marsh is inundated for extended periods during the year. The types of soils found within this community are Riviera fine sand, depressional and Okeelanta muck.

Freshwater Marsh/Electric Power Transmission Lines**FLUCFCS: 641/832****USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)**

This land use category consists of freshwater marsh located within an existing electric transmission line corridor. Within Alternative 4B, these marshes are dominated by maidencane, pickerelweed, torpedo grass, water dropwort, arrowhead, buttonweed, broom grass, flat sedge, button snakeroot, St. John's wort, and yellow-eyed grass.

This habitat most likely was hydric pine flatwoods, which were cleared during the construction of the transmission lines. The type of soil within this community type is Riviera fine sand, depressional.

Upland Habitat Classifications**Pine Flatwoods****FLUCFCS: 411**

This land use class is common throughout northern and central Florida, and is characterized by a canopy of either longleaf or slash pine. Within Alternative 4B, this pine flatwoods community is dominated by slash pine with a thick understory of saw palmetto. Native vegetation present within this community type's sub-canopy includes gallberry, wax myrtle, and beautyberry. Swamp fern, broom grass, false buttonweed, red root, tickseed, wire grass, and grape vine are present within the habitat's understory.

Pine trees throughout this community type were damaged by recent storm events. The types of soils found within this community are Riviera fine sand and Boca fine sand. These areas were most likely burn managed within the last 5 years.

Pine Flatwoods (Disturbed)**FLUCFCS: 411(d)**

This land use class is characterized by a canopy of slash pine. Within Alternative 4B, the canopy also has large numbers of cabbage palm. Additional native species within the sub-canopy and shrub layer include myrsine, cocoplum, red bay, wax myrtle, and beautyberry. The herbaceous groundcover includes swamp fern, false buttonweed, goldenrod, and grape vine. Also present within this habitat type are exotic species such as Brazilian pepper, lantana, and old world climbing fern.

This community type can be characterized as a remnant flatwood with limited amounts of human disturbance in the understory. The soils in this community type are Riviera fine sand and Pinellas fine sand.

Exotic Flatwoods**FLUCFCS: 411/422**

This land use category is characterized as a disturbed pine flatwoods with large amounts of Brazilian pepper. Within Alternative 4B, these forested areas also have small amounts saw palmetto and myrsine present within the sub-canopy. Exotic old world climbing fern was also observed within this habitat type. However, dense pine needle leaf-litter restricts groundcover within this habitat.

The type of soil within this community type is Riviera fine sand, depressionial.

Cabbage Palm**FLUCFCS: 428**

The canopy of this forest community type is dominated by cabbage palm. The cabbage palm communities within Alternative 4B include a wide variety of hardwoods such as American beautyberry, myrsine, cocoplum saw palmetto, and wild coffee. Large patches of saw palmetto are also present within some areas of this habitat type. Other areas have a ruderal understory as a result of past clearing activities. Sparse stands of slash pine were also observed within this habitat type.

The soil type found within this community is Pinellas fine sand.

Land Use Classifications**Residential, Low Density****FLUCFCS: 110**

This land use category is defined as having less than two dwelling units per acre. Within Alternative 4B, this land use classification consists of residential areas located south and east of the JWCWMA. The type of soils within this land use type are Riviera fine sand and Pineda sand.

Transportation

FLUCFCS: 810

The transportation classification is defined as those facilities used for the movement of people and goods. Within Alternative 4B, transportation facilities consist of road facilities including Seminole Pratt Whitney Road and adjacent residential roadways.

3.3 LAND USE EASEMENT MITIGATION

3.3.1 INTRODUCTION

As stated previously, the proposed project includes the change in use of two tracts of land located within the JWCWMA and totaling 30 acres (i.e., Corbett Parcels A and B). This change in land use, if approved, will be accomplished through the use of land use easements from the FWC to Palm Beach County. As a result of this easement, the use of the 30 acres of Corbett lands will change from managed conservation lands to man dominated uses, including roadways, an electrical power substation, a canal/flow way, and a canal maintenance area which will also be used as an activities trail. To compensate for the loss of conservation lands within the JWCWMA, Palm Beach County proposes to provide an existing 60-acre tract of land located adjacent to the JWCWMA's northern boundary. This tract of land is located in Martin County and is known as the Minkin Parcel (see Figure 3-1). The Minkin Parcel is a natural wetland area consisting of hydric pine flatwoods, freshwater marsh, and cypress stands.

3.3.2 SOILS

Based upon the USDA - NRCS, Soil Survey for Martin County, four soil types are mapped within the Minkin Parcel (see **Figure 3-9**). According to the Hydric Soils of Florida Handbook (Carlisle, 1990) three of the soil types found within the parcel are hydric soil types and one is a non-hydric soil type.

Listed below are the soil types found within the Minkin Parcel, their corresponding NRCS reference number for soils of Martin County, Florida, and general descriptions of their characteristics.

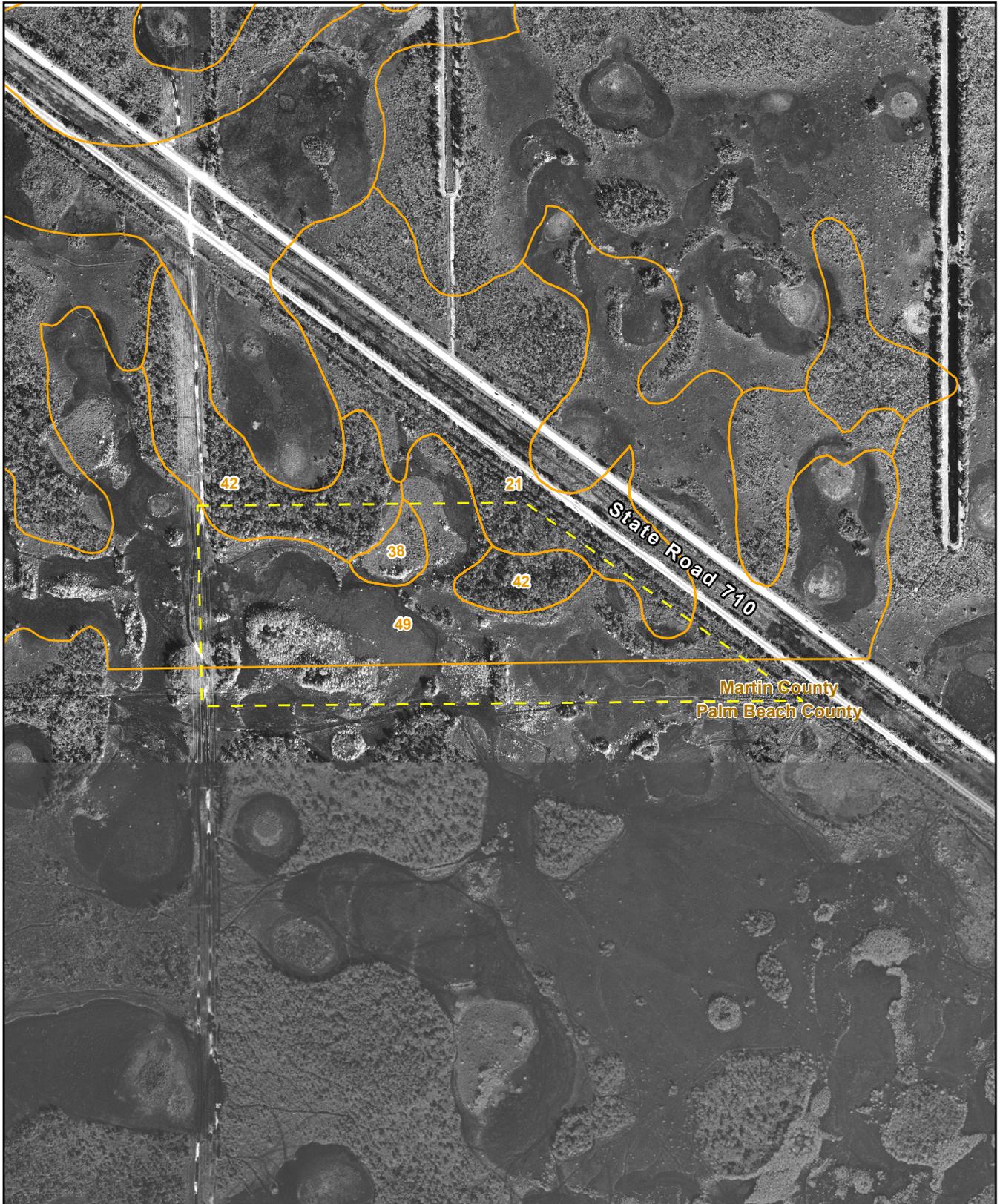
Pineda sand (21)

This nearly level soil is poorly drained and found in low grassy flats. Under natural conditions, the water table is within a depth of 10 inches for 2 to 6 months during wet seasons in most years. This soil is classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

Floridana fine sand (38)

This nearly level soil is very poorly drained and found in wet sloughs and depressions. Under natural conditions, this soil is ponded for more than 6 months during most years. The water table is at a depth less than 10 inches for the remainder of the year. This soil is classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

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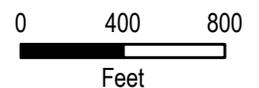


-  Minkin Alternative
-  Soil w/Map Unit ID
- 21 - Pineda Fine Sand
- 38 - Floridana Fine Sand; Depressional
- 42 - Hallandale Sand
- 49 - Riviera Fine Sand; Depressional

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Martin County Soils Map

Figure 3-9



Source: NRCS, dates vary

Hallandale sand (42)

This nearly level, shallow soil is poorly drained and found in broad low flats and along the edges of drainways. Under natural conditions, the soil is periodically covered with shallow water for a few days to a month and in most years, the water table is at a depth of less than 10 to 30 inches most of the rest of the year. This soil is not classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

Riviera fine sand (49)

This nearly level soil is poorly drained and found in depressions. Under natural conditions, this soil is ponded for 6 to 9 months in most years. During the dry season, the water table recedes to a depth of 10 to 40 inches. This soil is classified as hydric by the Hydric Soils of Florida Handbook (Carlisle, 1995).

3.3.3 HABITAT DESCRIPTION

The 60-acre Minkin Parcel is located at the southern terminus of Martin County adjacent to the JWCWMA northern boundary. Within the boundaries of the 60-acre parcel, there are four separate habitat classifications. These habitat classifications include hydric pine flatwoods, cypress, freshwater marsh, and sawgrass marsh. Descriptions of each of these habitat types are provided below as well as their FLUCFCS and USFWS classifications. The existing habitat types found on the Minkin Parcel are depicted on **Figure 3-10**. Acreages of each habitat type are provided in **Table 3-7**.

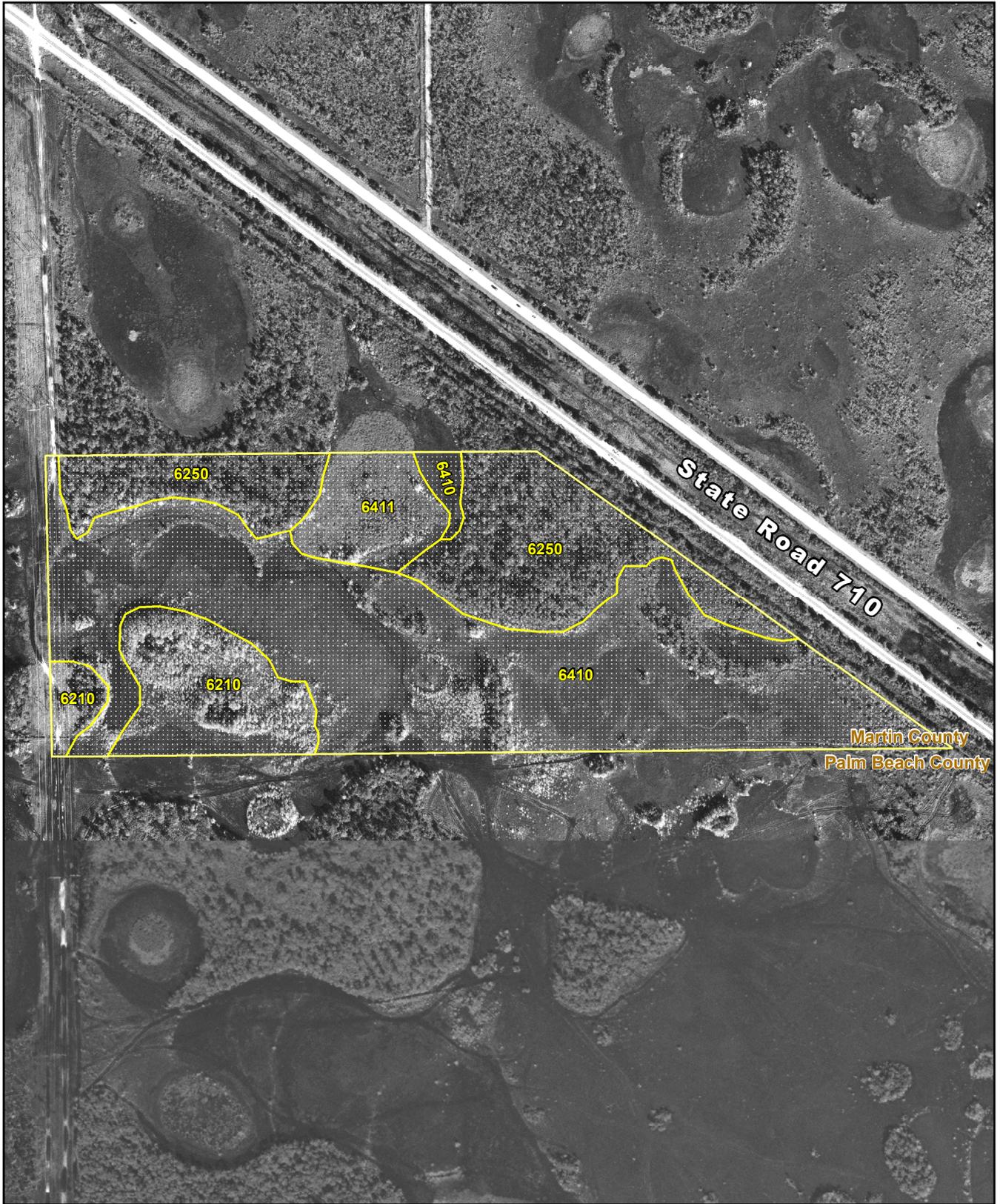
**TABLE 3-7
FLUCFCS CLASSIFICATIONS AND ACREAGES FOR MINKIN PARCEL**

Classification Type	Classification Name	FLUCFCS Classification*	USFWS Classification**	Acreage within Parcel	Percent of Total Area
Wetlands	Cypress	621	PFO2C	7.54	12.5%
	Hydric Pine Flatwoods	625	PFO4B	13.78	23.0%
	Freshwater Marsh	641	PEM1C	34.81	58.0%
	Sawgrass Marsh	6411	PEM1C	3.88	6.5%
Total				60.00	100%

* Based on the FLUCFCS (3rd ed.) (FDOT, 1999).

** Based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin *et. al.*, 1979).

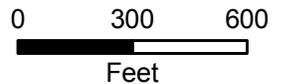
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- 6410 Land Use w/FLUCCS Code
- Minkin Alternative
- Ownership
- Corbett
- Other

J.W. Corbett W.M.A. Land Transfer Ecological Assessment

Minkin Alternative Habitat Map



Sources: Land Use - URS Field Survey, 2004
Cadastral - Martin and Palm Beach Counties, 2004

Figure 3-10

Wetland Habitat Classifications

Cypress

FLUCFCS: 621

USFWS: Palustrine, Forested, Needle-Leaved Deciduous, Seasonally Flooded (PFO2C)

This land use class is characterized by a canopy of bald or pond cypress (*Taxodium distichum* and *T. ascendens*, respectively). Within the Minkin parcel, pond cypress dominates the canopy of this wetland classification. Additional native species found within the sub-canopy include swamp bay and dahoon holly. The shrub lay and herbaceous lay is dominated by sawgrass, arrowhead, and maidencane.

The type of soil found within this community is Riviera fine sand, depressional.

Hydric Pine Flatwoods

FLUCFCS: 625

USFWS: Palustrine, Forested, Needle-Leaved Evergreen, Saturated (PFO4B)

This land use class is characterized by a canopy of slash pine. Within the Minkin Parcel, native vegetation also observed within the sub-canopy and shrub lay of this habitat type includes gallberry, wax myrtle, cocoplum, cabbage palm, pond cypress, and myrsine. The groundcover includes swamp fern, royal fern (*Osmunda regalis*), and broom grass. Saw palmetto is also sparsely dispersed throughout this habitat type.

The type of soil found within this community is Hallandale sand and Pineda sand.

Freshwater Marsh

FLUCFCS: 641

USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)

This land use class is characterized as non-forested areas that are dominated by herbaceous plant species with small amounts of shrubby vegetation usually along the perimeters. Within the Minkin Parcel, dominant herbaceous vegetation includes maidencane, pickerelweed, southern beakrush (*Rhynchospora microcarpa*), broom grass, water hyssops, floating-hearts (*Nymphoides aquatica*), bladderwort, and water dropwort.

This marsh is flooded throughout the year except during drought conditions. The type of soil found within this community is Riviera fine sand, depressional.

Sawgrass Marsh

FLUCFCS: 6411

USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)

This land use classification is characterized as non-forested areas that are dominated by sawgrass. The sawgrass marshes within the Minkin Parcel consist of dense monocultures of sawgrass with scattered cypress.

This marsh is flooded for extended period during the year. The type of soil found within this community is Floridana fine sand, depressional.

3.4 PROTECTED SPECIES ASSESSMENT

The Endangered Species Act of 1973 (ESA) PL 93-205, as amended, requires that all Federal agencies undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that would jeopardize a listed species or destroy or modify its “critical habitat.” A species may be classified as “endangered” when it is in danger of extinction within the foreseeable future throughout all or a significant portion of their ranges. A “threatened” classification is provided to those animals and plants likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges. Critical habitat is defined as a geographic area containing the physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. In accordance with the ESA, all alternatives associated with this project were evaluated to determine if they would result in impacts to protected species or their “critical habitat.”

State listed species are those plant and animal species protected by the State of Florida pursuant to Chapter 68A-27 FAC (animals) and Chapter 581.185 FS (plants). State listed species can be classified as endangered, threatened, or species of special concern. With respect to state listed animal species, endangered animal species are those species, subspecies, or isolated population of a species or subspecies which are so few or depleted in number or so restricted in range or habitat due to any man-made or natural factors that it is in imminent danger of extinction. Threatened species are those species, subspecies, or isolated population of a species or subspecies that is facing a very high risk of extinction in the future. Species of special concern are those species, subspecies, or isolated population of a species or subspecies that is facing a moderate risk of extinction in the future. State listed plant species are endangered if the species is in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended. Threatened plant species are those species that are in rapid decline in the number of plants within the state but have not so decreased in number as to cause them to be endangered. State listed plant species may also be considered commercially exploited if the species is subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.

The project study area was evaluated for the potential occurrences of Federal and state listed threatened and endangered plant and animal species, Federal candidate species, and state listed species of special concern. In order to better assess potential impacts associated with the proposed project, information on critical wildlife habitat, eagle nest sites, Federal or listed protected species, or candidate species that may occur within one mile of the project area was requested from the FNAI. In addition, information on wood stork rookeries that may occur within an 18.6-mile radius of the study area, the core foraging area (CFA) for wood stork rookeries, was also requested. Occurrence maps and additional information received from FNAI are attached to this assessment (see Appendix B). Coordination with FWC personnel located at the JWCWMA was also undertaken.

Using collected data, as well as field reviews of the project alternatives, a determination of those Federally and state protected species that had the potential to occur within one or more of the alternatives was undertaken. A list of those protected species that have the potential to occur within one or more of the alternatives are provided in **Table 3-8**. At the request of FWC staff located at the JWCWMA, an additional 9 state listed plant species and 1 state listed animal species not noted within the FNAI occurrence data set were added to Table 3-8. These 10 species are noted within Table 3-8. Table 3-8 also provides a brief description of each species, their Federal and state protection status, their potential for occurrence in the project study area, and their habitat preferences. The probability of occurrence is listed as low, moderate, or high and is based on the habitat requirements of each species and the documented occurrence of the species within one mile of the project corridor. A low listing indicates that potentially suitable habitat exists but no documented sightings have occurred within one mile of the project study area. A moderate listing indicates that suitable habitat exists and the species is documented to occur within one mile of the project study area. A high listing indicates that suitable habitat exists and the species was observed during field reviews within the project study area. Listing of probability of occurrence for 19 species were revised from the draft EA based on comments from FWC staff located at the JWCWMA. These 19 species are noted within Table 3-8.

TABLE 3-8
PROTECTED SPECIES THAT MAY OCCUR WITHIN ONE OR MORE ALTERNATIVES

Species	Designated Status			Habitat Preference	Potential for Occurrence On-Site
	USFWS	FWC	FDA		
PLANTS					
Giant leather fern ^{1,3} <i>Acrostichum danaeifolium</i>			C	Brackish and freshwater marshes (coastal)	Low ²
Pine pink orchid ¹ <i>Bletia purpurea</i>			T	Hardwood hammocks	Low ²
Bearded grass pink ¹ <i>Calopogon barabtus</i>			T	Wet pine flatwoods	Moderate ²
Long strap fern ¹ <i>Campyloneurum phyllitidis</i>			E	Hardwood hammocks	Low ²
Piedmont jointgrass <i>Coelorachis tuberculosa</i>			LT	Flatwoods, cypress swamp edges, pond margins, marshes	Low
Butterfly orchid ¹ <i>Encyclia rampensis</i>			C	Hardwood hammocks, swamps, sloughs	Low ²
Rein orchid ¹ <i>Habenaria distans</i>			E	Hardwood hammocks	Moderate ²
Catesby's lily ¹ <i>Lilium catesbaei</i>			T	Moist pine flatwoods, savannas	Moderate ²
Celestial lily <i>Nemastylis floridana</i>			LE	Wet flatwoods, prairies, marshes, cabbage palm hammock edges	Low
Hand fern <i>Ophioglossum palmatum</i>			LE	"Boots" or old leaf bases of cabbage palms	Low
Cutthroat grass <i>Panicum abscissum</i>			LE	Cutthroat seeps, depression marshes, wet flatwoods	Low
Terrestrial peperomia <i>Peperomia humilis</i>			LE	Maritime hammock, upland hardwood forest, hydric hammock, mangrove swamp	Low

TABLE 3-8 (CONTINUED)
PROTECTED SPECIES THAT MAY OCCUR WITHIN ONE OR MORE ALTERNATIVES

Species	Designated Status			Habitat Preference	Potential for Occurrence On-Site
	USFWS	FWC	FDA		
Snowy orchid ¹ <i>Platanthera nivea</i>			T	Wet pine flatwoods	Low ²
Rose pogonia ¹ <i>Pogonia ophioglossoides</i>			T	Marshes, wet pine flatwoods	Low ²
Giant orchid <i>Pteroglossaspis ecristata</i>			LT	Sandhill, scrub, pine flatwoods, pine rocklands	Low
Fahkahaatchee Ladies' tresses <i>Sacoila lanceolata</i> var. <i>paludicola</i>			LT	Swamps and hydric hammocks	Low
AMPHIBIAN					
Gopher frog <i>Rana capito</i>		S		Xeric or scrub habitats adjacent to ephemeral wetlands	Low
REPTILIAN					
American alligator <i>Alligator mississippiensis</i>	T (S/A)	S		Wetland habitats including streams, ponds, lakes, freshwater marshes and ditches	High ²
Eastern indigo snake <i>Drymarchon corais couperi</i>		T		Mangrove swamp, wet prairies, xeric pinelands, scrub	Moderate ²
Gopher tortoise <i>Gopherus polyphemus</i>		S		Xeric or scrub habitats	Low
Florida pine snake <i>Pituophis melanoleucus mugitus</i>		S		Sandhill, scrubby flatwoods, xeric hammock	Low
AVIAN					
Roseate spoonbill <i>Ajaia ajaja</i>		S		Mudflats, fresh and saltwater marshes, flats, mangroves, herbaceous wetlands, ditches	Moderate ²
Limpkin <i>Aramus guarana</i>		S		Freshwater marshes, swamps, springs and spring runs, pond and river margins	High ²
Florida burrowing owl <i>Athene cunicularia floridana</i>		S		Prairies, sandhills, farms or airfields	Low
Crested caracara <i>Caracara cheriway</i>	T	T		Open areas of dry prairie and pasture with cabbage palm groupings	Low
Little blue heron <i>Egretta caerulea</i>		S		Mudflats, coastal beaches, mangrove swamps, hardwood and cypress swamps, wet prairies	High
Snowy egret <i>Egretta thula</i>		S		Mudflats, coastal beaches, mangrove swamps, hardwood and cypress swamps, wet prairies	High ²
Tricolored heron <i>Egretta tricolor</i>		S		Mudflats, coastal beaches, mangrove swamps, hardwood and cypress swamps, wet prairies	High
White Ibis <i>Eudocimus albus</i>		S		Freshwater marshes, mangrove swamps, shallow lakes, wet prairies, cypress and hardwood swamps	High ²
Peregrine Falcon <i>Falco peregrinus</i>		E		Lake and river margins, salt marshes, dry prairies, wet prairies and marshes, coastal ponds, sloughs	Low
Southeastern American kestrel <i>Falco sparverius paulus</i>		T		Pine scrub, dry prairies, mixed pine and hardwood forests, pine flatwoods	High

TABLE 3-8 (CONTINUED)
PROTECTED SPECIES THAT MAY OCCUR WITHIN ONE OR MORE ALTERNATIVES

Species	Designated Status			Habitat Preference	Potential for Occurrence On-Site
	USFWS	FWC	FDA		
Florida sandhill crane <i>Grus canadensis pratensis</i>		T		Open terrain, lake and river margins, prairies, sloughs	High
Bald eagle <i>Haliaeetus leucocephalus</i>	T	T		Large open water bodies, saltwater marshes, dry prairies, mixed pine, hardwood forests, wet prairies, marshes, pine flatwoods, sandhills	Moderate ²
Wood stork <i>Mycteria americana</i>	E	E		Fresh and saltwater marshes, tidal flats, wet prairies, cypress swamps	High ²
Red-cockaded woodpecker <i>Picoides borealis</i>	E	T		Mature pine flatwoods	Moderate
Snail kite <i>Rostrhamus sociabilis plumbeus</i>	E	E		Open and shallow freshwater marshes and lakes	Moderate ²
Least tern ¹ <i>Sterna antillarum</i>		T		Beaches, lagoons, bays, estuaries	Moderate ²
MAMMALIAN					
Florida mouse <i>Podomys floridanus</i>		S		Sand pine scrub in an early successional stage, longleaf/pine oak and scrubby flatwoods	Low
Florida panther <i>Puma concolor coryi</i>	E	E		Extensive blocks of mostly forested communities	Low
Sherman's fox squirrel <i>Sciurus niger shermani</i>		S		Longleaf pine-turkey oak sandhills and flatwoods	Low
Florida black bear <i>Ursus americanus floridanus</i>		T		Forest habitat generalist	Low

Legend:

USFWS = U.S. Fish and Wildlife Service
FWC = Florida Fish and Wildlife Conservation Commission
FDA = Florida Department of Agriculture

E = Endangered
T = Threatened
S = Species of Special Concern
C = Commercially Exploited
(S/A) = Threatened/Similarity of Appearance

Low = Little or no suitable habitat; no documented occurrence of species within one mile of the study area.
Moderate = Potential suitable habitat exists within the project study area, but species was not found; species documented within one mile of the study area.
High = Suitable habitat exists on-site and species observed on-site.

¹ Added at the request of FWC.

² Potential for occurrence ranking as determined by FWC.

³ Not listed within 22 April 04 update of Chapter 5B-40 FAC, but included at request of FWC.

Listed below are descriptions of 12 Federal and/or state listed endangered and threatened species that have a medium or high potential to be found in one or more of the project alternatives or are of particular interest within the region.

Bearded grass pink (*Calopogon barbatus*)

This small terrestrial orchid is listed as threatened by the Florida Department of Agriculture (FDA). It is typically found within damp pinelands. This erect orchid is up to 15 inches tall with one to two slender leaves with purplish-green axis. The flowering spike extends vertical with multiple small pink flowers. This plant is not listed within Palm Beach County and was not identified within the FNAI database of rare species for Palm Beach County. However, this species was included and given a moderate probability of occurrence within project alternatives at the request of FWC staff located at the JWCWMA.

Rein Orchid (*Habenaria distans*)

This slender terrestrial orchid is listed as endangered by the FDA. It prefers dense, hardwood forests and hammocks. This erect, leafy below orchid is up to 12 inches tall with approximately five glossy green oblong leaves in a basal rosette. The flowering spike extends from the center of the rosette with multiple small yellowish-green flowers. This plant was not listed within primary references as occurring within Palm Beach County and was not identified within the FNAI database of rare species for Palm Beach County. However, this species was included and given a moderate probability of occurrence within project alternatives at the request of FWC staff located at the JWCWMA.

Catesby's Lily (*Lilium catesbaei*)

This perennial herb is listed as threatened by the FDA. It is typically found in wet flatwoods and bogs throughout much of Florida. This lily has alternate linear-lanceolate leaves with stems up to 24 inches in height. Flowers are solitary, erect, and orange to orange red in color. This species was not listed within the FNAI database of rare species for Palm Beach County. However, it was included and given a moderate probability of occurrence within project alternatives at the request of FWC staff located at the JWCWMA.

American Alligator (*Alligator mississippiensis*)

This large crocodylian is listed by the FWS as threatened due to similarity of appearance. The American alligator is a characteristic resident of the river swamps, lakes, marshes, and other permanent bodies of water throughout Florida. It is typically black in color, ranges between 6 and 16 feet in length, and feeds on a variety of animal species. No alligators were observed during the field reviews. However, the probability of occurrence for this species is listed as high based on comments from FWC staff located at the JWCWMA.

Eastern indigo snake (*Drymarchon corais couperi*)

This large, shiny black snake is listed as threatened on both the Service and FWC. The indigo snake can be found in a variety of habitats including wet prairies, xeric pinelands, and scrub. Indigo snakes are often found utilizing burrows of the gopher tortoise. It is improbable that gopher tortoises would be found within project alternatives due to high water tables. However, FNAI has documented occurrences (1980) of indigo snakes approximately 2.5 miles to the northwest and northeast of project alternatives. No indigo snakes were observed during the field reviews. The probability of occurrence is moderate based on comments from FWC staff located at JWCWMA. However, standard Eastern indigo snake construction guidelines will be utilized during construction to ensure that this species will not be affected by the construction of the proposed project.

Southeastern American kestrel (*Falco sparverius*)

This small falcon with blue-gray wings is listed as threatened by the FWC. Southeastern American kestrel utilizes open habitats for foraging and nests in tree cavities. Habitats such as pine scrub, dry prairies, mixed pine and hardwood forests, and pine flatwoods are preferable by this species. During November field surveys, a kestrel was observed perched on electrical transmission wires located within the limits of the project alternatives (within the JWCWMA). It was undetermined whether this kestrel was the southeastern variety as this observation occurred in the fall (November 12, 2004) when the migratory eastern American kestrel (*Falco sparverius sparverius*) is common in Florida. Based upon these visual observations, the probability of occurrence of this species within the project study area is high.

Florida sandhill crane (*Grus canadensis pratensis*)

This tall, long-necked and long-legged bird with a red head is listed as threatened by the FWC. The Florida sandhill crane prefers shallow freshwater areas, pasture, and openwoods habitats. This permanent resident of Florida closely resembles the more common migratory greater sandhill crane (*Grus canadensis tabida*), which winters in Florida. During November field reviews, a pair of sandhill cranes was observed in a freshwater marsh located within one of the project alternatives (adjacent to SR 710). It was undetermined whether these observed cranes were the migratory greater sandhill crane or the Florida subspecies. However, the FNAI database has confirmed sightings of the Florida sandhill crane within the vicinity of the project alternatives (\pm 2 miles). Based upon the visual observation, the probability of occurrence of this species within the project study area is high.

Bald eagle (*Haliaeetus leucocephalus*)

This large dark raptor with a white head and tail is listed as threatened by both the FWC and the Service. It is found most commonly in areas close to coastal areas, bays, rivers, lakes, and other water bodies that provide concentrations of food sources. Its primary food types include fish, water fowl, and wading birds. It usually nests in tall live pine trees that provide clear views of surrounding areas. According to the FNAI, no bald eagle nests are located within one mile of any of the project alternatives. However, this species was listed as having a moderate probability of occurrence within the project alternatives at the request of FWC personnel located at the JWCWMA.

Wood stork (*Mycteria americana*)

This large, white, wading bird is listed as an endangered species on both the FWC and the Service lists of endangered and threatened wildlife. This wading bird species is opportunistic, utilizing various open hydric pine-cypress habitats and man-made wetlands. A specialized method of feeding (groping) limits the wood stork to shallow water with high concentrations of small fish. The wood stork is known to utilize an 18.6-mile radius for foraging (CFA). According to the FNAI database, no recorded observations of wood storks have occurred within one mile of the project alternatives; however, a group of wood storks (20) were observed approximately 5 miles southwest of the project alternatives. In addition, the project area is within the CFA for two documented wood stork nesting colonies. One of these colonies is located 8 miles to the southeast and the second is located 18 miles to the south. No wood storks were observed during the field surveys. Nesting and roosting habitat for this species are present within many of the project alternatives. Foraging habitat is available during the dryer periods of the year as existing water levels in the freshwater marshes within the JWCWMA recede. The probability of occurrence of this species within the project study area is low due to lack of documented sightings within one mile of the project study area.

Red-cockaded woodpecker (*Picoides borealis*)

This small woodpecker inhabits old growth (60+ years) pine stands with low or sparse understory. The habitat for this species is dependent on fire for maintaining a minimal shrub layer and nesting trees are usually infected with red heart disease (*Phellinus pini*), a fungus that softens the wood of the pine. The red-cockaded woodpecker (RCW) is non-migratory and maintains its territories throughout the year. According to the South Florida Multi-Species Recovery Plan (USFWS, 1999), the JWCWMA currently has 14 nest clusters. Based on FNAI data, five of these clusters are documented within 2.5 miles of the project alternatives, with the closest cluster at a distance of approximately 0.75 miles. Required feeding habitat for a RCW cluster typically encompasses an area of approximately 200 to 300 acres surrounding nesting sites. The probability of occurrence is moderate due to the presence of a documented cluster within one mile of the project alternatives.

Snail kite (*Rostrhamus sociabilis plumbeus*)

This medium-sized gray to black raptor with a long, hooked bill is listed as endangered by both the FWC and the Service. The snail kite requires open freshwater marshes or lakes with almost permanently flooded shallow water to sustain its exclusive food source, the apple snail. None of the project alternatives are designated as critical habitat for this species. However, the intermittent marsh areas located within the pine flatwoods of the JWCWMA meet snail kite habitat requirements. According to FNAI, a snail kite has been documented approximately 2.5 miles northwest of project alternatives within the Pal-Mar Natural Area. The probability of occurrence is low due to the lack of documented sightings within one mile of any of the project alternatives.

Least Tern (*Sterna antillarum*)

The least tern is the smallest of the North American tern and is listed as threatened by the FWC. Adult birds are light gray above with a black cap and nape, a white forehead, and a black line running from their crown, through their eyes to the base of their bill. This bird is found in coastal areas throughout Florida. Primary habitat includes beaches, bays, lagoons and estuaries, with nests areas consisting of well-drained sand or gravel, with minimal vegetation. The FNAI did not list least terns within one mile of any project alternative. However, this species was listed as having a moderate probability of occurrence within the project alternatives at the request of FWC personal located at the JWCWMA.

3.5 OTHER WILDLIFE CONSIDERATIONS

During the November 2004 field reviews, two general types of direct wildlife survey methodology were employed: pedestrian transects and stationary observation points. Wildlife observations were conducted from 8:00 a.m. to 6:00 p.m. (dusk). Random pedestrian transects were conducted throughout each vegetative community type found within each project alternative and wildlife observations were recorded. The presence and location of wildlife indicators (e.g., tracks, burrows, scat) were also recorded. A total of 13 observation stations were established within the JWCWMA for Alternatives 1B, 3B, and 4B; four observation stations were established in Alternatives 1A and 1B, and six observation stations were established in the Minkin Parcel. Wildlife activity was observed independently by three observers for approximately 20 minutes at each observation station. Wildlife observed during field reviews are listed in **Table 3-9**. No Federal or state listed protected plant species were observed during the field reconnaissance.

In general, the wildlife habitat value of the natural areas within the alternatives located within the JWCWMA and the Minkin Parcel can be classified as moderate to high with each area providing some level of roosting and foraging habitat for many faunal species. Migratory and resident wading birds in particular would find these areas valuable for foraging during the majority of the year. Small and large mammals such as the white-tailed deer (*Odocoileus virginianus*) and the raccoon (*Procyon lotor*) would readily use these habitats for foraging. In addition, reptiles and amphibians such as the red bellied turtle (*Pseudemys nelsoni*) and oak toad (*Bufo quercicus*) would use these habitats for foraging and reproduction.

However, the natural areas within each alternative are adjacent to residential development and/or roadways that provide negative effects to wildlife. Anthropogenic effects such as roadkill, litter, and off-road vehicles usage are all evident within the natural areas of all alternatives.

**TABLE 3-9
WILDLIFE OBSERVED WITHIN PROJECT ALTERNATIVES**

Common Name	Scientific Name	Location/Number/ Activity Observed
Red-winged blackbird	<i>Agelaius phoeniceus</i>	Alternative 1B, 3B, 4B-JWCWMA / 4 / flying over emergent marsh
Anhinga	<i>Anhinga anhinga</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / flying overhead in southeast corner of site
Great egret	<i>Ardea alba</i>	Alternative 1B, 3B, 4B-JWCWMA / 5 / foraging in emergent marsh
Red-shouldered hawk	<i>Buteo lineatus</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / flying overhead
Green heron	<i>Butorides virescens</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / foraging in emergent marsh
Belted kingfisher	<i>Ceryle alcyon</i>	Alternative 1B, 3B, 4B-JWCWMA and Alternative 1A / 3 / flying overhead and perched on tree
Black vulture	<i>Coragyps atratus</i>	Alternative 1B, 3B, 4B-JWCWMA and Minkin Parcel / >5 / flying overhead
Virginia opossum	<i>Didelphis virginiana</i>	Alternative 1B, 3B, 4B-JWCWMA / tracks in saturated soils
Little blue-heron	<i>Egretta caerulea</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / adjacent to drainage canal
Tricolored heron	<i>Egretta tricolor</i>	Alternative 1A / 1 / foraging in emergent marsh
Southeastern American kestrel	<i>Falco sparverius paulus</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / flying overhead
Sandhill crane	<i>Grus canadensis</i>	Alternative 1A / 2 / foraging in emergent marsh
Mud turtle	<i>Kinosternon subrubrum</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / submerged in emergent marsh
Osprey	<i>Pandion haliaetus</i>	Alternative 1B,3B,4B-JWCWMA / 2 / flying overhead
Glossy ibis	<i>Plegadis falcinellus</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / flying over pine flatwoods
Apple snail	<i>Pomacea paludosa</i>	Alternative 1B, 3B, 4B-JWCWMA / 2 / within marsh
Common raccoon	<i>Procyon lotor</i>	Alternative 1B, 3B, 4B-JWCWMA and Minkin Parcel / observed tracks
Red-bellied turtle	<i>Pseudemys nelsoni</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / submerged on powerline easement
Wild boar	<i>Sus scrofa</i>	Minkin Parcel / 1 / rutting in soils on powerline easement
Florida softshell turtle	<i>Trionyx ferox</i>	Alternative 1B, 3B, 4B-JWCWMA / 1 / adjacent to drainage canal

APPENDIX A

REPRESENTATIVE PHOTOGRAPHS OF FLUCFCS HABITAT TYPES



**Photo 1. Pine Flatwoods
FLUCFCS: 411**



**Photo 2. Streams and Waterways
FLUCFCS: 510
USFWS: Palustrine, Unconsolidated bottom, Mud, Permanently Flooded (PUB3H)**



Photo 3. **Hydric Pine Flatwoods**
FLUCFCS: 625
USFWS: Palustrine, Forested, Needle-leaved Evergreen, Saturated (PFO4B)



Photo 4. **Freshwater Marsh**
FLUCFCS: 641
USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)



Photo 5. Cypress
FLUCFCS: 621
USFWS: Palustrine, Forested, Needle-Leaved Deciduous, Seasonally Flooded (PFO2C)



Photo 6. Sawgrass Marsh
FLUCFCS: 6411
USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)



Photo 7. Exotic Flatwoods
FLUCFCS: 411/422



Photo 8. Exotic Wetland Hardwoods (melaleuca)
FLUCFCS: 619
USFWS: Palustrine, Forested, Broad-leaved Evergreen, Seasonally Flooded (PFO3C)



Photo 9. **Wet Marsh/ Electric Power Transmission Lines**
FLUCFCS: 641, 832
USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)



Photo 10. **Cabbage Palm Hammock**
FLUCFCS: 428



Photo 11. Pine Flatwoods
FLUCFCS: 411 (d)



Photo 12. Mixed Wetland Hardwoods
FLUCFCS: 617
USFWS: Palustrine, Forested, Broad-leaved Deciduous, Seasonally Flooded (PFO2C)



Photo 13. Disturbed Land
FLUCFCS: 741



Photo 14. Maidencane Marsh
FLUCFCS: 6414
USFWS: Palustrine, Emergent Marsh, Persistent, Seasonally Flooded (PEM1C)



Photo 15. Unimproved Pasture
FLUCFCS: 212



Photo 16. Brazilian pepper
FLUCFCS: 422

APPENDIX B

FLORIDA NATURAL AREAS INVENTORY DATA



1018 Thomasville Road
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Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

November 22, 2004

Mike Dinardo
URS Corporation
7650 West Courtney Campbell Causeway
Tampa, FL 33607

Dear Mr. Dinardo:

Thank you for your request for information from the Florida Natural Areas Inventory (FNAI). We have compiled the following information for your project area.

Project: J.W. Corbett Proposed Land Transfer
Date Received: November 19, 2004
Location: Township 42 S, Range 40 E, Sections 1, 12, 13
Township 42 S, Range 41 E, Sections 6, 7, 18
Township 41 S, Range 40 E, Sections 13, 24, 25, 36
Township 41 S, Range 41 E, Sections 18, 19, 30, 31
Palm Beach County
Township 40 S, Range 40 E, Section 30
Martin County

Based on the information available, this site appears to be located within a significant region of natural areas and habitat for several rare species. Extra consideration should be taken to avoid and/or mitigate impacts to these natural resources, and to design land uses that are compatible with these resources.

Element Occurrences

A search of our maps and database indicates that currently we have several Element Occurrences mapped within the vicinity of the study area (see enclosed map and table). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

The Element Occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates the precision of the element occurrence location, defined as second (within about 300 feet of the point), minute (within about one mile), or general (within about 5 miles). For animals and plants, Element Occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations that may no longer be extant.

Several of the species and natural communities tracked by the Inventory are considered **data sensitive**. Occurrence records for these elements contain information that we consider sensitive due to collection



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

Tracking Florida's Biodiversity

Mike Dinardo

11/22/2004

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pressures, extreme rarity, or at the request of the source of the information. The Element Occurrence Record has been labeled "Data Sensitive." We request that you not publish or release specific locational data about these species or communities without consent from the Inventory. If you have any questions concerning this please do not hesitate to call.

Managed Areas

Portions of the site appear to be located within the John C. and Mariana Jones/Hungryland Wildlife and Environmental Area and J. W. Corbett Wildlife Management Area, both managed by the Florida Fish and Wildlife Conservation Commission.

The Managed Areas data layer shows public and privately managed conservation lands throughout the state. Federal, state, local, and privately managed conservation lands are included.

Land Acquisition Projects

This site appears to be located within the [Pal-Mar Florida Forever BOT Project](#) (in Martin County), which is part of the State of Florida's Conservation and Recreation Lands land acquisition program. A description of this project is enclosed. For more information on this Florida Forever Project, contact the Florida Department of Environmental Protection, Division of State Lands.

Florida Forever Board of Trustees (BOT) projects are proposed and acquired through the Florida Department of Environmental Protection, Division of State Lands. The state has no regulatory authority over these lands until they are purchased.

Potential Habitat for Rare Species

Portions of the site appear to be located on or near Potential Habitat for Rare Species. This potential habitat is associated with a known occurrence in the vicinity of: Florida sandhill crane (*Grus canadensis pratensis*), red-cockaded woodpecker (*Picoides borealis*), snail kite (*Rostrhamus sociabilis plumbeus*) and eastern indigo snake (*Drymarchon couperi*).

FNAI Potential Habitat for Rare Species indicates areas, which based on landcover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Potential habitat layers have been developed for approximately 250 of the most rare species tracked by the Inventory, including all federally listed species.

Potential Habitat is not a regulatory designation, and should not be confused with "critical habitat", which is an official designation made by the U.S. Fish and Wildlife Service. Information on critical habitats can be found in the Code of Federal Regulations, 50 CFR 17.95, which lists all critical habitats that have been designated. The Code of Federal Regulations can be accessed through the following website: "www.access.gpo.gov/nara/cfr/cfr-table-search.html".

The Inventory always recommends that a site-specific survey be conducted to determine the current presence or absence of rare, threatened, or endangered species. Surveys should be conducted by persons familiar with Florida's flora and fauna.

For more information about the rare plants and animals that may be found near your project site, please visit our searchable tracking list at: www.fnai.org/data.cfm

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or

Mike Dinardo

11/22/2004

Page 3 of 3

site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. FNAI data may not be resold for profit.

Thank you for your use of FNAI services. An invoice will be mailed to your accounts payable department. If I can be of further assistance, please give me a call at (850) 224-8207.

Sincerely,

Edwin A. Abbey

Edwin A. Abbey
Environmental Reviewer

encl



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FLORIDA
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Element Occurrences

Precision:

second minute general

- ▲ ■ Animals
- ▲ ■ Plants
- ▲ ■ Communities
- ▲ ■ Other

U.S. Fish & Wildlife Service
Scrub Jay Survey 1992-96

FL Fish & Wildlife Cons. Comm.
Breeding Bird Atlas Project 1986-91
center point of 10 sq mi survey block

Conservation Lands

- Federal
- State
- Local
- Private
- State Aquatic Preserves

Land Acquisition Projects

- Florida Forever
- Board of Trustees Projects

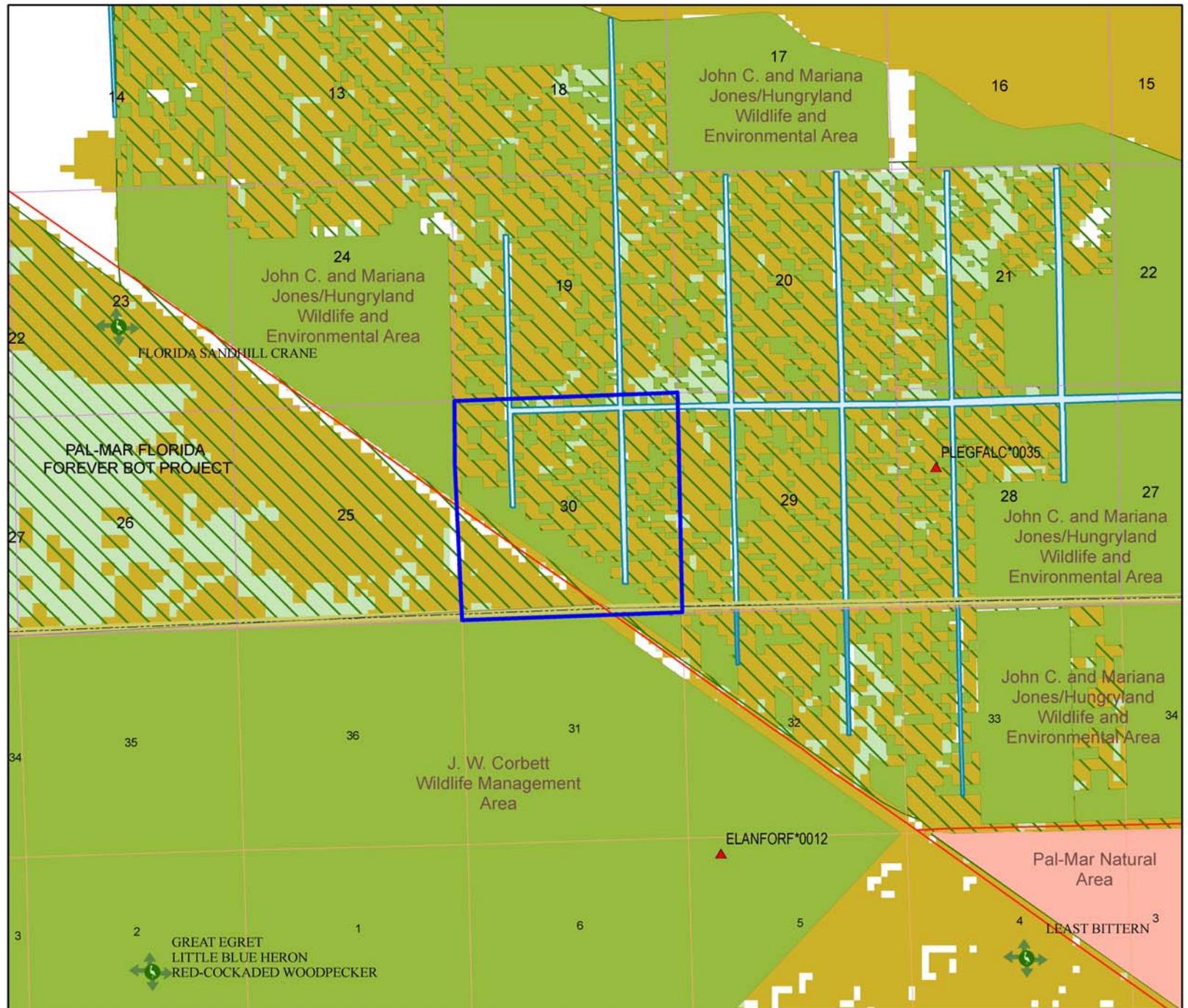
Non-Managed Natural Areas

- FNAI Potential Habitat for Rare Species
- FNAI Potential Natural Areas

- County Boundary
- == Interstate
- == Turnpike
- == Major Highway
- Local Road
- Water

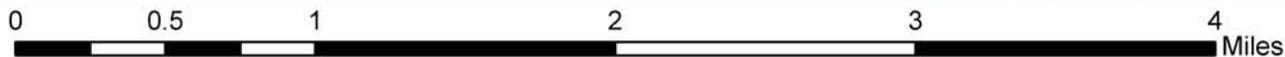
Township 40 S, Range 40 E, Section 30

Martin County



Map produced by EAA
Data Source: 09/2004

NOTE
Map should not be interpreted without
accompanying documents. Shading
of water bodies does not reflect known depths.





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ELEMENT OCCURRENCES MAPPED ON OR NEAR MARTIN COUNTY PROJECT SITE

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
PLEGFALC*0035	<i>Plegadis falcinellus</i>	Glossy Ibis	G5	S3	N	N	1987-04-14	Channelized, dredged or otherwise altered freshwater stream or canal	1987-04-14: D.E. Runde, GFC - "Total" = C (includes GREG, GBHE, GLIB).
ELANFORF*0012	<i>Elanoides forficatus</i>	Swallow-tailed Kite	G5	S2	N	N	1990-05-09	Wet Flatwoods; Freshwater Marsh.	1990-05-09: M.S. Robson, GFC - 2 adults soaring over the edge of a pine ridge, and near a sawgrass pond containing cypress.



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Element Occurrences

Precision:

second minute general

- ▲ ■ Animals
- ▲ ■ Plants
- ▲ ■ Communities
- ▲ ■ Other

U.S. Fish & Wildlife Service
Scrub Jay Survey 1992-96

FL Fish & Wildlife Cons. Comm.
Breeding Bird Atlas Project 1986-91
center point of 10 sq mi survey block

Conservation Lands

- Federal
- State
- Local
- Private
- State Aquatic Preserves

Land Acquisition Projects

- Florida Forever
- Board of Trustees Projects

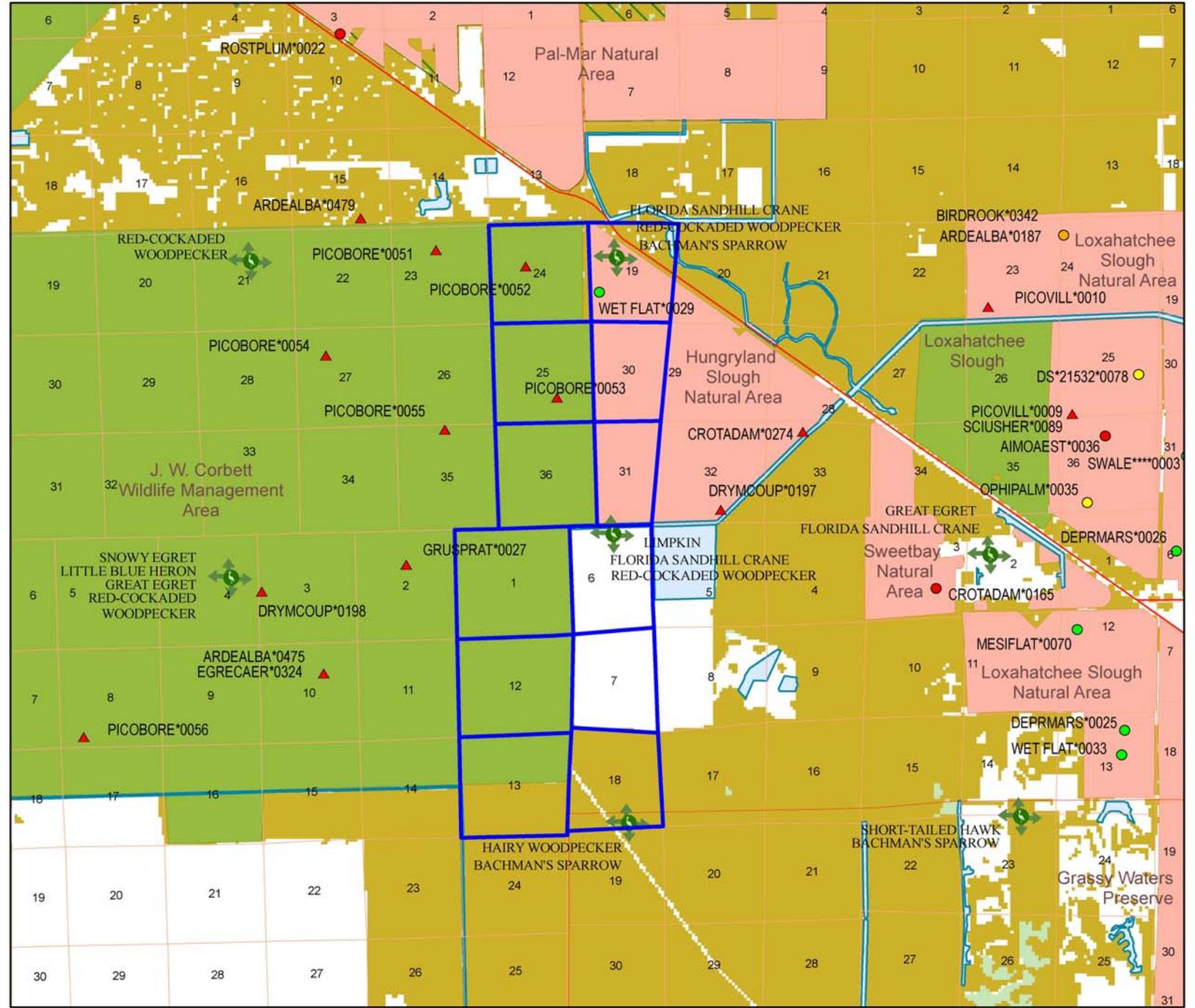
Non-Managed Natural Areas

- FNAI Potential Habitat
for Rare Species
- FNAI Potential
Natural Areas

- County Boundary
- Interstate
- Turnpike
- Major Highway
- Local Road
- Water

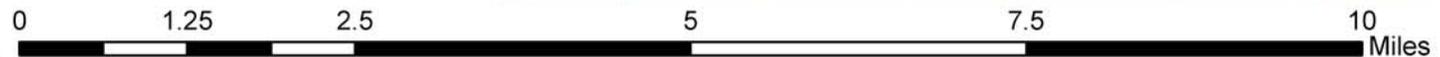
Township 42 S, Range 40 E, Sections 1, 12, 13; Township 41 S, Range 40 E, Sections 13, 24, 25, 36;
Township 42 S, Range 41 E, Sections 6, 7, 18; Township 41 S, Range 41 E, Sections 18, 19, 30

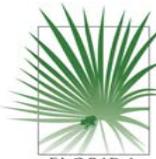
Palm Beach County



Map produced by EAA
Data Source: 09/2004

NOTE
Map should not be interpreted without
accompanying documents. Shading
of water bodies does not reflect known depths.





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ELEMENT OCCURRENCES MAPPED ON OR NEAR PALM COUNTY PROJECT SITE

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
PICOVILL*0010	Picoides villosus	Hairy Woodpecker	G5	S3	N	N	ZZ	No general description given	Occurrence on site.
PICOVILL*0009	Picoides villosus	Hairy Woodpecker	G5	S3	N	N	ZZ	No general description given	Occurrence on site.
PICOBORE*0053	Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS	ZZ	No general description given	ACTIVE COLONY
PICOBORE*0051	Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS	ZZ	No general description given	ACTIVE COLONY.
EGRECAER*0324	Egretta caerulea	Little Blue Heron	G5	S4	N	LS	1987-04-14	No general description given	1987/04/14: D.E. Runde, GFC, observation. No photo counts, but "Total" = 30 (includes GREG, GBHE, LBHE).
ARDEALBA*0475	Ardea alba	Great Egret	G5	S4	N	N	1987-04-14	No general description given	1987/04/14: D.E. Runde, GFC; No photo counts, but Total = 30 (includes GREG, GBHE, LBHE).
PICOBORE*0054	Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS	ZZ	No general description given	ACTIVE COLONY.
PICOBORE*0055	Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS	ZZ	No general description given	ACTIVE COLONY.
PICOBORE*0056	Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS	ZZ	No general description given	ACTIVE COLONY.
ARDEALBA*0479	Ardea alba	Great Egret	G5	S4	N	N	1987-04-14	Willow head near runway.	1987/04/14: D.E. Runde, GFC; No photo counts, but Total = B (includes GREG, GBHE, SMDARK).
DRYMCOU*0198	Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT	1980-	No general description given	INDIGO OBSERVED BY BRUCE BOWMAN IN 1980 (MOLER INTER- VIEW OF BOWMAN, 1981-10-06).
PICOBORE*0052	Picoides borealis	Red-cockaded Woodpecker	G3	S2	LE	LS	ZZ	No general description given	ACTIVE COLONY.
GRUSPRAT*0027	Grus canadensis pratensis	Florida Sandhill Crane	G5T2T	S2S3	N	LT	1992-03-27	POTHOLES IN FLATWOODS.	1981-82: 15-30 PAIRS. 1990-04-20: M. Robson (GFC) - 2 adults with 1 fledged young. 1992-03-27: J. Odell observed pair with 1 fledgling along youth camp road - 1 adult banded.
DRYMCOU*0197	Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT	1980-	No general description given	INDIGO (D.O.R.) OBSERVED BY BRUCE BOWMAN IN 1980 (MOLER INTERVIEW OF BOWMAN, 1981-10-06).



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ELEMENT OCCURRENCES MAPPED ON OR NEAR PALM COUNTY PROJECT SITE

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
SCIUSHER*0089	Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3	N	LS	ZZ	No general description given	1 individual seen.
CROTADAM*0274	Crotalus adamanteus	Eastern Diamondback Rattlesnake	G4	S3	N	N	1990-12-07	Wet flatwoods	1990-12-07: M.S. Robson, GFC, observed 1 adult.
OPHIPALM*0035	Ophioglossum palmatum	Hand Fern	G4	S2	N	LE	1992-08-18	Slough.	1992: Greater than 1000 individuals (U92FAR01).
DS*21532*0078	DATA SENSITIVE	DATA SENSITIVE	G5	S3	N	LT	1992-08-18		
WET FLAT*0033	Wet flatwoods		G4	S4	N	N	1992-06-10	THE LOXAHATCHEE SLOUGH PROPOSAL LIES WITHIN TWO BIOGEOGRAPHICAL REGIONS AS DEFINED BY IVERSON & AUSTIN (1987) FOR PALM BEACH COUNTY. THEY ARE THE HUNGRYLAND WETLANDS AND LOXAHATCHEE SLOUGH. THE HUNGRYLAND IS MENTIONED IN SOME OF DR. SMALL'S BOTANICAL NAR	WET FLATWOODS OCCUR ON SLIGHTLY LOWER LANDSCAPE POSITIONS THAN THE MESIC FLATWOODS AND HAVE A VERY OPEN, SAVANNA LIKE APPEARANCE. THE GROUNDCOVER IS TYPICALLY DOMINATED BY BLUE-MAIDENCANE (AMPHICARPUM MUHLENBERGIANUM), WITH BOGBUTTONS (LACHNOCAULON GLABRU
ARDEALBA*0187	Ardea alba	Great Egret	G5	S4	N	N	ZZ	No general description given	Rookery.
DEPRMARS*0026	Depression marsh		G4	S4	N	N	1992-06-10	DEPRESSION MARSHES ARE FOUND IN THE INNUMERABLE SHALLOW APPROXIMATELY CIRCULAR DEPRESSIONS, VARYING IN EXTENT FROM ONE TO MANY ACRES (UP TO 50 ACRES), WHICH MAY HOLD A FOOT OR MORE OF WATER IN WET WEATHER, BUT BECOME DRY DURING PART OF THE YEAR. THEY TYP	THE FOLLOWING IS A GENERALIZED CHARACTERIZATION OF THE VEGETATION ZONES THAT ONE MIGHT ENCOUNTER WITHIN THE PROPOSAL IN A TYPICAL DEPRESSION MARSH. IT IS BASED UPON NOTES TAKEN FROM SEVERAL SEPARATE DEPRESSION MARSHES DURING THE FIELD SURVEY. IN SOME DEP
ROSTPLUM*0022	Rostrhamus sociabilis plumbeus	Snail Kite	G4G5T	S2	N	LE	1998-12-15	98-12-15: EXTENSIVE MOSAIC OF BASIN MARSH, DEPRESSION MARSH AND MESIC FLATWOODS (PNDPRI03).	98-12-15: ONE FEMALE ADULT OBSERVED FORAGING FOR APPROXIMATELY 20 MINUTES; BIRD CONSUMED AT LEAST TWO SNAILS DURING THIS TIME (PNDPRI03, PNDSCH03).



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ELEMENT OCCURRENCES MAPPED ON OR NEAR PALM COUNTY PROJECT SITE

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
WETFLAT*0029	Wet flatwoods		G4	S4	N	N	1992-06-10	THESE FLATWOODS LIE WITHIN TWO BIOGEOGRAPHICAL REGIONS AS DEFINED BY IVERSON & AUSTIN (1987) FOR PALM BEACH COUNTY. THEY ARE THE HUNGRYLAND WETLANDS AND LOXAHATCHEE SLOUGH. THE HUNGRYLAND IS MENTIONED IN SOME OF DR. SMALL'S BOTANICAL NARRATIVES AS LOW AND	THE NATURAL COMMUNITIES ON THIS TRACT INCLUDE MESIC FLATWOODS, DEPRESSION MARSHES, WET FLATWOODS AND CYPRESS DOMES. PARTS OF THE SITE HAVE BEEN BURNED OF THIS WET-MESIC SOUTH FLORIDA SLASH PINE FLATWOODS DOMINATED BY PINUS ELLIOTTII VAR. DENSA WITH AN IN
BIRDROOK*0342	Bird rookery		GNR	SNR	N	N	ZZ	No general description given	Casmerodius albus rookery.
DEPRMARS*0025	Depression marsh		G4	S4	N	N	1992-06-10	DEPRESSION MARSHES ARE FOUND IN THE INNUMERABLE SHALLOW APPROXIMATELY CIRCULAR DEPRESSIONS, VARYING IN EXTENT FROM ONE TO MANY ACRES (UP TO 50 ACRES), WHICH MAY HOLD A FOOT OR MORE OF WATER IN WET WEATHER, BUT BECOME DRY DURING PART OF THE YEAR. THEY TYP	THE FOLLOWING IS A GENERALIZED CHARACTERIZATION OF THE VEGETATION ZONES THAT ONE MIGHT ENCOUNTER WITHIN THE PROPOSAL IN A TYPICAL DEPRESSION MARSH. IT IS BASED UPON NOTES TAKEN FROM SEVERAL SEPARATE DEPRESSION MARSHES DURING THE FIELD SURVEY. IN SOME DEP
MESIFLAT*0070	Mesic flatwoods		G4	S4	N	N	1992-06-11	THE FLATWOODS LIE WITHIN TWO BIOGEOGRAPHICAL REGIONS AS DEFINED BY IVERSON & AUSTIN (1987) FOR PALM BEACH COUNTY. THEY ARE THE HUNGRYLAND WETLANDS AND LOXAHATCHEE SLOUGH. THE HUNGRYLAND IS MENTIONED IN SOME OF DR. SMALL'S BOTANICAL NARRATIVES AS LOW AND	MESIC FLATWOODS OCCUR ONLY ON THE HIGHEST ELEVATIONS WITHIN THE LOXAHATCHEE SLOUGH CARL PROPOSAL. THE OVERSTORY CONSISTS OF SOUTH FLORIDA SLASH PINE (PINUS ELLIOTTII VAR. DENSA) WITH EITHER A DENSE OR SPARSE SHRUB LAYER PRIMARILY OF SAW PALMETTO (SERENOA
AIMOAE*0036	Aimophila aestivalis	Bachman's Sparrow	G3	S3	N	N	1992-08-18	Slough.	1992: Common within boundaries.
CROTADAM*0165	Crotalus adamanteus	Eastern Diamondback Rattlesnake	G4	S3	N	N	1994-04-00	Hydic flatwoods/dried wet prairie; preserve area surrounding a small airport.	1994-04-00: 2 adults (4-5 ft.) observed (U95GRI01).



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FLORIDA
Natural Areas
INVENTORY

18.6 Mile Woodstork Data
(*Mycteria americana*)

18.6 Mile Wood Stork Data

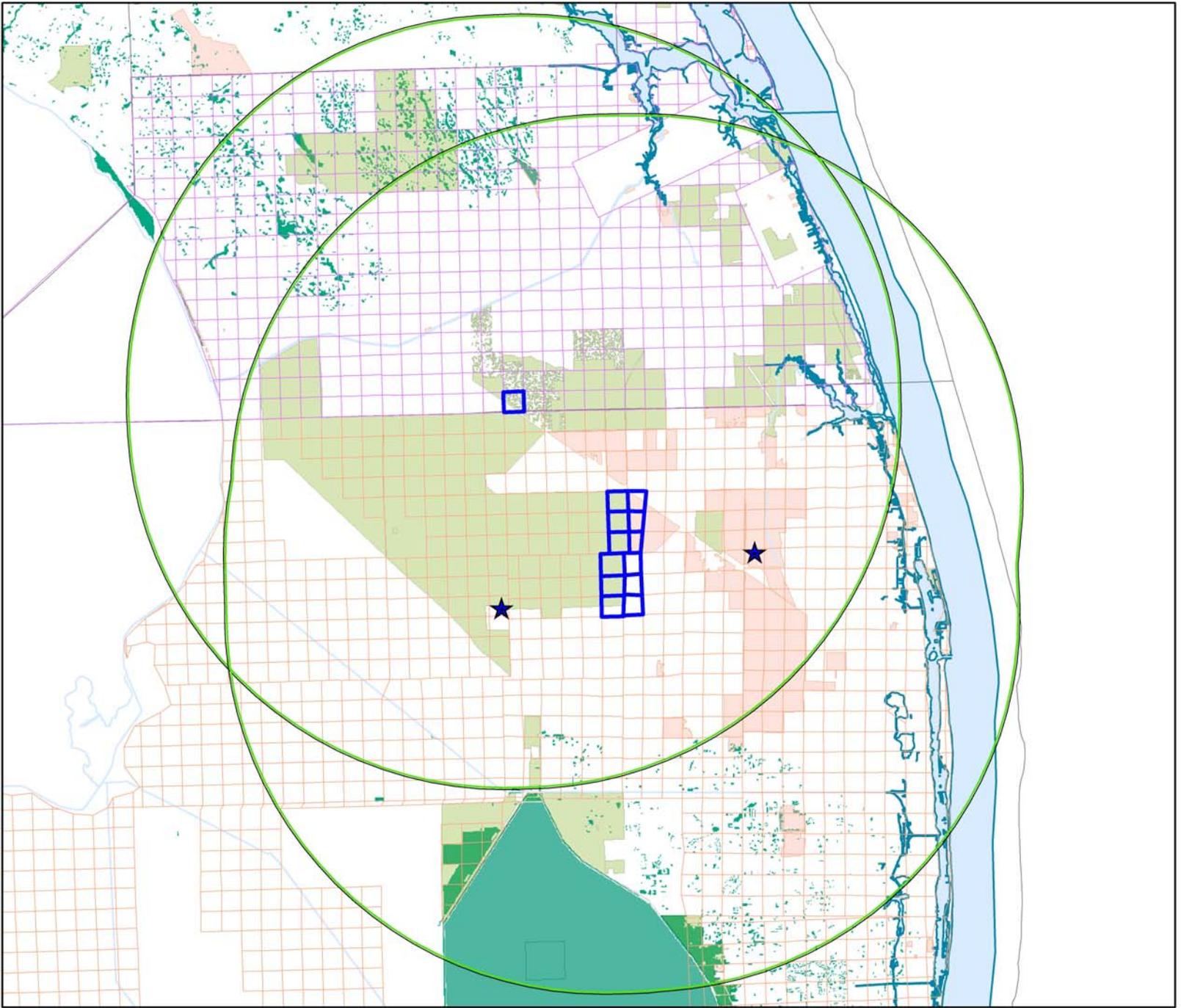
Martin & Palm Beach County

- ★ WS Element Occurrence
- ★ FL Fish & Wildlife Cons. Comm. Breeding Bird Atlas Project 1986-91 center point of 10 sq mi survey block
- FNAI Potential Habitat for Wood Stork

Conservation Lands

- Federal
- State
- Local
- Private
- ▨ State Aquatic Preserves

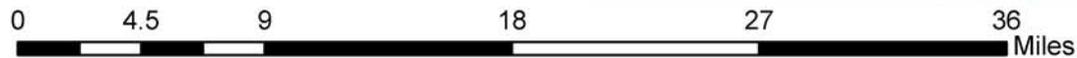
- County Boundary
- Interstate
- Turnpike
- Major Highway
- Local Road
- Water



Map produced by EAA
Data Source: 09/2004



NOTE
Map should not be interpreted without accompanying documents. Shading of water bodies does not reflect known depths.



Florida Natural Areas Inventory Potential Natural Areas (PNA) Data Layer

POTENTIAL NATURAL AREAS (PNA)

The Potential Natural Areas data layer indicates, throughout the State of Florida, lands that are in private ownership and are not managed or listed for conservation purposes that are possible examples of good quality natural communities. These areas were determined from FNAI's scientific staff vegetative interpretation of 1988-1993 FDOT aerial photographs and from input received during Regional Ecological Workshops held for each regional planning council. These workshops were attended by experts familiar with natural areas in the region. Element occurrences in the FNAI database may or may not be present on these sites. In order to be classified as a Potential Natural Area (with the exception of internal rank PNA-5) the natural communities identified through aerial photographs must meet the following criteria:

1. Must be a minimum of 500 acres. *Exceptions:* sandhill, min. 320 acres; scrub, min. 80 acres; pine rockland, min. 20 acres; dry prairie, min. 320 acres; *or* any example of coastal rock barren, upland glade, coastal dune lake, spring-run stream or terrestrial cave.
2. Must contain at least one of the following:
 - a. One or more high quality examples of FNAI state ranked S3 or above natural communities.
 - b. An outstanding example of any FNAI tracked natural community.

Potential Natural Areas have been assigned ranks of PNA-1 through PNA-4 mostly based on size and perceived quality and type of natural community present. The areas included in internal rank PNA-5 (former ACI Category C) are exceptions to the above criteria. These areas were identified through the same process of aerial photographic interpretation and regional workshops as the PNA 1 through 4 ranked sites, but do not meet the standard criteria. These PNA 5 areas are considered lower priority for conservation than areas ranked PNA 1- 4, but nonetheless are believed to be ecologically viable tracts of land representative of Florida's natural ecosystems.



Florida Resources
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FLORIDA NATURAL AREAS INVENTORY

Florida Scrub-Jay Survey and Breeding Bird Atlas Data Layers

In addition to our element occurrence database of rare species and natural community locations, the Inventory has additional data layers that have been provided by state and federal agencies.

Florida Scrub-Jay Survey - U.S. Fish and Wildlife Service

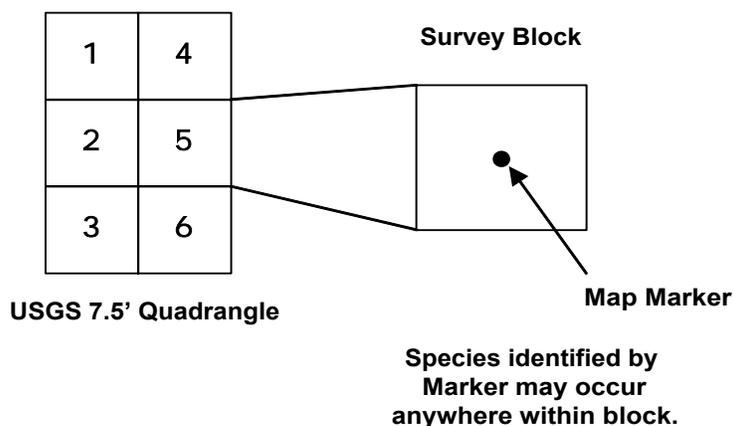
This survey was conducted by staff and associates of the Archbold Biological Station from 1992 to 1996. An attempt was made to record all scrub-jay (*Aphelocoma coerulescens*) groups, although most federal lands were not officially surveyed.

Each map point represents one or more groups.

Florida Breeding Bird Atlas Project - Florida Game and Fresh Water Fish Commission (now Florida Fish and Wildlife Conservation Commission)

This study was conducted from 1986 to 1991, (final report, *An Atlas of Florida's Breeding Birds* by Kale, Pranty, Stith, and Biggs, Nongame Wildlife Program, Florida Game and Fresh Water Fish Commission). The study divided the state into "blocks", with each block representing one-sixth of a U.S. Geological Survey 7.5 minute topographic quadrangle map. Several categories of breeding activity were recorded by observers.

Each map point is located at the center of a block, and represents species listed as Possible or Probable Breeders within the surrounding block (approximately 10 square miles in area).



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GLOBAL AND STATE RANKS

Florida Natural Areas Inventory (FNAI) defines an **element** as any rare or exemplary component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. FNAI assigns two ranks to each element found in Florida: the **global rank**, which is based on an element's worldwide status, and the **state rank**, which is based on the status of the element within Florida. Element ranks are based on many factors, including estimated number of occurrences, estimated abundance (for species and populations) or area (for natural communities), estimated number of adequately protected occurrences, range, threats, and ecological fragility.

GLOBAL RANK DEFINITIONS

- G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or human factor.
- G2 Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or human factor.
- G3 Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals), or found locally in a restricted range, or vulnerable to extinction from other factors.
- G4 Apparently secure globally (may be rare in parts of range).
- G5 Demonstrably secure globally.
- GH Occurred historically throughout its range, but has not been observed for many years.
- GX Believed to be extinct throughout range.
- GXC Extirpated from the wild but still known from captivity or cultivation.
- G#? Rank uncertain (e.g., G2?).
- G#G# Range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T# Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species, and the T portion refers to the subgroup; T# has same definition as G#.
- G#Q Ranked as species but there is some question as to whether it is a valid species.
- G#T#Q Same as above, but validity as subspecies or variety is questioned.
- GU Global rank unknown; due to lack of information, no rank or range can be assigned.
- G? Temporarily not ranked.

STATE RANK DEFINITIONS

State ranks (S#) follow the same system and have the same definitions as global ranks, except they apply only to Florida, with the following additions:

- SA Accidental in Florida and not part of the established biota.
- SE Exotic species established in Florida (may be native elsewhere in North America).
- SX Believed to be extirpated from state.



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FEDERAL AND STATE LEGAL STATUSES

Provided by FNAI for information only.
For official definitions and lists of protected species, consult the relevant state or federal agency.

FEDERAL LEGAL STATUS

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

LE	Endangered: species in danger of extinction throughout all or a significant portion of its range.
LT	Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
E(S/A)	Endangered due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
T(S/A)	Threatened due to similarity of appearance (see above).
PE	Proposed for listing as Endangered species.
PT	Proposed for listing as Threatened species.
C	Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
XN	Non-essential experimental population.
MC	Not currently listed, but of management concern to USFWS.
N	Not currently listed, nor currently being considered for listing as Endangered or Threatened.

FLORIDA LEGAL STATUSES

Animals: Definitions derived from “Florida’s Endangered Species and Species of Special Concern, Official Lists” published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

LE	Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
LT	Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
LS	Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
PE	Proposed for listing as Endangered.
PT	Proposed for listing as Threatened.
PS	Proposed for listing as Species of Special Concern.
N	Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505.

LE	Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
LT	Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
PE	Proposed for listing as Endangered.
PT	Proposed for listing as Threatened.
N	Not currently listed, nor currently being considered for listing.

Pal-Mar

Palm Beach and Martin Counties

Group A Full Fee

Purpose for State Acquisition

Agriculture and residential development have reduced natural areas in the interior of southeast Florida to fragments. One of the largest and best fragments, part of what was once a transition zone between pine flatwoods and the sawgrass marshes of the Everglades, will be protected by the Pal-Mar project. This project, by protecting these flatwoods and marshes, will protect habitat for the endangered Florida panther and snail kite, among other kinds of wildlife, will preserve natural lands linking the J. W. Corbett Wildlife Management Area with Jonathan Dickinson State Park, and will provide land to the public of this fast-growing region for hiking, bicycling, camping, hunting, and learning about the original nature of this part of Florida.

Manager

Florida Fish and Wildlife Conservation Commission (FWC) (west of I-95) and Division of Recreation and Parks (DRP), Florida Department of Environmental Protection (east of I-95).

General Description

The project includes some of the highest quality, most intact pine flatwoods in southern Florida in an ecotone between pine flatwoods and the treeless Everglades and also includes high-quality examples of wet prairie and savanna with exceptional ground-cover diversity. The project provides habitat for at least five federally endangered or threatened animals including the snail kite and wood stork. It is contiguous with the J.W. Corbett Wildlife Management Area and the private Pratt-Whitney Wildlife Refuge—and includes a mile-wide connector to Jonathan Dickinson State Park. The

project has low archaeological or historic value. Urbanization is rapidly isolating the State Park and growth pressures on the uplands in this project are intense.

Public Use

Most of this project has been designated for use as a wildlife management area. The easternmost portion of the project area will be added to Jonathan Dickinson State Park. Public uses will include hunting, fishing, hiking, horseback riding and nature appreciation.

Acquisition Planning and Status

Phase I of this project consists of approximately five larger ownerships, including tracts adjacent to J.W. Corbett WMA, FDIC (acquired by South Florida Water Management District and Martin County), MacArthur (acquired), Pal-Mar Water Control District (acquired), Lara and Florida National Bank.

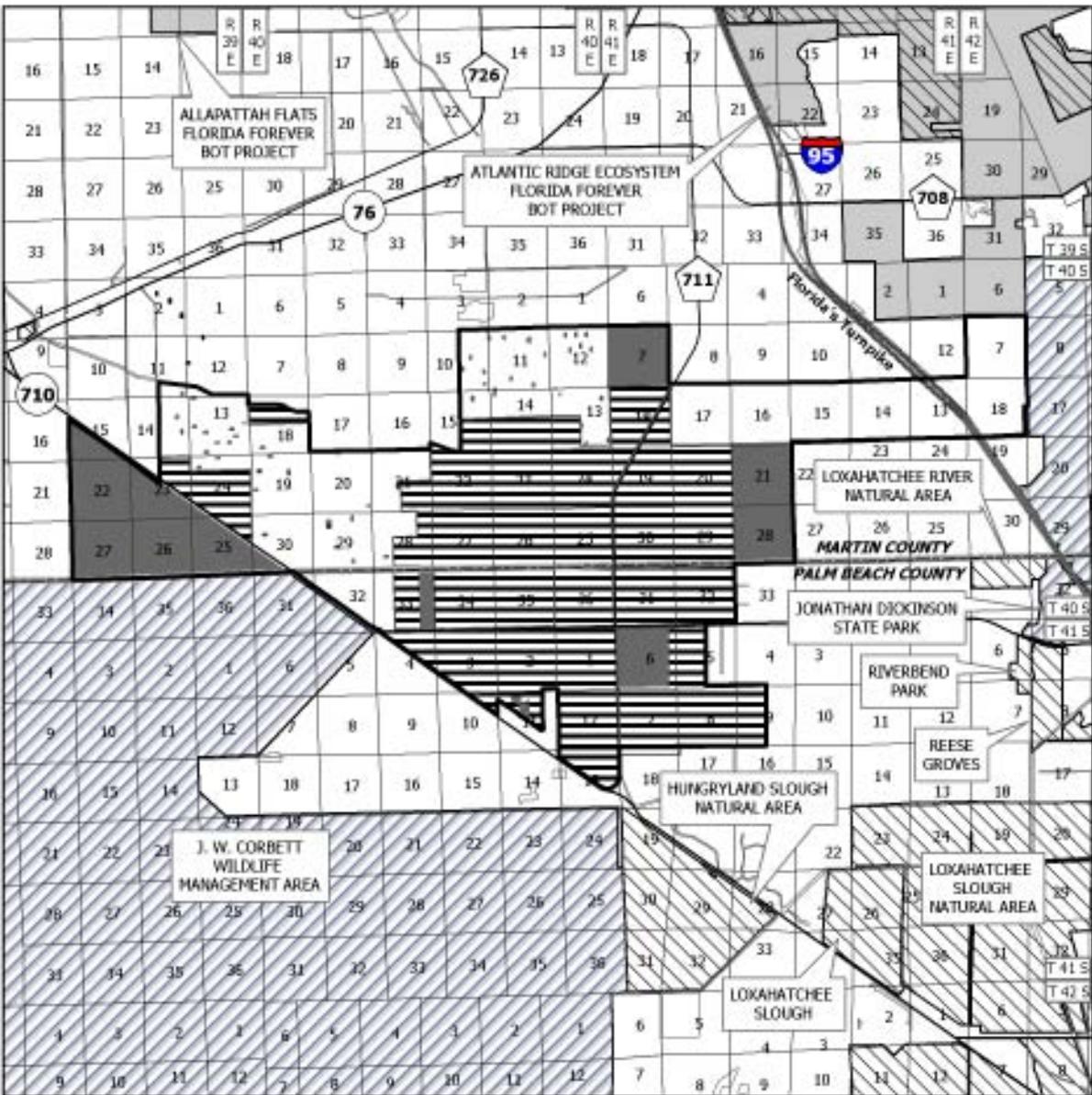
Phase II consists of subdivided areas and a corridor to Jonathan Dickinson State Park.

On October 21, 1999, the Council added 1,280 acres to the project boundary as essential parcels.

There is very little property remaining to acquire in the Palm Beach County side of the project. Martin County and the South Florida Water Management District are working to acquire the property on the Martin County side of the project.

FNAI Elements	
Florida panther	G4T1/S1
Snail kite	G4?T1/S1
<i>Florida threeawn</i>	G2/S2
Florida sandhill crane	G5T2T3/S2S3
<i>Piedmont jointgrass</i>	G3/S3
WET FLATWOODS	G?/S4?
HYDRIC HAMMOCK	G?/S4?
WET PRAIRIE	G?/S4?
15 elements known from project	

Placed on list	1992
Project Area (Acres)	35,668
Acres Acquired	16,995
at a Cost of	\$1,442,750
Acres Remaining	18,693
with Estimated (Tax Assessed) Value of	\$31,961,160



PAL-MAR

PALM BEACH AND MARTIN COUNTIES

-  Florida Forever Project Boundary
-  Acquired
-  Essential Parcel(s) Remaining
-  Other Florida Forever BOT Projects
-  State Owned Lands
-  Other Conservation Lands



MAY 2003

Pal-Mar -Group A/Full Fee

Coordination

South Florida Water Management District, Palm Beach and Martin Counties are acquisition partners in this project.

Most of the larger ownerships have been acquired. Palm Beach County is to begin acquiring smaller parcels.

Management Policy Statement

The primary goals of management of the Pal-Mar CARL project are: to conserve and protect environmentally unique and irreplaceable lands that contain native, relatively unaltered flora and fauna representing a natural area unique to, or scarce within, a region of this state or a larger geographic area; to conserve and protect significant habitat for native species or endangered and threatened species; to conserve, protect, manage, or restore important ecosystems, landscapes, and forests, in order to enhance or protect significant surface water, coastal, recreational, timber, fish or wildlife resources which local or state regulatory programs cannot adequately protect; and to provide areas, including recreational trails, for natural-resource-based recreation.

Management Prospectus

Qualifications for state designation Preventing isolation of natural lands is important in enabling genetic interchange among plant and animal populations. This project is a large natural area connecting the J.W. Corbett Wildlife Management Area on the west with Jonathan Dickinson State Park on the east. The size, quality of wildlife resources and location next to the Corbett WMA of the western part qualify it as a wildlife management area. The part of the project east of Interstate 95 is adjacent to Jonathan Dickinson and is a logical addition to that park.

Manager The FWC is recommended as Manager for the area west of I-95. The DRP is recommended as Manager for the area east of I-95.

Conditions affecting intensity of management For the project area west of I-95, there are no known conditions that would result in the need for intensive management. The land could be managed as a normal component of the WMA system. The portion of the project east of I-95 will be added to Jonathan Dickinson State Park, which is a high-need management area.

Timetable for implementing management and provisions for security and protection of infrastructure Initial management of the area west of I-95 would involve posting and otherwise securing the tract against trespassing and vandalism, preparing roads and other infrastructure for public recreation, performing resource inventories and initiating the planning process. These activities could be carried out totally, or in part, during the first year. Subsequent resource and recreation management could proceed immediately in the second year, particularly since Pal-Mar would represent an addition to an existing WMA (J.W. Corbett). In the first year after acquisition of the eastern part, management activities will concentrate on site security, natural and cultural resource protection, and the development of a plan for long-term public use and resource management.

Revenue-generating potential Revenue potential for the western part would be moderate to low since it does not contain significant upland (timber) resources. However, some revenue could be generated from recreational use (over and above licenses and permits sold by FWC), if the Legislature could approve user fees for non-consumptive activities. The eastern part is to be added to a larger developed park. No significant revenue is expected to be generated by the parcel on its own.

Cooperators in management No local governments or others are recommended for cooperating in management of this project area.

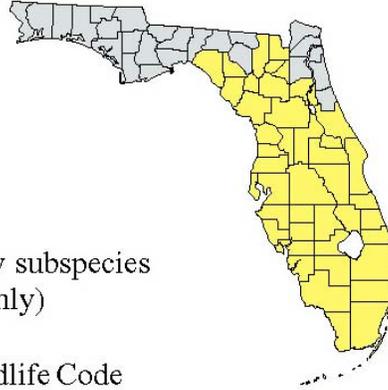
Management Cost Summary/DRP

Category	Startup	Recurring
Source of Funds	CARL	CARL
Salary	\$0	\$0
OPS	\$3,640	\$3,640
Expense	\$0	\$0
OCO	\$58,212	\$1,000
FCO	\$0	\$0
TOTAL	\$61,852	\$4,640

Management Cost Summary/FWC

Category	1996/97	1997/98	1998/99
Source of Funds	CARL	CARL	CARL
Salary	\$0	\$0	\$45,000
OPS	\$0	\$0	\$5,000
Expense	\$0	\$0	\$30,000
OCO	\$0	\$0	\$30,000
FCO	\$0	\$0	\$0
TOTAL	\$0	\$0	\$110,000

FLORIDA SANDHILL CRANE
Grus canadensis pratensis



Order: Gruiformes
Family: Gruidae
FNAIRanks: G5T2T3/S2S3
U.S. Status: Endangered (nonmigratory subspecies in Cuba and Mississippi only)
FL Status: Threatened
U.S. Migratory Bird Treaty Act and state Wildlife Code prohibit take of birds, nests, or eggs.



© Karla Brandt

Description: A tall, long-necked, long-legged bird with a clump of feathers that droops over the rump. Adult is gray overall, with a whitish chin, cheek, and upper throat, and dull red skin on the crown and lores (lacking in immatures); feathers may have brownish-red staining resulting from preening with muddy bill. Immature has pale to tawny feathers on head and neck and a gray body with brownish-red mottling. Flies with neck extended. Their distinctive rolling call can be heard from far away.

Similar Species: Indistinguishable from greater sandhill crane (*Grus canadensis tabida*), which winters in Florida. Greater sandhill crane generally arrives in Florida in October and leaves in March, so the date observed or definite evidence of reproduction may be used to differentiate the two. Great blue heron (*Ardea herodias*) is sometimes mistakenly

FLORIDA SANDHILL CRANE *Grus canadensis pratensis*

identified as a crane. This heron lacks the bald, red crown of the sandhill and flies with its neck tucked in, typical of herons and egrets. Whooping crane (*G. americana*) is white.

Habitat: Prairies, freshwater marshes, and pasture lands. Avoids forests and deep marshes but uses transition zones and edges between these and prairies or pasture lands. Will frequent agricultural areas like feed lots and crop fields, and also golf courses and other open lawns, especially in winter and early spring. Nest is a mound of herbaceous plant material in shallow water or on the ground in marshy areas. Favors wetlands dominated by pickerelweed and maidencane.

Seasonal Occurrence: Nonmigratory. Very sedentary, although may forage widely. Large influx of northern migratory subspecies in winter (October - March).

Florida Distribution: Most of peninsular Florida within appropriate habitat, though not as common south of Lake Okeechobee. Rarely reported west of Taylor County.

Range-wide Distribution: Florida range plus extreme southeastern Georgia (Okefenokee Swamp).

Conservation Status: Population estimate in 1975 of approximately 4,000 birds (25 percent are nonbreeding subadults) is still considered accurate. Habitat availability will become more and more of concern as Florida continues to lose open rangeland and native prairie to development and more intensive agricultural uses (e.g., citrus, row crops). Nesting success in human-altered areas is well below that of native areas. Shallow wetlands used by cranes are easily affected by drainage of adjacent uplands even if they are not directly disturbed. Florida sandhill cranes are found on federal and state lands and on local government lands (e.g., wellfields).

Protection and Management: Because of large home-range requirements, public lands do not protect large populations of cranes. Acquire land, through fee-simple acquisition and conservation easements on suitable ranchlands, in areas that bolster existing protected populations. Periodic fire important to retard invasion of woody vegetation in crane habitat. Filling drainage ditches to restore natural hydrological conditions important in some areas.

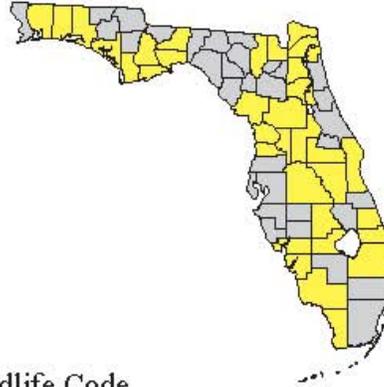
Selected References: Poole and Gill (eds.) 1992, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994, Toland 1999a.

RED-COCKADED WOODPECKER

Picoides borealis

Order: Piciformes
Family: Picidae
FNAI Ranks: G3/S2
U.S. Status: Endangered
FL Status: Threatened

U.S. Migratory Bird Treaty Act and state Wildlife Code prohibit take of birds, nests, or eggs.



Description: This small woodpecker can be distinguished by its barred, black and white back and wings, black cap and nape, and white cheek patches on each side of the head. Sexes of adults are difficult to distinguish. Red streaks or “cockades” on either side of head of adult males are rarely visible. Juvenile males can be identified by a small, circular patch of red on top of the head that is visible until early fall. This is absent in juvenile females.

Similar Species: No other Florida woodpecker has a barred “ladder” or “zebra” back and the large, unbroken white cheek patches. Downy (*Picoides pubescens*) and hairy (*P. villosus*) woodpeckers are most likely to be confused, but these species have solid white down the middle of the back and a black triangular patch that covers much of the cheek.



© Barry Mansell

Habitat: Inhabits open, mature pine woodlands that have a diversity of grass, forb, and shrub species. Generally occupies longleaf pine flatwoods in north and central Florida, mixed longleaf pine and slash pine in south-central Florida, and slash pine in south Florida outside the range of

RED-COCKADED WOODPECKER

Picoides borealis

longleaf pine. Forage in several forested habitat types that include pines of various ages, but prefer more mature pines.

Seasonal Occurrence: Nonmigratory. Maintains territories throughout year. They are cooperative breeders with young males characteristically remaining in many natal territories. Young females and non-helper males typically disperse a limited distance during their first winter in search of breeding opportunities elsewhere. Social groups or clans generally constrict the use of their home range when nestlings are present and expand their use during fall and winter after young have fledged.

Florida Distribution: Occurs locally from the western panhandle through the peninsula to south Florida. Distribution tied to remaining areas of old-growth pine forests. Southernmost occurrence is the Big Cypress National Preserve in Collier and Monroe counties.

Range-wide Distribution: Primarily Southeastern Coastal Plain from North Carolina to Texas and southern Arkansas. Currently, populations are highly fragmented, and most are small. As of 1990, nearly 90 percent of active sites were in Florida, Georgia, the Carolinas, Louisiana, and Texas. More than half of the remaining population (9,300 birds) were found on just six sites, while the remaining birds were scattered across more than 100 sites.

Conservation Status: Florida has the largest number of active sites in the world, but increasing fragmentation and poor management of appropriate habitat is cause for concern. Largest concentrations occur on federally managed lands (ca. 80 percent of active sites), with state-owned and private lands supporting a significant number of smaller populations. Two largest populations, comprising 70 percent of active sites, occur on Eglin Air Force Base and Apalachicola National Forest, and there is evidence of declines in the latter.

Protection and Management: Federal and state agencies must aggressively manage their extensive tracts of pine forests. Habitat quality in such areas depends on fire for maintaining open, park-like conditions. Considerable variation exists in habitat parameters range-wide, resulting in variable home-range sizes depending on amount and quality of available habitat. Focus management actions on both nesting and foraging requirements. Protect additional populations on private lands to help guard against catastrophic events (e.g., hurricanes).

Selected References: James 1991, Kulhavy et al. (eds.) 1995, Poole and Gill (eds.) 1994, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994.

SNAIL KITE

Rostrhamus sociabilis plumbeus

Order: Falconiformes

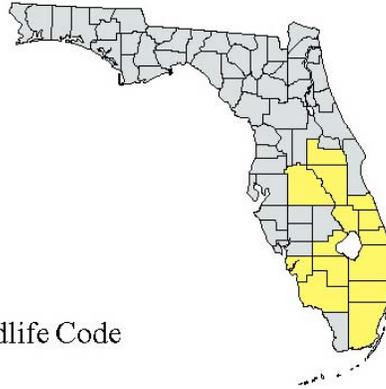
Family: Accipitridae

FNAIRanks: G4G5T2/S2

U.S. Status: Endangered

FL Status: Endangered

U.S. Migratory Bird Treaty Act and state Wildlife Code prohibit take of birds, nests, or eggs.



male © Robert Bennetts



female © Robert Bennetts

Description: Medium-sized raptor. Adult male is dark slate gray to black; tail is white with a broad, dark band and pale terminal band; long, hooked bill. Breeding birds have orange-red legs and reddish eyes and facial skin. Adult females are brown with streaking on head, throat, and underparts; soft part colors like males. Juveniles and subadults similar to adult females.

Similar Species: Northern harrier (*Circus cyaneus*) has white on rump and not on tail and has a gliding flight, tilting side to side, unlike the floppy flight of the snail kite.

Habitat: Large open freshwater marshes and lakes with shallow water, < 4 ft. (1.2 m) deep, and a low density of emergent vegetation are preferred foraging habitat. Dependent upon apple snails (*Pomacea paludosa*) caught

SNAIL KITE

Rostrhamus sociabilis plumbeus

at water surface. Nests usually over water in a low tree or shrub (commonly willow, wax myrtle, pond apple, or buttonbush, but also in non-woody vegetation like cattail or sawgrass).

Seasonal Occurrence: Nonmigratory. Nomadic dispersal in response to habitat changes (e.g., water level, food availability, hydroperiod).

Florida Distribution: Formerly in freshwater marshes throughout peninsular Florida. Now, depending on water conditions and food availability, restricted to St. Johns River headwaters, Kissimmee Valley, Lake Okeechobee, Loxahatchee National Wildlife Refuge, and Holey Land Wildlife Management Area; Water Conservation Areas 2A, 2B, 3A, 3B in Palm Beach, Broward and Dade counties; and parts of Everglades National Park and Big Cypress National Preserve. Also smaller wetlands in above counties plus St. Lucie, Martin, Hendry, and Lee counties. May disperse widely in drought years.

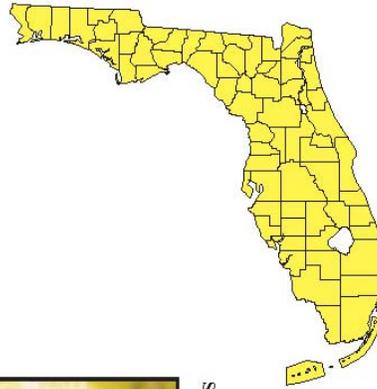
Range-wide Distribution: Subspecies *plumbeus* is restricted to Florida, Cuba, Isle of Pines, and northwest Honduras. Other subspecies occur in the neotropics.

Conservation Status: Much of range lies within conservation areas, although these lands are not necessarily managed for kites. Greatly affected by water management, especially in south Florida. Population fluctuates considerably, declining in drought years. Wetland drainage and conversion and introduction of exotic plants (which prevent foraging success) are major threats. Agricultural runoff has caused pollution, eutrophication, and snail die-offs. Concomitant increase in plant growth has led to continued use of herbicides, which contributes to nest collapse in non-woody nesting substrates.

Protection and Management: Continue mid-winter surveys to monitor population and identify areas used during droughts. Preserve extensive freshwater wetlands, including suitable refuges for kites during droughts; management should allow for the requirements of kites. Coordination among water managers is necessary to prevent drawdowns of lakes in central Florida at the same time drought conditions exist in south Florida.

Selected References: Poole and Gill (eds.) 1995, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994.

EASTERN INDIGO SNAKE
Drymarchon corais couperi



Order: Squamata
Family: Colubridae
FNAI Ranks: G4T3/S3
U.S. Status: Threatened
FL Status: Threatened



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Description: A very large, stout-bodied, shiny black snake reaching lengths as great as 8 ft. (244 cm). Black ventrally, but chin, throat, and sides of head may be reddish or (rarely) white. Scales typically smooth (no ridges), though adult males have keel on front half of some scales along back; anal scale undivided. Young similar to adults though often more reddish anteriorly, 17 - 24 in. (430 - 610 mm) at hatching. When encountered, often hisses, flattens neck vertically (from side to side), and vibrates tail, but rarely bites.

EASTERN INDIGO SNAKE *Drymarchon corais couperi*

Similar Species: Black racer (*Coluber constrictor*), which rarely exceeds 5 ft. (152 cm), is more slender, a duller sooty black usually with a white chin and throat, and has a divided anal scale. The mostly aquatic mud snake (*Farancia abacura*) is glossy black above and can grow to 6 ft. (183 cm), but has a reddish, rarely white, belly, with the coloration encroaching the sides, and a sharp-pointed tail tip.

Habitat: Broad range of habitats, from scrub and sandhill to wet prairies and mangrove swamps. In northern part of range, often winters in gopher tortoise burrows in sandy uplands but forages in more hydric habitats. Requires very large tracts to survive.

Seasonal Occurrence: Active nearly year-round in southern Florida but winters underground farther north. Lays eggs in May and June.

Florida Distribution: Statewide, including Upper and Lower Keys, but rare in panhandle.

Range-wide Distribution: Florida and southern Georgia; formerly extended from southern South Carolina to southeastern Mississippi.

Conservation Status: Rare in most areas, though species has been recorded from many public lands statewide; however, whether most of these support viable populations is uncertain. Major threats are habitat loss, degradation, and fragmentation, with associated highway mortality. Other threats include gassing of tortoise burrows for rattlesnakes, collection for pets, and deliberate persecution, all of which are illegal.

Protection and Management: Protect very large tracts (> 5000 acres = 2025 ha) of appropriate natural habitat unfragmented by roads; use prescribed fire as needed. Maintain gopher tortoise populations and dead stumps to provide natural subterranean refugia. Enforce bans on tortoise burrow gassing and on collection or molestation of snake. Avoid construction of roads through unfragmented habitat. Educate public to avoid wanton destruction of large snakes.

Selected References: Ashton and Ashton 1988b, Conant and Collins 1991, Ernst and Barbour 1989, Georgia DNR 1999, Lazell 1989, Moler (ed.) 1992, Mount 1975, Tenant 1997.