



## APPENDIX C

# Biological Resources

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C.1 | AGENCY CORRESPONDENCE

C.2 | BIOLOGICAL ASSESSMENT





## APPENDIX C.1

# Agency Correspondence

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U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Orlando Airports District Office  
8427 SouthPark Circle, Suite 524  
Orlando, FL 32819  
Phone: (407) 487-7720  
Fax: (407) 487-7135

October 21, 2020

Mr. John M. Wrublik  
South Florida Ecological Services Office  
U.S. Fish and Wildlife Service  
1339 20th Street  
Vero Beach, Florida 32960-3559



U.S. Fish and Wildlife Service  
1339 20<sup>th</sup> Street  
Vero Beach, Florida 32960  
772-562-3909 Fax 772-562-4288

FWS Log No. 2019-I-1188

The U.S. Fish and Wildlife Service has reviewed the information provided and finds that the proposed action is not likely to adversely affect any federally listed species or designated critical habitat protected by the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et. seq.). A record of this consultation is on file at the South Florida Ecological Service Office.

This fulfills the requirements of section 7 of the Act and further action is not required. If modifications are made to the project, if additional information involving potential effects to listed species becomes available, or if a new species is listed, reinitiation of consultation may be necessary.

  
Roxanna Hunzman, Field Supervisor 1/8/2021  
Date

RE: Section 7 Consultation  
Airfield Improvement Project  
Key West International Airport (Monroe County, Florida)

Dear Mr. Wrublik,

Monroe County, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to implement several airfield improvement projects at the Key West International Airport. The purpose of the proposed taxiway, aircraft parking apron, and airfield security fence improvements is to improve operational efficiency and enhance safety at the airport. The Proposed Action is described in more detail in the attached Biological Assessment (BA) report transmitted with this letter.

The proposed improvements require FAA action and approvals, which are subject to the *Endangered Species Act* (ESA) and the *National Environmental Policy Act*. The purpose of this letter is to initiate informal consultation with the U.S. Fish and Wildlife Service pursuant to Section 7 of the ESA and its implementing regulations at 50 CFR Part 402. Because the Proposed Action may affect species under the purview of the National Oceanic and Atmospheric Administration, the FAA is also initiating consultation with the National Marine Fisheries Service.

### Species Evaluation and Effect Determination

As described in the BA, the Proposed Action would fill approximately 7.51 acres of wetlands and clear an additional 0.20 acres of wetlands. This would affect 3.34 acres of mangrove habitat, 4.03 acres of saltwater marsh, and 0.09 acres of salt ponds/embayments.

The Proposed Action was reviewed for its effects on federally-listed threatened and endangered species, and designated Critical Habitat. Based on the analysis contained in the BA, FAA has determined that the Florida semaphore cactus (*Opuntia corallicola*), Garber's spurge (*Chamaesyce garberi*), Cape Sable thoroughwort (*Chromoiaena frustrate*), American crocodile (*Crocodylus acutus*), Eastern indigo snake (*Drymarchon corais couperi*), Piping plover (*Charadrius melodu*), Red knot (*Calidris canutus rufa*), Roseate tern (*Sterna dougallii dougallii*), Wood stork (*Mycteria Americana*), West Indian manatee (*Trichechus manatus*),

and Smalltooth sawfish (*Pristis pectinate*) occur, or have the potential to occur, in the vicinity of the airport and project site. Potential impacts to these species were identified and evaluated in the BA.

As discussed in the BA, compensatory wetland mitigation is proposed to replace functional loss associated with the impacts to mangroves, salt marsh, and salt pond habitats. Adherence to construction conditions and standard practices for protected species would also be implemented during the construction phase. In addition, the floating section of new security fence will be designed to avoid effects on the West Indian Manatee.

### **Effects Determination**

After reviewing the potential effects of the Proposed Action on the above-listed species and the proposed mitigation and conservation measures, the FAA has determined that the project may affect, but is not likely to adversely affect these species. We seek your concurrence on this determination.

If you have any questions or would like to discuss the project or information in the Biological Assessment, you can reach me at [peter.m.green@faa.gov](mailto:peter.m.green@faa.gov) or (407) 487-7296.

Sincerely,



Peter M. Green, AICP  
Environmental Protection Specialist

Enclosure

cc. Mr. Richard Strickland, Key West International Airport



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Orlando Airports District Office  
8427 SouthPark Circle, Suite 524  
Orlando, FL 32819  
Phone: (407) 487-7720  
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October 22, 2020

[via email: [nmfs.ser.esa.consultations@noaa.gov](mailto:nmfs.ser.esa.consultations@noaa.gov)]

Karla Reece  
Section 7 Team Lead  
Protected Resources Division  
National Marine Fisheries Service  
National Oceanic and Atmospheric Administration  
263 13th Avenue South  
St. Petersburg, FL, 33701

RE: Section 7 Consultation  
Airfield Improvement Project  
Key West International Airport (Monroe County, Florida)

Dear Ms. Reece,

Monroe County, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to implement several airfield improvement projects at the Key West International Airport. The purpose of the proposed taxiway, aircraft parking apron, and airfield security fence improvements is to improve operational efficiency and enhance safety at the airport. The Proposed Action is described in more detail in the attached Biological Assessment (BA) report transmitted with this letter.

The proposed improvements require FAA action and approvals, which are subject to the *Endangered Species Act* (ESA) and the *National Environmental Policy Act*. The purpose of this letter is to initiate informal consultation with the National Marine Fisheries Service pursuant to Section 7 of the ESA and its implementing regulations at 50 CFR Part 402. The FAA is also initiating consultation with the U.S. Fish and Wildlife Service for species under their purview.

### **Species Evaluation and Effect Determination**

As described in the BA, the Proposed Action would fill approximately 7.51 acres of wetlands and clear an additional 0.20 acres of wetlands. This would affect 3.34 acres of mangrove habitat, 4.03 acres of saltwater marsh, and 0.09 acres of salt ponds/embayments.

The Proposed Action was reviewed for its effects on federally-listed threatened and endangered species, and designated Critical Habitat. Based on the analysis contained in the BA, FAA has determined that the Florida semaphore cactus (*Opuntia corallicola*), Garber's spurge (*Chamaesyce garberi*), Cape Sable thoroughwort (*Chromoiaena frustrate*), American crocodile (*Crocodylus acutus*), Eastern indigo snake (*Drymarchon corais couperi*), Piping plover (*Charadrius melodu*), Red knot (*Calidris canutus rufa*), Roseate tern (*Sterna dougallii dougallii*), Wood stork (*Mycteria Americana*), West Indian manatee (*Trichechus manatus*),

and Smalltooth sawfish (*Pristis pectinate*) occur, or have the potential to occur, in the vicinity of the airport and project site. Potential impacts to these species were identified and evaluated in the BA.

As discussed in the BA, compensatory wetland mitigation is proposed to replace functional loss associated with the impacts to mangroves, salt marsh, and salt pond habitats. Adherence to Sea Turtle and Smalltooth Sawfish Construction Conditions would also be implemented during the construction phase. In addition, the floating section of new security fence will be designed to avoid effects on protected species.

### **Effects Determination**

After reviewing the potential effects of the Proposed Action on the above-listed species and the proposed mitigation and conservation measures, the FAA has determined that the project may affect, but is not likely to adversely affect these species. We seek your agency's concurrence on this determination.

If you have any questions or would like to discuss the project or information in the Biological Assessment, I can be reached at [peter.m.green@faa.gov](mailto:peter.m.green@faa.gov) or (407) 487-7296.

Sincerely,



Peter M. Green, AICP  
Environmental Protection Specialist

Enclosure

cc. Mr. Richard Strickland, Key West International Airport



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE**  
 Southeast Regional Office  
 263 13th Ave S  
 St. Petersburg, Florida 33701-5505  
<https://www.fisheries.noaa.gov/region/southeast>

F/SER31:KR/ZH  
 SERO-2020-02990

Peter M. Green, Environmental Protection Specialist  
 Orlando Airports District Office  
 Federal Aviation Administration  
 8427 SouthPark Circle, Suite 524  
 Orlando, FL 32819

Dear Mr. Green:

This letter responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act (ESA) for the following action.

<b>Applicant</b>	<b>SERO Number</b>	<b>Project Types</b>
Monroe County Airports Department	SERO-2020-02990	Airport taxiway “A” extension, apron expansions, security fencing improvements, and mangrove restoration

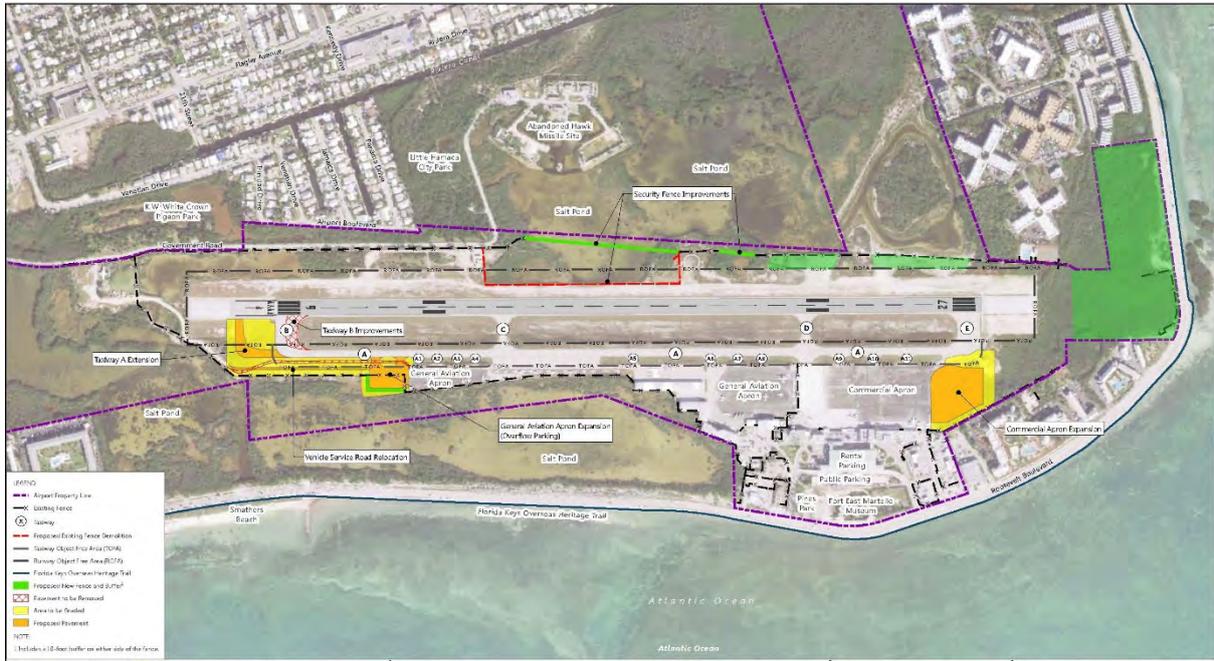
**Consultation History**

We received your letter requesting consultation dated October 22, 2020. We requested additional information on December 18, 2020. We received a final response to our request for additional information on December 28, 2020, and consultation was initiated on that date. The project has been assigned a tracking number in our new NMFS Environmental Consultation Organizer (ECO), SERO-2020-02990. Please refer to this number in any future inquiries regarding this project.

**Project Location**

<b>Address</b>	<b>Latitude/Longitude (North American Datum 1983)</b>	<b>Water Bodies</b>
3491 S Roosevelt Blvd, Key West, Monroe County, Florida	<ul style="list-style-type: none"> <li>• 24.555639°N, 81.758736°W Airport</li> <li>• 24.676080°N, 81.498855°W Off-site Mitigation Area (OFS) 1</li> <li>• 24.669816°N, 81.444013°W OFS-2</li> <li>• 24.674108°N, 81.445934°W OFS-3</li> </ul>	<ul style="list-style-type: none"> <li>• Airport Location: Multiple tidally influenced salt ponds opening to the Atlantic Ocean via culverts</li> <li>• Mitigation areas: Manmade canals leading to the Gulf of Mexico</li> </ul>





**Image of the project area and surrounding location with orange areas representing new pavement, yellow representing newly filled and graded areas, and transparent green representing on-site mitigation areas (Birkitt Environmental Services 2020)**

**Existing Site Conditions**

The primary project area is located adjacent to the Atlantic Ocean on the property of the Key West International Airport in Key West, Florida. There are 3 secondary locations on nearby islands that will be used as compensatory mitigation project sites. The airport property consists of 392 acres (ac) of developed and undeveloped land. The proposed action will occur on 30.6 ac of airport property (shaded areas on image above). The salt pond/wetland and aquatic habitats to the south and west of the airport are connected to the Atlantic Ocean by culverts: one large culvert under Venetian Drive connecting to Riviera Canal and 3 culverts passing under Government Road. The habitats to the north and east of the airport where on-site mitigation will take place are connected to the southern and western areas by a small mosquito ditch and 2 culverts west of the runway. Portions of the project area had been filled previously when the area was used as a military airfield during World War 2. These areas are inaccessible to our ESA-listed species.

Mangrove habitats throughout the off-site project areas include red, black, and white mangroves which are generally distributed by elevation. The saltwater marsh plant communities consist of a variety of species including seashore paspalum, seashore dropseed, saltgrass, perennial glasswort, and saltwort. There are no reported corals at any of the project locations.

The off-site mitigation areas are located on nearby keys, on manmade canals leading to the Gulf of Mexico, and consist of disturbed sites with fill. OFS-1 is located on Cudjoe Key. This site has an area of 0.19 ac of upland fill road that was constructed in intertidal habitat. The site contains existing mangrove habitat throughout the site and along the fill road. OFS-2 is located on Summerland Key. This site contains fill road and a building pad totaling approximately 0.19 ac. Existing mangrove communities are distributed throughout the site and along the fill road. OFS-3 is also located on Summerland Key, has a 0.58 ac upland berm consisting of limestone and sand fill, and has existing mangrove communities throughout the site and adjacent to the upland berm. The project area for each of the off-site mitigation areas

will have water elevations of 0.0 relative to the National Geodetic Vertical Datum (NGVD), with substrates consisting of limestone, sand, and fill.



**Map of off-site mitigation areas in relation to Key West International Airport (Birkitt Environmental Services 2020)**

**Project Description**

The applicant is proposing several actions to expand portions of the airport and improve overall usability. The elements of the proposed action that will occur on airport property and are inaccessible to NMFS ESA-listed species are listed in the table below and will not be further considered in this consultation.

**Project Elements That Will Occur in Areas Isolated From ESA-Listed Species (and are not further considered in this consultation)**

<b>Project Element</b>	<b>Description</b>
Taxiway A	Extend the taxiway by 274 lin ft; add 3,300 square yards (yd <sup>2</sup> ) of new pavement; add 600 cubic yards (yd <sup>3</sup> ) of fill
CA Expansion	Expand the commercial apron by adding 13,200 yd <sup>2</sup> of new pavement; add 2,000 yd <sup>3</sup> of fill; install exfiltration trenches under the apron to treat stormwater
GAA Expansion	Expand the GAA by adding 5,400 yd <sup>2</sup> of new pavement with 2 new taxiways to Taxiway A; add 1,800 yd <sup>3</sup> of fill; install exfiltration trenches under the apron to treat stormwater
Security Fence	Add 860 lin ft of floating security fence, install deadman-type anchors at each end, potentially install additional posts or anchors along the length; add an additional 450 lin ft of new security fence installed in the uplands
Taxiway B Improvements	Remove 2,300 yd <sup>2</sup> of bypass pavement; add 1,100 yd <sup>3</sup> of fill to regrade the area to match the elevation of adjacent areas
Vehicle Service Road Relocation	Relocate a portion of the vehicle service road to the expanded Taxiway A area; remove 1,900 yd <sup>2</sup> of pavement; add 1,600 yd <sup>2</sup> of new pavement and 500 yd <sup>3</sup> of fill

<b>Project Element</b>	<b>Description</b>
On-site Mitigation Area (ONS) 1	Excavate and grade 0.89 ac of remnant fill to match the elevation of the adjacent salt marsh communities (approximately 1.8 to 2.0 feet [ft] National Geodetic Vertical Datum [NGVD]) and plant with a mixture of saltwater marsh species (described below)
ONS-2	Excavate and grade 1.01 ac of fill to match the elevation of adjacent saltmarsh communities and plant with a mixture of saltwater marsh species; leave an existing patch of 0.25 ac of mangroves intact
ONS-3	Excavate and grade 1.15 ac of fill to match the elevation of adjacent mangrove communities at elevations ranging from 0.0 to 2.0 NGVD with mangrove plantings as described below
ONS-4	Expand the existing mosquito ditch and recontour the ditch banks to improve tidal circulation and hydrology to adjacent saltwater marsh and mangrove habitats; create a small tidal pool at the central portion of the site and plant with mangroves; treat the site to remove invasive Brazilian pepper plants; excavate 1.12 ac of limestone and gravel fill and grade to an elevation matching the adjacent saltmarsh communities (1.8 to 2.0 NGVD)

The only project actions that will occur in areas that may be accessible to ESA-Listed Species under NMFS Purview are the off-site mitigation locations that will occur along coastal shorelines on Cudjoe and Summerland Keys. These off-site mitigation actions will include excavation and grading of project locations followed by planting of native species. Sites will be excavated to the target elevation, and the sediments will be evaluated for appropriateness. If sediment unsuitable (i.e., fill or hard substrate) for planting is discovered, the applicant will excavate an additional 6 inches and place an appropriate clean sediment mixture including sand and organic material to support plantings. Mangroves will be planted based on relative elevation as follows: red mangroves between 0.0 and 0.5 ft NGVD, black mangroves between 0.5 and 1.5 ft NGVD, and white mangroves between 1.5 and 2.0 ft NGVD. Salt marsh areas will be planted with a variety of native salt marsh plants matching nearby salt marshes, including seashore paspalum, seashore dropseed, saltgrass, perennial glasswort, and saltwort. All fill, excavation, and grading activities will be conducted by upland-based heavy equipment such as excavators and bulldozers. All excavated materials and concrete debris will be disposed of at an appropriate upland location.

**Project Elements Considered in This Consultation that are Accessible to ESA-Listed Species Under NMFS Purview**

<b>Project Element</b>	<b>Description</b>
OFS-1, Cudjoe Key	Excavate 0.16 ac of upland fill road; grade to an elevation matching the adjacent mangrove communities and plant with mangrove species
OFS-2, Summerland Key	Excavate 0.19 ac of fill road and building pad down; grade to an elevation matching the adjacent mangrove communities and plant with mangrove species
OFS-3, Summerland Key	Excavate 0.58 ac of upland berm fill; grade to an elevation matching the adjacent mangrove communities and plant with mangrove species

The proposed action has an anticipated start date of October 2021, and is expected to be completed by August 2023. In-water work may occur throughout this period and will only be conducted during daylight hours.

**Construction Conditions**

The applicant has agreed to adhere to NMFS’s *Sea Turtle and Smalltooth Sawfish Construction Conditions*<sup>1</sup>, and will implement sediment control measures including silt fences and turbidity curtains.

**Effects Determination for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Action**

Species	ESA Listing Status <sup>2</sup>	Action Agency Effect Determination <sup>3</sup>	NMFS Effect Determination
<b>Sea Turtles</b>			
Green (North and South Atlantic distinct population segments [DPSs])	T	NE	NLAA
Hawksbill	E	NE	NLAA
Loggerhead (Northwest Atlantic DPS)	T	NE	NLAA
<b>Fish</b>			
Nassau grouper	T	NE	NLAA
Smalltooth Sawfish (U.S. DPS)	T	NLAA	NLAA

**Critical Habitat**

The project is not located in designated critical habitat, and there are no potential routes of effect to any designated critical habitat.

**Analysis of Potential Routes of Effects to Species**

Listed species may be physically injured if struck by construction equipment, vessels, or materials. This effect is extremely unlikely to occur due to the ability of the species to move away from the project site when disturbed and the applicant’s implementation of NMFS’s *Sea Turtle and Smalltooth Sawfish Construction Conditions* which require the contractor to cease operations when ESA-listed species are sighted within 50 ft of project activities. Fish are highly mobile and able to avoid construction noise, moving equipment, and placement or removal of materials during construction.

Construction activity and materials such as turbidity curtains may prevent or deter listed species from entering the project area. We believe the effects to listed species from exclusions to the project area will be insignificant. Any exclusionary effects will be temporary, only relatively small areas of the project area will be excluded at any point in time, and there are large amounts of similar mangrove habitat throughout the Florida Keys.

Smalltooth sawfish may be beneficially affected by the restoration of red mangrove habitat which serves as foraging and sheltering habitat for juvenile smalltooth sawfish. A total of

<sup>1</sup> NMFS. 2006. *Sea Turtle and Smalltooth Sawfish Construction Conditions* revised March 23, 2006. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida. <https://www.fisheries.noaa.gov/webdam/download/92937961>

<sup>2</sup> E = endangered; T = threatened

<sup>3</sup> NLAA = not likely to adversely affect, NE = no effect

0.93 ac of mangrove habitat will be restored in coastal waters accessible to smalltooth sawfish. The restored mangrove habitat will consist of red, black, and white mangroves. The final proportions of each type of mangrove will be based on site specific characteristics and final design elevations. This restored habitat has the potential to improve survival and availability of prey resources for juvenile smalltooth sawfish.

**Conclusion**

Because all potential project effects to listed species were found to be extremely unlikely to occur, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species under NMFS’s purview. This concludes your consultation responsibilities under the ESA for species under NMFS’s purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. NMFS’s findings on the project’s potential effects are based on the project description in this response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Karla Reece, Section 7 Team Lead, at [karla.reece@noaa.gov](mailto:karla.reece@noaa.gov).

Sincerely,

REECE.KARLA.M.1365885962  
Digitally signed by REECE.KARLA.M.1365885962  
Date: 2021.01.27 17:36:02 -05'00'

for David Bernhart  
Assistant Regional Administrator  
for Protected Resources

File: 1514-22.v



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Orlando Airports District Office  
8427 SouthPark Circle, Suite 524  
Orlando, FL 32819  
Phone: (407) 487-7720  
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November 10, 2020

[via email: Pace Wilber@noaa.gov]

Pace Wilber, Ph.D.  
HCD Atlantic Branch Supervisor  
NOAA Fisheries Service  
331 Ft Johnson Road  
Charleston, SC 29412

RE: Essential Fish Habitat Consultation  
Airfield Improvement Project  
Key West International Airport (Monroe County, Florida)

Dear Mr. Wilber,

Monroe County, through its Airports Department, has requested approval from the Federal Aviation Administration (FAA) to implement several airfield improvement projects at the Key West International Airport. The purpose of the proposed taxiway, aircraft parking apron, and airfield security fence improvements is to improve operational efficiency and enhance safety at the airport. The Proposed Action is described in more detail in the attached Biological Assessment (BA) report transmitted with this letter.

The proposed improvements require FAA action and approvals. These action and approvals are subject to provisions of the Magnuson-Stevens Fishery Conservation and Management Act that direct federal agencies to identify and protect important marine fish habitat. The purpose of this letter is to initiate informal consultation with the National Marine Fisheries Service in regard to the Proposed Action's effect on Essential Fish Habitat.

### **Essential Fish Habitat Evaluation**

As described in the BA, which contains the EFH assessment, the Proposed Action will affect Essential Fish Habitat. Direct impacts include filling approximately 7.51 acres of wetlands and clearing an additional 0.20 acres of wetlands. This would affect the following habitats: 3.34 acres of mangroves, 4.03 acres of saltwater marsh, and 0.09 acres of salt ponds/embayments.

The affected mangroves are essential for several managed species, including adult white grunt (*Haemulon plumieri*), juvenile and adult gray snapper (*Lutjanus griseus*), and juvenile mutton snapper (*Lutjanus analis*). The saltwater marsh provides habitat for several species, including snook (*Centropomus undecimalis*), red drum (*Sciaenops ocellatus*), and seatrout (*Cynoscion nebulosus*), all of which rely on this habitat for part of their lifecycle. The salt ponds/embayments, provide habitat and food sources for a variety of managed species. It is noted that existing site conditions and urban development, including U.S. Highway 1, limit direct access from adjacent marine waters to the project site.

Erosion and sediment controls and Best Management Practices will be implemented to maintain water quality in the vicinity of the project site during construction. The proposed project is not expected to cause secondary development or cumulative impacts that would affect EFH.

In addition to the information contained in the Biological Assessment and the Draft Environmental Assessment (which is being transmitted separately), the FAA also reviewed the prior EFH consultation undertaken at the airport in 2007 for the Runway Safety Area project.

Monroe County has taken steps to minimize the proposed project's impacts on Essential Fish Habitat. The conceptual mitigation measures identified to replace the functional loss of the affected, in as close proximity to the impact area as possible. Potential mitigation sites are identified and evaluated in the Biological Assessment. Specific mitigation plans and designs will be developed during the preparation of state and federal permit applications. The project's plans and specifications will require compliance with NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* and other measures, as appropriate, to minimize impacts to managed species and habitat. With the proposed measures, conditions, and mitigation, the net effect of the proposed project on Essential Fish Habitat should not be adverse.

We appreciate your review of the proposed project and recommendations to mitigate, conserve, or otherwise offset the project's effects on Essential Fish Habitat.

If you have any questions or would like to discuss the EFH Assessment, you can reach me at [peter.m.green@faa.gov](mailto:peter.m.green@faa.gov) or (407) 487-7296.

Sincerely,



Peter M. Green, AICP  
Environmental Protection Specialist

Enclosure

cc. Kurtis Gregg, NOAA  
Richard Strickland, Key West International Airport



December 9, 2020

FSER47:KG/pw

(Sent via Electronic Mail)

Peter M. Green, AICP  
Federal Aviation Administration, Orlando Airports District Office  
8427 South Park Circle  
Orlando, Florida 32819

Dear Mr. Green:

NOAA's National Marine Fisheries Service (NMFS) reviewed the Draft Environmental Assessment (EA) and Biological Assessment (BA) referenced in the notice of availability dated November 13, 2020, and letter dated November 10, 2020, from the Federal Aviation Administration (FAA) regarding Monroe County-Key West International Airport (KWIA). The FAA and Monroe County propose a total of 7.71 acres of wetland and estuarine impacts from fill and construction at KWIA, adjacent to the Atlantic Ocean, on Key West, Monroe County, to extend the taxiway, expand the apron, and install new perimeter fencing across a salt pond. As compensatory mitigation, FAA and Monroe County propose to improve 6.85 acres of onsite mangrove, salt marsh, and tide pool habitats and to restore 1.72 acres of mangrove and salt marsh wetlands offsite. The FAA has initially determined the proposed work would not have a substantial adverse impact on essential fish habitat (EFH) or federally managed fishery species (EA Section 4.2.7). As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the NMFS provides the following comments and recommendations pursuant to authorities of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the Fish and Wildlife Coordination Act.

#### *Essential Fish Habitat in the Project Area*

The FAA provided a BA describing results from biological resource surveys performed during September 2019. The tidal mangrove fringe along the existing taxiway is moderate in quality with a dense canopy composed of red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). Wetlands at higher elevations have salt marsh vegetation and occasional Brazilian pepper (*Schinus terebinthifolius*). Mangrove and salt marsh habitats fringe the unvegetated tide pools.

The South Atlantic Fishery Management Council (SAFMC) and Gulf of Mexico Fishery Management Council identify mangrove and salt marsh habitats as EFH for several species, including adult white grunt (*Haemulon plumieri*); juvenile and adult gray snapper (*Lutjanus griseus*); juvenile mutton snapper (*Lutjanus analis*); juvenile goliath grouper (*Epinephelus itajara*); and larval and juvenile pink shrimp (*Farfantepenaeus duorarum*). SAFMC also identifies mangroves as a Habitat Area of Particular Concern (HAPC) for several species within the snapper/grouper complex. HAPC's are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. Mangroves directly benefit the fishery resources of the Florida Keys by providing water quality benefits, foraging opportunities, and nursery habitat. Further, mangroves are part of a habitat complex that includes seagrass, hardbottom, and coral reefs. This complex supports a diverse community of fish and invertebrates. Mangroves help maintain water quality by filtering pollutants, stabilize shorelines, attenuate wave action, and produce and export detritus (decaying organic



material), which is an important component of marine and estuarine food chains. SAFMC provides additional information on EFH and HAPCs and their support of federally managed fishery species in *Fishery Ecosystem Plan of the South Atlantic Region*, which is available at [www.safmc.net](http://www.safmc.net).

#### *Avoidance and Minimization of Impacts to Essential Fish Habitat*

The FAA and Monroe County propose to extend the existing taxiway, expand the aprons for commercial and general aviation, and install a perimeter fencing across the tide pond on the northern side of the airport. These activities would directly impact by filling 3.14 acres of tidal mangroves, 4.03 acres of tidal salt marsh, 0.09 acres of salt ponds, and 0.25 acres of exotic hardwood wetlands. These activities would directly impact by clearing of 0.2 acres of mangroves. NMFS provided technical assistance to the FAA, Monroe County, and their consultants during pre-application meetings on April 27, 2020, and September 18, 2020. During these meetings, the NMFS discussed impact avoidance, minimization, and mitigation. The EA and BA and reflect these discussions, and the NMFS has no additional recommendations for avoiding and minimizing wetland impacts.

#### *Mitigation*

To offset unavoidable impacts to 7.71 acres of mangrove, salt marsh, and tide pool habitats, the FAA and Monroe County propose 8.57 acres of onsite and offsite wetland creation, restoration, and enhancement. The BA includes detailed information and tables with preliminary UMAM (Uniform Mitigation Assessment Method) scores. The BA notes the final mitigation plan and functional assessments will be developed during the state permitting process.

The BA proposes onsite wetland restoration and enhancement at four locations that will improve 6.85 acres of mangrove, salt marsh, and tide pool habitats on the KWIA property. Re-grading and planting mangrove and salt marsh species is proposed at all four locations. In addition, hydrologic improvements are proposed at ONS-4 that includes a 4.28-acre mangrove and salt marsh wetland. ONS-4 includes an existing mosquito-control ditch clogged with mangrove prop roots and detritus. The FAA proposes to trim the adjacent mangroves and widen the ditch to improve tidal circulation to the wetlands. A tide pool will be excavated with sloped sides and planting of mangroves on these slopes are also proposed at ONS-4. In addition to the onsite wetland improvements, mitigation on 1.72 acres of wetlands is proposed offsite at three county-owned locations, including OFS-1 on Cudjoe Key, approximately 18 miles east of the KWIA. Mitigation at OFS-1 includes regrading and planting with mangrove and salt marsh species on a fill road that fragments a 13.9-acre mangrove and salt marsh wetland; and two locations on Summerland Key approximately 20.8 miles (OFS-2) and 20.9 miles (OFS-3) east of KWIA. Restoration of wetlands at OFS-2 is proposed by removing a 0.16-acre fill road and building pad to restore mangrove and salt marsh habitats and to improve habitat connectivity for fish and wildlife. OFS-3, just north of OFS-2, includes a 10.35-acre parcel with a 0.58-acre berm fragmenting existing mangrove and salt marsh habitats. The FAA and Monroe County will regrade the berm to match adjacent elevations and include planting of red, black, and white mangroves to improve habitat connectivity for fish and wildlife access. Offsite mitigation consisting of the removal of these small upland features will improve hydrology and habitat connectivity for fish and wildlife in much larger mangrove and saltmarsh wetlands including fringing mangroves. Fringing mangrove communities are especially important for juvenile members of the snapper/grouper complex, such as goliath grouper<sup>1</sup>. NMFS believes the types of mitigation are appropriate for the habitats affected by the project and recommends the FAA coordinate the final compensatory mitigation plan and functional assessments with the NMFS West Palm Beach field office.

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<sup>1</sup> Frias-Torres S. 2006. Habitat use of juvenile goliath grouper *Epinephelus itijara* in the Florida Keys, USA. *Endangered Species Research* 2:1-6.

### EFH Conservation Recommendations

Section 305(b)(4)(A) of the Magnuson-Stevens Act requires NMFS to provide EFH Conservation Recommendations for any federal action or permit which may result in adverse impacts to EFH. Therefore, NMFS recommends the following to ensure the conservation of EFH and associated fishery resources:

1. A complete compensatory mitigation plan should be developed for the unavoidable impacts to mangrove, salt marsh, and tide pools. The mitigation plan should be based on functional assessments, including supporting information, demonstrating all adverse impacts to EFH are fully offset.
2. To minimize impacts to adjacent mangrove wetlands, the FAA should require use of Best Management Practices, including use of staked silt fences around work areas, to prevent sediment-laden runoff during construction.

Section 305(b)(4)(B) of the Magnuson-Stevens Act and implementing regulation at 50 CFR Section 600.920(k) require FAA to provide a written response to this letter within 30 days of its receipt. If it is not possible to provide a substantive response within 30 days, an interim response should be provided to NMFS. A detailed response then must be provided prior to final approval of the action. The detailed response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. If the response is inconsistent with the EFH conservation recommendations, the FAA must provide a substantive discussion justifying the reasons for not following the recommendations.

We appreciate the opportunity to provide these comments. Please direct related correspondence to the attention of Mr. Kurtis Gregg in our West Palm Beach Field Office, 400 North Congress Avenue, Suite 270, West Palm Beach, FL 33401. He also may be reached by telephone at (561)440-3167 or by email at Kurtis.Gregg@noaa.gov.

Sincerely,

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Virginia M. Fay  
Assistant Regional Administrator  
Habitat Conservation Division

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U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Orlando Airports District Office  
8427 SouthPark Circle, Suite 524  
Orlando, FL 32819  
Phone: (407) 487-7720  
Fax: (407) 487-7135

February 5, 2021

[via email: Kurtis.Gregg@noaa.gov]

Mr. Kurtis Gregg  
National Marine Fisheries Service  
National Oceanic and Atmospheric Administration  
West Palm Beach Field Office  
400 North Congress Avenue, Suite 270  
West Palm Beach, Florida 33401

RE: Essential Fish Habitat Consultation  
Airfield Improvement Project  
Key West International Airport (Monroe County, Florida)

Dear Mr. Gregg,

We appreciate NOAA's National Marine Fisheries Service (NMFS) review of the Draft Environmental Assessment and Biological Assessment for the proposed airfield improvements at the Key West International Airport. This letter responds to your agency's December 9, 2020 letter that provides Conservation Recommendations to ensure conservation of Essential Fish Habitat (EFH) and associated fishery resources. The Federal Aviation Administration (FAA) has reviewed the Conservation Recommendations and our responses are provided below.

*1. A complete compensatory mitigation plan should be developed for the unavoidable impacts to mangrove, salt marsh, and tide pools. The mitigation plan should be based on functional assessments, including supporting information, demonstrating all adverse impacts to EFH are fully offset.*

FAA agrees with the Conservation Recommendation that a complete compensatory mitigation plan be developed and the plan should be based on functional assessments, including supporting information, demonstrating all adverse impacts to EFH are fully offset.

As owner and operator of the Key West International Airport, Monroe County is responsible for obtaining all permits and approvals necessary to implement the proposed airfield improvements. During the preparation of the Environmental Assessment, the County developed a conceptual mitigation plan for unavoidable impacts to wetlands and EFH. Development of the final and complete mitigation plan is anticipated to include, but is not necessarily limited to, the following:

- Additional agency coordination and meetings.
- Additional environmental field reviews, wetland delineation, and jurisdictional determinations.
- Preparation of project plans and drawings to support the preparation of wetland permit applications.

- Preparation of the final compensatory mitigation plan in accordance with applicable regulatory requirements and agency guidance, including functional assessments using the Uniform Mitigation and Assessment Method. The mitigation plan will address adverse impacts to EFH.
- Submitting the applications and initiating the application review process.

At this time, the FAA is completing its environmental review of the proposed airfield improvements in accordance with the National Environmental Policy Act (NEPA). In making the agency's environmental finding, the FAA will consider the County's conceptual mitigation plan. If FAA's environmental finding results in the issuance of a Finding of No Significant Impact (FONSI), the FONSI will require that all necessary environmental permits and approvals are obtained prior to the County initiating any construction activities. This subsequent process will include development of a final mitigation plan. Because EFH consultation between FAA and NMFS would be ongoing until such time that a complete compensatory mitigation plan is available, the FONSI would also condition FAA's environmental approval on completion of EFH consultation. This would be accomplished by the County coordinating the draft and final compensatory mitigation plan with the FAA and NMFS.

2. *To minimize impacts to adjacent mangrove wetlands, the FAA should require use of Best Management Practices, including use of staked silt fences around work areas, to prevent sediment-laden runoff during construction.*

FAA agrees with this Conservation Recommendation and will require the use of BMPs during construction to control erosion, sedimentation, and turbidity. Because requests for federal funding are anticipated for the proposed airfield improvements, use of FAA Advisory Circular 150/5370-1H, *Standard Specifications for Construction of Airports*, is mandatory. This Advisory Circular provides guidelines and specifications for airport construction projects, including erosion and silt control. In addition, the County will be required to meet applicable state water quality standards and permit conditions during construction.

Please let us know if you have any questions or would like to discuss the proposed approach to completing EFH consultation. You can reach me at [peter.m.green@faa.gov](mailto:peter.m.green@faa.gov) or (407) 487-7296.

Sincerely,

Peter Matthias  
Green

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Peter M. Green, AICP  
Environmental Protection Specialist

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February 15, 2021

F/SER47:KG/pw

(Sent via Electronic Mail)

Peter M. Green, AICP  
Federal Aviation Administration, Orlando Airports District Office  
8427 South Park Circle  
Orlando, Florida 32819

Dear Mr. Green:

NOAA's National Marine Fisheries Service (NMFS) reviewed the letter from the Federal Aviation Administration (FAA) dated February 5, 2021, regarding the Draft Environmental Assessment and Biological Assessment for proposed airfield improvements at Key West International Airport (KWIA). The local sponsor, Monroe County-Key West International Airport, requests authorization from the FAA to expand existing taxiways and utility roads and replace perimeter fencing within the City of Key West, Monroe County. The letter replies to the conservation recommendations the NMFS provided by letter dated December 9, 2020, to protect mangrove wetlands designated essential fish habitat (EFH). The NMFS recommended the local sponsor provide a complete mitigation plan demonstrating all adverse impacts to mangrove wetlands will be fully offset and incorporate into the project best management practices, such as staked silt fencing around work areas, to minimize impacts to adjoining areas.

The FAA indicates the local sponsor will be required to submit a complete mitigation plan to the NMFS when applying for the project's state and federal permits. The NMFS has discussed conceptual mitigation plans and impact minimization with the local sponsor's agent during interagency coordination meetings, and the NMFS accepts deferring finalization of these plans to the permitting phase. The FAA notes the local sponsor will be required to comply with FAA Advisory Circular 150/5370-1H, Standard Specifications for Construction of Airports, which include impact minimization measures.

Thank you for the opportunity to provide comments. Please direct related correspondence to the attention of Mr. Kurtis Gregg at our West Palm Beach office. His email address is [Kurtis.Gregg@noaa.gov](mailto:Kurtis.Gregg@noaa.gov).

Sincerely,

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Virginia M. Fay  
Assistant Regional Administrator  
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## APPENDIX C.2

# Biological Assessment

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# KEY WEST INTERNATIONAL AIRPORT

Taxiway A Extension, Apron Expansion,  
and Security Fencing Project

## BIOLOGICAL ASSESSMENT OCTOBER 2020

**Prepared for:**

Federal Aviation Administration  
8427 South Park Circle  
Suite 524  
Orlando, Florida 32822

**Submitted by:**

Monroe County Board of County Commissioners  
Key West International Airport

**Prepared by:**



**BIRKITT**  
ENVIRONMENTAL  
SERVICES, INC.

**Birkitt Environmental Services, Inc.**  
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- A. Agency Correspondence
- B. Representative EYW Photographs
- C. Florida Natural Areas Inventory (FNAI) Element Occurrence Report
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## Errata

This errata sheet lists the corrections for the *Key West International Airport Taxiway A Extension, Apron Expansion, and Security Fencing Project Biological Assessment*, dated October 2020.

1. On page 25, change the taxonomic name of the White-crowned pigeon from "*Mendidia conchorum*," to "*Patagioenas leucocephala*."

Issue Date: February 4, 2021

# 1. Introduction

## 1.1 Purpose of Biological Assessment

The purpose of this Biological Assessment (BA) is to review and analyze the proposed extension of Taxiway A, the proposed expansion of the Commercial Apron (CA), the proposed expansion of the General Aviation (GA) Apron, and the proposed extension of a security fence at Key West International Airport (EYW or Airport) in sufficient detail to determine the extent to which the Proposed Action may affect federally threatened or endangered species and designated or proposed critical habitats protected under the Federal Endangered Species Act of 1973 (ESA). This BA has been prepared to support the Federal Aviation Administration's (FAA's) consultation with the United States Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS), pursuant to Section 7 of the ESA. FAA is the Lead Federal Agency. This BA is prepared in accordance with requirements set forth under regulations implementing Section 7 of the Endangered Species Act (50 Code of Federal Regulations [CFR] 402; 16 United States Code [U.S.C.] 1536 (c) and U.S. Fish and Wildlife Service recommended elements for a BA (50 Code of Federal Regulations [CFR] 402.12(f)).

In addition to compliance with provisions of the ESA, Section 305(b) of the Magnuson-Stevens Fishery Conservation Management Act (Magnuson-Stevens Act) requires federal agencies to consult with the NMFS regarding any action or proposed action that may adversely affect Essential Fish Habitat (EFH) for federally managed species.<sup>1</sup>

**Exhibit 1** shows the Airport location and vicinity map, respectively. The Proposed Action, as shown on **Exhibit 2** includes a 274-foot extension of Taxiway A, a 13,200 square yard expansion of the commercial apron, a 5,400-square yard expansion of the general aviation (GA) apron, and improvements to security fencing along the northern perimeter of the Airport.

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<sup>1</sup> Public Law 94-265.

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## 1.2 Purpose of and Need for the Proposed Action

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The purpose of the Proposed Action is to improve the layout of the airfield to enhance operational safety and efficiency of the Airport by extending Taxiway A to the end of Runway 9, constructing additional apron for commercial and general aviation aircraft, and improving security fencing along the Airport's north perimeter. To resolve operational inefficiencies resulting from the layout of existing taxiways and aprons and to improve airfield safety, the Proposed Action needs to: eliminate the need for departing aircraft to back-taxi to the Runway 9 end to use the full Runway 9 departure length while maintaining taxiway bypass capabilities, reduce commercial apron congestion and effects on operational efficiency during peak periods and irregular operations, provide additional general aviation apron for overflow aircraft parking, and improve non-standard sections of perimeter fence along the Airport's north perimeter.

## 2. Project Location and Action Area

### 2.1 Monroe County – Florida Keys

Monroe County and the City of Key West are substantially developed; but, also support natural and environmentally sensitive areas that provide habitat to federally protected species. Federal, state, and local agencies have recognized the importance of this portion of the Florida Keys and the need to manage sustainable and responsible growth within the remaining natural areas.

#### 2.1.1 ENVIRONMENTALLY SENSITIVE LANDS

Monroe County currently operates under the Year 2030 Comprehensive Plan, which was adopted in June 2016. The County utilizes a Tier System for development to protect environmentally sensitive lands and habitat including tropical hardwood hammock, wetlands, and beach berm. The Tier System has four tiers that classify land based on its importance to native/protected species and assigns a point value to each type of land. Tier I is for environmentally sensitive land that is difficult to develop. Tier II denotes transition or sprawl reduction land on Big Pine Key or No Name Key, which is easier to develop than Tier I land. Tier III is for infill area (50 percent or more developed) that is less environmentally sensitive than Tier I land. Tier IIIA denotes special protection area for land that does not qualify for Tier I and Tier III (e.g. environmentally sensitive areas invaded by non-native species or split by roadways). The City of Key West, including the Airport, does not have a tier designation. Selected habitats and plant and wildlife species are also protected by the County.

#### 2.1.2 AREA OF CRITICAL STATE CONCERN

The Florida Keys are the location of the third largest coral reef system in the world. The Florida Keys are also home to over 30 threatened and endangered species and are one of the most ecologically diverse ecosystems in the United States. Monroe County is in an Area of Critical State Concern (ACSC), as designated by the Administration Commission in December 1975 and the Florida Legislature in 1979 (Section 380.0552, Florida Statutes (F.S.)). This ACSC encompasses the Florida Keys and portions of mainland Florida, specifically Everglades National Park, and is home to approximately 70,000 residents. The designation is intended to protect environmental or natural resources of regional or statewide importance, historical or archaeological resources, and major public facilities and areas of major public investment. This designation also provides for state guidance relating to growth management issues within Monroe County.

#### 2.1.3 OUTSTANDING FLORIDA WATERS

The Florida Keys are designated as Outstanding Florida Waters pursuant to 403.061 (27), F.S., which is defined as “a waterbody deemed worthy of special protection because of its natural attributes.” Chapter 62.302.700, Florida Administrative Code (F.A.C.), affords special protection to these areas.

#### 2.1.4 FLORIDA KEYS NATIONAL MARINE SANCTUARY

Key West is located within the Florida Keys National Marine Sanctuary (FKNMS). The FKNMS was designated in 1990 to protect and conserve the diverse marine environment in the Florida Keys. Important resources in the

FKNMS include coral reefs, sea grass communities, hardbottom habitats, mangroves, and marine life associated with these areas. The FKNMS consists of all submerged lands and waters from the mean high water mark to its outer boundary, with the exception of areas within the Dry Tortugas National Park. The FKNMS is administered by the National Oceanic and Atmospheric Administration (NOAA) and is jointly managed with the State of Florida under a co-trustee agreement pursuant to 15 CFR Part 922, Subpart P.

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## 2.2 Action Area

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The Airport is in the southernmost key, approximately 130 miles southwest of Miami. It is located in the southeast portion of the City of Key West in Monroe County, Florida. The island of Key West is built out with the exception of the southeast part of the island. NOAA lists the Airport reference point as 24°33'20.30"N Latitude and 81°45'31.45"W Longitude (NAD 83). The surrounding landscape consists of a mixture of residential, commercial, and institutional development, wetland areas, and open water.

The Action Area is defined as the Biological Study Area (BSA) which includes all areas that may be directly or indirectly affected by the proposed project (50 CFR § 402.02). The Action Area covers the entire Airport property which consists of approximately 392 acres of developed and undeveloped land and interconnected habitats outside of the Airport. Based on further analysis, a Focused Biological Study Area (FBSA) was defined to encompass areas of ground disturbance where direct and indirect impacts on biological resources associated with the Proposed Action are expected to occur and consists of 30.6 acres of developed and undeveloped land on Airport property. The Action Area and FBSA are shown on **Exhibit 3** and **Exhibit 4**, respectively.

### 3. Agency Coordination

Notice of Preparation of an Environmental Assessment and scoping meeting for the Proposed Action was sent to the NMFS, the FWS, and other local, state, and federal entities to solicit input:

- Scoping letters mailed to agencies: August 19, 2019
- Scoping period: August 19, 2019 to September 30, 2019
- Agency scoping meeting: September 19, 2019 (3:00 p.m. Eastern)
- Public scoping meeting: September 19, 2019 (5:00 p.m. to 7:00 p.m. Eastern)

In addition, a biological resources web-based meeting was held with state and federal agencies on April 27, 2020 and a meeting was held with Monroe County representatives on June 10, 2020 to provide information about the affected biological resources and the proposed project and to solicit ideas and feedback on potential mitigation opportunities.

In a letter received from the USEPA Region IV on September 30, 2019 in response to the August 19, 2019 Notice, it was recommended that a BA be conducted “to evaluate the direct and indirect impacts that could result from losses in wetlands function”. Comments included a concern over nighttime lighting at the Airport and potential effects on loggerhead turtle nests on Smathers Beach. They also noted that because of impacts to jurisdictional waters of the U.S., a U.S. Army Corps of Engineer permit is required and mitigation may also be required. The proposed project and site conditions based on the field visit conducted September 17-19, 2020 were presented in the biological resources web-based meeting held on April 25, 2020. All state and federal agencies having a natural resource regulatory or informational role were invited to participate, Mitigation needs were identified based on preliminary Uniform Mitigation Assessment Method (UMAM) calculations. The USFWS raised a concern about the potential occurrence of the silver rice rat and the FWC asked about tropical hardwood hammock sites on the Airport and the potential presence of the white crowned-pigeon. Birkitt confirmed that no tropical hardwood hammock habitat occurs on the Airport property. Further investigation regarding the potential presence of the silver rice rat was conducted following the webinar and it was confirmed based on a review of the FEMA Biological Opinion and coordination with Monroe County that this species is not documented on the Airport and that suitable habitat is not available on the Airport.

The mitigation discussion during the April 25, 2020 biological resources web-based meeting included a potential to use excess mitigation credits from the previous South Florida Water Management District (SFWMD) Runway Safety Area (RSA) project and the Keys Restoration Fund (KERF). SFWMD will not approve the use of the KERF; but, SFWMD will review the previous permit and advise regarding potential use of remaining credits. SFWMD followed up after the webinar to confirm that the previous extra credits can be used for this project depending on habitat type. NOAA inquired about the tidal connections of the salt ponds and asked whether there was a potential to connect the south salt pond to tidal waters. Birkitt indicated that we would consider this possibility in evaluating mitigation options. Another agency webinar is planned once mitigation options have been identified and evaluated.

A meeting was also held with Monroe County representatives on June 10, 2020 to provide specific information about the proposed project activities, existing conditions of biological resources, and potential impacts to biological resources due to project implementation. A key goal of the meeting was to obtain input on the County's knowledge of sensitive biological resources on the Airport property and to identify mitigation potential on Airport and off-site properties that could benefit local biological resources. Regarding protected species, County representatives indicated that they were not aware of sensitive plant habitat on the Airport property and confirmed that the silver rice rat is not documented as occurring on Airport property. Potential mitigation areas both on-site and off-site were discussed and selected concepts were identified for follow up. A comprehensive plan amendment will be required for impacts to mangroves and for the proposed fencing project.

Additionally, it was also noted that in a BA for previous activities at the Airport including Runway Safety Area (RSA) improvements, NMFS raised questions about the occurrence and potential impact on the smalltooth sawfish. This species has been included in our evaluation of potential impacts from the currently proposed activities.

Correspondence received from these entities in response to the August 19, 20-19 Notice and minutes from agency meetings are provided in **Attachment A**.

## 4. Proposed Action

The Proposed Action, as shown on **Exhibit 2**, would include several components to address the Purpose and Need of the project, including:

- **Taxiway A Extension:** Taxiway A would be extended to provide access to the Runway 9 end of pavement for departing aircraft. The proposed 274-foot taxiway extension would add approximately 3,300 square yards of asphalt, require the placement of approximately 600 cubic yards of fill, and include new taxiway lighting and signage. Habitat affected by fill for the Taxiway A Extension includes saltwater marshes and mangrove swamp.
- **Commercial Apron (CA) Expansion:** The proposed expansion of the commercial apron, including signage, marking, and lighting, would add approximately 13,200 square yards of concrete. Stormwater runoff from the new impervious apron surface would be treated through exfiltration trenches constructed under the apron footprint, and a swale would be constructed along the fenceline. A vegetative buffer would be maintained between the apron and the fenceline. Approximately 2,000 cubic yards of fill material would be placed to allow the new apron pavement to meet the grade of the existing apron and to regrade surrounding land to match existing grades. Saltwater marshes, mangrove swamp, and Brazilian pepper infested wetlands would be filled for construction of the Commercial Apron.

**GA Apron Expansion for Overflow Parking:** The proposed 5,400-square-yard GA apron expansion, including access, signage, marking, and lighting, is needed to accommodate overflow parking for GA aircraft. The proposed apron would include two connector taxiways to Taxiway A. Stormwater runoff from the new impervious surface apron would be treated through exfiltration trenches constructed under the apron footprint. Approximately 1,800 cubic yards of fill material would be placed to allow the apron expansion to meet the grade of the existing apron and to regrade surrounding land to match existing grades. Portions of mangrove swamp, saltwater marshes, and salt ponds/embayments would be filled for the GA Apron Expansion.

- **Security Fence:** Two new sections of security fence would be installed along the north boundary of the Airport to replace the 1,500 linear feet of nonstandard fencing in the ROFA and close gaps in the existing fenceline. The security fencing would comprise an approximate 860-linear foot floating barrier across the open water of the salt pond north of Runway 9-27 to deter kayakers and canoers from entering the AOA and approximately 450-linear feet of new security fence on land to close the gaps between existing sections of fence along the northern perimeter of the airfield. A 10-foot buffer of cleared vegetation would be maintained on both sides of the new on-land segments of security fence. Mangrove swamp would be cleared for construction of the new security fence in the two new sections. Additionally, 360 linear feet of security fencing would be replaced as a result of the proposed GA apron expansion for overflow parking.

The floating security fence would maintain the flow of salt pond water, maintain connectivity for aquatic species in salt pond waters, and minimize effects to benthic habitat from fence system support elements. The fence structure will be anchored at each end of the barrier to a deadman type buried concrete anchor. The connections to the anchors can be made with a tensioned cable to prevent wildlife entanglement. There may be intermediate supports along the security barrier to prevent large lateral displacements of the barrier. These supports may be vertical steel or timber posts installed into the pond bottom or may be taut cable anchors to prevent entanglement.

The construction of the floating security fence begins with the construction of the deadman anchors on each side of the fence as well as the installation of the intermediate support posts or anchors. The intermediate posts will be installed from a small float or shore launched barge. Once the anchors are in place, the fence segments will be installed to one end anchor and then floated into position and anchored to the adjacent anchor. This process begins on one side and will continue until the opposite shore is reached by the boom. There will be a small boat, float or barge used to assist in constructing the boom.

An example of the proposed floating fence system is provided in **Photo 1** below.

**Photo 1** Example of Proposed Floating Security Fence Structure



SOURCE: Worthington Waterway Barriers

There are many different styles of security boom / barrier to choose from. Because this is an airport location, a large diameter boom without cable handrails, which presents a roosting point for birds will be considered.

The following are connected and enabling actions to the Proposed Action:

**Taxiway B Improvements:** Approximately 2,300 square yards of excess Taxiway B bypass pavement would be removed. Approximately 1,100 cubic yards of fill material would be placed to regrade the land to match existing grades.

**Vehicle Service Road Relocation:** A portion of the existing vehicle service road providing access between the GA apron and the west airfield would be located within the TOFA of the extended Taxiway A. Along with relocating the portion of the vehicle service road out of the extended TOFA, the remaining vehicle service road would also be shifted out of the TOFA. Approximately 1,900 square yards of existing roadway pavement would be removed, and 1,600 square yards of new roadway pavement would be constructed outside the Taxiway A TOFA. Approximately 500 cubic yards of fill material would be placed to allow the new roadway pavement to meet the grade of the existing taxiway and apron and to regrade surrounding land to match existing grades.

Section 6 Effects Analysis provides a breakdown of project- specific habitat impacts anticipated.

Construction of the Proposed Action is estimated to begin in October 2021 and be complete by August 2023, as shown below.

#### ESTIMATED CONSTRUCTION PHASING

Proposed Action Project Component	2021				2022								2023					
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Taxiway A Extension				■	■	■	■	■	■	■	■	■	■	■				
Commercial Apron Expansion															■	■	■	■
General Aviation Apron Expansion for Overflow Parking				■	■	■	■	■	■	■	■	■	■	■				
Security Fence				■	■	■	■	■	■	■	■	■	■	■				
Taxiway B Improvements				■	■	■	■	■	■	■	■	■	■	■				
Vehicle Service Road Relocation				■	■	■	■	■	■	■	■	■	■	■				

SOURCE: Monroe County, Key West International Airport, November 2019.

The County proposes to use a combination of federal (FAA), state, and local funds to implement the Proposed Action.

## 5. Existing Conditions

### 5.1 Methodology

Analysis of the Action Area was performed initially by gathering information via desktop research in June, July, and August 2019 and supplemented in 2020. A desktop analysis was conducted utilizing a wide variety of information and documents related to protected habitat and species in the Florida Keys. The following sources were utilized, but were not limited to:

- Aerial imagery
- Florida Natural Areas Inventory (FNAI) Element Occurrence Report
- United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC)
- Monroe County Property Appraiser's website
- Florida Fish & Wildlife Conservation Commission (FFWCC) Eagle Nest Locator and Quick Maps including the affiliated Fish and Wildlife Research Institute (FWRI) Habitats & Wildlife database
- FFWCC's Imperiled Species Management Plan
- United States Geological Survey (USGS) National Resources Conservation Service (NRCS) Web Soil Survey
- USGS National Hydrography Dataset (NHD)
- NMFS division of National Oceanic and Atmospheric Administration (NOAA)
- FWS National Wetlands Inventory (NWI)
- Florida Land Use, Cover and Forms Classification System (FLUCFCS) database

The data gathered from this desktop analysis were utilized in preparation of a field review of the Focused Biological Study Area (FBSA) and were also utilized to prepare the subsequent sections of this BA.

Scientists from Birkitt Environmental Services, Inc. conducted a review of the Action Area and a detailed survey of the FBSA September 17 through 19, 2019 to identify biological and/or natural resources within the Action Area and specific resources within the FBSA that may be affected by the Proposed Action. During the site assessment, all existing on-site habitats were mapped utilizing FLUCFCS and NWI classifications. Wetland limits within the FBSA were established utilizing the "1987 USACE Manual" and "Regional Supplement for the Atlantic and Gulf Coastal Plain Regions" along with the criteria found in the F.A.C. 62-340 – "Delineation of Landward Extent of Wetlands and Surface Waters" with the exception of the portion of the FBSA north of the runway. All wetland extents were recorded using a handheld GPS unit. In addition, representative photographs were taken and logged within each designated FLUCFCS habitat in the FBSA,

The functional value of wetlands present within the FBSA was evaluated using the Uniform Mitigation Assessment Method (UMAM), as described in Chapter 62-345, F.A.C. UMAM provides a standardized procedure to be used by federal and state regulatory agencies for assessing the functions provided by wetlands and other surface waters. The wetlands function indicators measured by UMAM include the following:

- Location and Landscape Support (L&LS)
- Water Environment (WE)
- Community Structure: Vegetation and/or Benthic Community (CS)

An assessment of federally listed species was accomplished by identifying listed species potentially occurring within the Action Area and determining the potential use of various habitats within the Action Area by those listed species (e.g., foraging, nesting, etc.). A general protected species survey of the FBSA was also conducted. Any observations of threatened or endangered species, species indicators, or potential habitat were documented.

Supplemental literature review and desktop assessments were provided in 2020 following questions from USFWS and Monroe County regarding the silver rice rat and Lower Keys marsh rabbit and consideration of the potential occurrence of the smalltooth sawfish as noted in a previous BA for activities at the Key West Airport.

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## 5.2 Land Use/Vegetative Cover

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During the September 2019 field events, all habitats within the Action Area and the FBSA were assigned a FLUCFCS code reflecting their land use or vegetative cover. Wetlands and open water habitats were described using the FWS “Cowardin system” of wetland classification. The location and acreage of land use and vegetative cover polygons within the FBSA were determined by: 1) marking field-observed wetland and FLUCFCS boundaries on an aerial photograph and recording representative boundary points via GPS, 2) creating habitat maps utilizing a geographic information system (GIS) database and field data points, and 3) overlaying the FBSA boundaries on the wetland and FLUCFCS map. The resulting information was used to describe existing land use, vegetative cover, and land forms in the FBSA. Representative photographs from the field surveys are provided in **Attachment B**.

**Exhibit 3** shows several generalized land uses and habitats within the Action Area. Land uses include airport facilities, single and multi-family residential housing, commercial, institutional, roads and highways, and disturbed land. Much of the urban and built-up areas surrounding the Airport are residential to the north with several hotels to the east.

All habitats within the Action Area were assigned a FLUCFCS code based on data obtained from the South Florida Water Management District. Wetlands and open water habitats are also described using the FWS Cowardin classification system. The resulting information was used to describe existing land use, vegetative cover, and land forms in the Action Area. The acres of land use by FLUCFCS code for the Action Area are shown in **Table 5-1**.

**Table 5-1: Florida Land Use, Cover and Forms Classification System Codes – Habitats within the Action Area**

FLUCFCS CODES	DESCRIPTION	ACRES WITHIN ACTION AREA
<b>Uplands</b>		
811	Airports	124.0
740	Disturbed Land	20.6
170	Institutional	12.4
420	Upland Hardwood Forests	7.7
814	Roads and Highways	4.9
185	Parks and Zoos	4.6
134	Multiple Dwelling Units, High Rise	2.4
320	Upland Shrub and Brushland	1.5
181	Swimming Beach	1.1
330	Mixed Rangeland	0.5
140	Commercial and Services	0.3
121	Fixed Single Family Units	0.2
<b>Wetlands</b>		
612 – Mangrove Swamp	E2FO3N – Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded	114.0
542 – Salt Ponds/Embayments Not Opening Directly to Gulf or Ocean	E1UB2 – Estuarine, Subtidal, Unconsolidated Bottom, Sand	93.5
642 - Saltwater Marshes	E2EM1 – Estuarine, Intertidal, Emergent, Persistent	2.9
541 - Embayments Opening Directly to Gulf or Ocean	E1UB2 – Estuarine, Subtidal, Unconsolidated Bottom, Sand	1.1
512 - Channelized Waterways, Canals	E1UB2 – Estuarine, Subtidal, Unconsolidated Bottom, Sand	0.3
<b>Total Acres of Habitats within the Action Area</b>		<b>392.0</b>

SOURCE: FLUCFCS, SFWMD 2016.

Land use and vegetative cover within the FBSA were assessed during field surveys conducted September 17 through September 19, 2019. Habitats were mapped and assigned a FLUCFCS code as described above. Note that some portions of the area designated by FLUCFCS as Airports (FLUCFCS Code 811) was mapped as Saltwater Marsh (FLUCFCS Code 642) during the site assessment. This resulted to an increase in the acreage of saltwater marsh habitat in the FBSA beyond what was included in Action Area. The acres of land use by FLUCFCS codes for the FBSA are shown in **Table 5-2**.

**Table 5-2: Florida Land Use, Cover and Forms Classification System Codes - Habitats within the Focused Biological Study Area**

FLUCFCS CODES	DESCRIPTION	ACRES WITHIN FBSA
<b>Uplands</b>		
811	Airports	8.8
740	Disturbed Land	0.6
422	Brazilian Pepper (Upland)	0.1
<b>Wetlands</b>		
612 – Mangrove Swamp	E2FO3N – Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded	8.3
642 - Saltwater Marshes	E2EM1 – Estuarine, Intertidal, Emergent, Persistent	6.5
542 - Embayments Not Opening Directly to Gulf or Ocean	E1UB2 – Estuarine, Subtidal, Unconsolidated Bottom, Sand	6.3
619 – Exotic Wetland Hardwoods (Wetland Brazilian Pepper)	E2FO3P – Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Irregularly Flooded	0.3
<b>Total Acres of Habitats within the FBSA</b>		<b>30.9</b>

SOURCE: Birkitt Environmental Services, September 17-19, 2019

Several salt ponds are located within and adjacent to the northern, southern, and western portions of the Action Area. Historically, some of these ponds were part of a larger pond which was utilized for salt mining dating back to the 1830's. Shallow, high salinity, and un-vegetated ponds are not directly connected to surrounding ocean waters; but, they may have some tidal influence with salinity fluctuation dependent upon rainfall. The western and southern tidal ponds are connected to Riviera Canal via a large culvert under Venetian Drive followed by a total of 3 culverts under Government Road. In addition the western and southern ponds are connected to the northern pond via a small mosquito ditch and 2 culverts west of the runway. The interior of the tidally connected or influenced ponds contain sparsely distributed seagrasses, primarily turtle grass (*Thalassia testudinum*), along with several species of macroalgae.

Mangrove swamps are coastal wetlands characterized by one or more of three tropical species of mangroves, red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), and white mangrove (*Laguncularia racemosa*). Mangroves are found along the coastline of south Florida and the Keys. In Florida, it is estimated that the four southern counties (Lee, Collier, Miami-Dade, and Monroe) contain 90 percent of the mangroves in

the state. Mangrove ecosystems provide valuable natural environment for a wide variety of amphibians, birds, fish, invertebrates, mammals, and reptiles in Florida.<sup>2</sup>

Mangrove swamps are present along the periphery of the salt ponds in the Action Area and surround the airport to the north, south, east, and west. These mangrove wetlands contain a mix of red and black mangroves within the deeper portion of the wetlands and both white mangroves and buttonwood (*Conocarpus erectus*) at higher elevations. Because of the dense canopy of mangroves in these areas, there is little to no understory species. The outer portions of mangrove communities adjacent to the airport terminal contain significant coverage of Brazilian pepper (*Schinus terebinthifolius*). This species is a Category I invasive exotic species per the Florida Exotic Pest Plant Council (FLEPPC) 2019 Invasive Plant List.

Saltmarsh habitat is also found directly adjacent to the periphery of the on-site mangrove forests, in the Action Area extending from the mangrove border to adjacent upland areas. This habitat is dominated by saltmarsh grasses including seashore paspalum (*Paspalum vaginatum*) and seashore dropseed (*Sporobolus virginicus*) with lesser coverage of bushy seaside oxeye (*Borrichia frutescens*), glasswort (*Salicornia spp.*), seacoast marshelder (*Iva imbricata*), and saltmeadow cordgrass (*Spartina patens*). Other species observed in small quantities with the saltmarsh habitat included seagrapes (*Coccoloba uvifera*) and pigeon plum (*Coccoloba diversifolia*). Finally, moderate coverage of cattail (*Typha spp.*) was observed within the saltmarsh directly west of the existing runway. Much of the saltmarsh habitat present within the FBSA on airport is maintained via mowing, and is thus lower quality habitat than other areas within the Action Area not on airport property.

Wetlands and open water areas within the FBSA are connected to adjacent tidal waters only via culverts except for the minimal area of clearing for the security fence, which has a natural connection through limited tidal channels within a mangrove system.

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## 5.3 Potential Occurrence – Protected Species

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### 5.3.1 PROTECTED PLANT SPECIES

#### **Action Area– Protected Plant Species**

A desktop assessment for federal and state protected plant species was conducted in order to determine the potential for these species inhabiting the Action Area. The analysis was performed utilizing data from the USFWS Information for Planning and Consultation (IPAC) system, a site-specific report (**Attachment C**) from the Florida Natural Areas Inventory (FNAI), and NMFS NOAA's Areas of Critical Habitat and protected species listings, data, and maps. Refer to Section 5.1 Methodology for a more complete list of sources reviewed for determining potential occurrence of protected species. Federal and state protected plant species with the

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<sup>2</sup>Odum, W.E. and C.C. McIvor, Mangroves, In R.L. Myers and J.J. Ewel (eds.), *Ecosystems of Florida*, University of Central Florida Press, Orlando, FL, 1990, pp. 517-548.

The Florida Keys Land Trust, *Ecology of the Salt Ponds: The Salt Ponds of Key West*

potential to occur within the Action Area are shown in **Table 5-3** and **Table 5-4**, respectively. All the federal special status species listed in **Table 5-3** are also considered protected by the State of Florida, and therefore, are not repeated in **Table 5-4**. Based on the results of the assessment, a total of eleven (11) state and federally protected plant species along with an additional five (5) state-only protected species were identified that have the potential to occur within the Action Area. None of these species were observed on-site during the field survey.

**Table 5-3: Federally Protected Plant Species- Action Area**

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT <sup>4/</sup>	HABITAT PRESENT/SPECIES OBSERVED
Blodgett's wild mercury <sub>1</sub>	<i>Argythamnia blodgettii</i>	T	Pine barrens, wet margins of hammocks.	No/No
Florida semaphore cactus <sub>1</sub>	<i>Opuntia corallicola</i>	E	Rocky hammocks, coastal barrens.	Yes/No
Garber's spurge <sub>1,2</sub>	<i>Chamaesyce garberi</i>	T	Pine rocklands, coastal berm, coastal grasslands.	Yes/No
Key tree cactus <sub>1</sub>	<i>Pilosocereus robinii</i>	E	Openings in tropical hardwood hammocks.	No/No
Big Pine partridge pea <sub>1</sub>	<i>Chamaecrista lineata keyensis</i>	E	Pine rocklands	No/No
Cape Sable thoroughwort <sub>1</sub>	<i>Chromolaena frustrata</i>	E	Coastal rock barrens and berms, sunny edges of rockland hammock	Yes/No
Everglades bully <sub>1</sub>	<i>Sideroxylon reclinatum ssp. austrofloridense</i>	T	Pine rocklands	No/No
Florida pineland crabgrass <sub>1</sub>	<i>Digitaria pauciflora</i>	T	Pine rocklands and marl prairie	No/No
Florida prairie-clover <sub>1</sub>	<i>Dalea carthagensis floridana</i>	E	Pine rocklands, edges of rockland hammocks, coastal uplands, marl prairie	No/No
Sand flax <sub>1</sub>	<i>Linum Arenicola</i>	E	Pine rocklands and marl prairie	No/No
Wedge spurge <sub>1</sub>	<i>Chamaesyce deltoidea serpullum</i>	E	Pine rocklands	No/No

NOTES: T—Threatened      E—Endangered

1/ Potential species obtained from USFWS IPAC and critical habitat data.

2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)

3/ Table lists observations from field survey conducted September 17-19, 2019.

4/ Various published and online sources used for animal habitat descriptions

SOURCE: Title 50 Code of Federal Regulations Part 17, *Endangered and Threatened Wildlife and Plants*, September 1975.

**Table 5-4: State Protected Plant Species – Action Area**

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	HABITAT <sup>4/</sup>	HABITAT PRESENT/SPECIES OBSERVED <sup>3/</sup>
Rough strongback <sup>2</sup>	<i>Bourreria radula</i>	E	Pinelands, tropical hardwood hammocks	No/No
Porter's broad-leaved spurge <sup>2</sup>	<i>Chamaesyce porteriana</i>	E	Coastal grasslands, coastal strand.	Yes/No
Maidenberry <sup>2</sup>	<i>Crossopetalum rhacoma</i>	T	Pine rocklands, hammocks.	No/No
West Indies mahogany <sup>2</sup>	<i>Swietenia mahagoni</i>	T	Maritime and rockland hammocks.	No/No
Florida thatch palm <sup>2</sup>	<i>Thrinax radiata</i>	E	Hammocks, coastal strands, and shores.	Yes/No

NOTES: T—Threatened      E—Endangered

1/ Potential species obtained from USFWS IPAC and critical habitat data.

2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)

3/ Table lists observations from field survey conducted September 17-19, 2019.

4/ Various published and online sources used for animal habitat descriptions

SOURCE: Florida Administrative Code 5B-40.0055, *Regulated Plant Index*, January 8, 2020; Florida Administrative Code 68A-27.003, *Florida Endangered and Threatened Species List*, July 25, 2019; Florida Administrative Code 68A-27.005, *Designation of Species of Special Concern*, November 5, 2017; Coile, Nancy C. and M.A. Garland, "Notes on Florida's Endangered and Threatened Plants," Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Bureau of Entomology, Nematology, and Plant Pathology – Botany Section, Contribution No. 38, 4<sup>th</sup> edition, Gainesville, Florida, 2003.

## Focused Biological Study Area – Protected Plant Species

The results of the assessment were further refined based on habitats identified during surveys in the FBSA. This analysis excluded species that utilize habitats not present in the FBSA including tropical hardwood hammocks and pine rocklands. A total of three (3) federally protected plant species were identified that have the potential to inhabit the FBSA (see **Table 5-5** below) as well as an additional two (2) state-only listed species (**Table 5-6**). None of these species were observed in the FBSA during the field surveys.

**Table 5-5: Federally Protected Plant Species- Focused Biological Study Area**

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT <sup>4/</sup>	HABITAT PRESENT/SPECIES OBSERVED <sup>1/</sup>
Florida semaphore cactus <sup>1/</sup>	<i>Opuntia corallicola</i>	E	Rocky hammocks, coastal barrens.	Yes/No
Garber's spurge <sup>1,2/</sup>	<i>Chamaesyce garberi</i>	T	Pine rocklands, coastal berm, coastal grasslands.	Yes/No
Cape Sable thoroughwort <sup>1/</sup>	<i>Chromoiaena frustrata</i>	E	Coastal rock barrens and berms, sunny edges of rockland hammock	Yes/No

NOTES: T—Threatened      E—Endangered

1/ Potential species obtained from USFWS IPAC and critical habitat data.

2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)

3/ Table lists observations from field survey conducted September 17-19, 2019.

4/ Various published and online sources used for animal habitat descriptions

SOURCE: Title 50 Code of Federal Regulations Part 17, *Endangered and Threatened Wildlife and Plants*, September 1975.

**Table 5-6: State Protected Plant Species – Focused Biological Study Area**

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	HABITAT <sup>4/</sup>	OBSERVED WITHIN FOCUSED BIOLOGICAL STUDY AREA <sup>3/</sup>
Porter's broad-leaved spurge <sup>2/</sup>	<i>Chamaesyce porteriana</i>	E	Coastal grasslands, coastal strand.	Yes/No
Florida thatch palm <sup>2/</sup>	<i>Thrinax radiata</i>	E	Hammocks, coastal strands, and shores.	Yes/No

NOTES: T—Threatened      E—Endangered

1/ Potential species obtained from USFWS IPAC and critical habitat data.

2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)

3/ Table lists observations from field survey conducted September 17-19, 2019.

4/ Various published and online sources used for animal habitat descriptions

SOURCE: Florida Administrative Code 5B-40.0055, *Regulated Plant Index*, January 8, 2020; Florida Administrative Code 68A-27.003, *Florida Endangered and Threatened Species List*, July 25, 2019; Florida Administrative Code 68A-27.005, *Designation of Species of Special Concern*, December 23, 2018

## Species Descriptions

### *Florida semaphore cactus (Opuntia corallicola)*

The Florida semaphore is an erect cactus growing from 3 to 15 feet tall. Older branches are green, flattened, oblong, and generally two to four times as long as wide. Spines are 1 to 4 inches long and grow in clusters of two to four per areole. The flower is orange to red and the fruit is flattened, yellow, and has spines. Florida semaphore cactus is federally listed as an endangered species. This species is endemic to the Florida Keys and

is found in buttonwood areas between hardwood hammock and coastal swamp. No Florida semaphore cacti were observed within the FBSA.

#### *Garber's spurge (Chamaesyce garberi)*

Garber's spurge is a robust perennial herb that is hairy throughout and has small oval leaves with thick, wiry stems that can grow to 12 inches long. Garber's spurge is generally found growing in sandy soils with a limestone substrate including pine rocklands and hammock edges. This species is federally listed as threatened. Individuals of this species were not observed within the FBSA.

#### *Cape Sable thoroughwort (Chromolaena frustrata)*

The Cape Sable thoroughwort is an erect herb growing from 8 to 40 inches tall. Disk flowers of blue or lavender are found on the long stalks at the end of its branches. Cape Sable thoroughwort flowers throughout the year and is endemic to south Florida. Typically located in coastal rock barrens and berms, as well as sunny edges of rockland hammocks. This species is federally listed as endangered and was not observed within the FBSA.

#### *Porter's broad-leaved spurge or Porter's Sandmat (Chamaesyce porteri)*

Porter's broad-leaved spurge is a smooth and hairless perennial herb with several waxy stems shooting from a taproot or woody base. This species has leaves sized to 0.4 inches long, opposite, relatively thick, oval and with a waxy coating underneath. Porter's broad-leaved spurge is generally found in pine rocklands, rockland hammock, coastal rock barrens, and marl prairies. This species is state listed as endangered and was not observed in the FBSA.

#### *Florida thatch palm (Thrinax radiata)*

The Florida thatch palm is a native palm with a slow growth pattern. The ultimate height can range from 15 to about 20 feet. This species can be found in natural habitats of sandy soils and can produce fall fruit that provide a good food source for birds. This species is state listed as endangered and was not observed in the FBSA.

### 5.3.2 PROTECTED WILDLIFE SPECIES AND HABITAT

Protected wildlife species and habitat were evaluated for the Action Area and the FBSA.

#### **Action Area – Protected Wildlife Species**

##### *Wildlife Species and Habitat*

The forested and herbaceous upland and wetland areas within the Action Area provide suitable habitat for various species of snakes, wading birds, birds of prey, songbirds, and mammals (e.g., mice and raccoons). The existing mangrove wetlands and saltmarsh habitats as well as the open water ponds located within the Action Area provide moderate quality habitat for wildlife species. Connections to adjoining habitats are fragmented and disrupted by roads, adjacent development, and security fencing along the periphery of the Airport which affect the quality of habitat in the Action Area. Additionally, the Action Area is within and adjacent to the Airport operations area, within which wildlife management techniques are employed to deter wildlife to support safe aircraft operations. Habitat fragmentation and wildlife deterrent activities further affect the on-Airport portions of Action Area habitats.

Mammals were not encountered during the field surveys of the Action Area; however, there is the potential that these habitats are utilized by small mammals including raccoons and rodents. Tidally inundated portions of the on-site saltmarsh and mangrove habitats may also be utilized by state or federally listed wading birds. The on-site salt ponds are also likely utilized by state or federally listed wading bird species. According to a review of FWC documented wading bird rookery data, however, no rookeries have been identified within the Action Area, with the nearest rookery located approximately 4.1 miles northeast of the site. In addition, based on wood stork active colonies and Core Foraging Area (CFA) data obtained from USFWS, the Action Area is not located in a CFA and the nearest documented nesting colony is over seventy-five (75) miles to the northeast.

### *Special Status Species and Critical Habitat*

The Action Area was evaluated for the occurrence of critical habitat for federal special status species designated in 17 CFR 35.1532 and critical habitat proposed by the FWS. No designated or proposed critical habitat for any federal special status species occurs within the Action Area. There is critical habitat for elkhorn and staghorn coral (*Acropora spp.*) and the loggerhead sea turtle (*Caretta caretta*) near the airport in waters south of Roosevelt Blvd. The Action Area is within the FWS consultation area for the American crocodile and piping plover.

For a species to potentially occur within the limits of the Action Area, the Action Area must be within the species' range, there must be appropriate habitat for the species, and there must be enough habitat area for the individual species to carry out reproduction, nesting, foraging, or resting activities. Potentially occurring species were identified based on the habitats present within the Action Area and a review of the habitat requirements of federal and state special status wildlife species, along with USFWS IPAC and a site-specific report from FNAI (**Attachment C**). In addition to those species identified by USFWS IPAC and FNAI, the silver rice rat was identified by USFWS and the Lower Keys marsh rabbit was identified by Monroe County as species that may have the potential to inhabit the project area. Based on the assessment, sixteen (16) federal threatened or endangered species have the potential to occur within the Action Area. These species include two (2) reptiles, three (3) amphibians, three (3) invertebrates, four (4) birds, and four (4) mammals, FAA consultation with the NMFS regarding a prior project at Key West International Airport also identified a concern that construction in the mangroves and adjoining waters may affect the juvenile smalltooth sawfish. Although this species was not identified during current research related to the Action Area, the smalltooth sawfish was added to this assessment.

Pursuant to the State Wildlife Code, listed federal species are considered protected by the State of Florida. In addition to the sixteen (16) federally-listed threatened or endangered species, eight (8) state special status species have the potential to occur with the Action Area. These species include one (1) reptile, one (1) amphibian, five (5) birds, and one (1) fish species. The key silverside, a federal species of concern, is listed as threatened by the state of Florida. Federal and state special status animal species (i.e., reptile, bird, fish, and invertebrate) with the potential to occur within the Action Area are shown in **Table 5-7** and **Table 5-8**, respectively. Federally-listed species are not repeated in Table 5-8 under the State listings.

Table 5-7: Federal Special Status Wildlife Species – Action Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT <sub>4</sub>	OBSERVED WITHIN ACTION AREA <sub>3</sub>
<b>Reptiles</b>				
American crocodile <sub>1</sub>	<i>Crocodylus acutus</i>	T	Brackish or saltwater areas such as ponds, coves, and creeks within mangrove swamps.	No
Eastern indigo snake <sub>1</sub>	<i>Drymarchon corais couperi</i>	T	Scrub, sandhill, wet prairie, mangrove swamp.	No
Hawksbill sea turtle <sub>1</sub>	<i>Eretmochelys imbricata</i>	E	Marine coastal and oceanic waters, nests on coastal sand beaches.	No
Leatherback sea turtle <sub>1</sub>	<i>Dermochelys coriacea</i>	E	Oceanic waters, nests on coastal sand beaches.	No
Loggerhead sea turtle <sub>1</sub>	<i>Caretta caretta</i>	T	Marine coastal and oceanic waters, nests on coastal sand beaches.	No
<b>Invertebrates</b>				
Bartram's hairstreak butterfly <sub>1</sub>	<i>Strymon acis bartrami</i>	E	Pine rocklands	No
Stock Island tree snail <sub>1</sub>	<i>Orthalicus reses</i>	T	Tropical hardwood hammocks.	No
Miami blue butterfly <sub>1</sub>	<i>Cyciargus thomasi bethunebakeri</i>	E	Tropical hardwood hammocks and pine rocklands	No
<b>Birds</b>				
Piping plover <sub>1</sub>	<i>Charadrius melodus</i>	T	Open, sandy beaches and tidal mudflats	No
Red knot <sub>1</sub>	<i>Calidris canutus rufa</i>	T	Tidal flats and coastlines	No
Roseate tern <sub>1</sub>	<i>Sterna dougallii dougallii</i>	T	Nests over bare limestone and shell-sand beaches, forages in open water over sandbars, reefs, and tidal channels	No
Wood stork <sub>1</sub>	<i>Mycteria americana</i>	T	Nests in forested wetlands, forages in marshes, swamps, and tidal creeks	No
<b>Mammals</b>				
Key Largo woodrat <sub>1</sub>	<i>Neotoma floridana smalli</i>	E	Tropical hammock	No
Silver rice rat <sub>1</sub>	<i>Oryzomys palustris natator</i>	E	Transition from upland to marine communities including mangrove swamps and saltgrass flats	No
West Indian manatee <sub>1</sub>	<i>Trichechus manatus</i>	T	Coastal waters, bays, and rivers	No
Lower Keys Marsh Rabbit	<i>Sylvilagus palustris heneri</i>	E	Saltwater marsh and freshwater marsh bordered by hammocks and flatwoods	No
<b>Fish</b>				
Smalltooth sawfish	<i>Pristis pectinate</i>	E	Shallow estuarine waters, rivers, mangroves	No

NOTES: T—Threatened      E—Endangered

1/ Potential species obtained from USFWS IPAC and critical habitat data.

2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)

3/ Table lists observations from field survey conducted September 17-19, 2019.

4/ Various published and online sources used for animal habitat descriptions

5/ Potential species obtained from Monroe County Board of County Commissioners, *Final Environmental Assessment for Proposed Runway Safety Area Improvements, Key West International Airport, Key West, Florida, July 23, 2007.*

SOURCE: Title 50 Code of Federal Regulations Part 17, *Endangered and Threatened Wildlife and Plants*, September 1975.

Table 5-8: State Special Status Wildlife Species – Action Area

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	HABITAT <sup>4</sup>	OBSERVED WITHIN ACTION AREA <sup>2/</sup>
<b>Reptiles</b>				
Florida Keys mole skink <sub>2</sub>	<i>Plestiodon egregius</i>	T	Variety of habitats that have stones, debris, and driftwood.	No
Striped mud turtle, lower keys population <sub>2</sub>	<i>Kinosternon baurii</i>	T	Freshwater to slightly brackish ponds and ditches	No
<b>Birds</b>				
Florida burrowing owl <sub>2</sub>	<i>Athene cunicularia floridana</i>	T	Sparsely vegetated sandy soils, ball fields, airports, pastures, vacant properties.	No
Reddish egret <sub>2</sub>	<i>Egretta rufescens</i>	T	Broad open tidal shorelines and flats. Mangrove islands.	No
Roseate spoonbill <sub>2</sub>	<i>Ajaia ajaja</i>	T	Mangrove wetlands, freshwater wetlands.	No
Tricolored heron <sub>2</sub>	<i>Egretta tricolor</i>	T	Mangrove swamps, tidal creeks, tidal ditches, edges of ponds and lakes.	No
White crowned pigeon <sub>2</sub>	<i>Patagioenas leucocephala</i>	T	Low-Lying forest habitats with ample fruiting trees	No
<b>Fish</b>				
Key silverside <sub>2</sub>	<i>Menidia conchorum</i>	T	Shallow pools surrounded by mangroves.	No

NOTES: T—Threatened E—Endangered

1/ Potential species obtained from USFWS IPAC and critical habitat data.

2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)

3/ Table lists observations from field survey conducted September 17-19, 2019.

4/ Various published and online sources used for animal habitat descriptions

SOURCES: Florida Administrative Code 5B-40.0055, *Regulated Plant Index*, January 8, 2020; Florida Administrative Code 68A-27.003, *Florida Endangered and Threatened Species List*, July 25, 2019; Florida Administrative Code 68A-27.005, *Designation of Species of Special Concern*, December 23, 2018;

## Focused Biological Study Area – Protected Wildlife Species

The results of the protected wildlife species assessment were further refined based on habitats identified during surveys within the FBSA. This analysis excluded species that utilize habitats not present in the FBSA including tropical hardwood hammocks and pine rocklands. A total of ten (10) federally protected wildlife species were identified that have the potential to inhabit the FBSA (see **Table 5-9** below) as well as an additional six (6) state-only listed species (**Table 5-10**). None of these species were observed in the FBSA during the field surveys.

**Table 5-9: Federal Special Status Wildlife Species – Focused Biological Study Area**

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT <sup>1/</sup>	HABITAT PRESENT/ SPECIES OBSERVED <sup>1/</sup>
<b>Reptiles</b>				
American crocodile	<i>Crocodylus acutus</i>	T	Brackish or saltwater areas such as ponds, coves, and creeks within mangrove swamps.	Yes/No
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	Scrub, sandhill, wet prairie, mangrove swamp.	Yes/No
<b>Birds</b>				
Piping plover	<i>Charadrius melodus</i>	T	Open, sandy beaches and tidal mudflats	Yes/No
Red knot	<i>Calidris canutus rufa</i>	T	Tidal flats and coastlines	Yes/No
Roseate tern	<i>Sterna dougallii dougallii</i>	T	Nests over bare limestone and shell-sand beaches, forages in open water over sandbars, reefs, and tidal channels	Yes/No
Wood stork	<i>Mycteria americana</i>	T	Nests in forested wetlands, forages in marshes, swamps, and tidal creeks	Yes/No
<b>Mammals</b>				
Silver rice rat	<i>Oryzomys palustris natator</i>	E	Transition from upland to marine communities including mangrove swamps and saltgrass flats	Yes, out of range/No
West Indian manatee	<i>Trichechus manatus</i>	T	Coastal waters, bays, and rivers	Yes, limited access/No
Lower Keys marsh rabbit	<i>Sylvilagus palustris heneri</i>	E	Saltwater marsh and freshwater marsh bordered by hammocks and flatwoods	Yes, out of range/No
<b>Fish</b>				
Smalltooth sawfish	<i>Pristis pectinate</i>	E	Shallow estuarine waters, rivers, mangroves	Yes/No

NOTES: T—Threatened E—Endangered

1/ Potential species obtained from USFWS IPAC and critical habitat data.

2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)

3/ Table lists observations from field survey conducted September 17-19, 2019.

SOURCE: Title 50 Code of Federal Regulations Part 17, *Endangered and Threatened Wildlife and Plants*, September 1975.

**Table 5-10: State Special Status Wildlife Species – Focused Biological Study Area**

COMMON NAME	SCIENTIFIC NAME	STATE STATUS	HABITAT <sup>1/</sup>	HABITAT PRESENT/SPECIES OBSERVED <sup>1/</sup>
<b>Reptiles</b>				
Florida Keys mole skink	<i>Plestiodon egregius egregius</i>	T	Variety of habitats that have stones, debris, and driftwood.	Yes/No
<b>Birds</b>				
Florida burrowing owl	<i>Athene cunicularia floridana</i>	T	Sparsely vegetated sandy soils, ball fields, airports, pastures, vacant properties.	Yes/No
Reddish egret	<i>Egretta rufescens</i>	T	Broad open tidal shorelines and flats. Mangrove islands.	Yes/No
Roseate spoonbill	<i>Ajaia ajaja</i>	T	Mangrove wetlands, freshwater wetlands.	Yes/No
Tricolored heron	<i>Egretta tricolor</i>	T	Mangrove swamps, tidal creeks, tidal ditches, edges of ponds and lakes.	Yes/No
<b>Fish</b>				
Key silverside	<i>Menidia conchorum</i>	T	Shallow pools surrounded by mangroves.	Yes/No

NOTES: T—Threatened      E—Endangered

- 1/ Potential species obtained from USFWS IPAC and critical habitat data.
- 2/ Potential species obtained from Florida Natural Areas Inventory (FNAI)
- 3/ Table lists observations from field survey conducted September 17-19, 2019.
- 4/ Various published and online sources used for animal habitat descriptions

SOURCES: Florida Administrative Code 5B-40.0055, Regulated Plant Index, January 8, 2020; Florida Administrative Code 68A-27.003, Florida Endangered and Threatened Species List, July 25, 2019; Florida Administrative Code 68A-27.005, Designation of Species of Special Concern, December 23, 2018;

## Species Descriptions

### *American crocodile (Crocodylus acutus)*

The American crocodile inhabits brackish or saltwater areas and can be found in ponds, coves, and creeks in mangrove swamps. Occasionally, crocodiles can inhabit inland freshwater areas. American crocodiles are grayish-brown in color and can reach lengths of up to 15 feet. They have a white belly, tapered snout, and the fourth tooth on the lower jaw can be seen when the snout is closed. This species is designated as threatened at both the federal and state levels. This species was not observed in the FBSA.

### *Eastern indigo snake (Drymarchon corais couperi)*

The Eastern indigo snake is federally listed as threatened and is found in a variety of habitats including swamps, wet prairies, and pinelands. It may use gopher tortoise burrows for shelter to escape hot or cold ambient temperatures within its range. No individuals were observed within the FBSA during field surveys.

### *Silver rice rat (Oryzomys palustris natator)*

The silver rice rat is a small rodent with brown or gray backs and gray belly. They are typically observed in salt marsh flats, mangrove swamps, and buttonwood transition vegetation systems. They feed primarily on snails, crabs, and insects and are nocturnal. This species is federally listed as endangered and was not observed during field surveys within the FBSA.

### *Lower Keys marsh rabbit (Sylvilagus palustris hefneri)*

The Lower Keys marsh rabbit is federally listed as endangered and inhabits saltwater marshes as well as freshwater marshes bordered by hammocks and flatwoods. It typically does not inhabit disturbed wetlands systems. The rabbit is a small to medium size marsh rabbit with short, dark fur and a greyish white belly. Their feet are small and their tails are dark brown. No individuals were observed within the FBSA during field surveys.

### *West Indian manatee (Trichechus manatus)*

The West Indian manatee is federally listed as threatened and is generally found in coastal waters, bays, rivers. This species is gray, nearly hairless and large with weight ranging from 182 lbs. to 400 lbs. The West Indian manatee has a flat, rounded, and broad shaped tail and front flipper-like limbs. This species was not observed during field surveys within the FBSA.

### *Florida Keys mole skink (Plestiodon egregius egregius)*

The Florida Keys mole skink is listed by the state as threatened. It is often found among or under stones, debris, and driftwood. This species is small, thin, and brownish in color with a red to brownish-red tail. Hints of black stripes can be found on the tail and breeding males develop orange to reddish sides. The Florida Keys mole skink can have adults sized up to 5 inches in total length. This species was not observed during the site visit to the FBSA.

### *Piping Plover (Charadrius melodus)*

The piping plover is a small plover with a black band across the forehead and a dark ring partially around the neck. This species has greenish-olive legs, very pale upperparts and a short, black bill. It inhabits open, sandy beaches and tidal mudflats. The piping plover is federally classified as threatened and was not observed during field surveys.

### *Red knot (Calidris canutus rufa)*

Red knot are one of the longest-distance migrants of shorebirds. This species has small head a short neck and a slightly tapered bill. The red knot nests on the ground near water and their breeding habitat consists of slightly vegetated lands. No individual observations of this federally listed species occurred within the FBSA during the site visits.

### *Roseate tern (Sterna dougallii)*

The roseate tern is federally listed as threatened and is found in habitats including bare limestone, shell-sand beaches, newly deposited rock fill and dredge material. This species nests on rooftops and forages for small fish in open water over sandbars, reefs, and tidal channels. A breeding adult of the roseate tern has pale gray upperparts, a black cap and nape, and white underparts with a bill that is thin and black. The bill turns red as breeding season progresses. This species was not observed within the FBSA during field visits.

### *Wood stork (Mycteria americana)*

The wood stork is a very large, white wading migratory bird with a short black tail and black in the wings. Adult wood storks have bare, dark-gray heads and long bill with legs that are dark and feet beige. This species nests in a variety of forested wetlands including mangroves, mixed hardwood swamps, and cypress domes. Foraging mainly occurs in shallow waters such as freshwater marshes, swamps, lagoons ponds and flooded pastures. This species is federally listed as endangered and was not observed during field surveys within the FBSA.

### *Florida burrowing owl (Athene cunicularia floridana)*

The Florida burrowing owl are found in large populations in southwestern and southeastern Florida. An adult Florida burrowing owl have bold spots with brown and white lines. This species is predominately non-migratory and maintains home territories while nesting. It is listed as threatened by the state. The Florida burrowing owl will dig their own burrow and line the entrance with grass, palm fronds and other materials before laying eggs. This species was not observed within the FBSA during field visits.

### *Reddish egret (Egretta rufescens)*

Reddish egrets are long-legged wading birds with a gray body and shaggy chestnut hair located on the head, neck, and upper breast. The bill of a reddish egret becomes a distinctly pink with black on the end during breeding season. This species is almost exclusively found in coastal habitats and generally forages in shallow water. The reddish egret is listed as threatened by the state and was not observed during field visits within the FBSA.

### *Roseate spoonbill (Ajaia ajaja)*

The roseate spoonbill is a brightly colored wading bird with bold pink bodies and white necks. The spoon-like bills is the defining characteristic that separates the spoonbill from other wading birds. Coastal mangrove sites provide ideal nesting habitats however freshwater sites are also occasionally used. The female spoonbill will build the nest usually 5 to 15 inches above ground. The roseate spoonbill's diet consists mainly of small fish, shrimp, crayfish, crabs and mollusks. This species is designated threatened by the state and was not observed during field surveys.

### *Tricolored heron (Egretta tricolor)*

The tricolored heron species is listed by the state as threatened. It is identified by the two-toned dark coloration on its head, neck and body and with a long white streak along the front of the neck. Mangrove islands provide for the ideal habitat with foraging opportunities in flooded wetlands, tidal creeks, ditches and ponds. The tricolored heron feeds mainly on fish and also aquatic insects, tadpoles, and frogs. Preference is made to forage in solitary often forcing others away from their territories. During field surveys, no observations were made of the tricolored heron.

### *White-crowned pigeon (Menidia conchorum)*

The white-crowned pigeon is listed by the state as threatened. It is a medium sized bird that can reach a length of 14 in. long, with a wingspan of 23 in. It is identified by its white head and gray body with green feathers on the back side of the neck. It inhabits low-lying forests, including tropical hardwood forests, with ample fruiting trees. Its distribution is restricted to Florida Bay, Biscayne Bay, and the Florida Keys. This species was not observed during site inspections of the FBSA.

### *Key silverside (Menidia conchorum)*

The Key silverside is a small fish (less than 2 inches in length) with a dark line along the mid-side and a distinctly large eye. The Key silverside is listed as threatened by the state. This species inhabits shallow pools surrounded by mangroves and can be found the length of the Florida Keys. No Key silverside were documented during site inspections of the FBSA.

### *Smalltooth sawfish (Pristis pectinata)*

The NMFS listed the smalltooth sawfish as an endangered species in 2003. The smalltooth sawfish gets its name from its snout, which is long and flat and lined with pairs of teeth that are used to capture and kill prey. This fish is often found in shallow water over sandy or muddy bottoms. Juveniles utilize mangrove dominated areas as cover from predators. The smalltooth sawfish is also a state protected species. Given the distance to open tidal waters and limited water flow through culverts, access is limited for this species. No smalltooth sawfish were observed during the field inspections of the FBSA.

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## 5.4 Designated Critical Habitat

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The Action Area was evaluated for the occurrence of federally listed species critical habitat designated in 17 CFR 35.1532 and critical habitat proposed by the FWS. No designated or proposed critical habitat for any federally listed species occurs within the Action Area. There is critical habitat for elkhorn and staghorn coral (*Acropora spp.*) and the loggerhead sea turtle (*Caretta caretta*) near the airport in waters south of Roosevelt Blvd.

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## 5.5 Migratory Birds

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The Migratory Bird Treaty Act (MBTA) (50 CFR 21) protects migratory birds by prohibiting intentional taking, selling, or other activities that would harm migratory birds, their eggs, or nests (such as removal of an active nest or nest tree), unless authorized under a special permit from the FWS. There are nine (9) species of birds potentially occurring in the Action Area that are protected under the MBTA. They include the piping plover, red knot, roseate tern, wood stork, reddish egret, roseate spoonbill, Florida burrowing owl, tricolored heron, and osprey.

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## 5.6 Essential Fish Habitat (EFH)

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The Magnuson-Stevens Fishery Conservation and Management Act specifies that each federal agency shall consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any EFH identified under the Act. EFH is defined by the Act as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The NMFS reviews potential impacts to EFH.

A review of EFH was conducted during the field surveys. Environmental scientists with knowledge of EFH requirements examined habitats within the Action Area and FBSA during the September 2019 site review. Based on this assessment, there are a total of (3) habitats present within the Action Area and FBSA that have the potential to provide EFH, including mangrove forests, saltwater marshes, and the salt ponds/embayments.

Pursuant to the South Atlantic Fishery Management Council (SAFMC) and Gulf of Mexico Fishery Management Council (GMFMC), mangrove dominated wetlands are considered EFH for several managed species including adult white grunt (*Haemulon plumieri*), juvenile and adult gray snapper (*Lutjanus griseus*), and juvenile mutton snapper (*Lutjanus analis*). Mangroves play an important role as habitat to juvenile fish species as mangrove roots and the shallow water of mangrove wetlands provide a refuge from predators. The mangrove forests present in the Action Area and FBSA are dominated by a mix of red and black mangroves at lower elevations along with lesser coverage of white mangroves and buttonwood at higher elevations bordering adjacent saltwater marsh. These mangrove habitats are generally located along the periphery of the on-site salt ponds/embayments that share limited or no hydrologic connection to nearby ocean waters. Therefore, utilization by fish of these habitats is anticipated to be less than typical.

Saltwater marshes also serve as EFH for several managed fish species including snook (*Centropomus undecimalis*), red drum (*Sciaenops ocellatus*), and seatrout (*Cynoscion nebulosus*), all of which rely on this habitat for part of their lifecycle. Saltwater marshes also provide foraging habitat for larger crustaceans, insect, and smaller fish that form the food chain for managed fish species. Marshes within the Action Area and FBSA are dominated by grasses including seashore paspalum, seashore dropseed, and saltmeadow cordgrass (*Spartina patens*). They are generally located landward of the mangrove forests and only the saltwater marsh habitats at lower elevations, in the intertidal zone, provide significant EFH. As with the on-site mangrove forests, these marshes are located along the periphery of the on-site salt ponds/embayments that share limited or no hydrologic connection to nearby ocean waters. Therefore, utilization by fish of these habitats is anticipated to be less than typical. In addition, significant portions of the saltwater marshes located within the FBSA are regularly maintained by mowing and these areas likely provide only limited benefits to managed fish.

Finally, the Action Area and FBSA contain several salt ponds/embayments that provide EFH for managed fish species. These habitats contain soft subtidal sediments that are inhabited by macroinvertebrates that serve as prey to managed fish species. The ponds also contain Submerged Aquatic Vegetation (SAV) consisting of intermittent coverage of seagrasses and attached macroalgae. Federally managed fish and many other species, including red drum, white grunt, gag grouper, shrimp, and spiny lobster are dependent on SAV for at least part of their lifecycles. SAV also provides habitat for invertebrates, attached bryozoans and tunicates, and smaller fish that provide feeding grounds for managed species. As noted above, the benefits provided to fish by the salt ponds/embayments are likely less than typical due to limited connection to adjacent ocean waters.

## 6. Effects Analysis

### 6.1 Methodology

The Action Area was further refined as the FBSA for a more detailed evaluation of potential impacts to biological resources and a review of the areas that would be directly or indirectly affected by construction, paving, grading, and clearing activities. No indirect impacts to biological resources within the Action Area outside of FBSA are anticipated from the Proposed Action. The resulting information was transferred into a GIS database, which was subsequently used to identify biotic communities occurring within the BSA that are confirmed to occur within the FBSA along with field verification. Potential disturbance to biotic communities within the FBSA as a result of the Proposed Action was assessed by overlaying a plan view of the Proposed Action on the land use/vegetative cover map. Anticipated disturbance was then calculated on an acreage basis using GIS.

Protected species data were also assessed. Potential effects to habitat were evaluated using GIS mapping of the FBSA. The assessment of potential effect on state and federally listed species was accomplished by identifying listed species potentially occurring within the FBSA, evaluating the potential use of various habitats within the FBSA by listed species (e.g., foraging, nesting, etc.), and assessing the loss of habitat potentially used by listed species. The potential for listed species occurring within the FBSA was assessed based on existing habitats, field observations, review of species records, effect determination keys/assessment guides, and agency responses to scoping letters.

Guides utilized to determine the potential for the Proposed Action to affect federally protected species include the *Eastern Indigo Snake (EIS) Programmatic Effect Determination Key* and the *Wood Stork Programmatic Effect Determination Key*. The assessment of eastern indigo snake was based on presence of habitat, use of Standard Protection Procedures during construction, and the fact that proposed activities consist of clearing vegetation only. For the wood stork, the assessment was based on the presence of potential Suitable Foraging Habitat (SFH), the location of the project outside of a Core Foraging Area (CFA), and the compensatory mitigation that is proposed. Finally, while an effect determination key for the manatee has been published by USFWS, the assessment was based on the design of the floating fencing and limited access to the salt ponds by the manatee.

The functions of wetlands present within the FBSA were evaluated and quantified using the UMAM methodology based on 62-345 F.A.C. UMAM provides a standardized procedure to be used by federal, state, and local regulatory agencies for assessing the functions provided by wetlands and other surface waters, the amount that those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset that loss. The difference between the two UMAM scores (with project and without project) indicates the net change in wetland function. This, in turn, provides guidance for determining potential mitigation requirements.

## 6.2 Upland/Wetland Impacts

The work associated with the Proposed Action within the FBSA would occur within developed portions of the airport (FLUCFCS 811), mangrove swamp (FLUCFCS 612), saltwater marshes (FLUCFCS 642), salt ponds/embayments (542), and both upland (FLUCFCS 422) and wetland (FLUCFCS 619) Brazilian pepper habitat. Habitats within the FBSA are shown on **Exhibit 4**. The Proposed Action would involve the fill of approximately 0.44 acres of mangrove swamp and 2.33 acres of saltwater marsh habitat for the construction of the new taxiway. It would also include the fill of approximately 0.63 acres of mangrove swamp, 0.83 acres of saltwater marsh, and 0.09 acres of salt ponds/embayments for the GA apron. In addition, it would include the fill of 2.07 acres of mangrove swamp, 0.87 acres of saltwater marsh, and 0.25 acres of wetland Brazilian pepper for the new commercial apron. Finally, the project would include the installation of a new security fence north of the existing runway. The fence installation will require the clearing of approximately 10 ft. of mangrove habitat on each side of the fence for a total of approximately 0.20 acres of clearing.

**Table 6-1** lists the land use/vegetative cover that would be affected by the Proposed Action.

**Table 6-1: Land Use/Vegetative Cover to be Impacted**

LAND USE/VEGETATIVE COVER	FLUCFCS CODE	FWS CLASSIFICATION	PROPOSED FILL (ACRES)	PROPOSED CLEARING (ACRES)
<b>Uplands</b>				
Airports	811	N/A	3.47	N/A
Brazilian Pepper (Upland)	422	N/A	0.07	N/A
<b>Wetlands</b>				
Mangrove Swamp	612	E2FO3N - Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded	3.14	0.2
Saltwater Marshes	642	E2EM1 - Estuarine, Intertidal, Emergent, Persistent	4.03	N/A
Salt Ponds/Embayments Not Opening Directly to Gulf or Ocean	542	E1UB2 - Estuarine, Subtidal, Unconsolidated Bottom, Sand	0.09	N/A
Exotic Wetland Hardwoods (Wetland Brazilian Pepper)	619	E2FO3P - Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Irregularly Flooded	0.25	N/A
<b>Subtotal Wetlands/Surface Waters</b>			<b>7.51</b>	<b>0.2</b>
<b>Total</b>			<b>11.05</b>	<b>0.2</b>

NOTES:

FLUCFCS—Florida Land Use, Cover and Forms Classification System

FWS—U.S. Fish and Wildlife Service, Classification of Wetland and Deepwater Habitats of the United States (Cowardin)

SOURCE: Birkitt Environmental Services, Inc.

Prepared By: Birkitt Environmental Services, Inc., July 2020.

## 6.2.1 WETLANDS/SURFACE WATERS

Approximately 3.14 acres of mangrove forest wetlands, 4.03 acres of saltwater marshes, 0.09 acres of salt ponds/embayments, and 0.25 acres of wetland Brazilian pepper within the FBSA would be affected by the Proposed Action (see **Table 6-1 and Exhibit 5**). Impacts to these habitats will consist of fill associated with the construction of the new taxiway, GA apron, and commercial apron. In addition, approximately 0.2 acres of mangrove habitat will be cleared for the installation of the new security fence. The cleared areas will be allowed to re-vegetate naturally as saltwater marsh habitat and will be managed to prevent woody and tall vegetative growth.

Based on the UMAM assessment, the proposed grading and/or paving of these habitats would result in a functional loss of approximately 3.83 UMAM credits. Functional loss is calculated by impact acreage times the change or delta in pre- and post- UMAM scores. **Table 6-2** summarizes the acreage of impact and UMAM evaluation for wetland impacts associated with each project within the FBSA.

**Table 6-2: Uniform Mitigation Assessment Method (UMAM) Impact Summary**

IMPACT AREA	IMPACT TYPE	IMPACT ACREAGE	IMPACT DELTA	FUNCTIONAL LOSS
<b>Taxiway</b>				
Wetland 1 (Mangrove Swamp)	Direct/Fill	0.44	0.467	0.205
Wetland 1 (Saltwater Marshes)	Direct/Fill	1.02	0.467	0.476
Wetland 2 (Saltwater Marshes)	Direct/Fill	1.31	0.50	0.655
<b>Taxiway Total</b>	<b>Direct</b>	<b>2.77</b>		<b>1.336</b>
<b>General Aviation Apron</b>				
Wetland 2 (Mangrove Swamp)	Direct/Fill	0.63	0.633	0.399
Wetland 2 (Saltwater Marshes)	Direct/Fill	0.83	0.50	0.415
Wetland 2 (Salt Ponds/Embayments)	Direct/Fill	0.09	0.50	0.045
<b>GA Apron Total</b>	<b>Direct</b>	<b>1.55</b>		<b>0.859</b>
<b>Commercial Apron</b>				
Wetland 3 (Mangrove Swamp)	Direct/Fill	2.07	0.567	1.173
Wetland 3 (Saltwater Marshes)	Direct/Fill	0.87	0.433	0.377
Wetland 3 (Wetland Brazilian Pepper)	Direct/Fill	0.25	0.23	0.058
<b>Commercial Apron Total</b>	<b>Direct/Fill</b>	<b>3.19</b>		<b>1.608</b>
<b>New Security Fence</b>				
<b>Wetland 4 (Mangrove Swamp)</b>	Direct/Clearing	<b>0.20</b>	<b>0.133</b>	<b>0.03</b>
<b>Total</b>		<b>7.71</b>		<b>3.833</b>

SOURCE: Birkitt Environmental Services, Inc.

Prepared By: Birkitt Environmental Services, Inc., July 2020

## 6.2.2 IMPACT MINIMIZATION

As part of the NEPA EA process, alternatives to address each development need (i.e., provide taxiway access to the full runway, provide additional commercial apron, provide additional GA apron, and improve security fencing along the north perimeter of the Airport) were evaluated against criteria to confirm whether the alternative met the purpose of and need for the Proposed Action, whether the alternative was operationally feasible and constructible, and whether the alternative demonstrated that impacts to Waters of the United States were minimized in accordance with Executive Order 11990, *Protection of Wetlands*, and US Department of Transportation Order 5660.1A, *Preservation of the Nation's Wetlands*. Alternatives were limited given the existing development at EYW and the extent of salt pond, saltwater marsh, and mangrove swamp habitats. The evaluation process demonstrated that impacts to Waters of the United States for the Proposed Action for the taxiway extension, commercial apron expansion, GA apron expansion, and security fencing were less than other alternatives. Design and construction alternatives to minimize potential impacts to manatees were also evaluated and a floating barrier was selected.

## 6.2.3 PROPOSED MITIGATION

### *Compensatory Wetland Mitigation*

The Proposed Action would result in the grading and/or paving of mangrove, saltwater marsh, salt ponds/embayments, and wetland Brazilian pepper within the FBSA. Compensatory mitigation for habitat loss is anticipated to be required under state and federal permits. Although the permit application process has not been initiated and the final mitigation requirements are not known, a conceptual mitigation approach was developed for this BA. The conceptual wetland mitigation measures identified in this BA are considered adequate and customary for impacts associated with the Proposed Action.

40 CFR Part 230 *Compensatory Mitigation for Losses of Aquatic Resources* states a hierarchical preference for the use of mitigation banks and In Lieu Fee (ILF) programs for mitigation over Permittee Responsible mitigation. However, where mitigation banks or ILF programs are not available, the rule provides for the use of Permittee Responsible mitigation provided the 12 Components of a Compensatory Mitigation Plan are adequately addressed.

Both the existing conditions and conditions under the Proposed Action were assessed using UMAM. A functional loss of 3.833 with the Proposed Action as compared to the No Action Alternative was determined based on UMAM. According to the assessment method, functional gain must be greater than functional loss for appropriate mitigation.

There are no mitigation banks approved within the vicinity of the Airport. The Keys Restoration Fund is an ILF; however, it is approved for mitigation only by the federal government. The state of Florida has not approved the Keys Restoration Fund as an ILF. Therefore, Permittee Responsible Mitigation is proposed to offset the proposed impacts. Demonstration of compliance with the 12 Components will be provided during the permitting process.

Compensatory wetland mitigation opportunities were identified both on-site and off-site and will consist of wetland restoration/creation, enhancement, and preservation. The on-site activities will restore both saltwater

marsh and mangrove communities along the periphery of the degraded salt ponds. They will also enhance tidal flow through the ponds via the expansion of a remnant mosquito ditch.

Off-site mitigation will also be provided and will include type for type creation and enhancement of mangrove habitat within the Lower Florida Keys. All mitigation areas will be preserved.

Mitigation for the impacts to EFH associated with the Proposed Action will be addressed by the proposed wetland habitat mitigation. Protective measures for species potentially occurring in EFH would be accomplished through the implementation of Standard Sea Turtle and Smalltooth Sawfish Construction Conditions (**Attachment D**).

UMAM assessments and mitigation options and plans will be finalized during the permitting process. Additionally, all on-site improvements must be reviewed by FAA to determine compatibility with safe airport operations. Specifically, 14 CFR 139.337 requires Airport operators to alleviate wildlife hazards when detected. FAA Advisory Circular 150/5200-33C states that Airport operators should maintain an appropriate environment for the safe and efficient operation of aircraft and requires that any wetland mitigation near the Airport not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. The Airport is located on Key West, the southernmost key of the Lower Keys. Key West is fully built out, and suitable mitigation opportunities in the Lower Keys are lacking. In the past, the limited opportunities for mitigation in the Lower Keys have supported use of on-site mitigation, in compliance with wildlife hazard management strategies. Therefore, on-site mitigation was considered as part of this plan, and the County will coordinate its mitigation plans with the FAA during the project's design and permitting phase to ensure aircraft and passenger safety.

### *On-Site Mitigation<sup>3</sup>*

#### On-Site Mitigation Area 1

On-Site Mitigation Area 1 (ONS-1) is approximately 0.94 acres and is located just north of the existing runway within the perimeter security fence of the airport. Within the northeast corner of this area is the existing Automated Surface Observing System (ASOS) weather monitor. Based on a review of historic aerials, the eastern portion of this area was filled as part of the southern extent of a runway for Meacham Field while the western portion of the area contained the southern extent of a blimp pad. Meacham Field was utilized as an air base by the United States Army after the Pearl Harbor attack during World War II and was abandoned after the war before coming under the ownership of Monroe County. The remainder of both the runway and blimp pad were removed as part of previous mitigation and restoration projects on the airport site.

This creation area currently contains an approximate 0.89-acre area of limestone and gravel fill with only a few sparse patches of saltwater marsh vegetation. There is also a small mosquito ditch (0.05 acres) within the western portion of the area that is a remnant of Meacham Field. The ditch contains red and black mangroves

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<sup>3</sup> All on-site improvements must be reviewed by FAA to determine compatibility with safe airport operations.

that are trimmed as part of ongoing airport operations. Approximately 0.87 acres of this fill area will be graded to an elevation matching adjacent existing saltmarsh communities to the north (approximately 1.8 to 2.0 feet National Geodetic Vertical Datum [NGVD]). If non-suitable sediment (i.e., hard substrate) is present at the proposed elevation, the site will be over-excavated to allow the placement of at least 6 inches of suitable soil mixture, including organic material and sand. It will then be planted with a mixture of saltwater marsh species present in adjacent areas such as seashore paspalum, seashore dropseed, saltgrass, perennial glasswort, and saltwort. All plantings will occur on 3-foot center spacing. An approximate 0.02 acre above grade access road will be maintained in the eastern portion of the creation area to provide access to the ASOS. No grading is proposed within the mangrove dominated mosquito ditch and this area will be preserved.

### On-Site Mitigation Area 2

On-Site Mitigation Area 2 (ONS-2) is approximately 1.27 acres and is located just north of the existing runway within the perimeter security fence of the airport. It is east of ONS-1 and directly south of the previous mitigation conducted as part of the Runway Safety Area (RSA) Improvements project.<sup>4</sup> The western portion of this area was filled as part of a runway for Meacham field while the eastern portion was filled as part of another blimp pad. The remainder of both of these areas were removed as part of the RSA Improvements mitigation.

Approximately 1.01 acres of ONS-2 consists of limestone and gravel. The southern portion of the creation area toward its center also contains some coverage of red and black mangroves (0.26 acres). The area of limestone and gravel will be graded to an elevation matching adjacent existing saltmarsh communities to the north (approximately 1.8 to 2.0 feet NGVD). If non-suitable sediment (i.e., hard substrate) is present at the proposed elevation, the site will be over-excavated to allow the placement of at least 6 inches of suitable soil mixture, including organic material and sand. It will then be planted with a mixture of saltwater marsh species present in adjacent areas such as seashore paspalum, seashore dropseed, saltgrass, perennial glasswort, and saltwort. All plantings will occur on 3-foot center spacing. The existing mangrove community within the mitigation area will be preserved.

### On-Site Mitigation Area 3

On-Site Mitigation Area 3 (ONS-3) is approximately 17.6 acres located on the east side of airport property and consists of two parcels. It includes one approximate 8.7-acre parcel located northeast of the EYW runway. Just south of this property and directly east of the runway is an additional approximate 8.9-acre parcel. The majority of this mitigation area consists of mature mangrove habitat estimated at approximately 16.0 acres. There are also areas of roadside fill (approximately 0.47 acres) within the southeast portion of ONS-3 along with disturbed buttonwood (*Conocarpus erectus*) habitat of approximately 0.37 acres in the northeast portion of the area. In addition, there is an approximate 0.68-acre area of limestone and gravel that according to historic aerials

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<sup>4</sup> Monroe County Board of County Commissioners, *Final Environmental Assessment for Proposed Runway Safety Area Improvements, Key West International Airport, Key West, Florida*, July 23, 2007.

previously contained mangrove habitat but now consists of unvegetated limestone and gravel. Until additional security fencing was installed by the airport in late 2019, this area was informally used for public parking.

The limestone and gravel area will be graded from an elevation of 0.0 NGVD adjacent to the existing mangrove community to an elevation of 2.0 feet NGVD near the fenceline. If non-suitable sediment (i.e., hard substrate) is present at the proposed elevation, the site will be over-excavated to allow the placement of at least 6 inches of suitable soil mixture, including organic material and sand. Red mangroves will be planted between elevations 0.0 and 0.5 NGVD; black mangroves will be planted between elevations 0.5 and 1.5 feet NGVD; and white mangroves will be planted between elevations 1.5 and 2.0 feet NGVD. No grading will occur within areas adjacent to the fence that are currently vegetated. In addition to the proposed mangrove habitat creation, existing mangrove and buttonwood habitat adjacent to the creation area will be preserved. The area of preservation will be determined during permitting and after FAA review to ensure there would be no wildlife hazards to airport operations.

#### On-Site Mitigation Area 4

On-Site Mitigation Area 4 (ONS-4) is approximately 4.28 acres and is located north of the existing runway and west of ONS-1. Based on a review of aerial imagery, this area historically contained a mix of saltwater marsh and mangrove habitat. Disturbances, however, have occurred since the time when the site was utilized as Meacham field. Based on historic aerials, a portion of the eastern side of the mitigation area once contained an upland road and over the years it has also been utilized for parking and the temporary storage of fill. Tidal circulation has also been channelized by a small mosquito ditch within the southern portion of ONS-4.

Currently, the eastern portion of this mitigation area contains a large area of gravel fill that is actively being used for the temporary Airport Traffic Control Tower (ATCT). There are also a number of unvegetated limestone and gravel roads through the central portion of the area as well as a large unvegetated limestone and gravel area within its western portion. In total, areas of unvegetated limestone and gravel represent approximately 1.12 acres of the mitigation site. Furthermore, there is a small, approximately 0.04-acre upland ridge dominated by herbaceous vegetation within the central portion of the site that is likely the result of past fill. Wetland communities within this mitigation area include approximately 0.43 acres of buttonwood habitat with lesser coverage of white mangroves. There is also minimal coverage of Brazilian pepper within this habitat and several small areas of additional fill. A significant portion (approximately 1.60 acres) of ONS-4 also contains disturbed saltwater marsh habitat. Tidal flows to both the existing buttonwood and saltwater marsh habitats are limited by the mosquito ditch as well as the large area of fill to the east. Finally, the western portion of this mitigation area contains approximately 1.09 acres of existing mangrove habitat.

As part of the mitigation design the approximate 18 inches wide by 2 feet deep mosquito ditch will be widened to allow additional tidal circulation and the banks of the ditch recontoured to allow tidal flows to overtop its banks and provide increased hydrology to the adjacent saltwater marsh and buttonwood/mangrove habitats. A small tidal pool will be created within the central portion of the site and the sides of the pool approaching existing grade will be planted with red and black mangroves. These activities will also increase tidal flushing within the existing mangrove community in the western portion of ONS-4. They will additionally result in an increase in tidal circulation between the salt ponds immediately to the east and west of the mitigation area as well as an overall increase in circulation between the ponds surrounding the airport runway. In addition to these

hydrologic enhancement activities, small areas of fill will be removed from the buttonwood/mangrove and saltwater marsh communities and they will be treated for nuisance/exotic species including Brazilian pepper. It total, approximately 1.37 acres of saltwater marsh enhancement, 1.52 acres of mangrove enhancement, 0.24 acres of tidal pool/embayments enhancement, and 0.08 acres of tidal pool/embayments creation will result from these activities.

Furthermore, the approximate 1.12-acre area of limestone and gravel fill will be graded to an elevation matching adjacent existing saltmarsh communities to the north (approximately 1.8 to 2.0 feet NGVD). If non-suitable sediment (i.e., hard substrate) is present at the proposed elevation, the site will be over-excavated to allow the placement of at least 6 inches of suitable soil mixture, including organic material and sand. It will then be planted with a mixture of saltwater marsh species present in adjacent areas such as seashore paspalum, seashore dropseed, saltgrass, perennial glasswort, and saltwort. All plantings will occur on 3-foot center spacing.

### *On-Site Credit Determination*

Based on the wetland impacts assessment contained in Section 6.2, a total of 1.807 mangrove UMAM credits, 1.923 saltwater marsh UMAM credits, and 0.045 salt pond/embayments credits are required to provided sufficient compensatory wetland mitigation for impacts associated with the proposed extension of Taxiway A, Commercial Apron expansion, General Aviation Apron expansion, and security fence installation. An additional 0.058 mangrove credits will also be provided to compensate for impacts to the on-site wetland Brazilian pepper community. The table below contains a breakdown of the anticipated functional gain for each on-site mitigation activity.

**Table 6-3: On-site Mitigation Area - Uniform Mitigation Assessment Method (UMAM) Summary**

MITIGATION AREA/ LOCATION	HABITAT	MITIGATION TYPE	MITIGATION ACREAGE	RELATIVE FUNCTIONAL GAIN (RFG)	FUNCTIONAL GAIN
Mitigation Area ONS-1	Saltwater Marshes	Creation	0.87	0.338	0.294
Mitigation Area ONS-2	Saltwater Marshes	Creation	1.01	0.338	0.341
Mitigation Area ONS-3	Mangroves	Creation	0.68	0.37	0.252
Mitigation Area ONS-4	Saltwater Marshes	Creation	1.08	0.395	0.427
Mitigation Area ONS-4	Saltwater Marshes	Enhancement	1.37	0.125	0.171
Mitigation Area ONS-4	Mangroves	Enhancement	1.52	0.097	0.147
Mitigation Area ONS-4	Salt Pond/ Embayments	Creation	0.08	0.449	0.036
Mitigation Area ONS-4	Salt Pond/ Embayments	Enhancement	0.24	0.075	0.018
<b>Total</b>			<b>6.85</b>		<b>1.686</b>

SOURCE: Birkitt Environmental Services, Inc.

Prepared By: Birkitt Environmental Services, Inc., July 2020

## *Off-Site Mitigation*

### Off-Site Monroe County Projects

According to the assessment of on-site credit potential above, sufficient salt pond/embayment credits will be generated to compensate for impacts to this habitat. An additional 1.466 mangrove credits and 0.69 saltwater marsh credits be required to fully compensate for impacts to these habitats. During the planning process the project team coordinated with the Monroe County Department of Planning and Environmental Resources to identify mitigation opportunities that would also serve to meet County restoration goals. The following projects were identified in coordination with the County and utilize lands currently owned and managed by the County – see **Exhibit 7-1**.

### Off-Site Mitigation Area 1

Off-Site Mitigation Area 1 (OFS-1) is located on Cudjoe Key immediately east of Blimp Road and north of Spain Road – see **Exhibit 7-2**. It is approximately 18 miles northeast of the airport. This site includes an approximate 13.9-acre parcel (Parcel ID. 00115520-000600) currently owned and managed by Monroe County. There is an approximate 0.19-acre upland fill road on this property that was constructed within existing tidal pool habitat. The fill road consists primarily of unvegetated crushed limestone with small red and black mangroves along its sidebanks.

The majority of the fill road (0.16 acres) will be removed and graded down to match the elevation of the existing red and black mangrove communities estimated at 0.0 to 1.5 feet NGVD. All sediments will be disposed of within uplands located off-site. If non-suitable sediment (i.e., hard substrate) is present at the proposed elevation, the site will be over-excavated to allow the placement of at least six (6) inches of suitable soil mixture, including organic material and sand. Existing mangroves along the periphery of the fill road will be selectively avoided. Red mangroves will be planted between elevations of approximately 0.0 and 0.5 feet NGVD, and black mangroves will be planted between elevations of approximately 0.5 and 1.5 feet NGVD. Based on coordination with the County, the northern extent of this fill road may provide nesting habitat for some bird species. Therefore, this approximate 0.3-acre area will be avoided during the restoration and will remain at grade in order to continue to provide this nesting habitat.

### Off-Site Mitigation Area 2

Off-Site Mitigation Area 2 (OFS-2) consists of a County-owned and managed parcel (Parcel ID. 00114470-001500) located on Summerland Key west of Niles Road and approximately 0.6 miles north of the Overseas Highway – see **Exhibit 7-3**. The parcel is approximately 20.8 miles northeast of the airport. This property has been identified by the County for restoration. It contains an upland fill road and building pad that were proposed for residential development prior to the purchase of the land by the County. The majority of the property contains mangrove and saltwater marsh habitats, with the above grade road and pad primarily consisting of unvegetated limestone and shell fill.

The fill road and building pad, totaling approximately 0.19 acres, will be removed and graded down to match the elevation of the existing mangrove communities. All sediments will be disposed of within uplands located off-site. If non-suitable sediment (i.e., hard substrate) is present at the proposed elevation, the site will be over-excavated to allow the placement of at least six (6) inches of suitable soil mixture, including organic material and sand. Existing mangroves along the periphery of the fill road will be selectively avoided. Red mangroves will be planted between elevations 0.0 and 0.5 feet NGVD; black mangroves will be planted between elevations 0.5 and 1.5 feet NGVD; and white mangroves will be planted between elevations 1.5 and 2.0 feet NGVD. Based on coordination with the County, there are several small state-threatened joewood (*Jacquinia keyensis*) shrubs present in the western portion of the restoration site in the area of the building pad. Prior to the grading of the site, a listed plant species survey will be conducted and any identified listed plants will be avoided during construction.

### Off-Site Mitigation Area 3

Off-Site Mitigation Area 3 (OFS-3) consists of approximately 10.35 acres of land containing a total of six (6) separate parcels owned and managed by Monroe County. It is located on Summerland Key west of Niles Road, approximately 0.8 miles north of the Overseas Highway, and just north of OFS-3 – see **Exhibit 7-4**. The site is approximately 20.9 miles northeast of the airport. The majority of the site is dominated by mangrove and saltwater marsh habitat. Its western boundary contains a significant upland berm consisting of limestone and sand fill that likely resulted from the dredge of tidal waters immediately to the west.

The above grade upland berm, totaling approximately 0.58 acres, will be removed and graded down to match the elevation of the existing mangrove communities. Prior to construction the sediments will be assessed to determine if they can be utilized to partially fill the dredged area west of the property. Otherwise, all sediments will be disposed of within uplands located off-site. If non-suitable sediment (i.e., hard substrate) is present at the proposed elevation, the site will be over-excavated to allow the placement of at least six (6) inches of suitable soil mixture, including organic material and sand. Existing mangroves along the periphery of the berm will be selectively avoided. Red mangroves will be planted between elevations 0.0 and 0.5 feet NGVD; black mangroves will be planted between elevations 0.5 and 1.5 feet NGVD; and white mangroves will be planted between elevations 1.5 and 2.0 feet NGVD. Low impact equipment and/or mats will be utilized during construction in order to minimize temporary impacts to adjacent saltmarsh communities due to access requirements through this habitat.

### Off-Site Credit Determination (Monroe County Sites)

As noted above, an additional 1.466 mangrove credits and an additional 0.690 saltwater marsh credits will be required to fully compensate for impacts following implementation of the on-site mitigation projects. As detailed below in **Table 6-4**, the off-site projects utilizing property currently owned and managed by Monroe County are anticipated to generate an additional 0.414 mangrove credits.

**Table 6-4: Off-Site Mitigation Areas (County Owned) - Uniform Mitigation Assessment Method (UMAM) Summary**

MITIGATION AREA/ LOCATION	HABITAT	MITIGATION TYPE	MITIGATION ACREAGE	RELATIVE FUNCTIONAL GAIN (RFG)	FUNCTIONAL GAIN
Mitigation Area OFS-1	Mangroves	Creation	0.16	0.429	0.069
Mitigation Area OFS-2	Mangroves	Creation	0.19	0.448	0.085
Mitigation Area OFS-3	Mangroves	Creation	1.37	0.448	0.260
<b>Total</b>			<b>1.72</b>		<b>0.414</b>

SOURCE: Birkitt Environmental Services, Inc.  
Prepared By: Birkitt Environmental Services

### *Additional Mitigation*

An additional 1.052 mangrove UMAM credits and 0.690 saltwater marsh UMAM credits, for a total of 1.742 UMAM credits will be required to fully compensate for impacts associated with the proposed projects. Additional privately owned properties that are currently for sale have been identified that have the potential to provide the remainder of the required credits. Site visits have been conducted to these parcels to assess their potential for restoration and credit generation. Based on the assessment, these sites have the potential to generate 0.139 mangrove UMAM credits via enhancement. They also have the potential to generate an additional 3.329 UMAM credits by wetland creation. As the creation areas could be designed to accommodate both mangrove and saltwater marsh habitat, these properties have the potential to generate significantly greater credits for both of these habitats than is required to compensate for impacts.

Furthermore, based on coordination with the SFWMD, an additional 0.275 mangrove credits remain from the RSA Improvement ERP Modification issued in July 2018 that may be utilized to compensate for impacts from the proposed projects. While it has not yet been determined if these credits can also be utilized for the USACE, the Keys Restoration Fund In-Lieu Fee Mitigation Program (KRF) is also available if additional federal credits are required.

### *Mitigation Plan Summary*

**Table 6-5** summarizes the available credits, by habitat, that comprise the proposed mitigation requirements.

**Table 6-5: Proposed Mitigation Plan Summary (UMAM)**

MIGITATION TYPE	MANGROVE HABITAT	SALTWATER MARSH HABITAT	SALT POND/ EMBAYMENT HABITAT	TOTAL
<b>Proposed Action</b>				
<b>Functional Loss <sup>1</sup></b>	<b>-1.865</b>	<b>-1.923</b>	<b>-0.045</b>	<b>-3.833</b>
<b>Mitigation Plan Summary – Functional Gain</b>				
On-Site Mitigation Areas 1, 2, 3, and 4	0.399	1.233	0.054	1.686
Off-Site County-Owned Properties Areas 1, 2, and 3	0.414	0.000	0.000	0.414
<b>Total Functional Gain – identified mitigation plans on-site and off-site</b>	<b>1.49</b>	<b>1.233</b>	<b>0.054</b>	<b>2.777</b>
<b>Total Functional Gain – remaining FG needed</b>	<b>-1.052</b>	<b>-0.690</b>	<b>0.0</b>	<b>-1.742</b>
<b>Additional Mitigation Options Available – to meet Functional Gain deficit</b>				
Off-site Privately Owned Properties <sup>2</sup>	1.8035	1.6645	0.0	3.468
Existing Previous RSA Credits <sup>3</sup>	0.275	0.000	0.209	0.275
<b>Total Additional Functional Gain - available</b>	<b>2.0785</b>	<b>1.6645</b>	<b>0.209</b>	<b>3.743</b>

## NOTE:

1. Mangrove functional loss include 0.058 functional loss due to impacts to Wetlands Brazilian Pepper habitat.
2. For purposes of this summary, the functional gain available to be achieved by creation on private property to offset the functional loss of the Proposed Action is shown split between mangrove and saltwater marsh habitats. Site evaluations conducted in support of the mitigation plan indicate the potential to exceed the needed mangrove and saltwater marsh habitat credits.
3. The South Florida Water Management District has indicated that 0.275 mangrove credits remain from the Runway Safety Area Improvements ERP Modification issued in July 2018 that may be utilized to compensate for impacts from the proposed projects.

SOURCE: Birkitt Environmental Services, Inc., September 2020.

## 6.3 Threatened and Endangered Species/Critical Habitat Impacts

As described in Section 6.1 above, the assessment of potential effect on listed species was accomplished by identifying listed species potentially occurring within the FBSA, evaluating the potential use of various habitats within the FBSA by listed species (e.g., foraging, nesting, etc.), and assessing the loss of habitat potentially used by listed species. The potential for listed species occurring within the FBSA was assessed based on existing habitats, field observations, review of species records, effect determination keys/assessment guides, and agency comments. As a result of this assessment, no formal effects determination was performed for species with the potential to inhabit the Action Area or FBSA based on the desktop assessment performed in Section 5.3; but, for which no potential habitat was identified in the areas to be disturbed.

In addition, as noted above the silver rice rat was identified by USFWS and the Lower Keys marsh rabbit was identified by Monroe County as species that may have the potential to inhabit the project area. Based on a review of literature and data obtained from USFWS, FWC, and Monroe County, however, the current range of the rice rat extends only as far southwest in the Florida Keys as the Saddlebunch Keys. Furthermore, the range

of the Lower Keys marsh rabbit extends only as far southwest in the Keys as Boca Chica. Therefore, a formal effects determination for a recommendation was not performed for these species since neither inhabit Key West including the area of the Airport.

Comments from the USEPA regarding potential effects to loggerhead turtle nests on Smathers Beach were considered. Lighting used for nighttime construction would be shielded and focused on the construction area to eliminate unnecessary light spillover and glare. With implementation of the Proposed Action, new lighting would be in place around the edge of pavement of the taxiway extension and apron expansions. Additionally, new mast lighting may be installed around the apron expansion areas. These new light sources would be consistent with the illuminated airfield environment and the adjacent Highway AIA, and, therefore, would not significantly change light emissions. Lighting associated with the Proposed Action would be shielded and focused on the aircraft movement areas to eliminate unnecessary light spillover and glare. Vegetative buffers would be maintained along the south side of the expanded commercial and GA aprons where existing mangrove habitat provides a natural buffer between the Airport and Smathers Beach. At its closest point, the proposed apron expansion that may include high mast lighting is approximately 860 feet from Smathers Beach, separated from the beach by the highway and mangrove habitat that provides a vegetative buffer. Other development, including five- and six-story structures, are located along the highway within 100 feet of Smathers Beach. Therefore, given the existing conditions of this area, no effects on sea turtle nesting are anticipated and a formal effects determination was not provided.

The Proposed Action would affect habitats that may be utilized by eleven (11) federally listed species. The potential impact activity for each species is shown in **Table 6-6** and discussed in the sections below. Based on a preliminary assessment, all eleven (11) of these species are recommended for a “may affect, not likely to adversely affect” determination. None of the species recommended as “may affect, not likely to adversely affect”, were observed within the FBSA or documented by FNAI within the FBSA. The West Indian manatee is recommended for a determination of “may affect, not likely to adversely affect” since the security fencing will be a floating structure that manatees will be able to swim underneath.

**Table 6-6: Federally Protected Species – Potential Impacts of Proposed Action**

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	POTENTIAL IMPACT ACTIVITY
<b>Plants</b>			
Florida semaphore cactus <sub>1</sub>	<i>Opuntia corallicola</i>	E	Fill of saltwater marshes
Garber's spurge <sub>1,2</sub>	<i>Chamaesyce garberi</i>	T	Fill of saltwater marshes
Cape Sable thoroughwort <sub>1</sub>	<i>Chromolaena frustrata</i>	E	Fill of saltwater marshes and mangrove swamp
<b>Reptiles</b>			
American crocodile	<i>Crocodylus acutus</i>	T	Fill of mangrove swamps
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	Fill of mangrove swamps
<b>Birds</b>			
Piping plover	<i>Charadrius melodus</i>	T	Fill of saltwater marshes and salt ponds
Red knot	<i>Calidris canutus rufa</i>	T	Fill of saltwater marshes and salt ponds
Roseate tern	<i>Sterna dougallii dougallii</i>	T	Fill of saltwater marshes and salt ponds
Wood stork	<i>Mycteria americana</i>	T	Fill of saltwater marshes and mangrove swamps
<b>Mammals</b>			
West Indian manatee	<i>Trichechus manatus</i>	T	Potential restriction from habitat by security fencing
<b>Fish</b>			
Smalltooth sawfish	<i>Pristis pectinate</i>	E	Fill of mangrove swamps

NOTES: T—Threatened    E—Endangered

SOURCE: 50 CFR 17.

Prepared By: Birkitt Environmental Services, Inc., July 2020.

### 6.3.1 PLANTS

The federally listed semaphore cactus (*Opuntia corallicola*) could be found in the buttonwood areas along the periphery of the mangrove swamps. However, no semaphore cacti were observed during field inspections of the Action Area or FBSA and this species has not been documented within one mile of the Airport in the FNAI report. The proposed mitigation for impacts to the mangrove swamp would be sufficient to offset the habitat impacts that could result from the Proposed Action. In addition, the FBSA would be surveyed for the semaphore cactus prior to construction. If this species is found within the FBSA, the semaphore cactus plants would be relocated to appropriate habitat that would not be disturbed by the Proposed Action. Therefore, a determination for the semaphore cactus of "may affect, not likely to adversely affect" is recommended.

In addition, the federally listed Garber's spurge (*Chamaesyce garberi*) is generally found in sandy soils with a limestone substrate, which may be found within and along the periphery of the on-site saltwater marshes. The FNAI report also documents one (1) documented observation of this species within the Action Area but not within the FBSA. This species, however, is typically associated with pine rocklands and hammock edges, habitats that are not present within the FBSA. Furthermore, no Garber's spurge individuals were observed during the field inspection of the Action Area or FBSA. In addition, the FBSA would be surveyed for the Garber's spurge prior to construction. If this species is found within the FBSA, the plants would be relocated to appropriate habitat that would not be disturbed by the Proposed Action. Therefore, a determination for the Garber's spurge of "may affect, not likely to adversely affect" is recommended.

Finally, the Cape Sable thoroughwort (*Chromolaena frustrata*) can be found in coastal environments such as those present within the FBSA. It is generally associated with coastal rock barrens and berms and along the sunny edges of rockland habitat, however, neither of which habitats are present within the FBSA. In addition, no Cape Sable thoroughwort individuals were documented during the field inspection. The FBSA would be surveyed for the thoroughwort prior to construction. If this species is found within the FBSA, the plants would be relocated to appropriate habitat that would not be disturbed by the Proposed Action. Therefore, a determination for the Cape Sable thoroughwort of "may affect, not likely to adversely affect" is recommended.

### 6.3.2 REPTILES

The federally listed American crocodile (*Crocodylus acutus*) could inhabit the mangrove swamp, saltwater marshes, or salt ponds/embayments within the FBSA, but these crocodylians are more common in southern peninsular Florida and are rarely found in the Lower Keys. No individuals were observed during field reviews of the Action Area and the FBSA. No documented occurrences have been reported in the FNAI within one mile of the Airport. In addition, the proposed mangrove and saltwater marsh wetland habitat mitigation measures would be sufficient to offset the on-site habitat impacts that could result from the Proposed Action. Therefore, a determination for the American crocodile of "may affect, not likely to adversely affect" is recommended.

In addition, the federally listed Eastern indigo snake (*Drymarchon corais couperi*) could inhabit the upland or mangrove wetlands at the Airport. All uplands areas, however, are maintained by the airport and are unlikely to provide habitat. No individuals were observed during field reviews of the Action Area and the FBSA, nor were any gopher tortoise (*Gopherus polyphemus*) burrows, a species the indigo snake is associated with, observed. To minimize any potential adverse impacts to this species the most current version of the FWS-approved Standard Protection Measures for the Eastern Indigo Snake would be utilized during construction of the Proposed Action. Therefore, since these protection measures will be utilized, the project will impact less than 25 acres of potential Eastern indigo snake habitat, and there are no known cavities or other refugia including gopher tortoise burrows present, a recommendation for the Eastern Indigo snake of "not likely to adversely affect" the Eastern indigo snake is recommended based on the *Eastern Indigo Snake (EIS) Programmatic Effect Determination Key*.

### 6.3.3 BIRDS

The federally listed piping plover (*Charadrius melodus*) could potentially be found within open mud flats interspersed within the on-site saltwater marsh habitat. These un-vegetated areas are minimal within the FBSA, however, as the majority of the saltwater marsh habitat is vegetated with saltmarsh species. No observations of this species were documented during the field inspection, nor has it been documented within 1 mile of the Airport by FNAI. In addition, the proposed mangrove and saltwater marsh wetland habitat mitigation measures would be sufficient to offset the on-site habitat impacts that could result from the Proposed Action. Therefore, a determination for the piping plover of “may affect, not likely to adversely affect” is recommended.

In addition, the federally listed red knot (*Calidris canutus rufa*) could also potentially be found within open mud flats interspersed within the on-site saltwater marsh habitat. As noted above, these un-vegetated areas are minimal within the FBSA, however, as the majority of the saltwater marsh habitat is vegetated with saltmarsh species. No observations of this species were documented during the field inspection, nor has it been documented within 1 mile of the airport by FNAI. In addition, the proposed mangrove and saltwater marsh wetland habitat mitigation measures would be sufficient to offset the on-site habitat impacts that could result from the Proposed Action. Therefore, a determination for the red knot of “may affect, not likely to adversely affect” is recommended.

Also, the federally listed roseate tern (*Sterna dougallii dougallii*) could potentially inhabit the FBSA. While no bare limestone or shell beaches, which this species utilizes for nesting, there is a minimal amount of open water habitat within the salt ponds that may be utilized for foraging. No observations of this species were documented during the field inspection, nor has it been documented within 1 mile of the Airport by FNAI. In addition, the proposed mangrove and saltwater marsh wetland habitat mitigation measures would be sufficient to offset the on-site habitat impacts that could result from the Proposed Action. Therefore, a determination for the roseate tern of “may affect, not likely to adversely affect” is recommended.

Finally, the federally listed wood stork (*Mycteria americana*) could potentially utilize the on-site saltwater marshes and salt ponds for foraging and the mangrove swamp for nesting. Based on wood stork active colonies and Core Foraging Area (CFA) data obtained from USFWS; however, the Action Area is not located in a CFA and, no observations of this species were documented during the field inspection, nor has it been documented within 1 mile of the airport by FNAI. Based on the USFWS South Florida *Wood Stork Programmatic Effect Determination Key* (see **Attachment D**), since the project is not located within a CFA and compensation will provide habitat similar to, or higher than, the impacted wetlands, a determination for the wood stork of “may affect, not likely to adversely affect” is recommended. Furthermore, the proposed mangrove and saltwater marsh wetland habitat mitigation measures would be sufficient to offset the on-site habitat impacts that could result from the Proposed Action.

### 6.3.4 MAMMALS

The West Indian manatee (*Trichechus manatus*) is a federally listed species that could potentially inhabit the salt ponds/embayments within the FBSA. No individuals were observed during field reviews of the Action Area and the FBSA and no documented occurrences have been reported in the FNAI within one mile of the Airport.

Furthermore, the project is not within an Important Manatee Area (IMA) as designated by FWS and access to the salt ponds from adjacent tidal waters is limited. As noted above, the security fencing will be floating at the surface and manatee will be able to access habitat behind the fence by swimming under it. Therefore, a determination for the West Indian manatee of “may affect, not likely to adversely affect” is recommended.

### 6.3.5 FISH

The federally listed juvenile smalltooth sawfish (*Pristis pectinata*) could be found within the tidally influenced mangrove areas of the Airport. However, it is unlikely that the smalltooth sawfish would inhabit this area because of limited access. Portions of the mangrove swamp are tidally connected via culverts to the Atlantic Ocean. In addition, this species is generally rare outside of southern peninsular Florida. No individuals were observed during field reviews within the Action Area or the FBSA and no documented occurrences have been reported in the FNAI in the vicinity of the Airport. To ensure the Proposed Action would not adversely affect the smalltooth sawfish, the standard Sea Turtle and Smalltooth Sawfish Construction Conditions (Attachment D), as developed by NMFS (2006), would be utilized during construction. In addition, the proposed mitigation for the mangrove impacts would be sufficient to offset the habitat impacts that could result from the Proposed Action. Based on the information above a determination for the smalltooth sawfish of “may affect, not likely to adversely affect” is recommended.

### 6.3.6 DESIGNATED CRITICAL HABITAT

The FBSA was evaluated for the occurrence of federally listed species critical habitat designated in 17 CFR 35.1532 and critical habitat proposed by the FWS. No designated or proposed critical habitat for any federally listed species is located on Airport property or would be affected by the Proposed Action.

### 6.3.7 ESSENTIAL FISH HABITAT (EFH)

A total of three (3) different habitats that serve as EFH for federally managed fish will be impacted by the proposed project. Approximately 3.14 acres of mangrove habitat will be filled and 0.2 acres will be cleared as part of the project. Mangrove dominated wetlands are considered EFH for several managed species including adult white grunt, juvenile and adult gray snapper, and juvenile mutton snapper. In addition, approximately 4.03 acres of saltwater marsh habitat will be filled by the project. Saltwater marshes also serve as EFH for several managed fish species including snook, red drum, and seatrout, all of which rely on this habitat for part of their lifecycle. Finally, the project will include the fill of approximately 0.09 acres of the on-site salt ponds/embayments. This habitat contains soft subtidal sediments that are inhabited by macroinvertebrates that serve as prey to managed fish species.

Based on existing conditions described in Section 5.6, Essential Fish Habitat, access from open waters to the wetlands and waters proposed to be impacted by the Proposed Action is limited.

As noted in Section 6.2.1.2 above, compensatory mitigation will be provided that will include the replacement of EFH for federally managed species. Both on-site and off-site mitigation is proposed to offset proposed impacts to EFH.

### 6.3.8 IMPACT MINIMIZATION

Prior to construction, the FBSA would be surveyed to determine the presence of affected species of protected plants and wildlife, and if needed, coordination with appropriate state and/or federal agencies would be initiated to provide habitat compensation or relocation.

Conservation measures to be implemented to minimize project impacts during construction include the following:

- Any federally protected plant species would be relocated to suitable habitat.
- Appropriate turbidity controls and construction area signage will be implemented during construction to minimize impacts to adjacent areas
- Construction of the Proposed Action, especially the land clearing element, would require use of the Standard Protection Measures for the Eastern Indigo Snake.
- Construction of the Proposed Action in-water work would require use of the Standard Sea Turtle and Smalltooth Sawfish Construction Conditions (Attachment D)

#### *Proposed Mitigation*

The mitigation proposed for filling approximately 3.14 acres of mangrove forest, approximately 4.03 acres of saltwater marsh habitat, 0.09 acres of salt ponds/embayments, and 0.25 acres of wetland Brazilian pepper would provide suitable replacement habitat both on-site and off-site for federally listed vegetative and wildlife species that may be affected by the Proposed Action.

## 7. Conclusion

In conclusion, eleven (11) federally listed species have been identified as having the potential to be present within the FBSA. None of these species, however, have been documented within the FBSA. Additionally, as described above, these species are not anticipated to be affected by the Proposed Action based on species range and distribution; limited connection to open waters, the nature of project impacts and compensatory mitigation.

In order to ensure the protection of these species, however, protective measures have been proposed. The approved Standard Sea Turtle and Smalltooth Sawfish Construction Conditions and Standard Protection and the approved Standard Protection Measures for the Eastern Indigo Snake would be implemented during construction of the Proposed Action. In addition, any federally protected plant species found within the FBSA would be relocated prior to project implementation.

Based on the findings and protective measures contained herein, an effect determination has been made that the Proposed Action "May Affect, Not Likely to Adversely Affect" eleven (11) federally listed animal or plant species and would have no effect on their critical habitat. **Table 7-1** summarizes the recommended project effect determination for the federally listed species.

**Table 7-1: Federally Protected Species Effects Determinations**

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	RECOMMENDED EFFECTS DETERMINATION
<b>Plants</b>			
Florida semaphore cactus <sup>1</sup>	<i>Opuntia corallicola</i>	E	May affect, not likely to adversely affect
Garber's spurge <sup>1</sup>	<i>Chamaesyce garberi</i>	T	May affect, not likely to adversely affect
Cape Sable thoroughwort <sup>1</sup>	<i>Chromolaena frustrata</i>	E	May affect, not likely to adversely affect
<b>Reptiles</b>			
American crocodile	<i>Crocodylus acutus</i>	T	May affect, not likely to adversely affect
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	May affect, not likely to adversely affect
<b>Birds</b>			
Piping plover	<i>Charadrius melodia</i>	T	May affect, not likely to adversely affect
Red knot	<i>Calidris canutus rufa</i>	T	May affect, not likely to adversely affect
Roseate tern	<i>Sterna dougallii dougallii</i>	T	May affect, not likely to adversely affect
Wood stork	<i>Mycteria Americana</i>	T	May affect, not likely to adversely affect
<b>Mammals</b>			
West Indian manatee	<i>Trichechus manatus</i>	T	May affect, not likely to adversely affect
<b>Fish</b>			
Smalltooth sawfish	<i>Pristis pectinate</i>	E	May affect, not likely to adversely affect

NOTES: T—Threatened E—Endangered

1/ Determination pending species-specific or nest survey to confirm presence/absence.

SOURCES: 50 CFR 17, Coile, Nancy C. and M.A. Garland, "Notes on Florida's Endangered and Threatened Plants," Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Bureau of Entomology, Nematology, and Plant Pathology – Botany Section, Contribution No. 38, 4<sup>th</sup> edition, Gainesville, Florida, 2003.

Prepared By: Birkitt Environmental Services, Inc., July 2020.

The project will include impacts to approximately 3.34 acres of mangrove habitat, 4.03 acres of saltwater marsh, and 0.09 acres of salt ponds/embayments, with each of these habitats considered EFH for federally managed fish. Compensatory wetland mitigation will be provided to replace functional loss associated with the proposed impacts.

Migratory birds including the piping plover, red knot, roseate tern, wood stork, reddish egret, roseate spoonbill, tricolored heron, and osprey are not expected to be adversely impacted by the proposed activities. Compensatory wetlands mitigation will be provided to replace habitat loss associated with the proposed project.

## 8. References

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USGS, 2010. *Geology and Hydrology of the Florida Keys*. By Robert B. Halley, H.L. Vacher, and Eugene A. Shinn. US Geological Survey. [http://sofia.usgs.gov/publications/papers/keys\\_geohydro/index.html](http://sofia.usgs.gov/publications/papers/keys_geohydro/index.html)

*Wild and Scenic Rivers Act*, as amended. U.S.C. 1968. Vol. 16 §1271 et seq. (1988).

## 9. List of Preparers

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### 9.1 Birkitt Environmental Services, Inc.

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#### *Beverly Birkitt, Principal Ecologist – Project Director*

Qualifications – Over 40 years of experience in the environmental consulting field with significant experience in environmental impact studies, state, federal, and local environmental permitting, NEPA coordination and Section 7 Consultation, ecosystem restoration, and regulatory compliance specializing in wetlands, wildlife, water quality, aquatic ecology, and mitigation.

Responsibilities – Principal-in-Charge and Principal Ecologist for the preparation of the Biological Assessment.

#### *Robert Toth, Ecologist - Lead Scientist*

Qualifications –Over 14 years of experience within the environmental field including conducting wetland surveys, flora and fauna identification, threatened and endangered species surveys, permitting processes for the Florida Department of Environmental Protection (FDEP) and United States Army Corps of Engineers (USACE) Section 404/10 and Section 7 Consultation.

Responsibilities – Lead Scientist for the preparation of the Biological Assessment

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### 9.2 Ricondo & Associates, Inc.

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#### *Lisa M. Reznar, Director*

Qualifications – Over 25 years of experience in airport environmental and planning analyses, with experience in preparing and managing environmental assessments airport sustainability master plans, and airport ground transportation planning studies.

Responsibilities – Project management, overall NEPA documentation, purpose and need, and alternatives.

#### *Julie A. Car, Managing Consultant*

Qualifications – More than 11 years of experience in aviation and environmental planning, with expertise in protected species, sensitive habitat, wetlands, and wildlife management.

Responsibilities – Overall NEPA analyses and documentation, affected environment, environmental consequences and Biological Assessment review.

## **EXHIBITS**

Exhibit 1: Airport Location

Exhibit 2: Proposed Action

Exhibit 3: Habitats within the Action Area

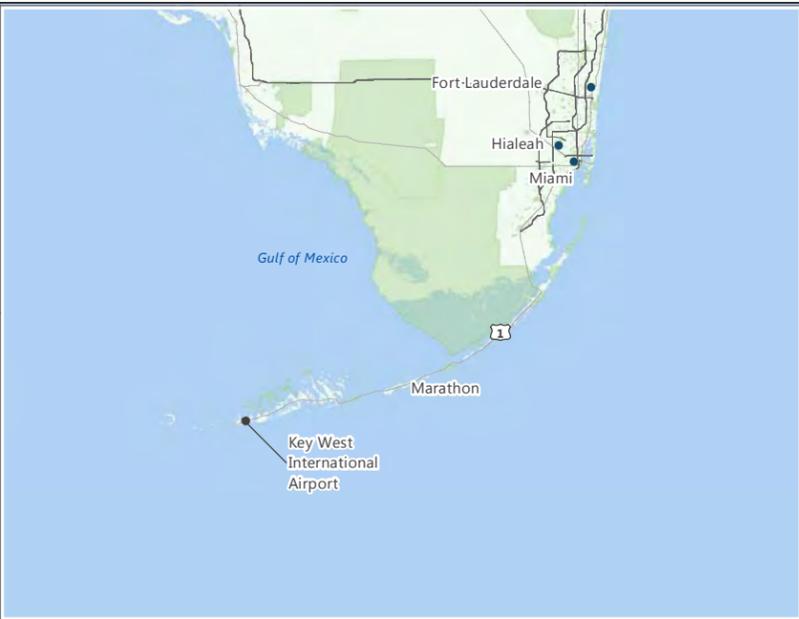
Exhibit 4: Habitats within the Focused Biological Study Area

Exhibit 5: Wetland/EFH Impacts

Exhibit 6: Proposed Wetland/EFH Mitigation - On-site Mitigation

Exhibit 7: Proposed Wetland/EFH Mitigation - Off-site Mitigation





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**Exhibit 1  
Airport Location**

Key West International Airport  
Monroe County, FL

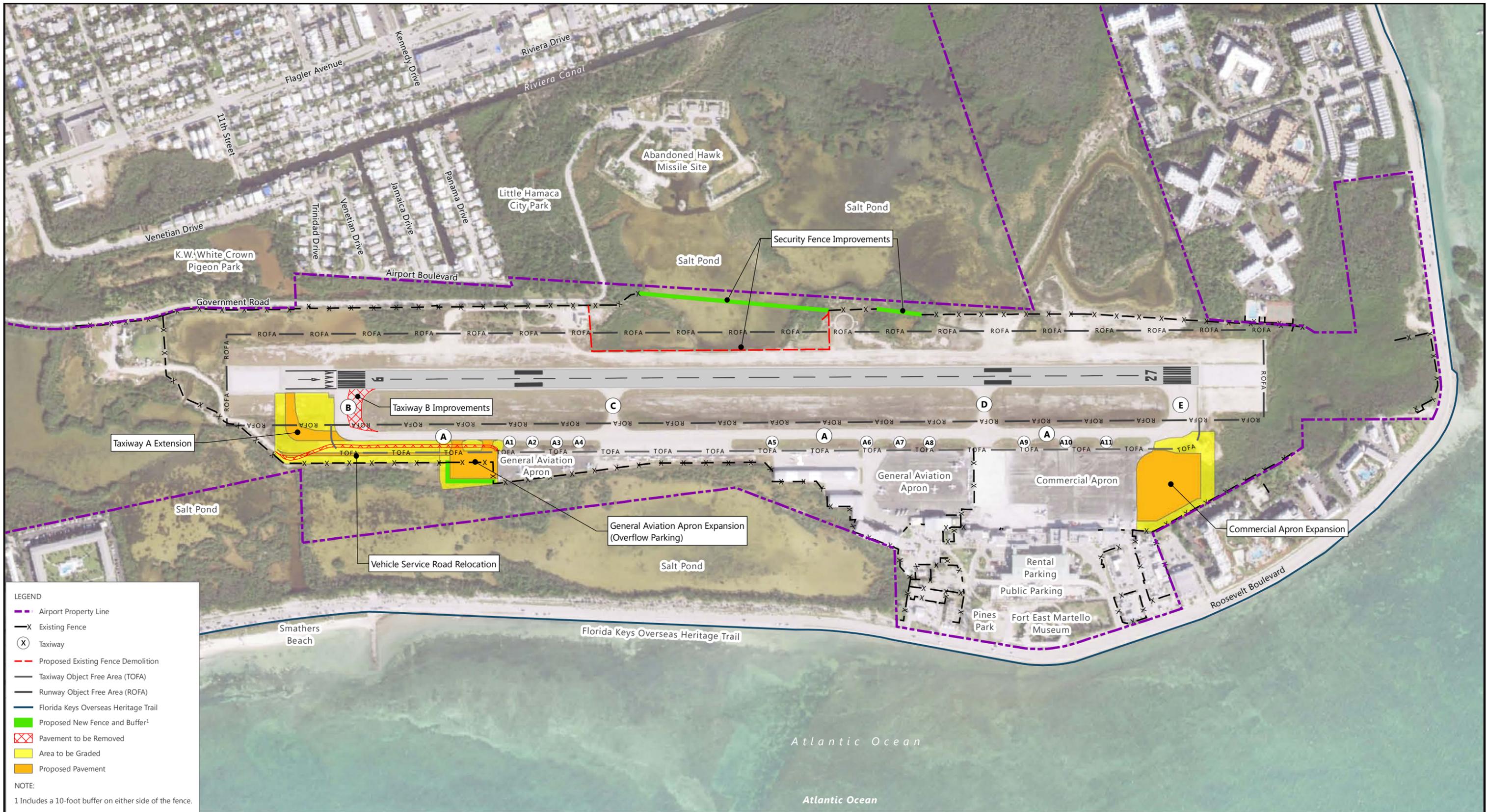
This map was developed using ArcGIS 10.3. It is provided for general reference, is subject to change, and is not warranted for any particular use or purpose. The information contained within is derived from several sources of varying quality and accuracy. Errors from non-coincidence of features from different sources may be present. Birkitt Environmental Services, Inc. and its employees are not liable for inappropriate or unintended uses of the information. This is not a map of survey.

Sources: Ricordo and Associates, Inc., Based on ESRI 2010 Data, 2010 (Airports, Roads, Parks, Water, Counties); US Census, Geography Division, Tiger/Line Shapefile, 2018 (Counties, Roads); USDOT, FAA, AIS Open Data, 2018 (Airports)  
File Path: T:\Key West Airport\Map\Ex 1 Location.mxd



0 2,500 5,000 Feet

NAD 83, State Plane Florida East [Feet]



**LEGEND**

- Airport Property Line
- Existing Fence
- Taxiway
- Proposed Existing Fence Demolition
- Taxiway Object Free Area (TOFA)
- Runway Object Free Area (ROFA)
- Florida Keys Overseas Heritage Trail
- Proposed New Fence and Buffer<sup>1</sup>
- Pavement to be Removed
- Area to be Graded
- Proposed Pavement

**NOTE:**  
1 Includes a 10-foot buffer on either side of the fence.

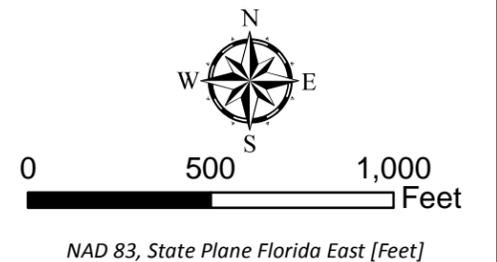


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**Exhibit 2  
Proposed Action**  
Key West International Airport  
Monroe County, FL

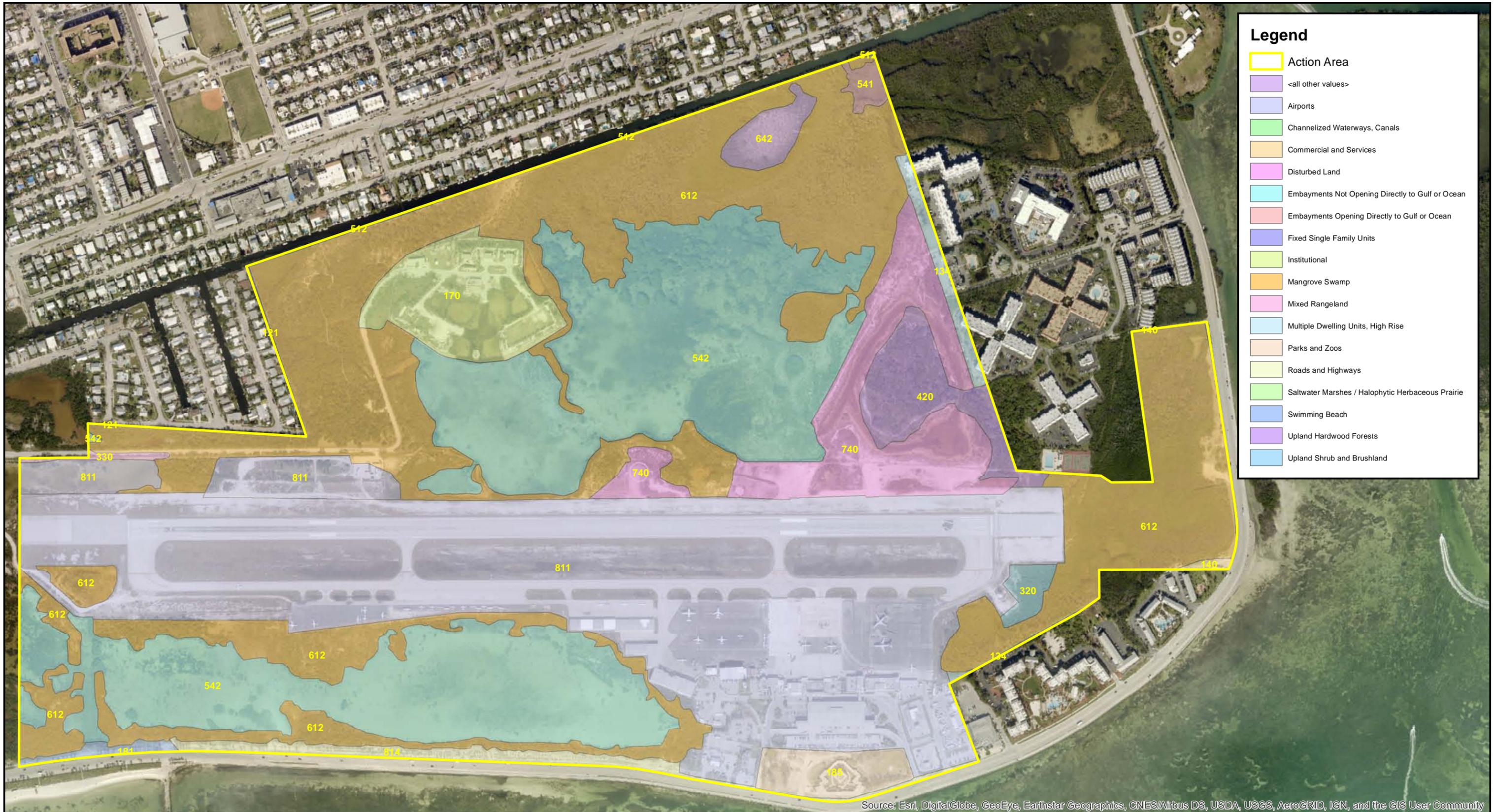
This map was developed using ArcGIS 10.3. It is provided for general reference, is subject to change, and is not warranted for any particular use or purpose. The information contained within is derived from several sources of varying quality and accuracy. Errors from non-coincidence of features from different sources may be present. Birkitt Environmental Services, Inc. and its employees are not liable for inappropriate or unintended uses of the information. This is not a map of survey.

Sources: Ricordo and Associates, Inc., June 2020; Based on United States Department of Agriculture, Farm Service Agency, Aerial Photography Field Office, Florida National Imagery Program, February 2018 (imagery); FDOT Office of Greenways & Trails (trail); Ricordo and Associates, Inc., January 2020 (proposed action components, property line, runway, ROFA, TOFA, fence); File Path: \\keywest-airport\Map\Ex 2 Proposed Action.mxd



0 500 1,000 Feet

NAD 83, State Plane Florida East [Feet]



**Legend**

- Action Area
- <all other values>
- Airports
- Channelized Waterways, Canals
- Commercial and Services
- Disturbed Land
- Embayments Not Opening Directly to Gulf or Ocean
- Embayments Opening Directly to Gulf or Ocean
- Fixed Single Family Units
- Institutional
- Mangrove Swamp
- Mixed Rangeland
- Multiple Dwelling Units, High Rise
- Parks and Zoos
- Roads and Highways
- Saltwater Marshes / Halophytic Herbaceous Prairie
- Swimming Beach
- Upland Hardwood Forests
- Upland Shrub and Brushland

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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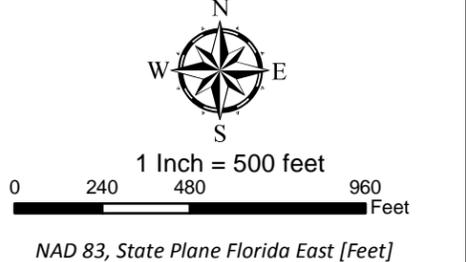
**Exhibit 3**

**Habitats Within the Action Area**

Key West International Airport  
Monroe County, FL

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), South Florida Water Management District (2014) (FLUCFS Habitats), Biondo and Associates, Inc. (January 2020) (Action Area), Creation Date: 8/28/20  
Author: Birkitt GIS Department: (RT)  
File Path: \\Key West Airport\Ex 3 Action Area Habitats.mxd



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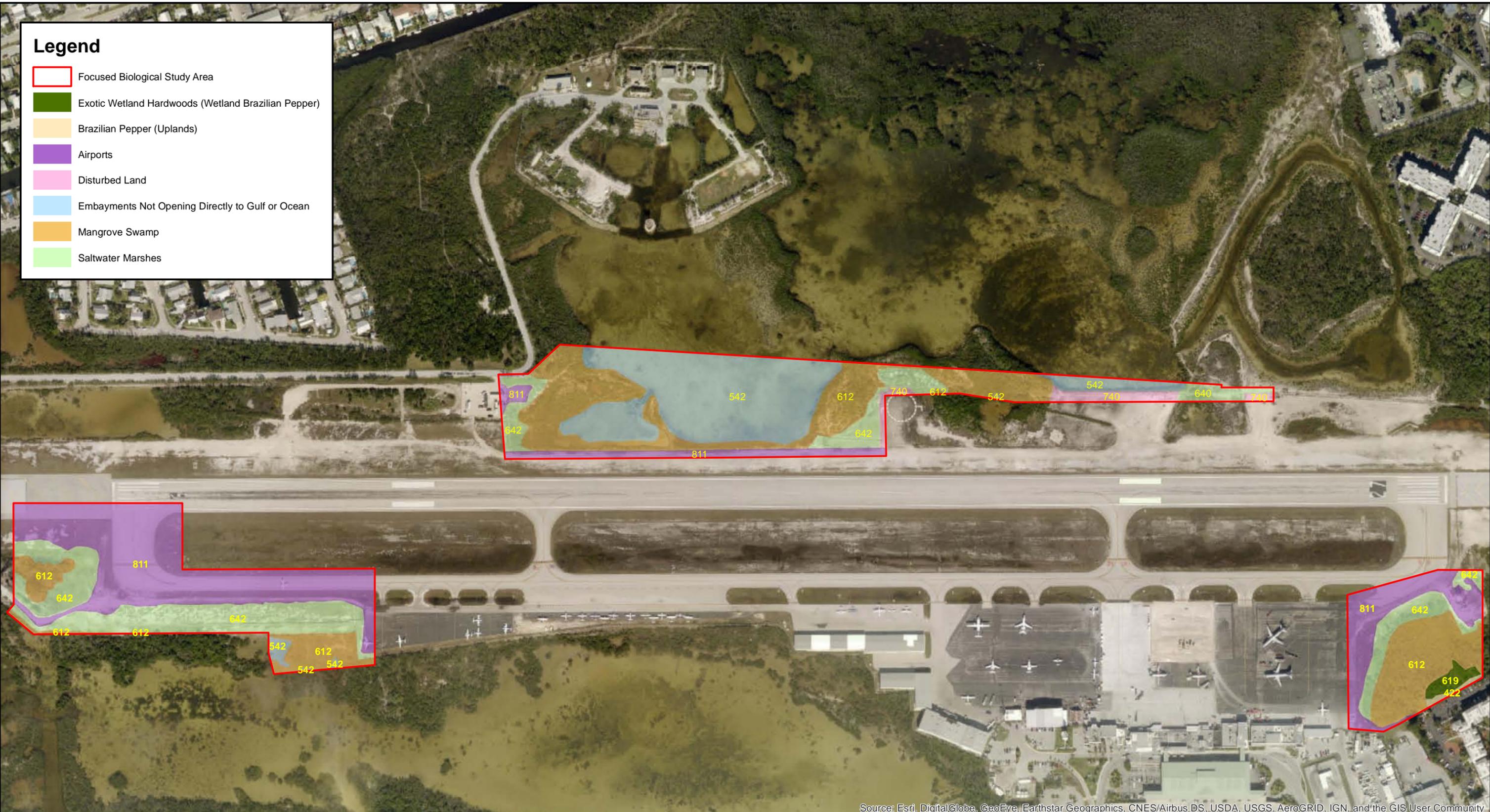
1 Inch = 500 feet

0 240 480 960 Feet

NAD 83, State Plane Florida East [Feet]

**Legend**

- Focused Biological Study Area
- Exotic Wetland Hardwoods (Wetland Brazilian Pepper)
- Brazilian Pepper (Uplands)
- Airports
- Disturbed Land
- Embayments Not Opening Directly to Gulf or Ocean
- Mangrove Swamp
- Saltwater Marshes



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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**Exhibit 4  
Habitats Within the  
Focused Biological Study Area**

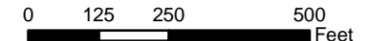
Key West International Airport  
Monroe County, FL

This map was developed using ArcGIS 10.3. It is provided for general reference, is subject to change, and is not warranted for any particular use or purpose. The information contained within is derived from several sources of varying quality and accuracy. Errors from non-coincidence of features from different sources may be present. Birkitt Environmental Services, Inc. and its employees are not liable for inappropriate or unintended uses of the information. This is not a map of survey.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (September 2019) (Field Verified FLUCFCS Habitats), Ricordo and Associates, Inc. (January 2020) (FBSA), Creation Date: 8/26/20, Author: Birkitt GIS Department (RT), File Path: \\Key West Airport\Ex 4 FBSA Habitats\_Rev8.28.20.mxd



1 Inch = 325 feet



NAD 83, State Plane Florida East [Feet]

**Legend**

- Focused Biological Study Area
- Proposed New Security Fence
- Existing Security Fence
- Proposed New Fence Disturbance Area
- Commercial Aviation Apron Disturbance Area
- General Aviation Apron Disturbance Area
- Taxiway and Vehicle Service Road Disturbance Area
- New Pavement
- Salt Ponds/Embayments Impacts
- Exotic Wetland Hardwoods (Wetland Brazilian Pepper) Impacts
- Mangrove Swamp Impacts
- Saltwater Marshes Impacts



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

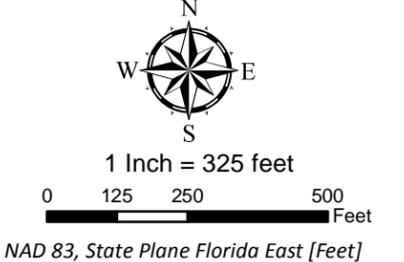


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**Exhibit 5  
Wetland Impacts**  
Key West International Airport  
Monroe County, FL

This map was developed using ArcGIS 10.3. It is provided for general reference, is subject to change, and is not warranted for any particular use or purpose. The information contained within is derived from several sources of varying quality and accuracy. Errors from non-coincidence of features from different sources may be present. Birkitt Environmental Services, Inc. and its employees are not liable for inappropriate or unintended uses of the information. This is not a map of survey.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial); Birkitt Environmental Services, Inc. (September 2019) (Habitats); Ricardo and Associates, Inc. (January 2020) (FBSA, Disturbance Areas, Paving, Fence)  
Creation Date: 8/28/20  
Author: Birkitt GIS Department: (RT)  
File Path: \\Key West Airport\GIS\5 Wetland Impacts\_Rev8.20.20.mxd



1 Inch = 325 feet  
0 125 250 500 Feet  
NAD 83, State Plane Florida East [Feet]

**Legend**

- Mitigation Area Boundary
- Unvegetated Limestone and Gravel
- Roadside Fill/Upland Grasses
- Buttonwood
- Mangroves
- Existing Mosquito Ditch

On-Site Mitigation Area 1

On-Site Mitigation Area 2

On-Site Mitigation Area 3

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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**Exhibit 6-1A**  
**Existing Conditions - ONS-1, 2, and 3**

Key West International Airport  
Monroe County, FL

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (2020) (Mitigation Area, Hazards)  
Creation Date: 8/27/20  
Author: Blake G. Department: (RT)  
File Path: \\Key West Airport\Exhibit 6-1A ONS-1-3 Ex Conditions



0 75 150 300  
Feet

NAD 83, State Plane Florida East [Feet]

### Legend

- Mitigation Area Boundary
- Mangroves
- Saltwater Marsh
- Buttonwood/Mangroves
- Unvegetated Limestone and Gravel
- Herbaceous Uplands
- Existing Mosquito Ditch

On-Site Mitigation Area 4

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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### Exhibit 6-1B

## Existing Conditions - ONS-4

Key West International Airport  
Monroe County, FL

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (2020) (Mitigation Areas, Habitat)  
Creation Date: 8/27/20  
Author: Birkitt Environmental Services, Inc. (RT)  
File Path: \\Key West Airport\Exhibit 6-1B ONS4 Ex Conditions



0 40 80 160  
Feet

NAD 83, State Plane Florida East [Feet]

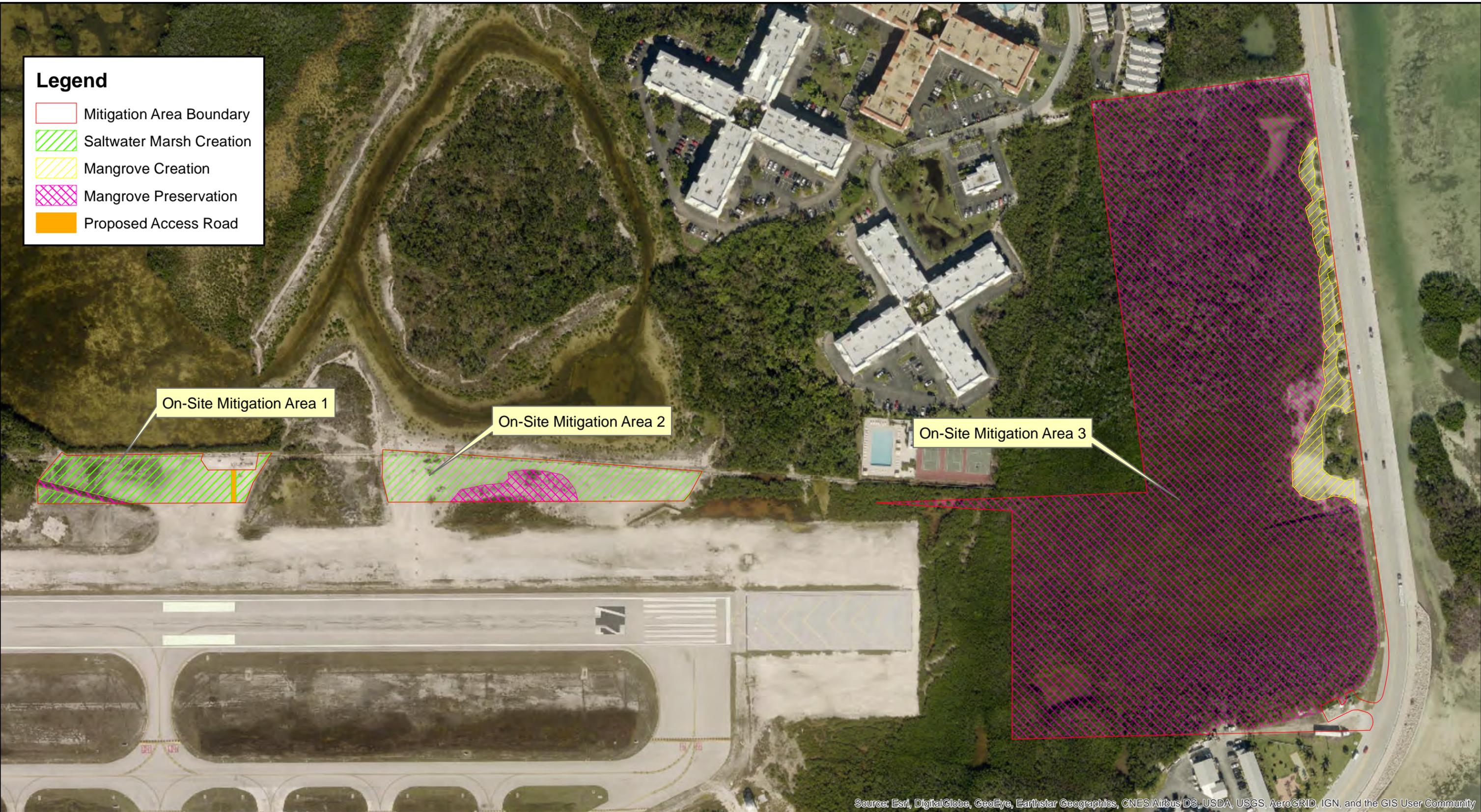
**Legend**

-  Mitigation Area Boundary
-  Saltwater Marsh Creation
-  Mangrove Creation
-  Mangrove Preservation
-  Proposed Access Road

On-Site Mitigation Area 1

On-Site Mitigation Area 2

On-Site Mitigation Area 3



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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**Exhibit 6-2A  
Mitigation Activities - ONS-1, 2, and 3**

Key West International Airport  
Monroe County, FL

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (2020) (Mitigation Areas, Mitigation Activities)  
Creation Date: 8/27/20  
Author: Blake D. Department: (RT)  
File Path: T:\Key West Airport\Exhibit 6-2A ONS 1-3 Mit Act



0 75 150 300 Feet

NAD 83, State Plane Florida East [Feet]

**Legend**

- Mitigation Area Boundary
- Salt Marsh Creation
- Mangrove Enhancement
- Saltmarsh Enhancement
- Tidal Pool/Embayment Creation
- Tidal Pool/Embayment Enhancement

On-Site Mitigation Area 4

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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**Exhibit 6-2B**  
**Mitigation Activities - ONS-4**  
Key West International Airport  
Monroe County, FL

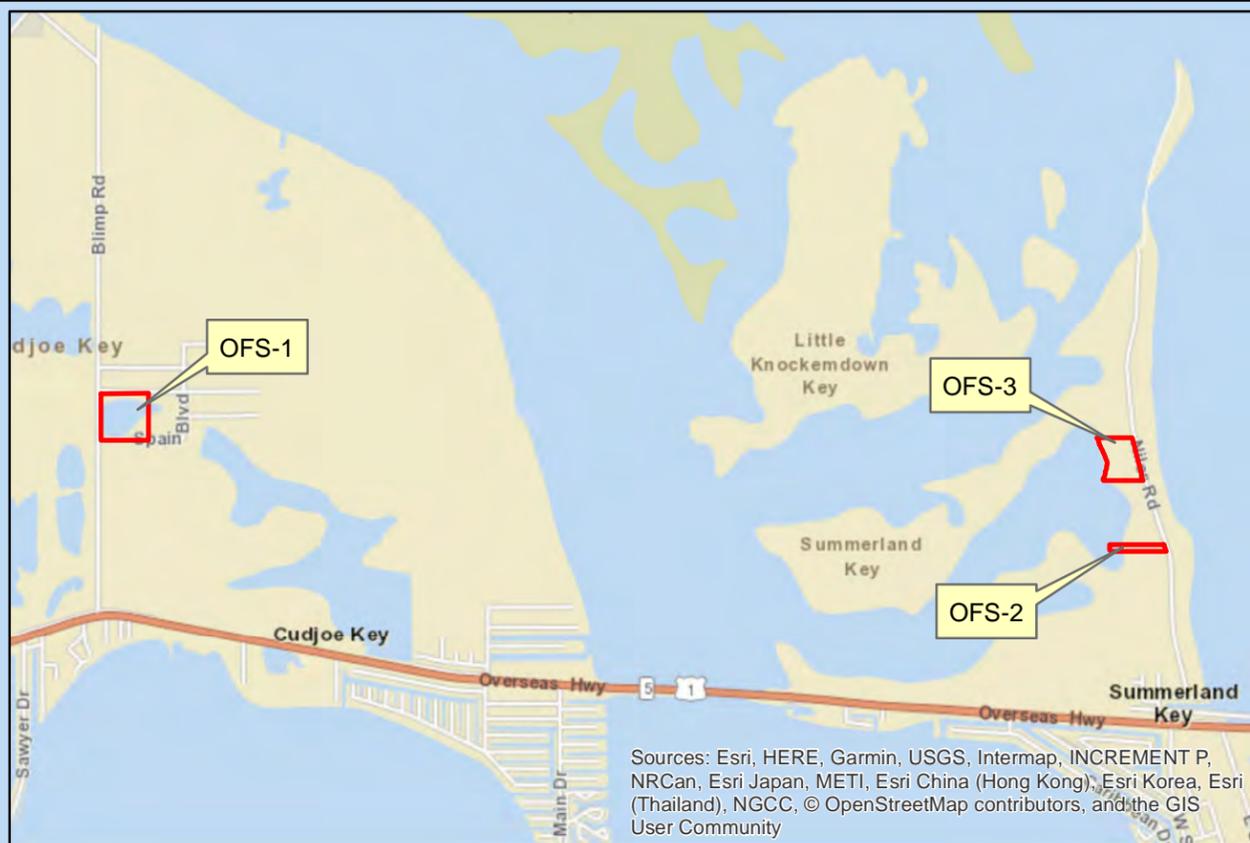
This map was developed using ArcGIS 10.3. It is provided for general reference, is subject to change, and is not warranted for any particular use or purpose. The information contained within is derived from several sources of varying quality and accuracy. Errors from non-coincidence of features from different sources may be present. Birkitt Environmental Services, Inc. and its employees are not liable for inappropriate or unintended uses of the information. This is not a map of survey.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (2020) (Mitigation Areas, Hazards)  
Creation Date: 8/27/20  
Author: Birkitt Environmental Services, Inc. Department: (RT)  
File Path: \\Key West Airport\Exhibit 6-1B ONS4 Ex Conditions

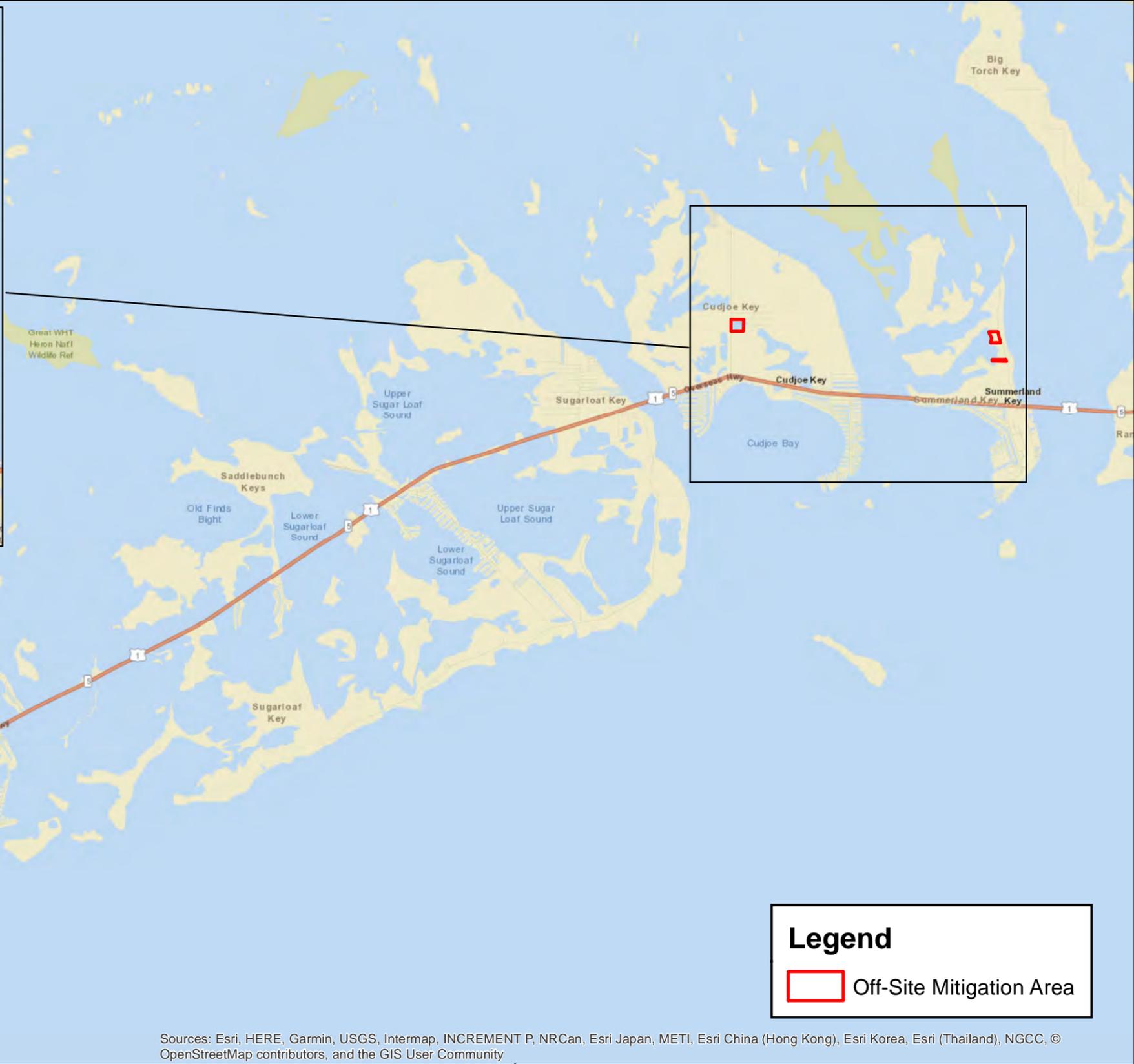


0 37.5 75 150 Feet

NAD 83, State Plane Florida East [Feet]



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community



**Legend**

Off-Site Mitigation Area

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

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**Exhibit 7-1**  
**Off-Site Mitigation**  
 Key West International Airport  
 Monroe County, FL

NAD 83, State Plane Florida East [Feet]

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Source: Parcels (FGDL)  
 Creation Date: 4/15/20  
 Author: Birkitt GIS Department: (RT)  
 File Path: T:\Key West Airport\Airport Parcels.mxd

**Legend**

- Off-Site Mitigation Area 1
- Upland Road Removal/Mangrove Creation



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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**Exhibit 7-2**  
**Off-Site Mitigation Area 1**  
Key West International Airport  
Monroe County, FL

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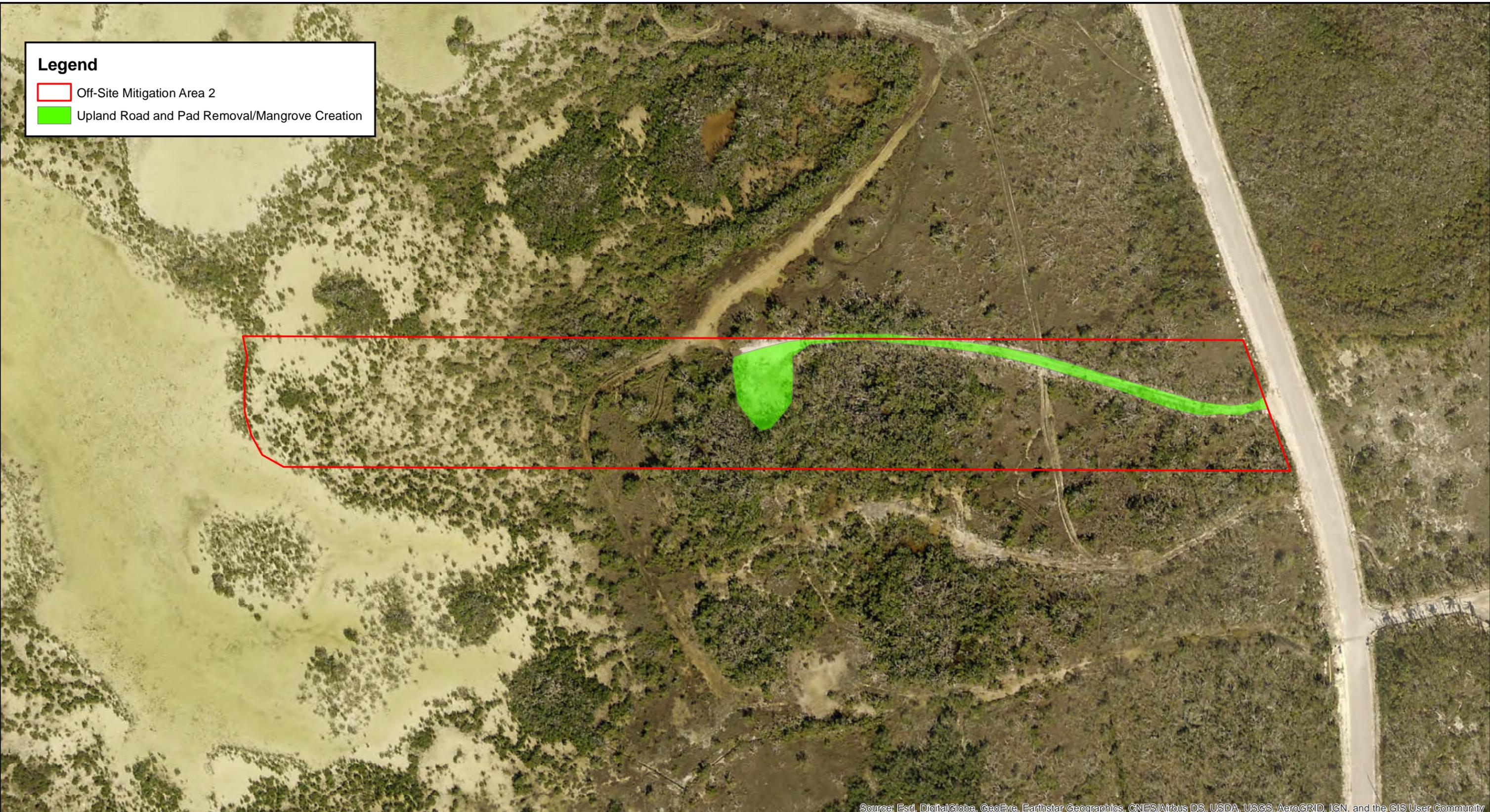
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (2020) (Mitigation Areas)  
Creation Date: 8/9/20  
Author: Birkitt GIS Department (RT)  
File Path: T:\Key West\Report\Exhibit 7-2 OFS1.mxd



NAD 83, State Plane Florida East [Feet]

**Legend**

- Off-Site Mitigation Area 2
- Upland Road and Pad Removal/Mangrove Creation



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



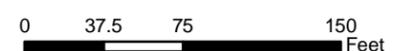
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**Exhibit 7-3**  
**Off-Site Mitigation Area 2**  
Key West International Airport  
Monroe County, FL

This map was developed using ArcGIS 10.3. It is provided for general reference, is subject to change, and is not warranted for any particular use or purpose. The information contained within is derived from several sources of varying quality and accuracy. Errors from non-coincidence of features from different sources may be present. Birkitt Environmental Services, Inc. and its employees are not liable for inappropriate or unintended uses of the information. This is not a map of survey.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (2020) (Mitigation Areas)  
Creation Date: 8/9/20  
Author: Birkitt GIS Department (RT)  
File Path: T:\Key West\Report\Exhibit 7-3 OFS2\_Rev9.30.20.mxd



NAD 83, State Plane Florida East [Feet]

**Legend**

- Off-Site Mitigation Area 3
- Upland Berm Removal/Mangrove Creation



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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**Exhibit 7-4**  
**Off-Site Mitigation Area 3**

Key West International Airport  
Monroe County, FL

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community (Aerial), Birkitt Environmental Services, Inc. (2020) (Mitigation Areas)  
Creation Date: 8/28/20  
Author: Birkitt GIS Department (RT)  
File Path: T:\Key West\Report\Exhibit 7-4 OF54Rev.mxd



NAD 83, State Plane Florida East [Feet]



# **ATTACHMENT A**

## Agency Correspondence and Meeting Minutes

EPA's response to EA Notice

EYW EA Agency - Biological Resources Web-based Conference Call –  
Meeting Minutes and Presentation

EYW EA Monroe County - Biological Resources Meeting – Meeting Minutes  
and Presentation

## EPA's response to EA Notice

**From:** [Gates, Kim](#)  
**To:** [Lisa Reznar](#)  
**Cc:** [Strickland-Richard@monroecounty-fl.gov](mailto:Strickland-Richard@monroecounty-fl.gov); [Leto-Beth@monroecounty-fl.gov](mailto:Leto-Beth@monroecounty-fl.gov); [Peter.M.Green@faa.gov](mailto:Peter.M.Green@faa.gov); [Militsher, Chris](#); [Kajumba, Ntale](#)  
**Subject:** EPA's Response to Environmental Assessment Preparation Notice for Key West International Airport Improvements  
**Date:** Monday, September 30, 2019 3:58:55 PM

---

September 30, 2019

Ms. Lisa Reznar  
Ricondo & Associates, Inc.  
20 North Clark Street, Suite 1500  
Chicago, IL 60602

SUBJ: Environmental Assessment Preparation Notice for Key West International Airport Improvements

Dear Ms. Reznar:

The U.S. Environmental Protection Agency (EPA) Region 4 acknowledges receipt of your Notice of Preparation of Environmental Assessment (EA), dated August 19, 2019, for the evaluation of potential environmental impacts from the proposed bypass taxiway, apron expansions, and security fencing improvements at Key West International Airport (Airport). Based on our review of available information, including the description of the Proposed Action, alternatives, and potential areas of concern in Attachment A of your letter, we offer the following recommendations for consideration in the EA.

**Air Quality.** The project area is currently in attainment with the National Ambient Air Quality Standards (<https://www3.epa.gov/airquality/greenbook/ancl.html>). However, given the proximity of residences to the airport, preventive action is needed during construction to minimize short-term air impacts. The EPA advocates controlling fugitive dust and implementing measures to reduce diesel emissions, such as switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, repowering older engines with newer cleaner engines, replacing older vehicles, and reducing idling through operator training and/or contracting policies.

**Contaminated Sites.** The EPA's online NEPassist mapping tool (<https://www.epa.gov/nepa/nepassist>) reported two RCRA Subtitle C facilities at the Airport:

Transportation Security Administration (TSA) at Key West International Airport, 3491 S Roosevelt Blvd

- EPA ID #: FLR000174292 ([https://ofmpub.epa.gov/enviro/rcrainfoquery\\_3.facility\\_information?pgm\\_sys\\_id=FLR000174292](https://ofmpub.epa.gov/enviro/rcrainfoquery_3.facility_information?pgm_sys_id=FLR000174292))
- No RCRA violations documented (<https://echo.epa.gov/detailed-facility-report?fid=110043536581>)
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/FLR000174292/facilitysearch>

Monroe County Public Works – Key West, 3583 S Roosevelt Blvd

- EPA ID #: FLR000025585 ([https://ofmpub.epa.gov/enviro/rcrainfoquery\\_3.facility\\_information?pgm\\_sys\\_id=FLR000025585](https://ofmpub.epa.gov/enviro/rcrainfoquery_3.facility_information?pgm_sys_id=FLR000025585))
- No RCRA violations documented (<https://echo.epa.gov/detailed-facility-report?fid=110005638907>)
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/FLR000025585/facilitysearch>

According to the FDEP's online Map Direct: Contamination Locator tool (<http://ca.dep.state.fl.us/mapdirect/?focus=contamlocator>), the following seven RCRA Subtitle I (petroleum storage) facilities are located at the Airport:

Signature Flight Support (formerly Island City Flying Service), 3471 S Roosevelt Blvd

- FDEP Storage Tank Contamination Monitoring (STCM) Facility ID #: 8624743

- Petroleum discharges in 12/1991 and 4/2001
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/8624743/facility!search>

FAA – Air Traffic Control Tower, Key West International Airport

- FDEP STCM Facility ID #: 8734110
- No petroleum discharges reported
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/8734110/gis-facility!search>

Monroe County – Key West International Airport, 3491 S Roosevelt Blvd

- FDEP STCM Facility ID #: 8511825
- Petroleum discharge in 4/1992
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/8511825/gis-facility!search>

Avis Rent A Car, 3495 S Roosevelt Blvd

- FDEP STCM Facility ID #: 8839449
- Petroleum discharge in 1/1987
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/8839449/facility!search>

Dollar Rent A Car, 3495 Roosevelt Blvd

- FDEP STCM Facility ID #: 8841250
- No petroleum releases reported
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/8841250/facility!search>

U.S. Air Express – Henson Aviation Inc, 3495 Roosevelt Blvd

- FDEP STCM Facility ID #: 8839982
- No petroleum releases reported
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/8839982/gis-facility!search>

Monroe County Public Works Division – Key West, 3583 S Roosevelt Blvd

- FDEP STCM Facility ID #: 8624745
- Petroleum discharges in 3/1994, 9/1996 & 5/1999
- FDEP documents, <http://prodenv.dep.state.fl.us/DepNexus/public/electronic-documents/8624745/facility!search>

In light of the petroleum releases that have occurred, conducting a Phase I Site Assessment in the area of the commercial apron expansion may be a good idea to ensure that residual contamination will not be problematic.

**Environmental Justice.** The EPA’s online EJSCREEN tool (<http://www2.epa.gov/ejscreen>) reported approximately 1,384 people living within 0.25 mile of the airport and 3,845 residents within 0.5 mile, but the demographics (below) did not reflect the potential for disproportionately high and adverse human health or environmental effects on federally-protected populations.

Special Population	0.25-Mile Buffer	0.5-Mile Buffer	Monroe County*	State
% Minority	36	34	34.2	44
% Low Income	30	31	Not Reported	37
% Linguistically Isolated	8	9	23.2	7
% Less than High School	6	9	8.8	13

Education				
% Under 5 Years Old	2	5	4.6	5
% Over 64 Years Old	18	20	23	19

\* U.S. Census QuickFacts for Monroe County, <https://www.census.gov/quickfacts/monroecountyflorida>

**Section 4(f) Resources.** Although it does not appear that the project will adversely affect Section 4(f) resources, please include a discussion in the EA. Several parks, wildlife refuges, and historic sites are located on or adjacent to Airport property, including:

- Little Hamaca Park (<https://www.cityofkeywest-fl.gov/egov/apps/locations/facilities.egov?view=detail&id=14>);
- HAWK Missile Bravo Battery Site (<https://www.nps.gov/orgs/1508/base-realignment-and-closure.htm>), which is an area of mangrove restoration (<https://www.cityofkeywest-fl.gov/egov/apps/document/center.egov?view=detail&id=18584>);
- Fran Ford White-Crowned Pigeon Preserve (<https://floridakeysaudubonsociety.tumblr.com/post/98553369941/the-fran-ford-white-crowned-pigeon-preserve-is/amp>);
- Battery 232 ([http://www.fortwiki.com/Battery\\_232](http://www.fortwiki.com/Battery_232)), which has a Florida Historical Marker (<http://apps.flheritage.com/markers/map/index.cfm?county=Monroe>); and
- Martello Gallery at the Key West Art & Historical Museum, which is on the National Register of Historic Places (<https://npgallery.nps.gov/pdfhost/docs/NRHP/Text/72000341.pdf>).

Furthermore, the Airport is in the Florida Keys National Marine Sanctuary (<https://floridakeys.noaa.gov/>), which has an active Water Quality Protection Program (<https://floridakeys.noaa.gov/wqpp/welcome.html?s=management>).

**Stormwater Management.** Based on the information you provided via email on September 26, 2019, the apron expansions will increase the Airport’s impervious surface area by about 3.8 acres. Because construction will disturb more than one acre of land, coverage under FDEP’s Generic Permit for Stormwater Discharge from Large and Small Construction Activities (<https://floridadep.gov/water/stormwater/content/construction-activity-cgp>) is required. Please discuss all applicable NPDES permitting requirements, including the City of Key West’s Phase II MS4 permit, in the EA.

The larger impervious surface area will generate more stormwater runoff during rain events. However, we could not determine if the existing stormwater management system has the capacity to handle greater volumes of runoff. Please include a hydrology discussion in the EA that addresses the system deficiencies reported by Peter Horton (the former Airport director) in August 2012 (<https://www.eenews.net/climatewire/stories/1059968684/>), the system assessment conducted in 2013 (<http://fl-monroecounty.civicplus.com/AgendaCenter/ViewFile/Item/2303?fileID=2149>), drainage improvements that have been implemented since then ([http://assets.convergeapp.net/DisplayTableList/7171/files/KeyWestAirportCapitalImprovementProgram\\_40020.pdf](http://assets.convergeapp.net/DisplayTableList/7171/files/KeyWestAirportCapitalImprovementProgram_40020.pdf)), and modifications that may be needed as part of this project to prevent direct discharges to adjacent wetland areas.

**Threatened & Endangered Species.** The U.S. Fish & Wildlife Service’s (FWS’s) online Information, Planning and Conservation (iPaC) tool (<http://ecos.fws.gov/ipac/>) identified a number of threatened and endangered species as well as migratory birds in the airport vicinity. Additionally, the City of Key West, in coordination with the FWS, developed an Endangered Species Habitat – Species Focus Areas map showing areas of concern surrounding the Airport ([https://www.cityofkeywest-fl.gov/egov/documents/1471027599\\_39964.pdf](https://www.cityofkeywest-fl.gov/egov/documents/1471027599_39964.pdf)). Most of these areas are also zoned for conservation (<https://www.cityofkeywest-fl.gov/department/division.php?structureid=136>).

Considering that estuarine wetland areas containing state-protected mangroves (see the Florida Fish & Wildlife Conservation Commission’s Marine Resources GIS, <https://ocean.floridamarine.org/mrgis/>, and FDEP’s mangrove website, <https://floridadep.gov/rcp/rcp/content/floridas-mangroves>) will be filled to accommodate the apron expansions, we recommend conducting a Biological Assessment to evaluate the direct and indirect impacts that could result from losses in wetland function. Further, we suggest contacting the FWS (<https://www.fws.gov/verobeach/>) and the FFWCC for assistance with avoiding, minimizing, and mitigating project

impacts on federal and state listed species that use these wetlands.

Another concern involves night-time lighting of the general aviation apron expansion. The FFWCC's Statewide Atlas of Sea Turtle Nesting Occurrence and Density (<https://myfwc.com/research/wildlife/sea-turtles/nesting/nesting-atlas/>) documents a history of loggerhead turtle nests on Smathers Beach below the proposed location of the expansion. Improper lighting could result in hatchling fatalities similar to those witnessed in Jacksonville Beach this year (<https://www.news4jax.com/weather/environment/sea-turtle-hatchlings-spill-into-jacksonville-beach-streets>).

**Waters of the United States.** In accordance with Section 404 of the Clean Water Act, the project should avoid and minimize, to the maximum extent practicable, placement of dredged or fill material in jurisdictional surface waters and wetlands. Comparing the proposed pavement areas with the jurisdictional waters in the U.S. Fish & Wildlife Service's Wetlands Mapper (<https://www.fws.gov/wetlands/data/mapper.html>), construction of the apron expansions will necessitate the filling of estuarine wetlands. Consequently, U.S. Army Corps of Engineers permitting is required and wetlands losses allowed under the Corps permit may have to be mitigated (<https://www.sas.usace.army.mil/Missions/Regulatory/Mitigation.aspx>).

The EPA appreciates the opportunity to provide input on the proposed improvements at the Key West International Airport, and we look forward to reviewing the draft EA. Please provide one hard copy and one electronic to my attention at the address shown below. If you have any questions in the interim, I can be contacted at (404) 562-9261 or via email at [gates.kim@epa.gov](mailto:gates.kim@epa.gov).

Sincerely,

*Kim Gates*

Kim Gates, Environmental Engineer  
NEPA Section  
Strategic Programs Office  
USEPA Region 4  
61 Forsyth Street SW  
Atlanta, GA 30303-8960

cc: Richard Strickland, Director, Key West International Airport  
Beth Leto, Senior Airport Business Manager, Key West International Airport  
Peter Green, Federal Aviation Administration

EYW EA Agency - Biological Resources Web-based  
Conference Call – Meeting Minutes and Presentation

# Taxiway A Extension, Apron Expansion, and Security Fencing Improvements at Key West International Airport, Environmental Assessment (EA)

April 27, 2020

## Biological Resources Web-based Conference Call

1:30 p.m. Eastern

19-04-1130-01.06

Web-based Conference Call

---

**MEETING FACILITATOR:** B. Birkitt (Birkitt)
 

---

**NOTE TAKER(S):** Birkitt/Ricondo
 

---

MEETING ATTENDEES	REPRESENTING	EMAIL
Peter Green	Federal Aviation Administration (FAA)	peter.m.green@faa.gov
Christine Raininger	Florida Fish and Wildlife Conservation Commission (FWC)	Christine.Raininger@myfwc.com
Stephen Werndli	National Oceanic and Atmospheric Administration (NOAA)	stephen.werndli@noaa.gov
Joanne Delaney	NOAA	joanne.delaney@noaa.gov
Pace Wilber	NOAA	pace.wilber@noaa.gov
Kurtis Gregg	NOAA (affiliate)	kurtis.gregg@noaa.gov
Danielle Sattelberger	South Florida Water Management District (SFWMD)	dsattelb@sfwmd.gov
Kim Gates	US Environmental Protection Agency (USEPA)	gates.kim@epa.gov
John Wrublik	US Fish and Wildlife Service (USFWS)	john_wrublik@fws.gov
Beverly Birkitt	Birkitt Environmental Services, Inc. (Birkitt)	bbirkitt@birkitt.com
Robert Toth	Birkitt	rtoth@birkitt.com
Nilda Callaghan	Birkitt	
Sebastien Carreau	Ricondo & Associates, Inc., (Ricondo)	scarreau@ricondo.com
Lisa Reznar	Ricondo	lreznar@ricondo.com
Julie Car	Ricondo	jcar@ricondo.com
Mariben Andersen	Michael Baker International	mandersen@mbakerintl.com

## SUMMARY OF MEETING DISCUSSION

The Key West International Airport (EYW) Environmental Assessment (EA) Consultant Team presented information on the Proposed Action (extension of Taxiway A, expansion of aircraft aprons, and construction of security fencing) at EYW, which is the subject of an EA being prepared pursuant to the National Environmental Policy Act (NEPA). The presentation (see **Attachment**) included discussion of the EA process and agency coordination, existing conditions of biological resources, and potential impacts to biological resources due to project implementation. The FAA is the lead federal agency for the EA. The EA Consultant Team opened up the conversation to attending federal and state agency representatives to solicit input on the potential project impacts and mitigation strategies. The purpose of the proposed project, EA process, environmental impacts, and mitigation needs were discussed.

The following points were discussed:

- SFWMD will not accept the Keys Restoration Fund (KERF) as mitigation.
- D. Sattleberger (SFWMMD) will speak to supervisor about ability to use excess mitigation credits from a previous project.
- It was clarified that a SFMWD permit has not been submitted yet for the projects included in the EA.
- USFWS suggested that mammal trapping protocol may be required to confirm presence/absence of the silver rice rat. FAA suggested previous documentation may demonstrate a no effects determination on the silver rice rat at EYW, so the EA team will evaluate this further.
- FWC suggested the need to consider tropical hardwood hammock sites near the project area that may support white-crowned pigeon.
- FAA will initiate consultation under Section 7 with federal agencies as a next step, following refinement of protected species impacts and habitat mitigation. Kurtis Gregg, (NOAA) recommended that Uniform Mitigation Assessment Method (UMAM) sheets be made available to the federal agencies during consultation if they have been prepared.
- NOAA asked for clarification of whether the salt ponds are tidally connected. The salt pond north of the Airport is tidally connected; but, the salt pond south of the Airport does not have an existing connection. The mitigation strategy of reconnecting the south salt pond was briefly discussed. It would provide a strong UMAM score for essential fish habitat (EFH). Two to three box culverts would likely be needed to restore the hydraulic connection.

## ACTION ITEMS LIST

DATE OPENED	DESCRIPTION	RESPONSIBLE PARTY	RESOLUTION
4/27/20	Ability to use mitigation credits from a previous project towards the EA projects.	SFWMD	Per follow-up email from D. Sattleberger to B. Birkitt, SFWMD anticipates the ability to allow EYW to use the excess mitigation credits for the EA projects.
4/27/20	Review existing documentation for demonstration that rice rat is not present at EYW.	FAA/Birkitt	Per review of FEMA BO, Birkitt confirmed that the silver rice rat is not documented on the Airport. follow-up with Monroe County confirmed, habitat at Key West is not suitable for the silver rice rat.

### ATTACHMENTS:

Presentation

### DISTRIBUTION:

19-04-1130

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## Agency Coordination

### Biological Resources Web-based Conference Call April 27, 2020

Proposed Taxiway A Extension, Apron Expansion, and Security Fencing Improvements Environmental Assessment at Key West International Airport

KEY WEST INTERNATIONAL AIRPORT

1

## Welcome and Introductions

KEY WEST INTERNATIONAL AIRPORT

**LEAD FEDERAL AGENCY**  
Federal Aviation Administration

**PROJECT SPONSOR**  
Monroe County Airport Administration

**EA CONSULTANT TEAM**  
Ricondo & Associates, Inc.  
Birkitt Environmental Services, Inc.  
Michael Baker International  
Deborah Murphy Lagos & Associates, LLC  
Janus Research

Agency Coordination  
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## Agenda

- Introduction
- EA Process and Agency Coordination
- Affected Environment – Existing Conditions
- Environmental Consequences – Proposed Conditions
- Mitigation
- Questions, Comments, and Discussion
- Summary of Comments and Next Steps

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## Environmental Assessment Process and Agency Coordination

### Agency Coordination

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4

## Existing Airport Facilities

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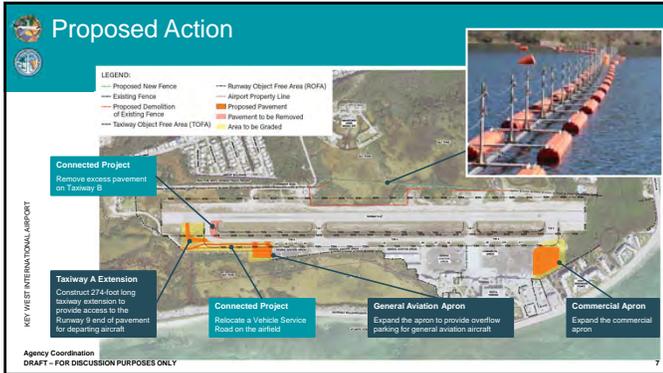
## Preliminary Purpose and Need

KEY WEST INTERNATIONAL AIRPORT

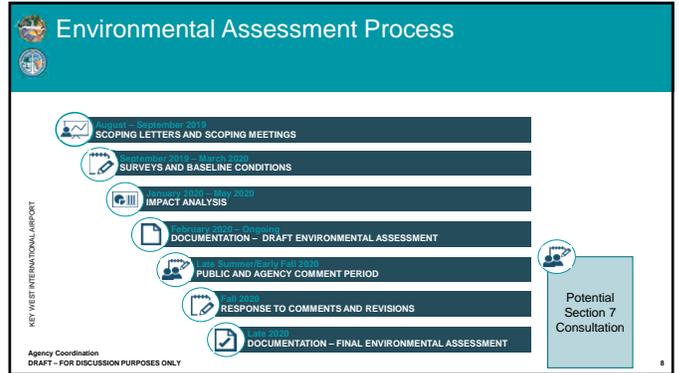
<p><b>PURPOSE</b></p> <p>Improve the layout of the taxiways and aprons to enhance operational safety and efficiency of the Airport by:</p> <ul style="list-style-type: none"> <li>• Providing taxiway access to the full Runway 9 departure length</li> <li>• Constructing additional apron for commercial and general aviation (GA) aircraft</li> <li>• Improving security fencing along the Airport's north perimeter</li> </ul>	<p><b>NEED</b></p> <p>Resolve operational inefficiencies resulting from the layout of the existing taxiways and aprons to improve airfield safety and security:</p> <ul style="list-style-type: none"> <li>• Back-taxi to the Runway 9 end</li> <li>• Reduce commercial apron congestion</li> <li>• Provide additional GA apron for overflow aircraft parking</li> <li>• Remove the non-standard section of perimeter fence within the Runway 9-27 object free area</li> </ul>
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### Affected Environment Methodology

LITERATURE REVIEW	
FNAI Element Occurrence Report	FLUCFCS database
FWC Eagle Nest Locator	USFWS NWI
FWC Imperiled Species Management Plan	USFWS IPAC
FWRI Habitats and Wildlife data base	Monroe County Property Appraisers Website
USFWS ECOS	Monroe County Land Development Code
USGS NRCS Web Soil Survey	Monroe County Year 2030 Comprehensive Plan
NMFS – NOAA	State and Federal Rules and Regulation
USFWS Wood Stork CFA and Rookery Data	Aerial imagery

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### Affected Environment Methodology – Continued

AGENCY COORDINATION	FIELD INVESTIGATION
Scoping Letters • August 2019	Biological Study Area • September 17-19, 2019 <input type="checkbox"/> Pedestrian Qualitative Survey
Scoping Meeting • September 19, 2019	Direct Study Area • September 17-19, 2019 <input type="checkbox"/> Pedestrian Qualitative Survey <input type="checkbox"/> UMAM Evaluations of Wetlands
Biological Resources Web-Based • Conference Call – April 27, 2020	

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### Affected Environment Habitat – Biological Study Area

- Within BSA – 392 acres
  - Uplands (airports, native, commercial, institutional, etc.) – 180.2 acres  
(Note: no tropical hardwood hammock)
  - Wetlands – 211.8 acres
    - Mangrove Swamp – 114.0 acres
    - Salt Ponds/Embaysments Not Opening Directly – 93.5 acres
    - Saltwater Marsh – 2.9 acres
    - Salt Ponds/Embaysments Opening Directly – 1.1 acres
    - Channelized Waterways – 0.3 acres

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### Affected Environment Habitat – Direct Study Area

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### Affected Environment Habitat – Direct Study Area

FLUCFCS CODES	DESCRIPTION	ACRES WITHIN DIRECT STUDY AREA
Uplands		
811	Airports	8.8
740	Disturbed Land	0.6
422	Brazilian Pepper (Upland)	0.1
Wetlands		
612 – Mangrove Swamp	E2F03N – Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded	8.0
642 – Saltwater Marshes	E2EM1 – Estuarine, Intertidal, Emergent, Persistent	6.5
542 – Embaysments Not Opening Directly to Gulf or Ocean	E1UB2 – Estuarine, Subtidal, Unconsolidated Bottom, Sand	6.3
619 – Exotic Wetland Hardwoods (Wetland Brazilian Pepper)	E2F03P – Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Irregularly Flooded	0.3
Total Acres of Habitats within the Direct Study Area		30.6

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### Affected Environment Federally Listed Wildlife Species – Direct Study Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT	OBSERVED WITHIN DIRECT STUDY AREA
American crocodile	<i>Crocodylus acutus</i>	T	Brackish or saltwater areas	No
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	Scrub, sandhill, wet prairie, mangrove swamp	No
Piping plover	<i>Charadrius melodus</i>	T	Open, sandy beaches, and tidal mudflats	No
Red knot	<i>Calidris canutus rufa</i>	T	Tidal flats and coastlines	No
Roseate tern	<i>Sterna dougalli dougalli</i>	T	Nests over bare limestone and shell-sand beaches, forages in open water	No
Wood stork	<i>Mycteria americana</i>	T	Nests in forested wetlands, forages in marshes, swamps, and tidal creeks	No, not in CFA
Silver rice rat	<i>Oryzomys palustris natator</i>	E	Transition from upland to marine communities	No
West Indian manatee	<i>Trichechus manatus</i>	T	Coastal waters, bays, and rivers	No

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### Affected Environment Federally Listed Plant Species – Direct Study Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT	OBSERVED WITHIN DIRECT STUDY AREA
Florida semaphore cactus	<i>Opuntia corallicola</i>	E	Rocky hammocks, coastal barrens	No
Garber's spurge	<i>Chamaesyce garberi</i>	T	Pine rocklands, coastal berm, coastal grasslands	No
Cape Sable thoroughwort	<i>Chromolaena frustata</i>	E	Coastal rock barrens and berms, sunny edges of rockland hammock	No

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### Environmental Consequences State Protected Wildlife Species – Direct Study Area

- Six species of potentially occurring state listed wildlife
- State only listed wildlife species – none observed
  - Florida Keys mole skink
  - Florida burrowing owl
  - Reddish egret
  - Roseate spoonbill
  - Tricolored heron
  - Key silverside

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# Environmental Consequences – Future Conditions

Agency Coordination

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## Environmental Consequences Land Use/Vegetative Cover/EFH Impacted Direct Study Area

LAND USE / VEGETATIVE COVER	FLUCFCS CODE	FWS CLASSIFICATION	PROPOSED FILL (ACRES) <sup>1</sup>
<b>WETLANDS</b>			
Mangrove Swamp	612	E2F03N - Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded	3.14
Saltwater Marshes	642	E2EM1 - Estuarine, Intertidal, Emergent, Persistent	4.03
Salt Ponds/Embayments Not Opening Directly to Gulf or Ocean	542	E1UB2 - Estuarine, Subtidal, Unconsolidated Bottom, Sand	0.09
Exotic Wetland Hardwoods (Wetland Brazilian Pepper)	619	E2F03P - Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Irregularly Flooded	0.25
<b>Total</b>			<b>7.51</b>

NOTE:  
1 Calculation of potential impact of proposed security fence improvements along the north side of the Airport is pending design.

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## Environmental Consequences Habitat – Wetlands/EFH Impacts

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## Environmental Consequences Habitat – Wetlands/EFH Impacts – Taxiway and GA Apron

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## Environmental Consequences Habitat – Wetlands/EFH Impacts – Commercial Apron

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## Environmental Consequences – Wetlands/EFH Impacts UMAM

HABITAT / FLUCFCS CODE	PROPOSED PROJECT – FILL/GRADING	UMAM – FUNCTIONAL LOSS <sup>1</sup>
Mangrove Swamp (FLUCFCS 612)	3.14 acres	-1.777
Saltwater Marshes (FLUCFCS 642)	4.03 acres	-1.923
Salt Ponds/Embayments Not Opening Directly to Gulf (FLUCFCS 542)	0.09 acres	-0.045
Exotic Hardwood Wetlands (FLUCFCS 619)	0.25 acres	-0.058
<b>Total</b>	<b>7.51 acres</b>	<b>-3.803</b>

NOTE:  
1 Calculation of potential impacts associated with the security fence improvements along the north side of the Airport is pending design.

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### Environmental Consequences Federally Protected Species

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	PRELIMINARY EFFECTS
<b>PLANTS</b>			
Florida semaphore cactus	<i>Opuntia corallicola</i>	E	May affect, not likely to adversely affect
Garber's spurge	<i>Chamaesyce garberi</i>	T	May affect, not likely to adversely affect
Cape Sable thoroughwort	<i>Chromolaena frustrata</i>	E	May affect, not likely to adversely affect
<b>REPTILES</b>			
American crocodile	<i>Crocodylus acutus</i>	T	May affect, not likely to adversely affect
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	May affect, not likely to adversely affect
<b>BIRDS</b>			
Piping plover	<i>Charadrius melodus</i>	T	May affect, not likely to adversely affect
Red knot	<i>Calidris canutus rufa</i>	T	May affect, not likely to adversely affect
Roseate tern	<i>Sterna dougalli dougalli</i>	T	May affect, not likely to adversely affect
Wood stork	<i>Mycteria Americana</i>	T	May affect, not likely to adversely affect
<b>MAMMALS</b>			
Silver rice rat	<i>Oryzomys palustris natator</i>	E	May affect, not likely to adversely affect
West Indian manatee	<i>Trichechus manatus</i>	T	May affect, not likely to adversely affect

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### Environmental Consequences State Protected Wildlife Species – Direct Study Area

- State only listed wildlife species – none observed during field surveys
  - Florida Keys mole skink – not likely
  - Florida burrowing owl – not likely
  - Reddish egret – potential
  - Roseate spoonbill – potential
  - Tricolored heron – potential
  - Key silverside – potential
- Habitat mitigation is expected to address potential impacts

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### Mitigation – Wetlands/EFH

Mitigation needs:

HABITAT / FLUCFCS CODE	UMAM – FUNCTIONAL LOSS
Mangrove Swamp (FLUCFCS 612)	-1.777
Saltwater Marshes (FLUCFCS 642)	-1.923
Salt Ponds/Embayments Not Opening Directly to Gulf (FLUCFCS 542)	-0.045
Exotic Hardwood Wetlands (FLUCFCS 619)	-0.058
<b>Total</b>	<b>-3.803</b>

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### Wetlands Mitigation/EFH – Looking for Opportunities

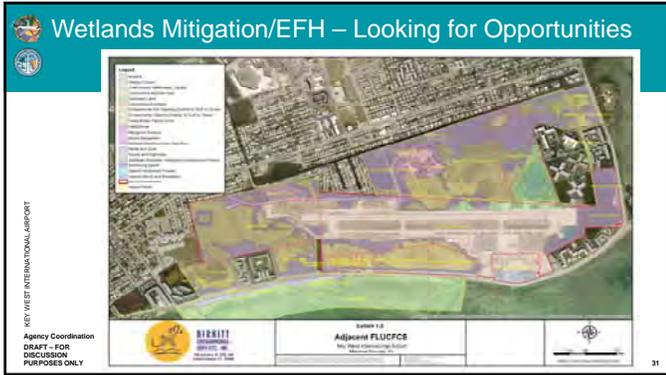
- Mitigation concepts
  - Assess on-site opportunities (extensive mitigation conducted on site for 2003, 2010, 2012, and 2014/2015 projects)
    - Additional habitat enhancement or wetlands creation opportunities?
    - Water quality improvements/connecting open water areas?
    - 0.48-acre Functional Gain from RSA mitigation project?
    - 1-acre site on east end of Runway 9-27 and Roosevelt Blvd?
  - Assess near-by off-site opportunities
  - KERF – possibility?
  - Other ideas?

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EYW EA Monroe County - Biological Resources  
Meeting – Meeting Minutes and Presentation

# Taxiway A Extension, Apron Expansion, and Security Fencing Improvements at Key West International Airport, Environmental Assessment (EA)

June 10, 2020

## Biological Resources Meeting

10:00 a.m. Eastern

19-04-1130-01.06

Murray Nelson Government  
Center, Key Largo, FL

MEETING FACILITATOR: R. Strickland

NOTE TAKER(S): Birkitt/Ricondo

MEETING ATTENDEES	REPRESENTING	EMAIL
Christine Hurley*	Monroe County	Hurley-Christine@monroecounty-fl.gov
Richard Strickland	Key West International Airport	Strickland-Richard@MonroeCounty-FL.Gov
Emily Schemper	Monroe County	Schemper-Emily@MonroeCounty-FL.Gov
Michael Roberts	Monroe County	Roberts-Michael@MonroeCounty-FL.Gov
Mayte Santamaria*	Monroe County	Santamaria-Mayte@MonroeCounty-FL.Gov
John Mafera	McFarland Johnson	jmafera@mjinc.com
Chris Bowker	Jacobs	Christopher.Bowker@jacobs.com
Lisa Reznar	Ricondo & Associates, Inc. (Ricondo)	lreznar@ricondo.com
Beverly Birkitt	Birkitt Environmental Services, Inc. (Birkitt)	bbirkitt@birkitt.com
Robert Toth	Birkitt	rtoth@birkitt.com

\*Attendee joined via web meeting.

## SUMMARY OF MEETING DISCUSSION

As part of a discussion of proposed development projects at Key West International Airport (EYW), the Environmental Assessment (EA) Consultant Team presented information on a set of projects that are the subject of an EA being prepared pursuant to the National Environmental Policy Act (NEPA). The projects are the extension of Taxiway A, expansion of aircraft aprons, and construction of security fencing. The presentation (see **Attachment**) included discussion of the EA process and agency coordination, existing conditions of biological resources, and potential impacts to biological resources due to project implementation. The FAA is the lead federal agency for the EA. The EA Consultant Team opened up the conversation to Monroe County representatives to solicit input on the potential project impacts and mitigation strategies.

The following items regarding the EA projects were discussed:

- It was clarified that per the County's Comprehensive Plan (Comp Plan), if no feasible alternative is available, mitigation is appropriate for hammock habitat, but it does not allow for mitigation for mangrove forests. Therefore, because mangrove wetlands would be impacted by the proposed airport improvements, the Comp Plan must be amended before the County can issue a permit.

- M. Santamaria will draft a schedule for the Comp Plan amendment, based on a July 1 date for submittal of the Comp Plan amendments.
- For purposes of County review, M. Roberts requested that the County habitat layer be used to quantify project impacts in addition to the Florida Land Use, Cover and Forms Classification System (FLUCFCS). He initially requested that habitat quality scoring use the Keys Wetland Evaluation Procedure (KEYWEP) in addition to the Uniform Mitigation Assessment Method (UMAM). However, he agreed that KEYWEP would not apply to the proposed mangrove impacts.
- M. Roberts confirmed that the silver rice rat is not documented as occurring on Airport property. Birkitt was requested to check for marsh rabbit habitat, as this is an issue in the Lower Keys. Habitat is available on Boca Chica.
- The County is not aware of any sensitive plant habitat on Airport property.
- For on-site mitigation consider flushing opportunities and exotic removal programs.
- Initial ideas for potential off-site mitigation opportunities were identified by the County:
  - Cudjoe Key has a small fill road in wetlands habitat in the middle of the community. The County has not calculated the UMAM score to quantify the lift associated with this habitat restoration project.
  - Island north of Big Coppitt Key (Monkey Island, zoned for research) that is not connected to the Overseas Highway may present opportunities.
  - Island north of Shark Key (mile marker 12), partially owned by Audubon, may present opportunities.
  - Property on Stock Key, owned by Toppino family, is a potential preservation area that may need some enhancements, such as exotics removal.
  - North end of Boca Chica has experienced extensive disturbance and 2 parcels and canal (privately owned) may present an opportunity for lift.
  - Upper Sugarloaf Key, loop road that is part of large Johnson tract. The County may already own the road.
- Next steps to expand and refine list of potential mitigation sites:
  - County will prepare a GIS map of County-owned parcels with wetland habitat.
  - Beth Bergh, County land steward, would be a good contact to identify wetland parcels owned by the County that may offer mitigation opportunities. M. Roberts will coordinate with Ms. Bergh.
  - County to share additional opportunities with Birkitt, if identified.
- M. Santamaria and L. Reznar to coordinate on the land use assurance letter. Additionally, R. Strickland to coordinate with Greg Vallez regarding City of Key West's adoption of Section 333.
- The fencing project is not consistent with the Comp Plan and would need to be addressed through an amendment.

## ACTION ITEMS LIST

DATE OPENED	DESCRIPTION	RESPONSIBLE PARTY	RESOLUTION
6/10/20	Draft schedule for the Comp Plan amendment based on a July 1 date for submittal of the Comp Plan amendments.	M. Santamaria	
6/10/20	Prepare GIS map of County-owned parcels with wetland habitat	E. Schemper, M. Roberts	
6/10/20	M. Roberts to coordinate with Beth Bergh; to discuss potential wetland parcels owned by the County that may offer mitigation opportunities.	E. Schemper	
6/10/20	Send Monroe County example land use assurance language.	L. Reznar	
6/10/20	Prepare draft land use assurance letter.	Monroe County	

### ATTACHMENTS:

Presentation

### DISTRIBUTION:

19-04-1130

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**Monroe County Coordination**  
 Key West International Airport  
 Biological Resources Meeting  
 June 10, 2020  
 FBO Access Road  
 Proposed Taxiway A Extension, Apron Expansion, and Security Fencing Improvements

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### Agenda

*Note: This PDF includes slides supporting discussion of the EYW EA projects. See highlighted agenda items below.*

- Introduction
- Ongoing Projects
  - EYW Master Plan
  - EYW FBO Access Road Project
- EYW EA Proposed Action – Taxiway A Extension, Apron Expansion, Security Fencing
- Existing Conditions and Preliminary Impacts
- Mitigation
- Comprehensive Plan Amendments
- Questions and Discussion

**PROJECT SPONSOR**  
Key West International Airport

**MASTER PLAN TEAM**  
Jacobs  
Ricordo & Associates, Inc.

**FBO ACCESS ROAD TEAM**  
McFarland Johnson, Inc.  
Birkitt Environmental Services, Inc.

**EA TEAM**  
Jacobs  
Ricordo & Associates, Inc.  
Birkitt Environmental Services, Inc.

**COMPREHENSIVE PLAN TEAM**  
McFarland Johnson, Inc.

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### EYA Taxiway A Extension, Apron Expansion, and Security Fencing Project - EA

Monroe County Coordination

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### EYW Taxiway A Extension, Apron Expansion, and Security Fencing Project

**Meeting Goals**

- Confirmation of approach on next steps to review impacts and identify mitigation opportunities.
- Follow-up call with County staff to review impacts and mitigation opportunities in more detail.
- Land Use Assurance Letter

**PROJECT SPONSOR**  
Key West International Airport

**EA TEAM**  
Jacobs  
Ricordo & Associates, Inc.  
Birkitt Environmental Services, Inc.

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### Proposed Action of EYW EA

**LEGEND:**  
 - - - Proposed New Fence  
 - - - Existing Fence  
 - - - Proposed Relocation of Existing Fence  
 - - - Taxiway Object Free Area (TOFA)  
 - - - Runway Object Free Area (ROFA)  
 - - - Airport Property Line  
 - - - Proposed Pavement  
 - - - Pavement to be Removed  
 - - - Area to be Graded

**Connected Project**  
 Remove excess pavement on Taxiway B

**Taxiway A Extension**  
 Construct 274-foot long taxiway extension to provide access to the Runway 9 end of pavement for departing aircraft

**Connected Project**  
 Relocate a Vehicle Service Road on the airfield

**General Aviation Apron**  
 Expand the apron to provide overflow parking for general aviation aircraft

**Commercial Apron**  
 Expand the commercial apron

**Security Fencing**  
 Relocate security fencing along north boundary of Airport

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### Environmental Review Process and Agency Coordination for EA Proposed Action

**SCOPING LETTERS AND SCOPING MEETINGS**

**SURVEYS, BASELINE CONDITIONS, and IMPACT ANALYSES**

**July 2019 – October 2019**  
**DOCUMENTATION – DRAFT ENVIRONMENTAL ASSESSMENT**

**July 2020 – Early Fall 2020**  
**PUBLIC AND AGENCY COMMENT PERIOD**

**Fall 2020**  
**RESPONSE TO COMMENTS AND REVISIONS**

**Final 2020**  
**DOCUMENTATION – FINAL ENVIRONMENTAL ASSESSMENT**

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**EA Proposed Action**  
Affected Environment – Existing Conditions  
Monroe County Coordination

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**EA Proposed Action**  
Affected Environment Methodology

LITERATURE REVIEW	
FNAI Element Occurrence Report	FLUCFCS database
FWC Eagle Nest Locator	USFWS NWI
FWC Imperiled Species Management Plan	USFWS IPAC
FWRI Habitats and Wildlife data base	Monroe County Property Appraisers Website
USFWS ECOS	Monroe County Land Development Code
USGS NRCS Web Soil Survey	Monroe County Year 2030 Comprehensive Plan
NMFS – NOAA	State and Federal Rules and Regulation
USFWS Wood Stork CFA and Rookery Data	Aerial imagery
FEMA Biological Opinion	

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**EA Proposed Action**  
Affected Environment Methodology – Continued

AGENCY COORDINATION	FIELD INVESTIGATION
Scoping Letters • August 2019	Biological Study Area • September 17-19, 2019 □ Pedestrian Qualitative Survey
Scoping Meeting • September 19, 2019	Direct Study Area • September 17-19, 2019 □ Pedestrian Qualitative Survey □ UMAM Evaluations of Wetlands
Biological Resources Web-Based Meeting • State/Federal Agency Conference Call – April 27, 2020	
Biological Resources Meeting • Monroe County Meeting – May 28, 2020 • Monroe County Work Session – June 10, 2020	

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**EA Proposed Action**  
Affected Environment – Existing Conditions  
Habitat – Direct Study Area

LEGEND  
 Direct Study Area  
 Airports  
 Disturbed Land  
 Embayments Not Opening Directly to Gulf or Ocean  
 Mangrove Swamp  
 Saltwater Marshes  
 Exotic Wetlands/Hardwoods (Wetland Brazilian Pepper)  
 Brazilian Pepper (Openings)

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**EA Proposed Action**  
Affected Environment  
Habitat – Direct Study Area

FLUCFCS CODES	DESCRIPTION	ACRES WITHIN DIRECT STUDY AREA
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Wetlands		
612 – Mangrove Swamp	E2FO3N – Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded	8.0
642 – Saltwater Marshes	E2EM1 – Estuarine, Intertidal, Emergent, Persistent	6.5
542 – Embayments Not Opening Directly to Gulf or Ocean	E1UB2 – Estuarine, Subtidal, Unconsolidated Bottom, Sand	6.3
619 – Exotic Wetland Hardwoods (Wetland Brazilian Pepper)	E2FO3P – Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Irregularly Flooded	0.3
Total Acres of Habitats within the Direct Study Area		30.6

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**Affected Environment**  
Federally Listed Wildlife Species – Direct Study Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT	OBSERVED WITHIN DIRECT STUDY AREA
American crocodile	<i>Crocodylus acutus</i>	T	Brackish or saltwater areas	No
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	Scrub, sandhill, wet prairie, mangrove swamp	No
Piping plover	<i>Charadrius melodus</i>	T	Open, sandy beaches, and tidal mudflats	No
Red knot	<i>Calidris canutus rufa</i>	T	Tidal flats and coastlines	No
Roseate tern	<i>Sterna dougalli dougalli</i>	T	Nests over bare limestone and shell-sand beaches, forages in open water	No
Wood stork	<i>Mycteria americana</i>	T	Nests in forested wetlands, forages in marshes, swamps, and tidal creeks	No, not in CFA
Silver rice rat	<i>Oryzomys palustris natator</i>	E	Transition from upland to marine communities	No, not in SFA, SBA or RE
West Indian manatee	<i>Trichechus manatus</i>	T	Coastal waters, bays, and rivers	No

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### Affected Environment Federally Listed Plant Species – Direct Study Area

COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS	HABITAT	OBSERVED WITHIN DIRECT STUDY AREA
Florida semaphore cactus	<i>Opuntia corallicola</i>	E	Rocky hammocks, coastal barrens	No
Garber's spurge	<i>Chamaesyce garberi</i>	T	Pine rocklands, coastal berm, coastal grasslands	No
Cape Sable thoroughwort	<i>Chromolaena frustrata</i>	E	Coastal rock barrens and berms, sunny edges of rockland hammock	No

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### Environmental Consequences State Protected Wildlife Species – Direct Study Area

- Six species of potentially occurring state listed wildlife
- State only listed wildlife species – none observed
  - Florida Keys mole skink
  - Florida burrowing owl
  - Reddish egret
  - Roseate spoonbill
  - Tricolored heron
  - Key silverside

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### EA Proposed Action Environmental Consequences – Future Conditions

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### Environmental Consequences Land Use/Vegetative Cover/EFH Impacted Direct Study Area

LAND USE / VEGETATIVE COVER	FLUCFCS CODE	FWS CLASSIFICATION	PROPOSED FILL (ACRES) <sup>1</sup>
<b>WETLANDS</b>			
Mangrove Swamp	612	E2F03N - Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Regularly Flooded	3.14
Saltwater Marshes	642	E2EM1 - Estuarine, Intertidal, Emergent, Persistent	4.03
Salt Ponds/Embayments Not Opening Directly to Gulf or Ocean	542	E1UB2 - Estuarine, Subtidal, Unconsolidated Bottom, Sand	0.09
Exotic Wetland Hardwoods (Wetland Brazilian Pepper)	619	E2F03P - Estuarine, Intertidal, Forested, Broad-leaved Evergreen, Irregularly Flooded	0.25
<b>Total</b>			<b>7.51</b>

NOTE:  
1 Calculation of potential impact of proposed security fence improvements along the north side of the Airport is pending design.

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### Environmental Consequences Habitat – Wetlands/EFH Impacts

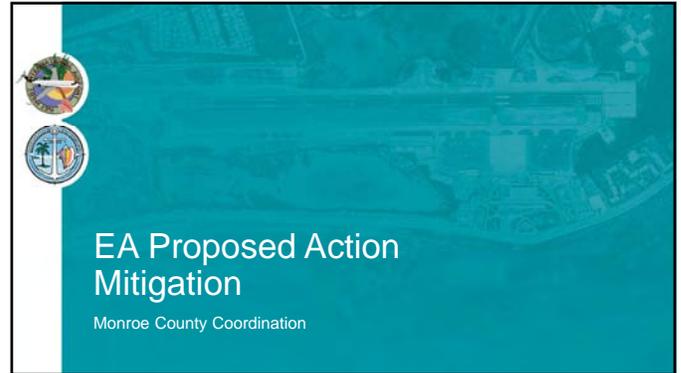
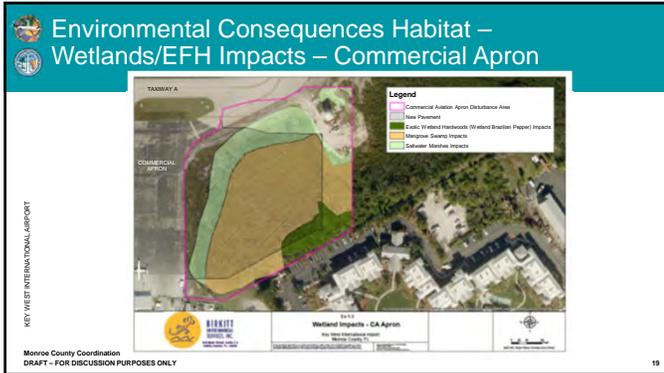
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### Environmental Consequences Habitat – Wetlands/EFH Impacts – Taxiway and GA Apron

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### EA Proposed Action Mitigation – Wetlands/EFH

Mitigation needs:

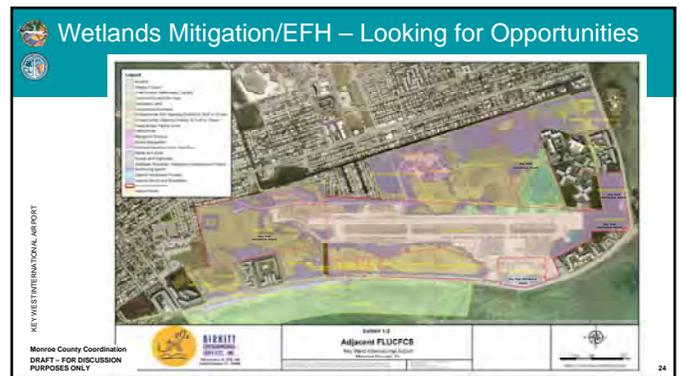
HABITAT / FLUCFCS CODE	UMAM – FUNCTIONAL LOSS
Mangrove Swamp (FLUCFCS 612)	-1.777
Saltwater Marshes (FLUCFCS 642)	-1.923
Salt Ponds/Embayments Not Opening Directly to Gulf (FLUCFCS 542)	-0.045
Exotic Hardwood Wetlands (FLUCFCS 619)	-0.058
<b>Total</b>	<b>-3.803</b>

KEY WEST INTERNATIONAL AIRPORT

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- ### Wetlands Mitigation/EFH – Looking for Opportunities
- Mitigation concepts
    - Assess on-site opportunities (extensive mitigation conducted on site for 2003, 2010, 2012, and 2014/2015 projects)
      - Additional habitat enhancement or wetlands creation opportunities?
      - Water quality improvements/connecting open water areas?
      - 0.48-acre Functional Gain from RSA mitigation project?
      - Site on east end of Runway 9-27 and Roosevelt Blvd?
  - Assess near-by off-site opportunities
  - KERF? – not for SFWMD
  - Other ideas?
- KEY WEST INTERNATIONAL AIRPORT
- Monroe County Coordination  
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## **ATTACHMENT B**

EYW Representative Photographs – September 2019

Key West International Airport – Biological Assessment  
Representative Photographs – September 2019



Photo 1 – Mangrove and saltwater marsh habitat within Wetland 1.



Photo 2 – Additional photograph of mangrove and saltwater marsh habitat within Wetland 1.

Key West International Airport – Biological Assessment  
Representative Photographs – September 2019



Photo 3 – Culvert connecting Wetland 1 and Wetland 2.



Photo 4 – Mangrove habitat within Wetland 2.

Key West International Airport – Biological Assessment  
Representative Photographs – September 2019



Photo 5 – Mangrove habitat with saltwater marsh periphery in Wetland 2.



Photo 6 – Saltwater marsh periphery of Wetland 2.

Key West International Airport – Biological Assessment  
Representative Photographs – September 2019



Photo 7 – Mangrove habitat within Wetland 3.



Photo 8 – Saltwater marsh periphery of Wetland 3.

Key West International Airport – Biological Assessment  
Representative Photographs – September 2019



Photo 9 – Brazilian pepper habitat adjacent to Wetland 3.



Photo 10 – Mangrove and saltwater marsh habitat within Wetland 4.

Key West International Airport – Biological Assessment  
Representative Photographs – September 2019



Photo 11 – Looking north at northern salt pond.



Photo 12 – Mangrove periphery of northern salt pond.

# **ATTACHMENT C**

Florida Natural Areas Inventory (FNAI)

Element Occurrence Report



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850-224-8207  
fax 850-681-9364  
www.fnai.org

August 13, 2019

Rob Toth  
Birkitt Environmental Services, Inc  
126 3rd Ave, N Ste 104  
Safety Harbor, FL 34695

Dear Mr. Toth,

Thank you for requesting information from the Florida Natural Areas Inventory (FNAI). At your request we have produced the following report for your project area.

The purpose of this Standard Data Report is to provide objective scientific information on natural resources located in the vicinity of a site of interest, in order to inform those involved in project planning and evaluation. This Report makes no determination of the suitability of a proposed project for this location, or the potential impacts of the project on natural resources in the area.

**Project:** Key West International Expansion  
**Date Received:** 08/02/19  
**Location:** Monroe County

### Element Occurrences

A search of our maps and database indicates that we currently have several element occurrences mapped in the vicinity of the study area (see enclosed map and element occurrence 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.

### Federally Listed Species

Our data indicate federally listed species are present on or very near this site, specifically *Chelonia mydas* and *Caretta caretta* (see enclosed map and tables for details). This statement should not be interpreted as a legal determination of presence or absence of federally listed species on a property.

*The element occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates that some element occurrences occur in the general vicinity of the label point. This may be due to lack of precision of the source data, or an element that occurs over an extended area (such as a wide ranging species or large natural community). 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 which may no longer be extant. Extirpated element occurrences will be marked with an 'X' following the occurrence label on the enclosed map.*



Florida Resources  
and Environmental  
Analysis Center

Institute of Science  
and Public Affairs

The Florida State University

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 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

*Tracking Florida's Biodiversity*

*data about these species or communities without consent from the Inventory. If you have any questions concerning this please do not hesitate to call.*

### **Likely and Potential Rare Species**

In addition to documented occurrences, other rare species and natural communities may be identified on or near the site based on habitat models and species range models (see enclosed Biodiversity Matrix Report). These species should be taken into consideration in field surveys, land management, and impact avoidance and mitigation.

*FNAI habitat models indicate areas, which based on land cover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Habitat models have been developed for approximately 300 of the rarest species tracked by the Inventory, including all federally listed species.*

*FNAI species range models indicate areas that are within the known or predicted range of a species, based on climate variables, soils, vegetation, and/or slope. Species range models have been developed for approximately 340 species, including all federally listed species.*

*The FNAI Biodiversity Matrix Geodatabase compiles Documented, Likely, and Potential species and natural communities for each square mile Matrix Unit statewide.*

### **CLIP**

The enclosed map shows natural resource conservation priorities based on the Critical Lands and Waters Identification Project. CLIP is based on many of the same natural resource data developed for the Florida Forever Conservation Needs Assessment, but provides an overall picture of conservation priorities across different resource categories, including biodiversity, landscapes, surface waters, and aggregated CLIP priorities (that combine the individual resource categories). CLIP is also based primarily on remote sensed data and is not intended to be the definitive authority on natural resources on a site.

For more information on CLIP, visit <http://www.fnai.org/clip.cfm> .

### **Managed Areas**

Portions of the site appear to be located within the Monroe County Managed Areas, managed by the Monroe County and within the Little Hamaca Park managed by the City of Key West.

*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.*

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

Please visit [www.fnai.org/trackinglist.cfm](http://www.fnai.org/trackinglist.cfm) for county or statewide element occurrence distributions and links to more element information.

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 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. **The maps contain sensitive environmental information, please do not distribute or publish without prior consent from FNAI.** FNAI data may not be resold for profit.

Thank you for your use of FNAI services. An invoice will be mailed separately. If I can be of further assistance, please contact me at (850) 224-8207 or at [kbrinegar@fnai.fsu.edu](mailto:kbrinegar@fnai.fsu.edu).

Sincerely,

*Kerri Brinegar*

Kerri Brinegar  
GIS / Data Services

Encl

# Key West International Expansion

Site boundaries are approximate.

Monroe County



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- Element Occurrences**
- Animals
  - Plants
  - Communities
  - Other
  - Data Sensitive
- Point Indicates General Vicinity of Element
- U.S. Fish & Wildlife Service  
Scrub Jay Survey 1992-96

- Conservation Lands**
- Federal
  - State
  - Local
  - Private
  - State Aquatic Preserves
- Land Acquisition Projects**
- Florida Forever
  - Board of Trustees Projects
- FNAI Rare Species Habitat
- FNAI Biodiversity Matrix Square Mile Units
- County Boundary
- Roads
- Water

**NOTE**  
This map contains environmentally sensitive information. Please do not distribute or publish without prior consent from FNAI. Map should not be interpreted without accompanying documents.



Map produced by KAB  
8/13/2019

# Key West International Expansion

Site boundaries are approximate.

Monroe County



CLIP Biodiversity Resource Priorities



CLIP Landscape Resource Priorities



CLIP Surface Water Resource Priorities



CLIP Aggregated Resource Priorities





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**CLIP v4.0 Resource Priorities**

**Biodiversity Resource Category**

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

**Landscape Resource Category**

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

**Surface Water Resource Category**

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

**Aggregated CLIP Priorities**

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Site Boundary

*Map should not be interpreted without accompanying documents.*

Critical Lands and Waters Identification Project (CLIP) is a cooperative effort between the FSU Florida Natural Areas Inventory, UF Center for Landscape Conservation Planning, and FL Fish & Wildlife Conservation Commission, with additional funding from FL Dept of Environmental Protection and US Fish & Wildlife Service.



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**FNAI ELEMENT OCCURRENCE REPORT on or near**  
**Key West International Airport**



Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
ALLIMISS*50	<i>Alligator mississippiensis</i>	American Alligator	G5	S4	SAT	FT(S/A)	1986-01-09	PONDS IN HAMMOCK AT BOTANICAL GARDENS AND AT GOLF COURSE.	GOOD POPULATION OF 8-10 ADULTS AND MANY YOUNG (LAZELL). FIVE SPECIMENS FROM "KEY WEST" IN USN.
ATAESCAB*1	<i>Ataenius scabrellus</i>	An Ataenius Beetle	G5	S1	N	N	1968-08-09	1968-08-09: No description given (B73WOO01FLUS).	1994-Pre: This species was collected (B94DEY01FLUS). 1968-08-09: Seven specimens were collected by F.A. Buchanan using a blacklight trap (B73WOO01FLUS).
ATAEWENZ*11	<i>Ataenius wenzelii</i>	An Ataenius Beetle	G3G5	S2S3	N	N	1968-05-21	1968-05-21: No description given (B73WOO01FLUS).	1968-05-21:(Stock Island) A total of fifty-nine specimens were collected from February to December (1958-1968) by various collectors using black light traps (B73WOO01FLUS). 1961-01-27: ( Key West) A total of 7 specimens were collected by C.A. Bennett using black light traps (B73WOO01FLUS). 1960-11-26: (Key West) A total of 2 specimens were collected by C.A. Bennett using black light traps (B73WOO01FLUS). 1960-05-15: (Key West) One specimen was collected by C.A. Bennett using black light traps (B73WOO01FLUS). 1960-04-28: (Key West) One specimen was collected by C.A. Bennett using black light traps (B73WOO01FLUS). no year-07-08: (Key West) A total of five specimens were collected by Ben Niren using a mosquito light trap (B73WOO01FLUS).
BIRDROOK*137	Bird Rookery		G5	SNR	N	N	1987-06-09	No general description given	1987: HOVIS REPORTS 3 BREEDING PAIRS OF STERNA ANTILLARUM USING SPOIL/FILL NEST SUBSTRATE ON 9 JUNE.



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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
BOURRADU*1	<i>Bourreria radula</i>	rough strongbark	G2?	S1	N	E	1992-11-24	HAMMOCKS, DRY THICKETS, SMALL ROCKLAND HAMMOCK DOMINATED BY METOPIUM TOXIFERUM, REYNOSIA SEPTENTRIONALIS, GAUIPIRA DISCOLOR, CONOCARPUS ERECTA, COCCOLOBA UVIFERA, EUGENIA MYRTIODES, MANIKARA BAHAMENCE, ERITHALIS FRUTICOSA, XIMENIA AMERICANA. HAMMOCK GRADES E AND NE INTO BUTTONWOOD ECOTONE WITH MANGROVES (UNDHIL02FL).	J.K. SMALL SPECIMEN #10205 COLLECTED 14 DEC 1921 (FLAS #28109). ERDMAN WEST SPECIMEN #? COLLECTED 15 DEC 1937 (FLAS #28438). A.H. CURTISS SPECIMEN #5427 COLLECTED 21 JUNE 1895 (FLAS #20847). FIVE MATURE TREES, ALL IN FRUIT (FRUIT RED-ORANGE) SCATTERED IN HAMMOCK ALONG TRAIL CA. 25 METERS S OF RIVIERA CANAL (UNDHIL02FL).
BOURRADU*2	<i>Bourreria radula</i>	rough strongbark	G2?	S1	N	E	1986-03-21	1986-02-10: IN REMNANT HAMMOCK AREA (A. WILLIAMS).	SEVERAL MATURE TREES IN FRUIT, NO SEEDLINGS SEEN (R. HILSENBECK). 1986-02-10: A SHRUB; 1 SPECIMEN TAKEN (FERTILE) (A. WILLIAMS).



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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
BOURRADU*3	<i>Bourreria radula</i>	rough strongbark	G2?	S1	N	E	1993-03-28	This roughly triangular site is approximately 8 acres in extent and consists primarily of rather early successional Rockland Hammock vegetation growing on a thin marl soil. The hammock intergrades to the east into Coastal Rock Barren and mixed mangrove Tidal Swamp. The hammock canopy is rather structurally uniform with limited vertical development and no distinct layering. The average vegetation height ranges between 2 and 3m. The floristic composition of the community is relatively diverse, composed primarily of Poisonwood, Buttonwood, Blolly, Jamaica Dogwood, Spanish Stopper, Joewood, Erithalis, Wild Dilly and Rhacoma. The hammock is transected in several areas by heavily used foot trails and several old road cuts. Recent vegetational management, such as removing exotic plants, mulching and introducing native species is evident. Along the hammock margins on shallower marls is a well developed Buttonwood dominated Coastal Rock Barren with substantial populations of Sea-Ox Eye Daisy, Joewood and Salt Grass. Several populations of EO's present.	An small population consisting of several (2) reproductives averaging 4m in height and many seedlings and saplings scattered rather widely throughout the site. In relation to the overall size of the site, it occurs with low frequency, but the overall population structure is favorable, being heavily skewed toward expansion with several vigorous subadult cohorts present. Overall, the population consists of an estimated 50 individuals, primarily seedling and sapling age classes. There has been some loss to the population due to trampling.



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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
CARECARE*35	<i>Caretta caretta</i>	Loggerhead Sea Turtle	G3	S3	T	FT	2012	Beaches and dunes along the Florida Keys.	Nesting beaches in the Keys of the Southeast Florida genetic subunit as defined by Shamblyn et al. (2011) (A11SHA01FLUS). This includes all observed and likely habitat from Key West to Lower Matecumbe Key. From 2008-2012, annual nesting density ranged from 0.27 to 12.75 nests per km; the highest nesting densities were on Key West (Fort Zachary Taylor State Park) and the west end of Long Key (U13FWC01FLUS).
CESOIRV*1	<i>Cesonia irvingi</i>	Keys Gnaphosid Spider	GNR	S1	N	N	1994 pre	1994-pre: Description was not given (B94DEY01FLUS).	1994-pre: This spider is only known from Florida Keys (Key West), Bimini, and Bahamas (B94DEY01FLUS).
CHAMGAR*41	<i>Chamaesyce garberi</i>	Garber's spurge	G1	S1	T	E	2007-08-16	No general description given	2007-08-16: extirpated (U07GRE01FLUS).
CHAMPORT*25	<i>Chamaesyce porteriana</i>	Porter's broad-leaved spurge	G2	S2	N	E	1986-03-21	No general description given	VERY RARE IN LOW HAMMOCK AREAS. EVIDENCE OF SCALE INSECTS PRESENT.
CHAMPORT*28	<i>Chamaesyce porteriana</i>	Porter's broad-leaved spurge	G2	S2	N	E	1992-11-24	SMALL ROCKLAND HAMMOCK DOMINATED BY METOPIUM TOXIFERUM, REYNOSIA SEPTENTRIONALIS, GUAPIRA DISCOLOR, CONOCARPUS ERECTA, COCCOLOBA UVIFERA, EUGENIA MYRTOIDES, CROSSOPETALUM RHACOMA, MANILKARA BAHAMENSIS, ERITRALIS FRUTICOSA, AND XIMENIA AMERICANA. HAMMOCK GRADES E AND NE INTO BUTTONWOOD ECOTONE (I.E., COASTAL ROCK BARREN) AND MANGROVES (I.E., MARINE TIDAL SWAMP).	AT LEAST 15 INDIVIDUALS SCATTERED OVER OPEN LIMESTONE NEAR DISTURBED EDGE AT S AREA OF HAMMOCK.



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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
CHAMPOR*29	<i>Chamaesyce porteriana</i>	Porter's broad-leaved spurge	G2	S2	N	E	1993-03-28	This roughly triangular site is approximately 8 acres in extent and consists primarily of rather early successional Rockland Hammock vegetation growing on a thin marl soil. The hammock intergrades to the east into Coastal Rock Barren and mixed mangrove Tidal Swamp. The hammock canopy is rather structurally uniform with limited vertical development and no distinct layering. The average vegetation height ranges between 2 and 3m. The floristic composition of the community is relatively diverse, composed primarily of Poisonwood, Buttonwood, Blolly, Jamaica Dogwood, Spanish Stopper, Joewood, Erithalis, Wild Dilly and Rhacoma. The hammock is transected in several areas by heavily used foot trails and several old road cuts. Recent vegetational management, such as removing exotic plants, mulching and introducing native species is evident. Along the hammock margins on shallower marls is a well developed Buttonwood dominated Coastal Rock Barren with substantial populations of Sea-Ox Eye Daisy, Joewood and Salt Grass. Several populations of EO's present.	An abundant population restricted to the marl soils along the northern and southern ecotonal fringes of the site. In relation to the overall size of the site, it occurs with high frequency, but the population is limited in extent and there appears to be limited area available for future colonization. Overall, the estimated population consists of over 500 individuals, of all age classes. Mature plants average 25 cm. in height. Mature individuals are flowering and about 10% are in early fruit. There has been some loss to the population due to trampling and some plants have been partially covered over by mulch.
CHELMYDA*13	<i>Chelonia mydas</i>	Green Sea Turtle	G3	S2S3	T	FT	2012	Beaches and dunes on multiple islands (keys) extending south and west from the tip of mainland Florida. Some islands support development whereas others are protected natural areas.	Observed and likely nesting beaches from Dry Tortugas to Bahia Honda State Park. From 2008-2012, the surveyed beaches had annual nesting densities ranging from 0.08 to 115.63 nests per km; the highest nesting densities were on East Key and Loggerhead Key in the Dry Tortugas (U13FWC01FLUS).



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 Key West International Airport**



Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
CHONDENT*11	<i>Chondropoma dentatum</i>	Crenulate Horn	G2G3	S2?	N	N	1980-09-24	1980-09-24: No description given (WPDFLO01FLUS).	1980-09-24: This species was collected by F. G. Thompson (WPDFLO01FLUS). 1980-08-16: This species was collected by J. E. Deisler somewhere in the Key West Botanical Gardens (WPDFLO01FLUS). 1980-07-13: This species was collected by F. G. Thompson in "botanical gardens" (WPDFLO01FLUS). 1980-07-12: This species was collected by F. G. Thompson in the "municipal golf course, at 5th street" and "0.2 miles west Key West bridge" (WPDFLO01FLUS). 1980-07-11: This species was collected by F. G. Thompson (WPDFLO01FLUS). 1930-08-10: This species was collected on Stock Island by an unknown collector (WPDFLO01FLUS)
COCHPOEY*6	<i>Cochlodinella poeyana</i>	Truncate Urocoptid	G1G2	S1S2	N	N	1998 pre	1998-Pre: None given (WPDFLO01FLUS).	1998-Pre: There are five undated records for this species from Key West, with H.H. Hemphill being listed as the collector for one record (WPDFLO01FLUS).



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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
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CROSRHAC*11	<i>Crossopetalum rhacoma</i>	rhacoma	G5	S3	N	T	1993-03-28	This roughly triangular site is approximately 8 acres in extent and consists primarily of rather early successional Rockland Hammock vegetation growing on a thin marl soil. The hammock intergrades to the east into Coastal Rock Barren and mixed mangrove Tidal Swamp. The hammock canopy is rather structurally uniform with limited vertical development and no distinct layering. The average vegetation height ranges between 2 and 3m. The floristic composition of the community is relatively diverse, composed primarily of Poisonwood, Buttonwood, Blolly, Jamaica Dogwood, Spanish Stopper, Joewood, Erithalis, Wild Dilly and Rhacoma. The hammock is transected in several areas by heavily used foot trails and several old road cuts. Recent vegetational management, such as removing exotic plants, mulching and introducing native species is evident. Along the hammock margins on shallower marls is a well developed Buttonwood dominated Coastal Rock Barren with substantial populations of Sea-Ox Eye Daisy, Joewood and Salt Grass. Several populations of EO's present.	An abundant population consisting of numerous reproductives averaging 2.5m in height with many seedlings and saplings scattered rather widely throughout the site. In relation to the overall size of the site, it occurs with high frequency, and has a favorable population structure, being skewed toward expansion with large subadult cohorts present. Overall, the population consists of an estimated 250 individuals, including seedling and sapling age classes. There has been some loss to the population due to trampling. Approximately 30% of mature individuals are in flower and 10% in early fruit.



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CROSRHAC*6	<i>Crossopetalum rhacoma</i>	rhacoma	G5	S3	N	T	1992-11-24	SMALL ROCKLAND HAMMOCK DOMINATED BY METOPIUM TAXIFERUM, REYNOSIA SEPTENTRIONALIS, GUAIPIRA DISCOLOR, CONOCARPUS ERECTA, COCCOLOBA UVIFERA, EUGENIA MYRTOIDES, CROSSAPETALUM RHACOMA, MANILKARA BAHAMENSIS, ERITRALIS FRUITICOSA, AND XIMENIA AMERICANA. HAMMOCK GRADES E AND NE INTO BUTTONWOOD ECOTONE (I.E., COASTAL ROCK BARREN) AND MANGROVES (I.E., MARINE TIDAL SWAMP).	50-100 MATURE (8'-10' TALL) SMALL TREES THAT ACTUALLY FORM PART OF THE CANOPY OF THIS SMALL, LOW STATURE HAMMOCK. THE SPECIES IS AS ABUNDANT HERE AS PROBABLY ANY OTHER LOCATION IN FLORIDA.
CTENSTIG*9	<i>Ctenogobius stigmaturus</i>	Spottail Goby	G2	S2	N	N	1930 pre?	1930-PRE?: inshore marine (shallows) (A32GIN01FLUS).	1930-PRE?: Ginsburg (1932) reported species as fairly common at Key West, where it could be taken by seining the shallows; specimens in USNM (including Holotype?) (A32GIN01FLUS).
CYCLMIAM*1	<i>Cyclocephala miamiensis</i>	Miami Chafer Beetle	G1?	S1?	N	N	1994 pre	1994-Pre: No description given (B94DEY01FLUS).	1994-Pre: This species was collected at this site (B94DEY01FLUS).
DS*16221	<i>Data Sensitive Element</i>	Data Sensitive	G4?	S1	N	E	1984-06-01	Data Sensitive	Data Sensitive
DS*23913	<i>Data Sensitive Element</i>	Data Sensitive	G2	S1	N	E	1977-04-02	Data Sensitive	Data Sensitive
DS*26060	<i>Data Sensitive Element</i>	Data Sensitive	G2T1	S1	T	FT	1997	Data Sensitive	Data Sensitive
EPARZEST*1	<i>Epargyreus zestos</i>	Zestos Skipper	G4	SX	N	N	2004-01-24	2013-05-23: No observations have been made of this butterfly by any FNAI scientists. This record was entered into the FNAI database to document the FNAI "Extirpated" ranking for this species. When present in the past, the Zestos Skipper was a forest butterfly that often perched on the underside of leaves. Forest and trail edges with flower and nectar sources were good locations for finding this butterfly (R12MIN01FLUS).	2012-09: No individuals of this species have been seen since 2004 (R12MIN01FLUS). 2004-01-24: One adult seen at the Key West Tropical Forest and Botanical Garden on Stock Island (R12MIN01FLUS). 1986-05-15: At least one female specimen collected (R12MIN01FLUS). 1983-07-31: At least one male specimen collected (R12MIN01FLUS).



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EUGERHOM*7	<i>Eugenia rhombea</i>	red stopper	G5	S1	N	E	1966-08-07	[Hammock.]	1954-08-31: Mapped centroid: Specimen taken [fruiting branch] (Killip). 1966-08-07: Specimen taken [flowering branch] (Long et al). 1963-09-18: Specimen taken [fruiting] (Popenoe). 1954-08-31: Small tree in hammock remnant; specimen taken [sterile] (Thorne).
GAMBRHIZ*15	<i>Gambusia rhizophorae</i>	Mangrove Gambusia	G3	S3	N	N	1977	Tidal creek.	Getter collected species here between 1973-1977 (UNDGET01FLUS, Table 6).
KINOPOP1*11	<i>Kinosternon baurii</i> pop. 1	Striped Mud Turtle, Lower Keys Population	G5T1Q	S1	N	N	1900	Mostly urbanized development, with some freshwater ponds in area.	1985: none found by Lazell, who thought that population may be extirpated although likely habitat (freshwater ponds) still existed around Key West International Airport (PNDLAZ01FLUS). 1930s: Carr failed to find species on Key West, suspected population was long extirminated (A40CAR01FLUS). Two older museum specimens collected from "Key West" by Warner (UF 7105-6) (FNAI note: but some older collectors also used this to include Stock Island). Others also only restricted to Key West (see Specimens field). Additional Specimen In USNM. 1891-Pre: Garman (1891), cited by Carr (1940) (A40CAR01FLUS), reported multiple captures by various collectors, including himself, on Key West (FNAI: though possibly he included Stock Island as part of Key West).
KINOPOP1*3	<i>Kinosternon baurii</i> pop. 1	Striped Mud Turtle, Lower Keys Population	G5T1Q	S1	N	N	1985-02	Freshwater ponds in rockland hammock (PNDLAZ01FLUS, UNDLAZ01FLUS).	1980s: Lazell estimates that island supports 100 or more turtles; the Botanical Garden site probably supports 24, while others are in sloughs by Monroe General Hospital and Key West Country Club. (PNDLAZ01FLUS, UNDLAZ01FLUS). 1 Specimen (LACM-23506), Los Angeles Co. Museum, collector and date unknown, from Stock Island, Key West. 2 specimens (UM-108480-1), University of Michigan, collector and date unknown, from Stock Island.
MALARHIZ*14	<i>Malaclemys terrapin rhizophorarum</i>	Mangrove Terrapin	G4T2Q	S2	N	N	ZZ	No general description given	ONE SPECIMEN FROM KEY WEST IN USN -- NO FURTHER DATA.



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MANGSWAM*18	Mangrove swamp		G5	S4	N	N	1999	BLACK MANGROVE FOREST. COVERS CA. 1/4 OF TRACT.	2010: Prior to the 2010 natural community reclassification effort this EO had been known as Estuarine tidal swamp EO number 18 (see U10FNA01FLUS for updated community descriptions). 1999: Update to last obs date was based on interpretation of aerial photography (previous value was 1983-01-05) (U05FNA02FLUS). EO QUALITY LISTED AS FAIR TO POOR.
MANGSWAM*45	Mangrove swamp		G5	S4	N	N	1999	SMALL ROCKLAND HAMMOCK DOMINATED BY METOPIUM TOXIFERUM, REYNOSIA SEPTENTRIONALIS, GUAIPIRA DISCOLOR, CANOCARPUS ERECTA, COCCOLOBA UVIFERA, EUGENIA MYRTOIDES, CROSSAPETALUM RHACOMA, MANILKARA BAHAMENSIS, ERITRALIS FRUTICOSA, AND XIMENIA AMERICANA. HAMMOCK GRADES E AND NE INTO BUTTONWOOD ECOTONE (I.E., COASTAL ROCK BARREN) AND MANGROVES (I.E., MARINE TIDAL SWAMP).	2010: Prior to the 2010 natural community reclassification effort this EO had been known as Marine tidal swamp EO number 24 (see U10FNA01FLUS for updated community descriptions). 1999: Update to last obs date was based on interpretation of aerial photography (previous value was 1992-11-24) (U05FNA02FLUS). MANGROVE-DOMINATED AREA SUBJECT TO TIDAL FLOW, BEST DEVELOPED ALONG THE EASTERN EDGE OF THIS SITE. DOMINANTS INCLUDE ALL THREE MANGROVES, BLACK (ARICINNIA GERMINANS), WHITE (LAGUNCULAVIA RACEMOSA), AND RED (RHIZOPHORA MONGLE). ADDITIONALLY, MANY BUTTONWOODS (COMOCARPUS ERECTUS) OCCUR ALONG THE MANGROVE FRINGES.



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MANGSWAM*46	Mangrove swamp		G5	S4	N	N	1999	APPROXIMATELY 75% OF THE NATURAL COMMUNITIES IN THE STUDY AREA CAN BE CLASSIFIED AS TIDAL SWAMPS. THESE ARE AREAS DOMINATED BY FOUR PLANT SPECIES. THREE SPECIES OF MANGROVE, THE RHIZOPHORA MANGLE AND THE LAGUNCULARIA RACEMOSA AND CONOCARPUS ERECTA. THE EXACT PROPORTION OF EACH SPECIES VARIES GREATLY FROM AREA TO AREA AND THE DENSITY, AVERAGE HEIGHT. THIS ROUGHLY TRIANGULAR SITE IS APPROXIMATELY 8 ACRES IN EXTENT AND CONSISTS PRIMARILY OF RATHER EARLY SUCCESSIONAL ROCKLAND HAMMOCK VEGETATION GROWING ON A THIN MARL SOIL. THE HAMMOCK INTERGRADES TO THE EAST INTO COASTAL ROCK BARREN AND MIXED MANGROVE TIDAL SWAMP. THE HAMMOCK CANOPY IS RATHER STRUCTURALLY UNIFORM WITH LIMITED VERTICAL DEVELOPMENT AND NO DISTINCT LAYERING. THE AVERAGE VEGETATION HEIGHT RANGES BETWEEN 2 AND 3 M. THE HAMMOCK IS TRANSECTED IN SEVERAL AREAS BY HEAVILY USED FOOT TRAILS AND SEVERAL OLD ROAD CUTS. RECENT VEGETATIONAL MANAGEMENT, SUCH AS REMOVING EXOTIC PLANTS, MULCHING AND INTRODUCING NATIVE	2010: Prior to the 2010 natural community reclassification effort this EO had been known as Marine tidal swamp EO number 25 (see U10FNA01FLUS for updated community descriptions). 1999: Update to last obs date was based on interpretation of aerial photography (previous value was 1993-03-28) (U05FNA02FLUS).



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MENICONC*1	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1978	SPECIES IS EVIDENT. ALONG THE HAMMOCK MARGINS ON SHALLOWER MARLS IS A WELL DEVELOPED BUTTWOOD DOMINATED COASTAL ROCK BARREN WITH SUBSTANTIAL POPULATIONS OF SEA-OX EYE DAISY, JOEWOOD AND SALT GRASS. SEVERAL POPULATIONS OF EO'S PRESENT.	1978: Getter collected species at three stations, conducted feeding studies here (U81GET01FLUS).
MENICONC*2	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1978	IMPOUNDED MARINE LAGOON ("POND") DISTURBANCES: PARTLY IMPOUNDED, IMPEDED CIRCULATION, REDUCED HABITAT & WATERSHED. ROAD-RESIDENTIAL-INDUSTRIAL- MATERIALS, TRASH.	GETTER COLL. SPECIES AT 2 STATIONS.
MENICONC*23	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1965-03-30	1965-03-30: mangrove swamp; a small shallow bay bordered by mangroves; substrate of loose coralline remains ( <i>Halimeda</i> sp.); shoreline bordered by organic debris; no freshwater drainage (U69ROB01FLUS).	1965-03-30: Robbins, Emery and Deboo collected one 29 mm specimen (U65ROB01FLUS).
MENICONC*3	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1978	IMPOUNDED MARINE LAGOON ("POND") DISTURBANCES: PARTLY IMPOUNDED, IMPEDED CIRCULATION, HABITAT & WATERSHED REDUCED, ROAD-RESIDENTIAL-INDUSTRIAL MATERIALS.	GETTER COLL. SPECIES HERE.
PANTPOP1*21	<i>Pantherophis guttatus</i> pop. 1	Red Rat Snake, Lower Keys Population	G5T2Q	S2	N	N	1989 pre	No general description given	LAZEL STATES THAT SCHWARTZ AND DUELLEMAN COLLECTED SPECIMEN FROM STOCK ISLAND.



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PARARAPT*1	<i>Paraphrynus raptator</i>	Dusky-handed Tailless Whip Scorpion	GNR	S1	N	N	1962-08-09	1994-pre: This species occurs under privies, cisterns, old lumber, old plywood, old cardboards, and flat rocks (B94DEY01FLUS). B94DEY01FLUS reported this species to live mostly in caves.	1962-08-09: Found in bathroom by Frank Gonzales, but sent to the FSCA by F.A. Buchanan (U08ALM01FLUS). 1959-07-10: specimen was collected by W.W. Warner (in display case at FSCA) (U08ALM01FLUS). 1994-pre: species found on site (B94DEY01FLUS).
PATALEUC*19	<i>Patagioenas leucocephala</i>	White-crowned Pigeon	G3	S3	N	ST	2004-06-11	Mostly Rockland Hammock	White-crowned Pigeons are frequent and relatively abundant in the Lower Keys. They forage in many of the Rockland Hammock communities throughout.
PLESEGRE*4	<i>Plestiodon egregius egregius</i>	Florida Keys Mole Skink	G5T1	S1	N	ST	1970-03-21	1970-03-21: Stock Island is heavily developed. Specimens were taken on or near golf course adjacent to old botanical gardens (S70DODSFFLUS).	1970-03-21: uncatalogued USF specimen, F. Dodd, from old botanical garden. 1960-01-29: UF specimen #12630, J.A. Holman, from golf course. 1958-Pre: recorded as present by Duellman and Schwartz (A58DUE01FLUS). Date unknown: 2 specimens from L.A. County museum (LA-61242, 14880), collector and date not available.
PLESEGRE*7	<i>Plestiodon egregius egregius</i>	Florida Keys Mole Skink	G5T1	S1	N	ST	1985 pre	1985-pre: relatively large key nearly completely developed for housing and commercial purposes (PNDLAZ01FLUS).	1985: Lazell receives occasional reports to present (1985), said to survive in cemeteries, vacant lots, and back yards; might be more common in town than in wilderness (PNDLAZ01FLUS to T. MacLaren). 1946-03-13: L.H. Babbitt witnessed courtship behavior (B89LAZ01FLUS). 1932-03-24: USNM specimens 85259-60. Dates not specified; MCZ specimens 6152 (2), 31904, 44754; 4 specimens from L.A. County Museum (LACM 14878-79, 66383, 74236) recorded as Key West, collector and date N/A; UF 1839 (in A57MCC01FLUS); and CM 6247-248 (in A57MCC01FLUS).
ROCKHAMM*132	Rockland hammock		G2	S2	N	N	1999	COMMON TREE SPECIES INCLUDE CONOCARPUS ERECTUS, ERITHALIS FRUITICOSA, GUSPIRA DISCOLOR, AMYRIS ELEMIFERA, EUGENIA POETIDA, JACQUINIA KEYENSIS. COVERS CA. 1/4 OF TRACT.	1999: Update to last obs date was based on interpretation of aerial photography (previous value was 1986-03-21) (U05FNA02FLUS). CONDITION OF EO LISTED AS GOOD.



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ROCKHAMM*153	Rockland hammock		G2	S2	N	N	1999	SMALL ROCKLAND HAMMOCK DOMINATED BY METOPIUM TOXIFERUM, REYNOSIA SEPTENTRIONALIS, GUAIPIRA DISCOLOR, CONOCARPUS ERECTA, COCCOLOBA UVIFERA, EUGENIA MYRTOIDES, CROSSOPETALUM RHACOMIA, MANILKARA BAHAMENSIS, ERITRALIS FRUTICOSA, AND XIMENIA AMERICANA. HAMMOCK GRADES E AND NE INTO BUTTONWOOD ECOTONE (I.E., COASTAL ROCK BARREN) AND MANGROVES (I.E., MARINE TIDAL SWAMP).	1999: Update to last obs date was based on interpretation of aerial photography (previous value was 1992-11-24) (U05FNA02FLUS). SMALL SIZED (10-15 ACRES), LOW STATURE HAMMOCK WITH CANOPY ONLY TO ABOUT 12'. CONTAINS GOOD DIVERSITY OF TROPICAL HARDWOODS CHARACTERISTIC OF THE LOWER KEYS. SOME DEGRADATION AND DISTURBANCE. A THOROUGH SURVEY OF THE HAMMOCK WAS NOT COMPLETED ON THIS DATE.



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ROCKHAMM*157	Rockland hammock		G2	S2	N	N	1999	<p>THE ROCKLAND HAMMOCK FORESTS WITHIN THE STUDY AREA GENERALLY HAVE A DISCONTINUOUS EMERGENT LAYER COMPRISED OF DRY-SEASON DECIDUOUS SPECIES SUCH AS PISCIDIA PISCIPULA, METOPIUM TOXIFERUM OR BURSERA SIMARUBA. THE EVERGREEN CONTINUOUS CANOPY LAYER IS TYPICALLY COMPOSED OF PISONIA DISCOLOR, COCCOLOBA DIVERSIFOLIA, EUGENIA MYRTOIDES, E. AXILLARIS, KRUGIODENDRON FERRUM, DIPHOLIS SALICIFOLIA, REYNOSIA SEPTENTRIONALIS, MANILKARA BAHAMENSIS, THRINAX MORRISII, AMYRIS ELEMIFERA AND EXOTHEA PANICULATA ALONG WITH A SUITE OF OTHER SPECIES THAT VARY FROM COMMON TO RARE DEPENDING ON SPECIFIC SITE FACTORS, PARTICULARLY ELEVATION, DISTURBANCE HISTORY AND SOIL MOISTURE. THIS ROUGHLY TRIANGULAR SITE IS APPROXIMATELY 8 ACRES IN EXTENT AND CONSISTS PRIMARILY OF RATHER EARLY SUCCESSIONAL ROCKLAND HAMMOCK VEGETATION GROWING ON A THIN MARL SOIL. THE HAMMOCK INTERGRADES TO THE EAST INTO COASTAL ROCK BARREN AND MIXED MANGROVE TIDAL SWAMP. THE HAMMOCK CANOPY IS RATHER STRUCTURALLY UNIFORM WITH LIMITED VERTICAL DEVELOPMENT AND NO</p>	<p>1999: Update to last obs date was based on interpretation of aerial photography (previous value was 1993-03-28) (U05FNA02FLUS).</p>



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SIPRSTEL*3	<i>Siproeta stelenes</i>	Malachite	G5	S2	N	N	2012-03-22	<p>DISTINCT LAYERING, THE AVERAGE VEGETATION HEIGHT RANGES BETWEEN 2 AND 3 M. THE HAMMOCK IS TRANSECTED IN SEVERAL AREAS BY HEAVILY USED FOOT TRAILS AND SEVERAL OLD ROAD CUTS. RECENT VEGETATIONAL MANAGEMENT, SUCH AS REMOVING EXOTIC PLANTS, MULCHING AND INTRODUCING NATIVE SPECIES IS EVIDENT. ALONG THE HAMMOCK MARGINS ON SHALLOWER MARLS IS A WELL DEVELOPED BUTTONWOOD DOMINATED COASTAL ROCK BARREN WITH SUBSTANTIAL POPULATIONS OF SEA-OX EYE DAISY, JOEWOOD AND SALT GRASS. SEVERAL POPULATIONS OF EO'S PRESENT.</p> <p>2012-03-22: None provided (F12JUE01FLUS). 2011-11-12: None provided (F11JUE01FLUS).</p>	<p>2012-03-22: One adult seen and photographed by Barbara Conolly (F12JUE01FLUS). 2011-11-12: One adult seen and photographed by Bob Webster (F11JUE01FLUS).</p>



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SWIEMAHA*14	<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T	1993-03-28	This roughly triangular site is approximately 8 acres in extent and consists primarily of rather early successional Rockland Hammock vegetation growing on a thin marl soil. The hammock intergrades to the east into Coastal Rock Barren and mixed mangrove Tidal Swamp. The hammock canopy is rather structurally uniform with limited vertical development and no distinct layering. The average vegetation height ranges between 2 and 3m. The floristic composition of the community is relatively diverse, composed primarily of Poisonwood, Buttonwood, Blolly, Jamaica Dogwood, Spanish Stopper, Joewood, Erithalis, Wild Dilly and Rhacoma. The hammock is transected in several areas by heavily used foot trails and several old road cuts. Recent vegetational management, such as removing exotic plants, mulching and introducing native species is evident. Along the hammock margins on shallower marls is a well developed Buttonwood dominated Coastal Rock Barren with substantial populations of Sea-Ox Eye Daisy, Joewood and Salt Grass. Several populations of EO's present.	An marginal population limited primarily to the hammock community and consisting of widely scattered reproductives averaging 4.5m in height with occasional seedlings and saplings scattered rather widely, but with low density throughout the site. In relation to the potentially available habitat, it occurs with less than expected frequency, but has a stable population structure. Overall, the population consists of an estimated 40 individuals, including seedling and sapling age classes. There has been some loss to the population due to trampling. Approximately 80% of mature individuals are in the later stages of seasonal leaf loss, and the balance are beginning to exhibit signs of leaf flushing.
SWIEMAHA*40	<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T	2004-03-12	FNAI NC recorded as ruderal.	53-530 plants in leaf/fruit
SWIEMAHA*41	<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T	2004-03-24	FNAI NC recorded as ruderal.	37-370 plants in leaf/fruit
SWIEMAHA*43	<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T	2004-03-26	FNAI NC recorded as ruderal.	2-20 plants in fruit/leaf



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TANTOOLI*17	<i>Tantilla oolitica</i>	Rim Rock Crowned Snake	G1G2	S1S2	N	ST	2009 spring	Key West is highly developed, both residential and commercial. 2009: specimen observed in backyard woodpile.	At best, probably scattered small populations on this highly developed island. 2009-Spring: R. Sterling observed specimen in backyard woodpile (A11HIN01FLUS). 1938: Milwaukee Public Museum specimen, H. Jungmann (A11HIN01FLUS).
THRIRADI*32	<i>Thrinax radiata</i>	Florida thatch palm	G4G5	S2	N	E	1986-03-21	No general description given	ONE PLANT SEEN (1983). TWO VIGOROUS PLANTS SEEN (1986).
THRIRADI*72	<i>Thrinax radiata</i>	Florida thatch palm	G4G5	S2	N	E	2007-04-17	2007-04-17: Roadside, in right-of-way (U07IRC01FLUS).	2007-04-17: Population size 1 - 10 plants (U07IRC01FLUS).
THRIRADI*82	<i>Thrinax radiata</i>	Florida thatch palm	G4G5	S2	N	E	2004-03-26	2004-03-26: ruderal community with heavy exotics and long term filled disturbance along fenceline (F04FNA12FLUS).	At least one plant observed in this developed area in 2004. Not found in 2010.
THRIRADI*89	<i>Thrinax radiata</i>	Florida thatch palm	G4G5	S2	N	E	2004-03-29	FNAI NC recorded as ruderal.	12-120 plants, some in flower/bud or fruit (F13FNA03FLUS).



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**FNAI ELEMENT OCCURRENCE REPORT on or near  
 Key West International Airport**



Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
VIREALTI*40	<i>Vireo altiloquus</i>	Black-whiskered Vireo	G5	S3	N	N	1993-05-22	This roughly triangular site is approximately 8 acres in extent and consists primarily of rather early successional Rockland Hammock (EO #157) vegetation growing on a thin marl soil. The hammock intergrades to the east into Coastal Rock Barren (EO #10) and mixed mangrove Tidal Swamp (EO #25). The hammock canopy is rather structurally uniform with limited vertical development and no distinct layering. The average vegetation height ranges between 2 and 3m. The floristic composition of the community is relatively diverse, composed primarily of Poisonwood, Buttonwood, Blolly, Jamaica Dogwood, Spanish Stopper, Joewood, Erithalis, Wild Dilly and Rhacoma. The hammock is transected in several areas by heavily used foot trails and several old road cuts. Recent vegetational management, such as removing exotic plants, mulching and introducing native species is evident. Along the hammock margins on shallower marls is a well developed Buttonwood dominated Coastal Rock Barren with substantial populations of Sea-Ox Eye Daisy, Joewood and Salt Grass. Several populations of EOs present.	A good breeding population of the Black-Whiskered Vireo estimated at 12-15 pairs was present throughout the mangrove edges and fringes as well as in the Buttonwood Coastal Rock Barren communities of the site. A number of additional singing males were noted beyond the eastern, western and the southern boundaries of the actual site and along the access road that transects the salt ponds just north of the Key West Airport. The estimated total number of breeding pairs utilizing the entire mangrove salt marsh-hammock complex appears to be in excess of 35 pairs at this time.
VIREALTI*51	<i>Vireo altiloquus</i>	Black-whiskered Vireo	G5	S3	N	N	2004-05-24	2004-05-24: tidal swamp (F04FNA12FLUS).	2004-05-24: 2 singing birds and northeast point and 1 singing bird and southwest point (F04FNA12FLUS).



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 BSA Intersects ONLY**



Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
ATAEWENZ*11	<i>Ataenius wenzelii</i>	An Ataenius Beetle	G3G5	S2S3	N	N	1968-05-21	1968-05-21: No description given (B73WOO01FLUS).	1968-05-21:(Stock Island) A total of fifty-nine specimens were collected from February to December (1958-1968) by various collectors using black light traps (B73WOO01FLUS).1961-01-27: ( Key West) A total of 7 specimens were collected by C.A. Bennett using black light traps (B73WOO01FLUS).1960-11-26: (Key West) A total of 2 specimens were collected by C.A. Bennett using black light traps (B73WOO01FLUS). 1960-05-15: (Key West) One specimen was collected by C.A. Bennett using black light traps (B73WOO01FLUS). 1960-04-28: (Key West) One specimen was collected by C.A. Bennett using black light traps (B73WOO01FLUS). no year-07-08: (Key West) A total of five specimens were collected by Ben Niren using a mosquito light trap (B73WOO01FLUS).
CESOIRVI*1	<i>Cesonia irvingi</i>	Keys Gnaphosid Spider	GNR	S1	N	N	1994 pre	1994-pre: Description was not given (B94DEY01FLUS).	1994-pre: This spider is only known from Florida Keys (Key West), Bimini, and Bahamas (B94DEY01FLUS).
COCHPOEY*6	<i>Cochlodinella poeyana</i>	Truncate Urocoptid	G1G2	S1S2	N	N	1998 pre	1998-Pre: None given (WPDFLO01FLUS).	1998-Pre: There are five undated records for this species from Key West, with H.H. Hemphill being listed as the collector for one record (WPDFLO01FLUS).
CTENSTIG*9	<i>Ctenogobius stigmaturus</i>	Spottail Goby	G2	S2	N	N	1930 pre?	1930-PRE?: inshore marine (shallows) (A32GIN01FLUS).	1930-PRE?: Ginsburg (1932) reported species as fairly common at Key West, where it could be taken by seining the shallows; specimens in USNM (including Holotype?) (A32GIN01FLUS).
CYCLMIAM*1	<i>Cyclocephala miamiensis</i>	Miami Chafer Beetle	G1?	S1?	N	N	1994 pre	1994-Pre: No description given (B94DEY01FLUS).	1994-Pre: This species was collected at this site (B94DEY01FLUS).
DS*26060	<i>Data Sensitive Element</i>	Data Sensitive	G2T1	S1	T	FT	1997	Data Sensitive	Data Sensitive
GAMBRHIZ*15	<i>Gambusia rhizophorae</i>	Mangrove Gambusia	G3	S3	N	N	1977	Tidal creek.	Getter collected species here between 1973-1977 (UNDGET01FLUS, Table 6).



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Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
KINOPOP1*11	<i>Kinosternon baurii</i> pop. 1	Striped Mud Turtle, Lower Keys Population	G5T1Q	S1	N	N	1900	Mostly urbanized development, with some freshwater ponds in area.	1985: none found by Lazell, who thought that population may be extirpated although likely habitat (freshwater ponds) still existed around Key West International Airport (PNDLAZ01FLUS). 1930s: Carr failed to find species on Key West, suspected population was long extirminated (A40CAR01FLUS). Two older museum specimens collected from "Key West" by Warner (UF 7105-6) (FNAI note: but some older collectors also used this to include Stock Island). Others also only restricted to Key West (see Specimens field). Additional Specimen In USNM. 1891-Pre: Garman (1891), cited by Carr (1940) (A40CAR01FLUS), reported multiple captures by various collectors, including himself, on Key West (FNAI: though possibly he included Stock Island as part of Key West).
MALARHIZ*14	<i>Malaclemys terrapin rhizophorarum</i>	Mangrove Terrapin	G4T2Q	S2	N	N	ZZ	No general description given	ONE SPECIMEN FROM KEY WEST IN USN -- NO FURTHER DATA.
MENICONC*1	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1978	1978: marine lagoon; disturbances; totally impounded, habitat reduction, impeded circulation, reduced watershed, road and residential material, and trash (U81GET01FLUS).	1978: Getter collected species at three stations, conducted feeding studies here (U81GET01FLUS).
MENICONC*2	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1978	IMPOUNDED MARINE LAGOON ("POND") DISTURBANCES: PARTLY IMPOUNDED, IMPEDED CIRCULATION, REDUCED HABITAT & WATERSHED, ROAD-RESIDENTIAL-INDUSTRIAL- MATERIALS, TRASH.	GETTER COLL. SPECIES AT 2 STATIONS.
MENICONC*23	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1965-03-30	1965-03-30: mangrove swamp; a small shallow bay bordered by mangroves; substrate of loose coralline remains ( <i>Halimeda</i> sp.); shoreline bordered by organic debris; no freshwater drainage (U69ROB01FLUS).	1965-03-30: Robbins, Emery and Deboo collected one 29 mm specimen (U65ROB01FLUS).



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**FNAI ELEMENT OCCURRENCE REPORT on or near**  
**BSA Intersects ONLY**



Map Label	Scientific Name	Common Name	Global State Federal State Observation				Date	Description	EO Comments
			Rank	Rank	Status	Listing			
MENICONC*3	<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST	1978	IMPOUNDED MARINE LAGOON ("POND") DISTURBANCES: PARTLY IMPOUNDED, IMPEDED CIRCULATION, HABITAT & WATERSHED REDUCED, ROAD-RESIDENTIAL-INDUSTRIAL MATERIALS.	GETTER COLL. SPECIES HERE.
PARARAPT*1	<i>Paraphrynus raptator</i>	Dusky-handed Tailless Whip Scorpion	GNR	S1	N	N	1962-08-09	1994-pre: This species occurs under privies, cisterns, old lumber, old plywood, old cardboard, and flat rocks (B94DEY01FLUS). B94DEY01FLUS reported this species to live mostly in caves.	1962-08-09: Found in bathroom by Frank Gonzales, but sent to the FSCA by F.A. Buchanan (U08ALM01FLUS). 1959-07-10: specimen was collected by W.W. Warner (in display case at FSCA) (U08ALM01FLUS). 1994-pre: species found on site (B94DEY01FLUS).
PLESEGRE*7	<i>Plestiodon egregius egregius</i>	Florida Keys Mole Skink	G5T1	S1	N	ST	1985 pre	1985-pre: relatively large key nearly completely developed for housing and commercial purposes (PNDLAZ01FLUS).	1985: Lazell receives occasional reports to present (1985), said to survive in cemeteries, vacant lots, and back yards; might be more common in town than in wilderness (PNDLAZ01FLUS to T. MacLaren). 1946-03-13: L.H. Babbitt witnessed courtship behavior (B89LAZ01FLUS). 1932-03-24: USNM specimens 85259-60. Dates not specified: MCZ specimens 6152 (2), 31904, 44754; 4 specimens from L.A. County Museum (LACM 14878-79, 66383, 74236) recorded as Key West, collector and date N/A; UF 1839 (in A57MCC01FLUS); and CM 6247-248 (in A57MCC01FLUS).



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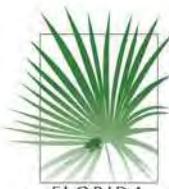
## Florida Natural Areas Inventory

### Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
<b>Matrix Unit ID: 40128</b>					
<b>Documented</b>					
<i>Bourreria radula</i>	rough strongbark	G2?	S1	N	E
<i>Chamaesyce porteriana</i>	Porter's broad-leaved spurge	G2	S2	N	E
<i>Crossopetalum rhacoma</i>	rhacoma	G5	S3	N	T
Mangrove swamp		G5	S4	N	N
<i>Patagioenas leucocephala</i>	White-crowned Pigeon	G3	S3	N	ST
Rockland hammock		G2	S2	N	N
<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T
<i>Vireo altiloquus</i>	Black-whiskered Vireo	G5	S3	N	N
<b>Documented-Historic</b>					
<i>Chamaesyce garberi</i>	Garber's spurge	G1	S1	T	E
<i>Thrinax radiata</i>	Florida thatch palm	G4G5	S2	N	E
<b>Likely</b>					
<i>Caretta caretta</i>	Loggerhead Sea Turtle	G3	S3	T	FT
<i>Chelonia mydas</i>	Green Sea Turtle	G3	S2S3	T	FT
<i>Cochlodinella poeyana</i>	Truncate Urocoptid	G1G2	S1S2	N	N
<i>Cyclocephala miamiensis</i>	Miami Chafer Beetle	G1?	S1?	N	N
<i>Plestiodon egregius egregius</i>	Florida Keys Mole Skink	G5T1	S1	N	ST
<b>Potential</b>					
<i>Ardea herodias occidentalis</i>	Great White Heron	G5T2	S2	N	N
<i>Ataenius wenzelii</i>	An Ataenius Beetle	G3G5	S2S3	N	N
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Cesonia irvingi</i>	Keys Gnaphosid Spider	GNR	S1	N	N
<i>Charadrius melodus</i>	Piping Plover	G3	S2	T	FT
<i>Consolea corallicola</i>	semaphore pricklypear	G1	S1	E	E
<i>Crocodylus acutus</i>	American Crocodile	G2	S2	T	FT
<i>Ctenogobius stigmaturos</i>	Spottail Goby	G2	S2	N	N
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Eretmochelys imbricata</i>	Hawksbill Sea Turtle	G3	S1	E	FE
<i>Gambusia rhizophorae</i>	Mangrove Gambusia	G3	S3	N	N
<i>Harrisia simpsonii</i>	Simpson's prickly apple	G2	S2	N	N
<i>Kinosternon baurii</i> pop. 1	Striped Mud Turtle, Lower Keys Popul	G5T1Q	S1	N	N
<i>Malaclemys terrapin rhizophorarum</i>	Mangrove Terrapin	G4T2Q	S2	N	N
<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST
<i>Orthalicus reses reses</i>	Stock Island Tree Snail	G2T1	S1	T	FT
<i>Oryzomys palustris natator</i>	Key Rice Rat	G5T2Q	S2	E	FE
<i>Pantherophis guttatus</i> pop. 1	Red Rat Snake, Lower Keys Populatic	G5T2Q	S2	N	N
<i>Paraphrynus raptator</i>	Dusky-handed Tailless Whip Scorpion	GNR	S1	N	N
<i>Procyon lotor incautus</i>	Key West Raccoon	G5T2Q	S2	N	N
<i>Rallus longirostris insularum</i>	Mangrove Clapper Rail	G5T3	S3	N	N
<i>Rivulus marmoratus</i>	Mangrove Rivulus	G4G5	S3	SC	N
<i>Roystonea regia</i>	Florida royal palm	G2G3	S2	N	E
<i>Sachsia polycephala</i>	Bahama sachsia	G2	S2	N	T
<i>Setophaga discolor paludicola</i>	Florida Prairie Warbler	G5T3	S3	N	N
<i>Sigmodon hispidus exsputus</i>	Lower Keys Cotton Rat	G5T2	S2	N	N

**Definitions:** Documented - Rare species and natural communities documented on or near this site.  
 Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.  
 Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.  
 Potential - This site lies within the known or predicted range of the species listed.



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## Florida Natural Areas Inventory

### Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
<i>Sterna dougallii</i>	Roseate Tern	G4	S1	T	FT
<i>Trichechus manatus</i>	West Indian Manatee	G2	S2	T	FT

Matrix Unit ID: 40129

#### Likely

<i>Bourreria radula</i>	rough strongbark	G2?	S1	N	E
<i>Cochlodinella poeyana</i>	Truncate Urocoptid	G1G2	S1S2	N	N
<i>Cyclocephala miamiensis</i>	Miami Chafer Beetle	G1?	S1?	N	N
<i>Plestiodon egregius egregius</i>	Florida Keys Mole Skink	G5T1	S1	N	ST

#### Potential

<i>Ardea herodias occidentalis</i>	Great White Heron	G5T2	S2	N	N
<i>Ataenius wenzelii</i>	An Ataenius Beetle	G3G5	S2S3	N	N
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Caretta caretta</i>	Loggerhead Sea Turtle	G3	S3	T	FT
<i>Cesonia irvingi</i>	Keys Gnaphosid Spider	GNR	S1	N	N
<i>Chelonia mydas</i>	Green Sea Turtle	G3	S2S3	T	FT
<i>Consolea corallicola</i>	semaphore pricklypear	G1	S1	E	E
<i>Crocodylus acutus</i>	American Crocodile	G2	S2	T	FT
<i>Ctenogobius stigmaturus</i>	Spottail Goby	G2	S2	N	N
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Eretmochelys imbricata</i>	Hawksbill Sea Turtle	G3	S1	E	FE
<i>Gambusia rhizophorae</i>	Mangrove Gambusia	G3	S3	N	N
<i>Harrisia simpsonii</i>	Simpson's prickly apple	G2	S2	N	N
<i>Kinosternon baurii pop. 1</i>	Striped Mud Turtle, Lower Keys Popul	G5T1Q	S1	N	N
<i>Malaclemys terrapin rhizophorarum</i>	Mangrove Terrapin	G4T2Q	S2	N	N
<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST
<i>Orthalicus reses reses</i>	Stock Island Tree Snail	G2T1	S1	T	FT
<i>Oryzomys palustris natator</i>	Key Rice Rat	G5T2Q	S2	E	FE
<i>Pantherophis guttatus pop. 1</i>	Red Rat Snake, Lower Keys Populatic	G5T2Q	S2	N	N
<i>Paraphrynus raptator</i>	Dusky-handed Tailless Whip Scorpion	GNR	S1	N	N
<i>Patagioenas leucocephala</i>	White-crowned Pigeon	G3	S3	N	ST
<i>Procyon lotor incautus</i>	Key West Raccoon	G5T2Q	S2	N	N
<i>Rallus longirostris insularum</i>	Mangrove Clapper Rail	G5T3	S3	N	N
<i>Rivulus marmoratus</i>	Mangrove Rivulus	G4G5	S3	SC	N
<i>Roystonea regia</i>	Florida royal palm	G2G3	S2	N	E
<i>Sachsia polycephala</i>	Bahama sachsia	G2	S2	N	T
<i>Setophaga discolor paludicola</i>	Florida Prairie Warbler	G5T3	S3	N	N
<i>Sigmodon hispidus exsputus</i>	Lower Keys Cotton Rat	G5T2	S2	N	N
<i>Sterna dougallii</i>	Roseate Tern	G4	S1	T	FT
<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T
<i>Trichechus manatus</i>	West Indian Manatee	G2	S2	T	FT

Matrix Unit ID: 40496

#### Likely

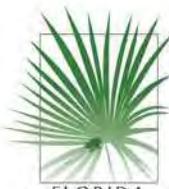
<i>Caretta caretta</i>	Loggerhead Sea Turtle	G3	S3	T	FT
<i>Chelonia mydas</i>	Green Sea Turtle	G3	S2S3	T	FT
<i>Cochlodinella poeyana</i>	Truncate Urocoptid	G1G2	S1S2	N	N

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## Florida Natural Areas Inventory

### Biodiversity Matrix Report



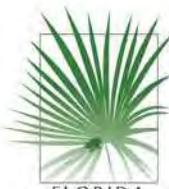
Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
<i>Cyclocephala miamiensis</i>	Miami Chafer Beetle	G1?	S1?	N	N
<i>Plestiodon egregius egregius</i>	Florida Keys Mole Skink	G5T1	S1	N	ST
Rockland hammock		G2	S2	N	N
<b>Potential</b>					
<i>Ardea herodias occidentalis</i>	Great White Heron	G5T2	S2	N	N
<i>Argythamnia argothamnoides</i>	Blodgett's silverbush	GNR	S2	T	E
<i>Ataenius wenzelii</i>	An Ataenius Beetle	G3G5	S2S3	N	N
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Bouffieria radula</i>	rough strongbark	G2?	S1	N	E
<i>Cesonia irvingi</i>	Keys Gnaphosid Spider	GNR	S1	N	N
<i>Chamaesyce garberi</i>	Garber's spurge	G1	S1	T	E
<i>Chamaesyce porteriana</i>	Porter's broad-leaved spurge	G2	S2	N	E
<i>Charadrius melodus</i>	Piping Plover	G3	S2	T	FT
<i>Consolea corallicola</i>	semaphore pricklypear	G1	S1	E	E
<i>Crocodylus acutus</i>	American Crocodile	G2	S2	T	FT
<i>Crossopetalum ilicifolium</i>	Christmas berry	G3	S3	N	T
<i>Ctenogobius stigmaturus</i>	Spottail Goby	G2	S2	N	N
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Eretmochelys imbricata</i>	Hawksbill Sea Turtle	G3	S1	E	FE
<i>Gambusia rhizophorae</i>	Mangrove Gambusia	G3	S3	N	N
<i>Guaiacum sanctum</i>	lignum-vitae	G2	S1	N	E
<i>Harrisia simpsonii</i>	Simpson's prickly apple	G2	S2	N	N
<i>Kinosternon baurii pop. 1</i>	Striped Mud Turtle, Lower Keys Popul	G5T1Q	S1	N	N
<i>Malaclemys terrapin rhizophorarum</i>	Mangrove Terrapin	G4T2Q	S2	N	N
<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST
<i>Orthalicus reses reses</i>	Stock Island Tree Snail	G2T1	S1	T	FT
<i>Oryzomys palustris natator</i>	Key Rice Rat	G5T2Q	S2	E	FE
<i>Pantherophis guttatus pop. 1</i>	Red Rat Snake, Lower Keys Populatic	G5T2Q	S2	N	N
<i>Paraphrynus raptator</i>	Dusky-handed Tailless Whip Scorpion	GNR	S1	N	N
<i>Patagioenas leucocephala</i>	White-crowned Pigeon	G3	S3	N	ST
<i>Pilosocereus robinii</i>	tree cactus	G1	S1	E	E
<i>Poinsettia pinetorum</i>	pineland spurge	G2	S2	N	E
<i>Procyon lotor incautus</i>	Key West Raccoon	G5T2Q	S2	N	N
<i>Rallus longirostris insularum</i>	Mangrove Clapper Rail	G5T3	S3	N	N
<i>Rivulus marmoratus</i>	Mangrove Rivulus	G4G5	S3	SC	N
<i>Roystonea regia</i>	Florida royal palm	G2G3	S2	N	E
<i>Sachsia polycephala</i>	Bahama sachsia	G2	S2	N	T
<i>Setophaga discolor paludicola</i>	Florida Prairie Warbler	G5T3	S3	N	N
<i>Sigmodon hispidus exsputus</i>	Lower Keys Cotton Rat	G5T2	S2	N	N
<i>Sterna dougallii</i>	Roseate Tern	G4	S1	T	FT
<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T
<i>Trichechus manatus</i>	West Indian Manatee	G2	S2	T	FT

Matrix Unit ID: 40497

#### Documented

<i>Siproeta stelenes</i>	Malachite	G5	S2	N	N
<i>Swietenia mahagoni</i>	West Indies mahogany	G3G4	S3	N	T
<i>Thrinax radiata</i>	Florida thatch palm	G4G5	S2	N	E

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Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.  
Potential - This site lies within the known or predicted range of the species listed.



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FLORIDA  
Natural Areas  
INVENTORY

## Florida Natural Areas Inventory

### Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
<b>Documented-Historic</b>					
<i>Epargyreus zestos</i>	Zestos Skipper	G4	SX	N	N
<i>Guaicum sanctum</i>	lignum-vitae	G2	S1	N	E
<i>Zanthoxylum flavum</i>	satinwood	G4?	S1	N	E
<b>Likely</b>					
<i>Cochlodinella poeyana</i>	Truncate Urocoptid	G1G2	S1S2	N	N
<i>Cyclocephala miamiensis</i>	Miami Chafer Beetle	G1?	S1?	N	N
<i>Pantherophis guttatus pop. 1</i>	Red Rat Snake, Lower Keys Populatic	G5T2Q	S2	N	N
<i>Plestiodon egregius egregius</i>	Florida Keys Mole Skink	G5T1	S1	N	ST
Rockland hammock		G2	S2	N	N
<b>Potential</b>					
<i>Alligator mississippiensis</i>	American Alligator	G5	S4	SAT	FT(S/A)
<i>Ardea herodias occidentalis</i>	Great White Heron	G5T2	S2	N	N
<i>Argythamnia argothamnoides</i>	Blodgett's silverbush	GNR	S2	T	E
<i>Ataenius scabrellus</i>	An Ataenius Beetle	G5	S1	N	N
<i>Ataenius wenzelii</i>	An Ataenius Beetle	G3G5	S2S3	N	N
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
Bird Rookery		G5	SNR	N	N
<i>Caretta caretta</i>	Loggerhead Sea Turtle	G3	S3	T	FT
<i>Cesonia irvingi</i>	Keys Gnaphosid Spider	GNR	S1	N	N
<i>Chamaesyce garberi</i>	Garber's spurge	G1	S1	T	E
<i>Chamaesyce porteriana</i>	Porter's broad-leaved spurge	G2	S2	N	E
<i>Chelonia mydas</i>	Green Sea Turtle	G3	S2S3	T	FT
<i>Chondropoma dentatum</i>	Crenulate Horn	G2G3	S2?	N	N
<i>Consolea corallicola</i>	semaphore pricklypear	G1	S1	E	E
<i>Crocodylus acutus</i>	American Crocodile	G2	S2	T	FT
<i>Ctenogobius stigmaturos</i>	Spottail Goby	G2	S2	N	N
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Eretmochelys imbricata</i>	Hawksbill Sea Turtle	G3	S1	E	FE
<i>Gambusia rhizophorae</i>	Mangrove Gambusia	G3	S3	N	N
<i>Harrisia simpsonii</i>	Simpson's prickly apple	G2	S2	N	N
<i>Kinosternon baurii pop. 1</i>	Striped Mud Turtle, Lower Keys Popul	G5T1Q	S1	N	N
<i>Malaclemys terrapin rhizophorarum</i>	Mangrove Terrapin	G4T2Q	S2	N	N
<i>Menidia conchorum</i>	Key Silverside	G2Q	S2	SC	ST
<i>Orthalicus reses reses</i>	Stock Island Tree Snail	G2T1	S1	T	FT
<i>Oryzomys palustris natator</i>	Key Rice Rat	G5T2Q	S2	E	FE
<i>Paraphrynus raptator</i>	Dusky-handed Tailless Whip Scorpion	GNR	S1	N	N
<i>Patagioenas leucocephala</i>	White-crowned Pigeon	G3	S3	N	ST
<i>Pilosocereus robinii</i>	tree cactus	G1	S1	E	E
<i>Procyon lotor incautus</i>	Key West Raccoon	G5T2Q	S2	N	N
<i>Rallus longirostris insularum</i>	Mangrove Clapper Rail	G5T3	S3	N	N
<i>Rivulus marmoratus</i>	Mangrove Rivulus	G4G5	S3	SC	N
<i>Roystonea regia</i>	Florida royal palm	G2G3	S2	N	E
<i>Sachsia polycephala</i>	Bahama sachsia	G2	S2	N	T
<i>Setophaga discolor paludicola</i>	Florida Prairie Warbler	G5T3	S3	N	N
<i>Sigmodon hispidus exsputus</i>	Lower Keys Cotton Rat	G5T2	S2	N	N
<i>Sterna dougallii</i>	Roseate Tern	G4	S1	T	FT

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## Florida Natural Areas Inventory

### Biodiversity Matrix Report



<b>Scientific Name</b>	<b>Common Name</b>	<b>Global Rank</b>	<b>State Rank</b>	<b>Federal Status</b>	<b>State Listing</b>
<i>Trichechus manatus</i>	West Indian Manatee	G2	S2	T	FT

---

**Definitions:** Documented - Rare species and natural communities documented on or near this site.  
 Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.  
 Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.  
 Potential - This site lies within the known or predicted range of the species listed.

---

## Elements and Element Occurrences

An **element** is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature.

An **element occurrence (EO)** is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.

## Element Ranking and Legal Status

Using a ranking system developed by NatureServe and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks for each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element Occurrences (EOs), estimated abundance (number of individuals for species; area for natural communities), geographic range, estimated number of adequately protected EOs, relative threat of destruction, and ecological fragility.

### **FNAI GLOBAL ELEMENT RANK**

- 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 man-made 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 man-made 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** = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
- GX** = Believed to be extinct throughout range.
- GXC** = Extirpated from the wild but still known from captivity or cultivation.
- G#?** = Tentative rank (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 specific subgroup; numbers have same definition as above (e.g., G3T1).
- G#Q** = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
- G#T#Q** = Same as above, but validity as subspecies or variety is questioned.
- GU** = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).
- GNA** = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
- GNR** = Element not yet ranked (temporary).
- GNRTNR** = Neither the element nor the taxonomic subgroup has yet been ranked.

### **FNAI STATE ELEMENT RANK**

- S1** = Critically imperiled in Florida 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 man-made factor.
- S2** = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- S3** = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- S4** = Apparently secure in Florida (may be rare in parts of range).
- S5** = Demonstrably secure in Florida.
- SH** = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
- SX** = Believed to be extirpated throughout Florida.
- SU** = Unrankable; due to a lack of information no rank or range can be assigned.
- SNA** = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
- SNR** = Element not yet ranked (temporary).

## **FEDERAL LEGAL STATUS**

Legal status information provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant federal agency.

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.

**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.

**E** = Endangered: species in danger of extinction throughout all or a significant portion of its range.

**E, T** = Species currently listed endangered in a portion of its range but only listed as threatened in other areas

**E, PDL** = Species currently listed endangered but has been proposed for delisting.

**E, PT** = Species currently listed endangered but has been proposed for listing as threatened.

**E, XN** = Species currently listed endangered but tracked population is a non-essential experimental population.

**T** = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

**PE** = Species proposed for listing as endangered

**PS** = Partial status: some but not all of the species' infraspecific taxa have federal

**PT** = Species proposed for listing as threatened

**SAT** = Treated as threatened 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.

**SC** = Not currently listed, but considered a "species of concern" to USFWS.

## **STATE LEGAL STATUS**

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

**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.

**C** = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service

**FE** = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service

**FT** = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service

**FXN** = Federal listed as an experimental population in Florida

**FT(S/A)** = Federal Threatened due to similarity of appearance

**ST** = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.

**SSC** = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC\* for *Pandion haliaetus* (Osprey) indicates that this status applies in Monroe county only.)

**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 or see: <http://www.doacs.state.fl.us/pi/>.

**E** = 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.

**T** = 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.

**N** = Not currently listed, nor currently being considered for listing.

## Element Occurrence Ranking

FNAI ranks of quality of the element occurrence in terms of its viability (EORANK). Viability is estimated using a combination of factors that contribute to continued survival of the element at the location. Among these are the size of the EO, general condition of the EO at the site, and the conditions of the landscape surrounding the EO (e.g. an immediate threat to an EO by local development pressure could lower an EO rank).

- A** = Excellent estimated viability
- A?** = Possibly excellent estimated viability
- AB** = Excellent or good estimated viability
- AC** = Excellent, good, or fair estimated viability
- B** = Good estimated viability
- B?** = Possibly good estimated viability
- BC** = Good or fair estimated viability
- BD** = Good, fair, or poor estimated viability
- C** = Fair estimated viability
- C?** = Possibly fair estimated viability
- CD** = Fair or poor estimated viability
- D** = Poor estimated viability
- D?** = Possibly poor estimated viability
- E** = Verified extant (viability not assessed)
- F** = Failed to find
- H** = Historical
- NR** = Not ranked, a placeholder when an EO is not (yet) ranked.
- U** = Unrankable
- X** = Extirpated

\*For additional detail on the above ranks see: <http://www.natureserve.org/explorer/eorankguide.htm>

FNAI also uses the following EO ranks:

- H?** = Possibly historical
- F?** = Possibly failed to find
- X?** = Possibly extirpated

The following offers further explanation of the H and X ranks as they are used by FNAI:

The rank of H is used when there is a lack of recent field information verifying the continued existence of an EO, such as (a) when an EO is based only on historical collections data; or (b) when an EO was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area. This definition of the H rank is dependent on an interpretation of what constitutes "recent" field information. Generally, if there is no known survey of an EO within the last 20 to 40 years, it should be assigned an H rank. While these time frames represent suggested maximum limits, the actual time period for historical EOs may vary according to the biology of the element and the specific landscape context of each occurrence (including anthropogenic alteration of the environment). Thus, an H rank may be assigned to an EO before the maximum time frames have lapsed. Occurrences that have not been surveyed for periods exceeding these time frames should not be ranked A, B, C, or D. The higher maximum limit for plants and communities (i.e., ranging from 20 to 40 years) is based upon the assumption that occurrences of these elements generally have the potential to persist at a given location for longer periods of time. This greater potential is a reflection of plant biology and community dynamics. However, landscape factors must also be considered. Thus, areas with more anthropogenic impacts on the environment (e.g., development) will be at the lower end of the range, and less-impacted areas will be at the higher end.

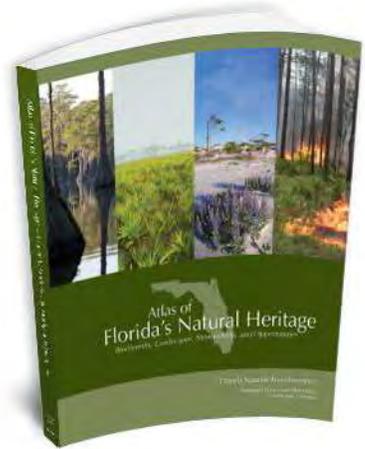
The rank of X is assigned to EOs for which there is documented destruction of habitat or environment, or persuasive evidence of eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element at that location).



# Atlas of Florida's Natural Heritage

*Biodiversity, Landscapes, Stewardship, and Opportunities*

The Florida Natural Areas Inventory is pleased to announce the publication of the ***Atlas of Florida's Natural Heritage: Biodiversity, Landscapes, Stewardship, and Opportunities***. This high-quality, full-color *Atlas* is sure to become a standard reference for anyone involved in the conservation, management, study, or enjoyment of Florida's rich natural resources. We hope the *Atlas* will inspire, educate, and raise awareness of and interest in biodiversity and conservation issues.



Learn more about the Atlas, view sample pages and order your copy today at:  
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and



# **ATTACHMENT D**

## Guidelines, Conditions, and Effects Keys

USFWS Consultation Key for the Eastern Indigo Snake

USFWS Consultation Key Revised for the Wood Stork

Standard Sea Turtle and Smalltooth Sawfish Construction Conditions

Standard Manatee Conditions for In-Water Work

USFWS Consultation Key for the  
Eastern Indigo Snake

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

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

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

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

**POSTER INFORMATION**

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

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

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

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

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

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

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

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

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

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

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

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

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

## **PRE-CONSTRUCTION ACTIVITIES**

1. The applicant or designated agent will post educational posters in the construction office and throughout the construction site, including any access roads. The posters must be clearly visible to all construction staff. A sample poster is attached.
2. Prior to the onset of construction activities, the applicant/designated agent will conduct a meeting with all construction staff (annually for multi-year projects) to discuss identification of the snake, its protected status, what to do if a snake is observed within the project area, and applicable penalties that may be imposed if state and/or federal regulations are violated. An educational brochure including color photographs of the snake will be given to each staff member in attendance and additional copies will be provided to the construction superintendent to make available in the onsite construction office (a final brochure for Plan compliance, to be printed double-sided on 8.5" x 11" paper and then properly folded, is attached). Photos of eastern indigo snakes may be accessed on USFWS and/or FWC websites.
3. Construction staff will be informed that in the event that an eastern indigo snake (live or dead) is observed on the project site during construction activities, all such activities are to cease until the established procedures are implemented according to the Plan, which includes notification of the appropriate USFWS Field Office. The contact information for the USFWS is provided on the referenced posters and brochures.

## **DURING CONSTRUCTION ACTIVITIES**

1. During initial site clearing activities, an onsite observer may be utilized to determine whether habitat conditions suggest a reasonable probability of an eastern indigo snake sighting (example: discovery of snake sheds, tracks, lots of refugia and cavities present in the area of clearing activities, and presence of gopher tortoises and burrows).
2. If an eastern indigo snake is discovered during gopher tortoise relocation activities (i.e. burrow excavation), the USFWS shall be contacted within one business day to obtain further guidance which may result in further project consultation.
3. Periodically during construction activities, the applicant's designated agent should visit the project area to observe the condition of the posters and Plan materials, and replace them as needed. Construction personnel should be reminded of the instructions (above) as to what is expected if any eastern indigo snakes are seen.

## **POST CONSTRUCTION ACTIVITIES**

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

## USFWS Consultation Key Revised for the Wood Stork



## United States Department of the Interior



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

May 18, 2010

Donnie Kinard  
Chief, Regulatory Division  
Jacksonville District Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

Service Federal Activity Code: 41420-2007-FA-1494  
Service Consultation Code: 41420-2007-I-0964  
Subject: South Florida Programmatic  
Concurrence  
Species: Wood Stork

Dear Mr. Kinard:

This letter addresses minor errors identified in our January 25, 2010, wood stork key and as such, supplants the previous key. The key criteria and wood stork biomass foraging assessment methodology have not been affected by these minor revisions.

The Fish and Wildlife Service's (Service) South Florida Ecological Services Office (SFESO) and the U.S. Army Corps of Engineers Jacksonville District (Corps) have been working together to streamline the consultation process for federally listed species associated with the Corps' wetland permitting program. The Service provided letters to the Corps dated March 23, 2007, and October 18, 2007, in response to a request for a multi-county programmatic concurrence with a criteria-based determination of "may affect, not likely to adversely affect" (NLAA) for the threatened eastern indigo snake (*Drymarchon corais couperi*) and the endangered wood stork (*Mycteria americana*) for projects involving freshwater wetland impacts within specified Florida counties. In our letters, we provided effect determination keys for these two federally listed species, with specific criteria for the Service to concur with a determination of NLAA.

The Service has revisited these keys recently and believes new information provides cause to revise these keys. Specifically, the new information relates to foraging efficiencies and prey base assessments for the wood stork and permitting requirements for the eastern indigo snake. This letter addresses the wood stork key and is submitted in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*). The eastern indigo snake key will be provided in a separate letter.

Wood stork

### Habitat

The wood stork is primarily associated with freshwater and estuarine habitats that are used for nesting, roosting, and foraging. Wood storks typically construct their nests in medium to tall



trees that occur in stands located either in swamps or on islands surrounded by relatively broad expanses of open water (Ogden 1991, 1996; Rodgers et al. 1996). Successful colonies are those that have limited human disturbance and low exposure to land-based predators. Nesting colonies protected from land-based predators are characterized as those surrounded by large expanses of open water or where the nest trees are inundated at the onset of nesting and remain inundated throughout most of the breeding cycle. These colonies have water depths between 0.9 and 1.5 meters (3 and 5 feet) during the breeding season.

Successful nesting generally involves combinations of average or above-average rainfall during the summer rainy season and an absence of unusually rainy or cold weather during the winter-spring breeding season (Kahl 1964; Rodgers et al. 1987). This pattern produces widespread and prolonged flooding of summer marshes, which maximize production of freshwater fishes, followed by steady drying that concentrate fish during the season when storks nest (Kahl 1964). Successful nesting colonies are those that have a large number of foraging sites. To maintain a wide range of foraging sites, a variety of wetland types should be present, with both short and long hydroperiods. The Service (1999) describes a short hydroperiod as a 1 to 5-month wet/dry cycle, and a long hydroperiod as greater than 5 months. During the wet season, wood storks generally feed in the shallow water of the short-hydroperiod wetlands and in coastal habitats during low tide. During the dry season, foraging shifts to longer hydroperiod interior wetlands as they progressively dry-down (though usually retaining some surface water throughout the dry season).

Wood storks occur in a wide variety of wetland habitats. Typical foraging sites for the wood stork include freshwater marshes and stock ponds, shallow, seasonally flooded roadside and agricultural ditches, narrow tidal creeks and shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs. Because of their specialized feeding behavior, wood storks forage most effectively in shallow-water areas with highly concentrated prey. Through tactolocation, or grope feeding, wood storks in south Florida feed almost exclusively on fish between 2 and 25 centimeters [cm] (1 and 10 inches) in length (Ogden et al. 1976). Good foraging conditions are characterized by water that is relatively calm, uncluttered by dense thickets of aquatic vegetation, and having a water depth between 5 and 38 cm (5 and 15 inches) deep, although wood storks may forage in other wetlands. Ideally, preferred foraging wetlands would include a mosaic of emergent and shallow open-water areas. The emergent component provides nursery habitat for small fish, frogs, and other aquatic prey and the shallow, open-water areas provide sites for concentration of the prey during seasonal dry-down of the wetland.

### Conservation Measures

The Service routinely concurs with the Corps' "may affect, not likely to adversely affect" determination for individual project effects to the wood stork when project effects are insignificant due to scope or location, or if assurances are given that wetland impacts have been avoided, minimized, and adequately compensated such that there is no net loss in foraging potential. We utilize our *Habitat Management Guidelines for the Wood Stork in the Southeast Region* (Service 1990) (Enclosure 1) (HMG) in project evaluation. The HMG is currently under review and once final will replace the enclosed HMG. There is no designated critical habitat for the wood stork.

The SFESO recognizes a 29.9 kilometer [km] (18.6-mile) core foraging area (CFA) around all known wood stork colonies in south Florida. Enclosure 2 (to be updated as necessary) provides locations of colonies and their CFAs in south Florida that have been documented as active within the last 10 years. The Service believes loss of suitable wetlands within these CFAs may reduce foraging opportunities for the wood stork. To minimize adverse effects to the wood stork, we recommend compensation be provided for impacts to foraging habitat. The compensation should consider wetland type, location, function, and value (hydrology, vegetation, prey utilization) to ensure that wetland functions lost due to the project are adequately offset. Wetlands offered as compensation should be of the same hydroperiod and located within the CFAs of the affected wood stork colonies. The Service may accept, under special circumstances, wetland compensation located outside the CFAs of the affected wood stork nesting colonies. On occasion, wetland credits purchased from a "Service Approved" mitigation bank located outside the CFAs could be acceptable to the Service, depending on location of impacted wetlands relative to the permitted service area of the bank, and whether or not the bank has wetlands having the same hydroperiod as the impacted wetland.

In an effort to reduce correspondence in effect determinations and responses, the Service is providing the Wood Stork Effect Determination Key below. If the use of this key results in a Corps determination of "no effect" for a particular project, the Service supports this determination. If the use of this Key results in a determination of NLAA, the Service concurs with this determination<sup>1</sup>. This Key is subject to revisitation as the Corps and Service deem necessary.

The Key is as follows:

- A. Project within 0.76 km (0.47 mile)<sup>2</sup> of an active colony site<sup>3</sup> ..... "may affect"<sup>4</sup>
  - Project impacts Suitable Foraging Habitat (SFH)<sup>5</sup> at a location greater than 0.76 km (0.47 mile) from a colony site..... "go to B"

<sup>1</sup> With an outcome of "no effect" or "NLAA" as outlined in this key, and the project has less than 20.2 hectares (50 acres) of wetland impacts, the requirements of section 7 of the Act are fulfilled for the wood stork and no further action is required. For projects with greater than 20.2 hectares (50 acres) of wetland impacts, written concurrence of NLAA from the Service is necessary.

<sup>2</sup> Within the secondary zone (the average distance from the border of a colony to the limits of the secondary zone is 0.76 km (2,500 feet, or 0.47 mi).

<sup>3</sup> An active colony is defined as a colony that is currently being used for nesting by wood storks or has historically over the last 10 years been used for nesting by wood storks.

<sup>4</sup> Consultation may be concluded informally or formally depending on project impacts.

<sup>5</sup> Suitable foraging habitat (SFH) includes wetlands that typically have shallow-open water areas that are relatively calm and have a permanent or seasonal water depth between 5 to 38 cm (2 to 15 inches) deep. Other shallow non-wetland water bodies are also SFH. SFH supports and concentrates, or is capable of supporting and concentrating small fish, frogs, and other aquatic prey. Examples of SFH include, but are not limited to freshwater marshes, small ponds, shallow, seasonally flooded roadside or agricultural ditches, seasonally flooded pastures, narrow tidal creeks or shallow tidal pools, managed impoundments, and depressions in cypress heads and swamp sloughs.

Project does not affect SFH..... “no effect”.

B. Project impact to SFH is less than 0.20 hectare (one-half acre)<sup>6</sup>.....NLAA<sup>1</sup>”

Project impact to SFH is greater in scope than 0.20 hectare (one-half acre).....go to C

C. Project impacts to SFH not within the CFA (29.9 km, 18.6 miles) of a colony site .....go to D

Project impacts to SFH within the CFA of a colony site .....go to E

D. Project impacts to SFH have been avoided and minimized to the extent practicable; compensation (Service approved mitigation bank or as provided in accordance with Mitigation Rule 33 CFR Part 332) for unavoidable impacts is proposed in accordance with the CWA section 404(b)(1) guidelines; and habitat compensation replaces the foraging value matching the hydroperiod<sup>7</sup> of the wetlands affected and provides foraging value similar to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance<sup>8</sup>.....NLAA<sup>1</sup>”

Project not as above..... “may affect<sup>4</sup>”

E. Project provides SFH compensation in accordance with the CWA section 404(b)(1) guidelines and is not contrary to the HMG; habitat compensation is within the appropriate CFA or within the service area of a Service-approved mitigation bank; and habitat compensation replaces foraging value, consisting of wetland enhancement or restoration matching the hydroperiod<sup>7</sup> of the wetlands affected, and provides foraging value similar

<sup>6</sup> On an individual basis, SFH impacts to wetlands less than 0.20 hectare (one-half acre) generally will not have a measurable effect on wood storks, although we request that the Corps require mitigation for these losses when appropriate. Wood storks are a wide ranging species, and individually, habitat change from impacts to SFH less than one-half acre are not likely to adversely affect wood storks. However, collectively they may have an effect and therefore regular monitoring and reporting of these effects are important.

<sup>7</sup> Several researchers (Flemming et al. 1994; Ceilley and Bortone 2000) believe that the short hydroperiod wetlands provide a more important pre-nesting foraging food source and a greater early nestling survivor value for wood storks than the foraging base (grams of fish per square meter) than long hydroperiod wetlands provide. Although the short hydroperiod wetlands may provide less fish, these prey bases historically were more extensive and met the foraging needs of the pre-nesting storks and the early-age nestlings. Nest productivity may suffer as a result of the loss of short hydroperiod wetlands. We believe that most wetland fill and excavation impacts permitted in south Florida are in short hydroperiod wetlands. Therefore, we believe that it is especially important that impacts to these short hydroperiod wetlands within CFAs are avoided, minimized, and compensated for by enhancement/restoration of short hydroperiod wetlands.

<sup>8</sup> For this Key, the Service requires an analysis of foraging prey base losses and enhancements from the proposed action as shown in the examples in Enclosure 3 for projects with greater than 2.02 hectares (5 acres) of wetland impacts. For projects with less than 2.02 hectares (5 acres) of wetland impacts, an individual foraging prey base analysis is not necessary although type for type wetland compensation is still a requirement of the Key.

to, or higher than, that of impacted wetlands. See Enclosure 3 for a detailed discussion of the hydroperiod foraging values, an example, and further guidance<sup>8</sup> ..... “NLAA<sup>1</sup>”

Project does not satisfy these elements ..... “may affect<sup>4</sup>”

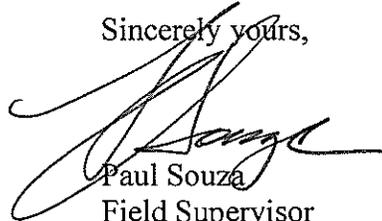
This Key does not apply to Comprehensive Everglades Restoration Plan projects, as they will require project-specific consultations with the Service.

Monitoring and Reporting Effects

For the Service to monitor cumulative effects, it is important for the Corps to monitor the number of permits and provide information to the Service regarding the number of permits issued where the effect determination was: “may affect, not likely to adversely affect.” We request that the Corps send us an annual summary consisting of: project dates, Corps identification numbers, project acreages, project wetland acreages, and project locations in latitude and longitude in decimal degrees.

Thank you for your cooperation and effort in protecting federally listed species. If you have any questions, please contact Allen Webb at extension 246.

Sincerely yours,



Paul Souza  
Field Supervisor  
South Florida Ecological Services Office

Enclosures

- cc: w/enclosures (electronic only)
- Corps, Jacksonville, Florida (Stu Santos)
- EPA, West Palm Beach, Florida (Richard Harvey)
- FWC, Vero Beach, Florida (Joe Walsh)
- Service, Jacksonville, Florida (Billy Brooks)

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# HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION



**HABITAT MANAGEMENT GUIDELINES  
FOR THE WOOD STORK IN THE  
SOUTHEAST REGION**

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# HABITAT MANAGEMENT GUIDELINES FOR THE WOOD STORK IN THE SOUTHEAST REGION

## Introduction

A number of Federal and state laws and/or regulations prohibit, cumulatively, such acts as harrassing, disturbing, harming, molesting, pursuing, etc., wood storks, or destroying their nests (see Section VII). Although advisory in nature, these guidelines represent a biological interpretation of what would constitute violations of one or more of such prohibited acts. Their purpose is to maintain and/or improve the environmental conditions that are required for the survival and well-being of wood storks in the southeastern United States, and are designed essentially for application in wood stork/human activity conflicts (principally land development and human intrusion into stork use sites). The emphasis is to avoid or minimize detrimental human-related impacts on wood storks. These guidelines were prepared in consultations with state wildlife agencies and wood stork experts in the four southeastern states where the wood stork is listed as Endangered (Alabama, Florida, Georgia, South Carolina).

## General

The wood stork is a gregarious species, which nests in colonies (rookeries), and roosts and feeds in flocks, often in association with other species of long-legged water birds. Storks that nest in the southeastern United States appear to represent a distinct population, separate from the nearest breeding population in Mexico. Storks in the southeastern U.S. population have recently (since 1980) nested in colonies scattered throughout Florida, and at several central-southern Georgia and coastal South Carolina sites. Banded and color-marked storks from central and southern Florida colonies have dispersed during non-breeding seasons as far north as southern Georgia, and the coastal counties in South Carolina and southeastern North Carolina, and as far west as central Alabama and northeastern Mississippi. Storks from a colony in south-central Georgia have wintered between southern Georgia and southern Florida. This U.S. nesting population of wood storks was listed as endangered by the U.S. Fish and Wildlife Service on February 28, 1984 (*Federal Register* 49(4):7332-7335).

Wood storks use freshwater and estuarine wetlands as feeding, nesting, and roosting sites. Although storks are not habitat specialists, their needs are exacting enough, and available habitat is limited enough, so that nesting success and the size of regional populations are closely regulated by year-to-year differences in the quality and quantity of suitable habitat. Storks are especially sensitive to environmental conditions at feeding sites; thus, birds may fly relatively long distances either daily or between regions annually, seeking adequate food resources.

All available evidence suggests that regional declines in wood stork numbers have been largely due to the loss or degradation of essential wetland habitat. An understanding of the qualities of good stork habitat should help to focus protection efforts on those sites

that are seasonally important to regional populations of wood storks. Characteristics of feeding, nesting, and roosting habitat, and management guidelines for each, are presented here by habitat type.

#### **I. Feeding habitat.**

A major reason for the wood stork decline has been the loss and degradation of feeding habitat. Storks are especially sensitive to any manipulation of a wetland site that results in either reduced amounts or changes in the timing of food availability.

Storks feed primarily (often almost exclusively) on small fish between 1 and 8 inches in length. Successful foraging sites are those where the water is between 2 and 15 inches deep. Good feeding conditions usually occur where water is relatively calm and uncluttered by dense thickets of aquatic vegetation. Often a dropping water level is necessary to concentrate fish at suitable densities. Conversely, a rise in water, especially when it occurs abruptly, disperses fish and reduces the value of a site as feeding habitat.

The types of wetland sites that provide good feeding conditions for storks include: drying marshes or stock ponds, shallow roadside or agricultural ditches, narrow tidal creeks or shallow tidal pools, and depressions in cypress heads or swamp sloughs. In fact, almost any shallow wetland depression where fish tend to become concentrated, either through local reproduction or the consequences of area drying, may be used by storks.

Nesting wood storks do most of their feeding in wetlands between 5 and 40 miles from the colony, and occasionally at distances as great as 75 miles. Within this colony foraging range and for the 110-150 day life of the colony, and depending on the size of the colony and the nature of the surrounding wetlands, anywhere from 50 to 200 different feeding sites may be used during the breeding season.

Non-breeding storks are free to travel much greater distances and remain in a region only for as long as sufficient food is available. Whether used by breeders or non-breeders, any single feeding site may at one time have small or large numbers of storks (1 to 100+), and be used for one to many days, depending on the quality and quantity of available food. Obviously, feeding sites used by relatively large numbers of storks, and/or frequently used areas, potentially are the more important sites necessary for the maintenance of a regional population of birds.

Differences between years in the seasonal distribution and amount of rainfall usually mean that storks will differ between years in where and when they feed. Successful nesting colonies are those that have a large number of feeding site options, including sites that may be suitable only in years of rainfall extremes. To maintain the wide range of feeding site options requires that many different wetlands, with both relatively short and long annual hydroperiods, be preserved. For example, protecting only the larger wetlands, or those with longer annual hydroperiods, will result in the eventual loss of smaller, seemingly less important wetlands. However, these small scale wetlands are crucial as the only available feeding sites during the wetter periods when the larger habitats are too deeply flooded to be used by storks.

## II. Nesting habitat.

Wood storks nest in colonies, and will return to the same colony site for many years so long as that site and surrounding feeding habitat continue to supply the needs of the birds. Storks require between 110 and 150 days for the annual nesting cycle, from the period of courtship until the nestlings become independent. Nesting activity may begin as early as December or as late as March in southern Florida colonies, and between late February and April in colonies located between central Florida and South Carolina. Thus, full term colonies may be active until June-July in south Florida, and as late as July-August at more northern sites. Colony sites may also be used for roosting by storks during other times of the year.

Almost all recent nesting colonies in the southeastern U.S. have been located either in woody vegetation over standing water, or on islands surrounded by broad expanses of open water. The most dominant vegetation in swamp colonies has been cypress, although storks also nest in swamp hardwoods and willows. Nests in island colonies may be in more diverse vegetation, including mangroves (coastal), exotic species such as Australian pine (*Casuarina*) and Brazilian Pepper (*Schinus*), or in low thickets of cactus (*Opuntia*). Nests are usually located 15-75 feet above ground, but may be much lower, especially on island sites when vegetation is low.

Since at least the early 1970's, many colonies in the southeastern U.S. have been located in swamps where water has been impounded due to the construction of levees or roadways. Storks have also nested in dead and dying trees in flooded phosphate surface mines, or in low, woody vegetation on mounded, dredge islands. The use of these altered wetlands or completely "artificial" sites suggests that in some regions or years storks are unable to locate natural nesting habitat that is adequately flooded during the normal breeding season. The readiness with which storks will utilize water impoundments for nesting also suggests that colony sites could be intentionally created and maintained through long-term site management plans. Almost all impoundment sites used by storks become suitable for nesting only fortuitously, and therefore, these sites often do not remain available to storks for many years.

In addition to the irreversible impacts of drainage and destruction of nesting habitat, the greatest threats to colony sites are from human disturbance and predation. Nesting storks show some variation in the levels of human activity they will tolerate near a colony. In general, nesting storks are more tolerant of low levels of human activity near a colony when nests are high in trees than when they are low, and when nests contain partially or completely feathered young than during the period between nest construction and the early nestling period (adults still brooding). When adult storks are forced to leave their nests, eggs or downy young may die quickly (<20 minutes) when exposed to direct sun or rain.

Colonies located in flooded environments must remain flooded if they are to be successful. Often water is between 3 and 5 feet deep in successful colonies during the nesting season. Storks rarely form colonies, even in traditional nesting sites, when they are dry, and may abandon nests if sites become dry during the nesting period. Flooding in colonies may be most important as a defense against mammalian predators. Studies of stork colonies in Georgia and

Florida have shown high rates of raccoon predation when sites dried during the nesting period. A reasonably high water level in an active colony is also a deterrent against both human and domestic animal intrusions.

Although nesting wood storks usually do most feeding away from the colony site (>5 miles), considerable stork activity does occur close to the colony during two periods in the nesting cycle. Adult storks collect almost all nesting material in and near the colony, usually within 2500 feet. Newly fledged storks, near the end of the nesting cycle, spend from 1-4 weeks during the fledging process flying locally in the colony area, and perched in nearby trees or marshy spots on the ground. These birds return daily to their nests to be fed. It is essential that these fledging birds have little or no disturbance as far out as one-half mile within at least one or two quadrants from the colony. Both the adults, while collecting nesting material, and the inexperienced fledglings, do much low, flapping flight within this radius of the colony. At these times, storks potentially are much more likely to strike nearby towers or utility lines.

Colony sites are not necessarily used annually. Regional populations of storks shift nesting locations between years, in response to year-to-year differences in food resources. Thus, regional populations require a range of options for nesting sites, in order to successfully respond to food availability. Protection of colony sites should continue, therefore, for sites that are not used in a given year.

### **III. Roosting habitat.**

Although wood storks tend to roost at sites that are similar to those used for nesting, they also use a wider range of site types for roosting than for nesting. Non-breeding storks, for example, may frequently change roosting sites in response to changing feeding locations, and in the process, are inclined to accept a broad range of relatively temporary roosting sites. Included in the list of frequently used roosting locations are cypress "heads" or swamps (not necessarily flooded if trees are tall), mangrove islands, expansive willow thickets or small, isolated willow "islands" in broad marshes, and on the ground either on levees or in open marshes.

Daily activity patterns at a roost vary depending on the status of the storks using the site. Non-breeding adults or immature birds may remain in roosts during major portions of some days. When storks are feeding close to a roost, they may remain on the feeding grounds until almost dark before making the short flight. Nesting storks traveling long distances (>40 miles) to feeding sites may roost at or near the latter, and return to the colony the next morning. Storks leaving roosts, especially when going long distances, tend to wait for mid-morning thermals to develop before departing.

### **IV. Management zones and guidelines for feeding sites.**

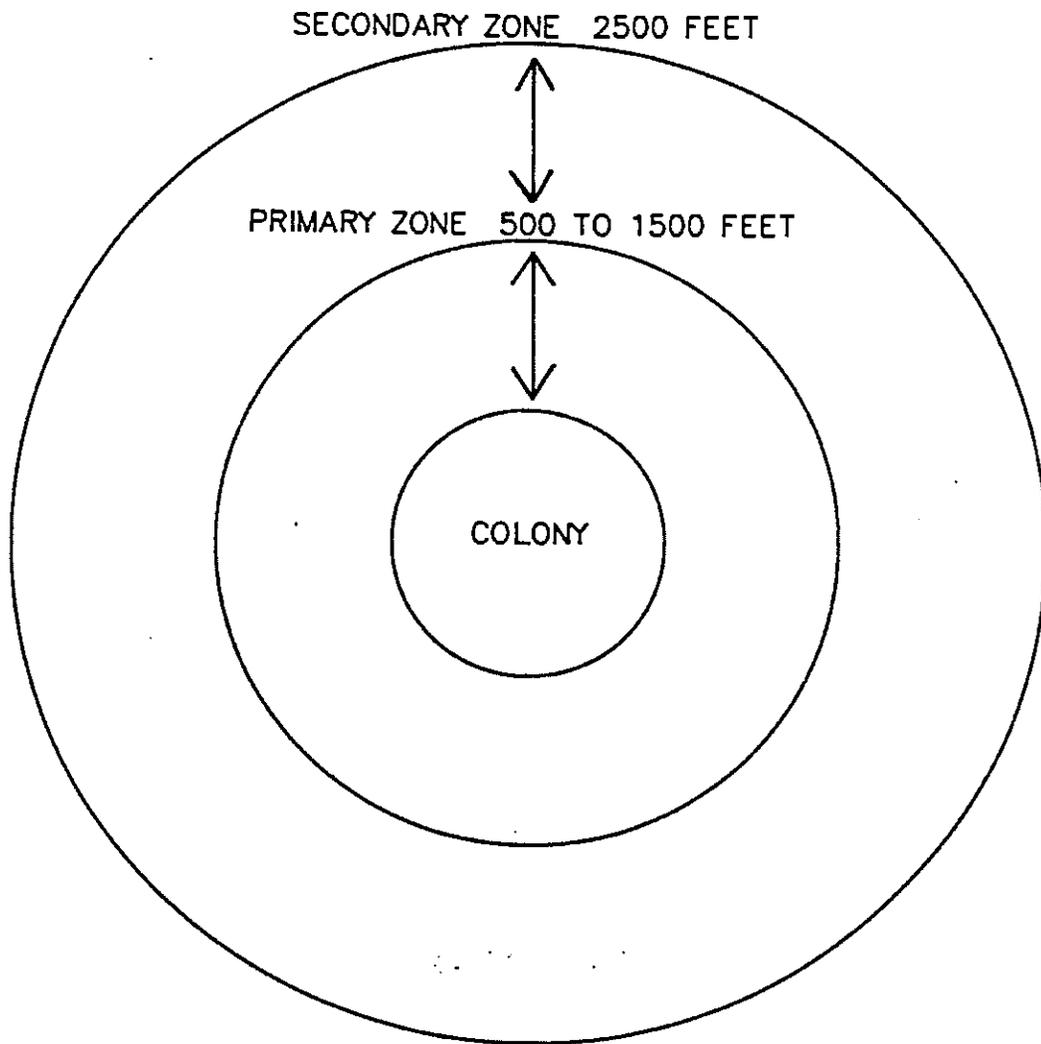
To the maximum extent possible, feeding sites should be protected by adherence to the following protection zones and guidelines:

- A. There should be no human intrusion into feeding sites when storks are present. Depending upon the amount of screening vegetation, human activity should be no closer than between 300 feet (where solid vegetation screens exist) and 750 feet (no vegetation screen).

- B. Feeding sites should not be subjected to water management practices that alter traditional water levels or the seasonally normal drying patterns and rates. Sharp rises in water levels are especially disruptive to feeding storks.
- C. The introduction of contaminants, fertilizers, or herbicides into wetlands that contain stork feeding sites should be avoided, especially those compounds that could adversely alter the diversity and numbers of native fishes, or that could substantially change the characteristics of aquatic vegetation. Increase in the density and height of emergent vegetation can degrade or destroy sites as feeding habitat.
- D. Construction of tall towers (especially with guy wires) within three miles, or high power lines (especially across long stretches of open country) within one mile of major feeding sites should be avoided.

**V. Management zones and guidelines for nesting colonies.**

- A. Primary zone: This is the most critical area, and must be managed according to recommended guidelines to insure that a colony site survives.
  - 1. Size: The primary zone must extend between 1000 and 1500 feet in all directions from the actual colony boundaries when there are no visual or broad aquatic barriers, and never less than 500 feet even when there are strong visual or aquatic barriers. The exact width of the primary zone in each direction from the colony can vary within this range, depending on the amount of visual screen (tall trees) surrounding the colony, the amount of relatively deep, open water between the colony and the nearest human activity, and the nature of the nearest human activity. In general, storks forming new colonies are more tolerant of existing human activity, than they will be of new human activity that begins after the colony has formed.
  - 2. Recommended Restrictions:
    - a. Any of the following activities within the primary zone, at any time of the year, are likely to be detrimental to the colony:
      - (1) Any lumbering or other removal of vegetation, and
      - (2) Any activity that reduces the area, depth, or length of flooding in wetlands under and surrounding the colony, except where periodic (less than annual) water control may be required to maintain the health of the aquatic, woody vegetation, and
      - (3) The construction of any building, roadway, tower, power line, canal, etc.
    - b. The following activities within the primary zone are likely to be detrimental to a colony if they occur when the colony is active:
      - (1) Any unauthorized human entry closer than 300 feet of the colony, and



- (2) Any increase or irregular pattern in human activity anywhere in the primary zone, and
  - (3) Any increase or irregular pattern in activity by animals, including livestock or pets, in the colony, and
  - (4) Any aircraft operation closer than 500 feet of the colony.
- B. Secondary Zone: Restrictions in this zone are needed to minimize disturbances that might impact the primary zone, and to protect essential areas outside of the primary zone. The secondary zone may be used by storks for collecting nesting material, for roosting, loafing, and feeding (especially important to newly fledged young), and may be important as a screen between the colony and areas of relatively intense human activities.
- 1. Size: The secondary zone should range outward from the primary zone 1000-2000 feet, or to a radius of 2500 feet of the outer edge of the colony.
  - 2. Recommended Restrictions:
    - a. Activities in the secondary zone which may be detrimental to nesting wood storks include:
      - (1) Any increase in human activities above the level that existed in the year when the colony first formed, especially when visual screens are lacking, and
      - (2) Any alteration in the area's hydrology that might cause changes in the primary zone, and
      - (3) Any substantial (>20 percent) decrease in the area of wetlands and woods of potential value to storks for roosting and feeding.
    - b. In addition, the probability that low flying storks, or inexperienced, newly-fledged young will strike tall obstructions, requires that high-tension power lines be no closer than one mile (especially across open country or in wetlands) and tall transmission towers no closer than 3 miles from active colonies. Other activities, including busy highways and commercial and residential buildings may be present in limited portions of the secondary zone at the time that a new colony first forms. Although storks may tolerate existing levels of human activities, it is important that these human activities not expand substantially.

## VI. Roosting site guidelines.

The general characteristics and temporary use-patterns of many stork roosting sites limit the number of specific management recommendations that are possible:

- A. Avoid human activities within 500-1000 feet of roost sites during seasons of the year and times of the day when storks may be present. Nocturnal activities in active roosts may be especially disruptive.

- B. Protect the vegetative and hydrological characteristics of the more important roosting sites--those used annually and/or used by flocks of 25 or more storks. Potentially, roosting sites may, some day, become nesting sites.

## VII. Legal Considerations.

### A. Federal Statutes

The U.S. breeding population of the wood stork is protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act). The population was listed as endangered on February 28, 1984 (49 Federal Register 7332); wood storks breeding in Alabama, Florida, Georgia, and South Carolina are protected by the Act.

Section 9 of the Endangered Species Act of 1973, as amended, states that it is unlawful for any person subject to the jurisdiction of the United States to take (defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.") any listed species anywhere within the United States.

The wood stork is also federally protected by its listing (50 CFR 10.13) under the Migratory Bird Treaty Act (167 U.S.C. 703-711), which prohibits the taking, killing or possession of migratory birds except as permitted.

### B. State Statutes

#### 1. State of Alabama

Section 9-11-232 of Alabama's Fish, Game, and Wildlife regulations curtails the possession, sale, and purchase of wild birds. "Any person, firm, association, or corporation who takes, catches, kills or has in possession at any time, living or dead, any protected wild bird not a game bird or who sells or offers for sale, buys, purchases or offers to buy or purchase any such bird or exchange same for anything of value or who shall sell or expose for sale or buy any part of the plumage, skin, or body of any bird protected by the laws of this state or who shall take or willfully destroy the nests of any wild bird or who shall have such nests or eggs of such birds in his possession, except as otherwise provided by law, shall be guilty of a misdemeanor..."

Section 1 of the Alabama Nongame Species Regulation (Regulation 87-GF-7) includes the wood stork in the list of nongame species covered by paragraph (4). " It shall be unlawful to take, capture, kill, possess, sell, trade for anything of monetary value, or offer to sell or trade for anything of monetary value, the following nongame wildlife species (or any parts or reproductive products of such species) without a scientific collection permit and written permission from the Commissioner, Department of Conservation and Natural Resources,..."

#### 2. State of Florida

Rule 39-4.001 of the Florida Wildlife Code prohibits "taking, attempting to take, pursuing, hunting, molesting, capturing, or killing (collectively defined as "taking"), transporting, storing, serving, buying, selling,

possessing, or wantonly or willingly wasting any wildlife or freshwater fish or their nests, eggs, young, homes, or dens except as specifically provided for in other rules of Chapter 39, Florida Administrative Code.

Rule 39-27.011 of the Florida Wildlife Code prohibits "killing, attempting to kill, or wounding any endangered species." The "Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida" dated 1 July 1988, includes the wood stork, listed as "endangered" by the Florida Game and Fresh Water Fish Commission.

### 3. State of Georgia

Section 27-1-28 of the Conservation and Natural Resources Code states that "Except as otherwise provided by law, rule, or regulation, it shall be unlawful to hunt, trap, fish, take, possess, or transport any nongame species of wildlife..."

Section 27-1-30 states that, "Except as otherwise provided by law or regulation, it shall be unlawful to disturb, mutilate, or destroy the dens, holes, or homes of any wildlife; "

Section 27-3-22 states, in part, "It shall be unlawful for any person to hunt, trap, take, possess, sell, purchase, ship, or transport any hawk, eagle, owl, or any other bird or any part, nest, or egg thereof..."

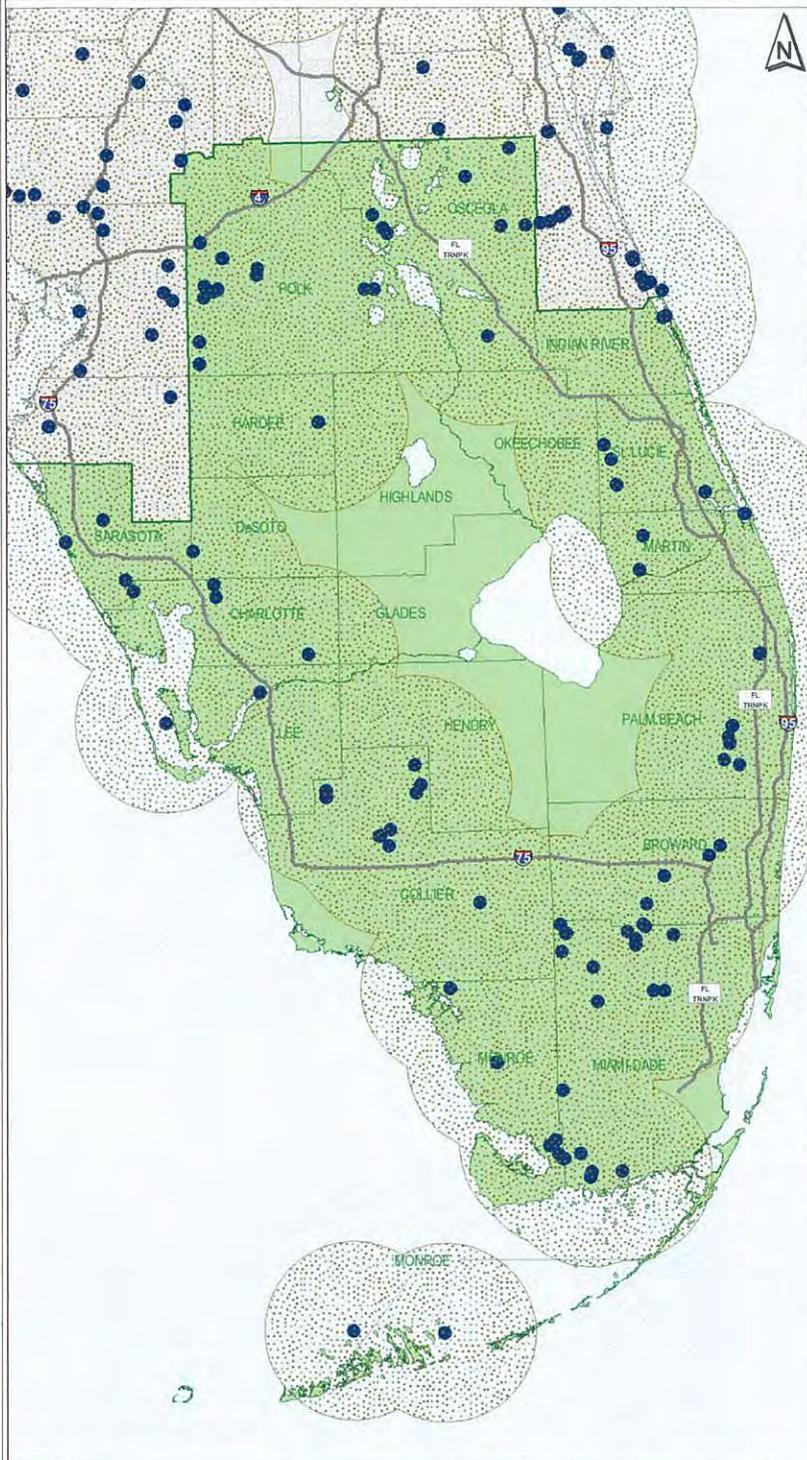
The wood stork is listed as endangered pursuant to the Endangered Wildlife Act of 1973 (Section 27-3-130 of the Code). Section 391-4-13-.06 of the Rules and Regulations of the Georgia Department of Natural Resources prohibits harassment, capture, sale, killing, or other actions which directly cause the death of animal species protected under the Endangered Wildlife Act. The destruction of habitat of protected species on public lands is also prohibited.

### 4. State of South Carolina

Section 50-15-40 of the South Carolina Nongame and Endangered Species Conservation Act states, "Except as otherwise provided in this chapter, it shall be unlawful for any person to take, possess, transport, export, process, sell, or offer of sale or ship, and for any common or contract carrier knowingly to transport or receive for shipment any species or subspecies of wildlife appearing on any of the following lists: (1) the list of wildlife indigenous to the State, determined to be endangered within the State...(2) the United States' List of Endangered Native Fish and Wildlife... (3) the United States' List of Endangered Foreign Fish and Wildlife ..."

5/21/2010

# Wood Stork



## Nesting Colonies Core Foraging Areas

1999 to 2005

- Colony Location
- ▨ Core Foraging Area
- South Florida Service Area



Produced by:  
South Florida Ecological Services Office  
<http://verobeach.fws.gov>  
Phone: 772.562.3909



5/21/2010

## Enclosure 3

**Wood Stork Foraging Analysis:** Excerpts of concepts and procedure as presented by the Service in this appendix may be viewed in detail in any one of our recent Biological Opinions for project related impacts to the wood stork. These documents can be found at the internet website address <http://www.fws.gov/filedownloads/ftp%5verobeach>.

### Foraging Habitat

Researchers have shown that wood storks forage most efficiently and effectively in habitats where prey densities are high and the water shallow and canopy open enough to hunt successfully (Ogden et al. 1978, Browder 1984, Coulter 1987). Prey availability to wood storks is dependent on a composite variable consisting of density (number or biomass/m<sup>2</sup>) and the vulnerability of the prey items to capture (Gawlik 2002). For wood storks, prey vulnerability appears to be largely controlled by physical access to the foraging site, water depth, the density of submerged vegetation, and the species-specific characteristics of the prey. For example, fish populations may be very dense, but not available (vulnerable) because the water depth is too deep (greater than 30 cm) for storks or the tree canopy at the site is too dense for storks to land. Calm water, about 5-40 cm (2-16 in) in depth, and free of dense aquatic vegetation is ideal (Coulter and Bryan 1993).

Coulter and Bryan's (1993) study suggested that wood storks preferred ponds and marshes, and visited areas with little or no canopy more frequently. Even in foraging sites in swamps, the canopy tended to be sparse. They suggested that open canopies may have contributed to detection of the sites and more importantly may have allowed the storks to negotiate landing more easily than at closed-canopy sites. In their study, the median amount of canopy cover where wood stork foraging was observed was 32 percent. Other researchers (P.C. Frederick, University of Florida, personal communication 2006; J.A. Rodgers, FWC, personal communication 2006) also confirm that wood storks will forage in woodlands, though the woodlands have to be fairly open and vegetation not very dense. Furthermore, the canopies must be open enough for wood storks to take flight quickly to avoid predators.

**Melaleuca-infested Wetlands:** As discussed previously, wetland suitability for wood stork foraging is partially dependent on vegetation density. Melaleuca is a dense-stand growth plant species, effectively producing a closed canopy and dense understory growth pattern that generally limits a site's accessibility to foraging by wading birds. However, O'Hare and Dalrymple (1997) suggest moderate infestations of melaleuca may have little effect on some species' productivity (*i.e.*, amphibians and reptiles) as long as critical abiotic factors such as hydrology remain. They also note as the levels of infestation increase, usage by wetland dependent species decreases. Their studies also showed that the number of fish species present in a wetland system remain stable at certain levels of melaleuca. However, the availability of the prey base for wood storks and other foraging wading birds is reduced by the restriction of access caused from dense and thick exotic vegetation. Wood storks and other wading birds can forage in these systems in open area pockets (*e.g.*, wind blow-downs), provided multiple conditions are optimal (*e.g.*, water depth, prey density). In O'Hare and Dalrymple's study (1997), they identify five cover types (Table 1) and

provide information on the number of wetland dependent bird species and the number of individuals observed within each of these vegetation classes (Table 2).

**Table 1: Vegetation classes**

DMM	75-100 percent mature dense melaleuca coverage
DMS or (SDM)	75-100 percent sapling dense melaleuca coverage
P75	50-75 percent melaleuca coverage
P50	0-50 percent melaleuca coverage
MAR (Marsh)	0-10 percent melaleuca coverage

The number of wetland-dependent species and individuals observed per cover type is shown below in columns 1, 2, and 3 (Table 2). To develop an estimate of the importance a particular wetland type may have (based on density and aerial coverage by exotic species) to wetland dependent species, we developed a foraging suitability value using observational data from O'Hare and Dalrymple (1997). The Foraging Suitability Value as shown in column 5 (Table 2) is calculated by multiplying the number of species by the number of individuals and dividing this value by the maximum number of species and individuals combined ( $12 \times 132 = 1584$ ). The results are shown below for each of the cover types in O'Hare and Dalrymple (1997) study (Table 1). As an example, for the P50 cover type, the foraging suitability is calculated by multiplying 11 species times 92 individuals for a total of 1,012. Divide this value by 1,584, which is the maximum number of species times the maximum number of individuals ( $12 \times 132 = 1,584$ ). The resultant is 0.6389 or 64 percent  $11 \times 92 = 1012 / 1584 \times 100 = 63.89$ .

**Table 2: Habitat Foraging Suitability**

Cover Type	# of Species (S)	# of Individuals (I)	S*I	Foraging Suitability
DMM	1	2	2	0.001
DMS	4	10	40	0.025
P75	10	59	590	0.372
P50	11	92	1,012	0.639
MAR	12	132	1,584	1.000

This approach was developed to provide us with a method of assessing wetland acreages and their relationship to prey densities and prey availability. We consider wetland dependent bird use to be a general index of food availability. Based on this assessment we developed an exotic foraging suitability index (Table 3):

**Table 3. Foraging Suitability Percentages**

Exotic Percentage	Foraging Suitability (percent)
Between 0 and 25 percent exotics	100
Between 25 and 50 percent exotics	64
Between 50 and 75 percent exotics	37
Between 75 and 90 percent exotics	3
Between 90 and 100 percent exotics	0

In our assessment however, we consider DMM to represent all exotic species densities between 90 and 100 percent and DMS to represent all exotic species densities between 75 and 90 percent. In our evaluation of a habitat's suitability, the field distinction between an exotic coverage of

90 percent and 100 percent in many situations is not definable, therefore unless otherwise noted in the field reports and in our analysis; we consider a suitability value of 3 percent to represent both densities.

**Hydroperiod:** The hydroperiod of a wetland can affect the prey densities in a wetland. For instance, research on Everglades fish populations using a variety of quantitative sampling techniques (pull traps, throw traps, block nets) have shown that the density of small forage fish increases with hydroperiod. Marshes inundated for less than 120 days of the year average  $\pm 4$  fish/m<sup>2</sup>; whereas, those flooded for more than 340 days of the year average  $\pm 25$  fish/m<sup>2</sup> (Loftus and Eklund 1994, Trexler et al. 2002).

The Service (1999) described a short hydroperiod wetland as wetlands with between 0 and 180-day inundation, and long hydroperiod wetlands as those with greater than 180-day inundation. However, Trexler et al. (2002) defined short hydroperiod wetlands as systems with less than 300 days per year inundation. In our discussion of hydroperiods, we are considering short hydroperiod wetlands to be those that have an inundation of 180 days or fewer.

The most current information on hydroperiods in south Florida was developed by the SFWMD for evaluation of various restoration projects throughout the Everglades Protection Area. In their modeling efforts, they identified the following seven hydroperiods:

**Table 4. SFWMD Hydroperiod Classes – Everglades Protection Area**

Hydroperiod Class	Days Inundated
Class 1	0-60
Class 2	60-120
Class 3	120-180
Class 4	180-240
Class 5	240-300
Class 6	300-330
Class 7	330-365

**Fish Density per Hydroperiod:** In the Service’s assessment of project related impacts to wood storks, the importance of fish data specific to individual hydroperiods is the principle basis of our assessment. In order to determine the fish density per individual hydroperiod, the Service relied on the number of fish per hydroperiod developed from throw-trap data in Trexler et al.’s (2002) study and did not use the electrofishing data also presented in Trexler et al.’s study that defined fish densities in catch per unit effort, which is not hydroperiod specific. Although the throw-trap sampling generally only samples fish 8 cm or less, the Service believes the data can be used as a surrogate representation of all fish, including those larger than 8 cm, which are typically sampled by either electrofishing or block net sampling.

We base this evaluation on the following assessment. Trexler et al.’s (2002) study included electrofishing data targeting fish greater than 8 cm, the data is recorded in catch per unit effort and in general is not hydroperiod specific. However, Trexler et al. (2002) notes in their assessment of the electrofishing data that in general there is a correlation with the number of fish per unit effort per changes in water depth. In literature reviews of electrofishing data by Chick et

al. (1999 and 2004), they note that electrofishing data provides a useful index of the abundance of larger fish in shallow, vegetated habitat, but length, frequency, and species compositional data should be interpreted with caution. Chick et al. (2004) also noted that electrofishing data for large fish (> 8cm) provided a positive correlation of the number of fish per unit effort (abundance) per changes in hydroperiod. The data in general show that as the hydroperiod decreases, the abundance of larger fishes also decreases.

Studies by Turner et al. (1999), Turner and Trexler (1997), and Carlson and Duever (1979) also noted this abundance trend for fish species sampled. We also noted in our assessment of prey consumption by wood storks in the Ogden et al. (1976) study (Figure 4) (discussed below), that the wood stork's general preference is for fish measuring 1.5 cm to 9 cm, although we also acknowledged that wood storks consume fish larger than the limits discussed in the Ogden et al. (1976) study. A similar assessment is reference by Trexler and Goss (2009) noting a diversity of size ranges of prey available for wading birds to consume, with fish ranging from 6 to 8 cm being the preferred prey for larger species of wading birds, particularly wood storks (Kushlan et al. 1975).

Therefore, since data were not available to quantify densities (biomass) of fish larger than 8 cm to a specific hydroperiod, and Ogden et al.'s (1976) study notes that the wood stork's general preference is for fish measuring 1.5 cm to 9 cm, and that empirical data on fish densities per unit effort correlated positively with changes in water depth, we believe that the Trexler et al. (2002) throw-trap data represents a surrogate assessment tool to predict the changes in total fish density and the corresponding biomass per hydroperiod for our wood stork assessment.

In consideration of this assessment, the Service used the data presented in Trexler et al.'s (2002) study on the number of fish per square-meter per hydroperiod for fish 8 cm or less to be applicable for estimating the total biomass per square-meter per hydroperiod for all fish. In determining the biomass of fish per square-meter per hydroperiod, the Service relied on the summary data provided by Turner et al. (1999), which provides an estimated fish biomass of 6.5 g/m<sup>2</sup> for a Class 7 hydroperiod for all fish and used the number of fish per square-meter per hydroperiod from Trexler et al.'s data to extrapolate biomass values per individual hydroperiods.

Trexler et al.'s (2002) studies in the Everglades provided densities, calculated as the square-root of the number of fish per square meter, for only six hydroperiods; although these cover the same range of hydroperiods developed by the SFWMD. Based on the throw-trap data and Trexler et al.'s (2002) hydroperiods, the square-root fish densities are:

**Table 5. Fish Densities per Hydroperiod from Trexler et al. (2002)**

Hydroperiod Class	Days Inundated	Fish Density
Class 1	0-120	2.0
Class 2	120-180	3.0
Class 3	180-240	4.0
Class 4	240-300	4.5
Class 5	300-330	4.8
Class 6	330-365	5.0

Trexler et al.'s (2002) fish densities are provided as the square root of the number of fish per square meter. For our assessment, we squared these numbers to provide fish per square meter, a simpler calculation when other prey density factors are included in our evaluation of adverse effects to listed species from the proposed action. We also extrapolated the densities over seven hydroperiods, which is the same number of hydroperiods characterized by the SFWMD. For example, Trexler et al.'s (2002) square-root density of a Class 2 wetland with three fish would equate to a SFWMD Model Class 3 wetland with nine fish. Based on the above discussion, the following mean annual fish densities were extrapolated to the seven SFWMD Model hydroperiods:

**Table 6. Extrapolated Fish Densities for SFWMD Hydroperiods**

Hydroperiod Class	Days Inundated	Extrapolated Fish Density
Class 1	0-60	2 fish/m <sup>2</sup>
Class 2	60-120	4 fish/m <sup>2</sup>
Class 3	120-180	9 fish/m <sup>2</sup>
Class 4	180-240	16 fish/m <sup>2</sup>
Class 5	240-300	20 fish/m <sup>2</sup>
Class 6	300-330	23 fish/m <sup>2</sup>
Class 7	330-365	25 fish/m <sup>2</sup>

**Fish Biomass per Hydroperiod:** A more important parameter than fish per square-meter in defining fish densities is the biomass these fish provide. In the ENP and WCA-3, based on studies by Turner et al. (1999), Turner and Trexler (1997), and Carlson and Duever (1979), the standing stock (biomass) of large and small fishes combined in unenriched Class 5 and 6 hydroperiod wetlands averaged between 5.5 to 6.5 grams-wet-mass/m<sup>2</sup>. In these studies, the data was provided in g/m<sup>2</sup> dry-weight and was converted to g/m<sup>2</sup> wet-weight following the procedures referenced in Kushlan et al. (1986) and also referenced in Turner et al. (1999). The fish density data provided in Turner et al. (1999) included both data from samples representing fish 8 cm or smaller and fish larger than 8 cm and included summaries of Turner and Trexler (1997) data, Carlson and Duever (1979) data, and Loftus and Eklund (1994) data. These data sets also reflected a 0.6 g/m<sup>2</sup> dry-weight correction estimate for fish greater than 8 cm based on Turner et al.'s (1999) block-net rotenone samples.

Relating this information to the hydroperiod classes developed by the SFWMD, we estimated the mean annual biomass densities per hydroperiod. For our assessment, we considered Class 7 hydroperiod wetlands based on Turner et al. (1999) and Trexler et al. (2002) studies to have a mean annual biomass of 6.5 grams-wet-mass/m<sup>2</sup> and to be composed of 25 fish/m<sup>2</sup>. The remaining biomass weights per hydroperiod were determined as a direct proportion of the number of fish per total weight of fish for a Class 7 hydroperiod (6.5 grams divided by 25 fish equals 0.26 grams per fish).

For example, given that a Class 3 hydroperiod has a mean annual fish density of 9 fish/m<sup>2</sup>, with an average weight of 0.26 grams per fish, the biomass of a Class 3 hydroperiod would be 2.3 grams/m<sup>2</sup> (9\*0.26 = 2.3). Based on the above discussion, the biomass per hydroperiod class is:

**Table 7. Extrapolated Mean Annual Fish Biomass for SFWMD Hydroperiods**

Hydroperiod Class	Days Inundated	Extrapolated Fish Biomass
Class 1	0-60	0.5 gram/m <sup>2</sup>
Class 2	60-120	1.0 gram/m <sup>2</sup>
Class 3	120-180	2.3 grams/m <sup>2</sup>
Class 4	180-240	4.2 grams/m <sup>2</sup>
Class 5	240-300	5.2 grams/m <sup>2</sup>
Class 6	300-330	6.0 grams/m <sup>2</sup>
Class 7	330-365	6.5 grams/m <sup>2</sup>

**Wood stork suitable prey size:** Wood storks are highly selective in their feeding habits and in studies on fish consumed by wood storks, five species of fish comprised over 85 percent of the number and 84 percent of the biomass of over 3,000 prey items collected from adult and nestling wood storks (Ogden et al. 1976). Table 8 lists the fish species consumed by wood storks in Ogden et al. (1976).

**Table 8. Primary Fish Species consumed by Wood Storks from Ogden et al. (1976)**

Common name	Scientific name	Percent Individuals	Percent Biomass
Sunfishes	<i>Centrarchidae</i>	14	44
Yellow bullhead	<i>Italurus natalis</i>	2	12
Marsh killifish	<i>Fundulus confluentus</i>	18	11
Flagfish	<i>Jordenella floridae</i>	32	7
Sailfin molly	<i>Poecilia latipinna</i>	20	11

These species were also observed to be consumed in much greater proportions than they occur at feeding sites, and abundant smaller species [e.g., mosquitofish (*Gambusia affinis*), least killifish (*Heterandria formosa*), bluefin killifish (*Lucania goodei*)] are under-represented, which the researchers believed was probably because their small size did not elicit a bill-snapping reflex in these tactile feeders (Coulter et al. 1999). Their studies also showed that, in addition to selecting larger species of fish, wood storks consumed individuals that are significantly larger (>3.5 cm) than the mean size available (2.5 cm), and many were greater than 1-year old (Ogden et al. 1976, Coulter et al. 1999). However, Ogden et al. (1976) also found that wood storks most likely consumed fish that were between 1.5 and 9.0 cm in length (Figure 4 in Ogden et al. 1976).

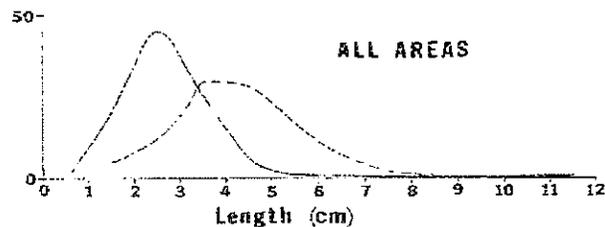


FIGURE 4. Length frequency distribution of fish available to and consumed by Wood Storks in different habitats.

In Ogden et al.'s (1976) Figure 4, the dotted line is the distribution of fish consumed and the solid line is the available fish. Straight interpretation of the area under the dotted line curve

represents the size classes of fish most likely consumed by wood storks and is the basis of our determination of the amount of biomass that is within the size range of fish most likely consumed by wood storks, which in this example is a range size of 1.5 to 9.0 cm in length.

**Wood stork suitable prey base (biomass per hydroperiod):** To estimate that fraction of the available fish biomass that might be consumed by wood storks, the following analysis was conducted. Trexler et al.'s (2002) 2-year throw trap data of absolute and relative fish abundance per hydroperiod distributed across 20 study sites in the ENP and the WCAs was considered to be representative of the Everglades fish assemblage available to wood storks (n = 37,718 specimens of 33 species). Although Trexler et al.'s (2002) data was based on throw-trap data and representative of fish 8 cm or smaller, the Service believes the data set can be used to predict the biomass/m<sup>2</sup> for total fish (those both smaller and larger than 8 cm). This approach is also supported, based on our assessment of prey consumption by wood storks in Ogden et al.'s (1976) study (Figure 4), that the wood storks general preference is for fish measuring 1.5 cm to 9 cm and is generally inclusive of Trexler et al.'s (2002) throw-trap data of fish 8 cm or smaller.

To estimate the fraction of the fish biomass that might be consumed by wood storks, the Service, using Trexler et al.'s (2002) throw-trap data set, determined the mean biomass of each fish species that fell within the wood stork prey size limits of 1.5 to 9.0 cm. The mean biomass of each fish species was estimated from the length and wet mass relationships for Everglades' ichthyofauna developed by Kushlan et al. (1986). The proportion of each species that was outside of this prey length and biomass range was estimated using the species mean and variance provided in Table 1 in Kushlan et al. (1986). These biomass estimates assumed the length and mass distributions of each species was normally distributed and the fish biomass could be estimated by eliminating that portion of each species outside of this size range. These biomass estimates of available fish prey were then standardized to a sum of 6.5 g/m<sup>2</sup> for Class 7 hydroperiod wetlands (Service 2009).

For example, Kushlan et al. (1986) lists the warmouth (*Lepomis gulosus*) with a mean average biomass of 36.76 g. In fish samples collected by Trexler et al. (2002), this species accounted for 0.048 percent ( $18/37,715=0.000477$ ) of the Everglades freshwater ichthyofauna. Based on an average biomass of 36.76 g (Kushlan et al. 1986), the 0.048 percent representation from Trexler et al. (2002) is equivalent to an average biomass of 1.75 g ( $36.76*0.048$ ) or 6.57 percent ( $1.75/26.715$ ) of the estimated average biomass (26.715 g) of Trexler et al.'s (2002) samples (Service 2009).

Standardizing these data to a sample size of 6.5 g/m<sup>2</sup>, the warmouth biomass for long hydroperiod wetlands would be about 0.427 g (Service 2009). However, the size frequency distribution (assumed normal) for warmouth (Kushlan et al. 1986) indicate 48 percent are too large for wood storks and 0.6 percent are too small (outside the 1.5 cm to 9 cm size range most likely consumed), so the warmouth biomass within the wood stork's most likely consumed size range is only 0.208 g ( $0.427*(0.48+0.006)=0.2075$ ) in a 6.5 g/m<sup>2</sup> sample. Using this approach summed over all species in long hydroperiod wetlands, only 3.685 g/m<sup>2</sup> of the 6.5 g/m<sup>2</sup> sample consists of fish within the size range likely consumed by wood storks or about 57 percent ( $3.685/6.5*100=56.7$ ) of the total biomass available.

An alternative approach to estimate the available biomass is based on Ogden et al. (1976). In their study (Table 8), the sunfishes and four other species that accounted for 84 percent of the biomass eaten by wood storks totaled 2.522 g of the 6.5 g/m<sup>2</sup> sample (Service 2009). Adding the remaining 16 percent from other species in the sample, the total biomass would suggest that 2.97 g of a 6.5 g/m<sup>2</sup> sample are most likely to be consumed by wood storks or about 45.7 percent (2.97/6.5=0.4569)

The mean of these two estimates is 3.33g/m<sup>2</sup> for long hydroperiod wetlands (3.685 + 2.97 = 6.655/ 2 = 3.33). This proportion of available fish prey of a suitable size (3.33 g/m<sup>2</sup> / 6.5 g/m<sup>2</sup> = 0.51 or 51 percent) was then multiplied by the total fish biomass in each hydroperiod class to provide an estimate of the total biomass of a hydroperiod that is the appropriate size and species composition most likely consumed by wood storks.

As an example, a Class 3 SFWMD model hydroperiod wetland with a biomass of 2.3 grams/m<sup>2</sup>, adjusted by 51 percent for appropriate size and species composition, provides an available biomass of 1.196 grams/m<sup>2</sup>. Following this approach, the biomass per hydroperiod potentially available to predation by wood storks based on size and species composition is:

**Table 9. Wood Stork Suitable Prey Base (fish biomass per hydroperiod)**

Hydroperiod Class	Days Inundated	Fish Biomass
Class 1	0-60	0.26 gram/m <sup>2</sup>
Class 2	60-120	0.52 gram/m <sup>2</sup>
Class 3	120-180	1.196 grams/m <sup>2</sup>
Class 4	180-240	2.184 grams/m <sup>2</sup>
Class 5	240-300	2.704 grams/m <sup>2</sup>
Class 6	300-330	3.12 grams/m <sup>2</sup>
Class 7	330-365	3.38 grams/m <sup>2</sup>

**Wood Stork-Wading Bird Prey Consumption Competition:** In 2006, (Service 2006), the Service developed an assessment approach that provided a foraging efficiency estimate that 55 percent of the available biomass was actually consumed by wood storks. Since the implementation of this assessment approach, the Service has received comments from various sources concerning the Service's understanding of Fleming et al.'s (1994) assessment of prey base consumed by wood storks versus prey base assumed available to wood stork and the factors included in the 90 percent prey reduction value.

In our original assessment, we noted that, "*Fleming et al. (1994) provided an estimate of 10 percent of the total biomass in their studies of wood stork foraging as the amount that is actually consumed by the storks. However, the Fleming et al. (1994) estimate also includes a second factor, the suitability of the foraging site for wood storks, a factor that we have calculated separately. In their assessment, these two factors accounted for a 90 percent reduction in the biomass actually consumed by the storks. We consider these two factors as equally important and are treated as equal components in the 90 percent reduction; therefore, we consider each factor to represent 45 percent of the reduction. In consideration of this approach, Fleming et al.'s (1994) estimate that 10 percent of the biomass would actually be consumed by the storks would be added to the 45 percent value for an estimate that 55 percent (10 percent plus the remaining 45 percent) of the available biomass would actually be consumed by the storks and is the factor we believe represents the amount of the prey base that is actually consumed by the stork.*"

In a follow-up review of Fleming et al.'s (1994) report, we noted that the 10 percent reference is to prey available to wood storks, not prey consumed by wood storks. We also noted the 90 percent reduction also includes an assessment of prey size, an assessment of prey available by water level (hydroperiod), an assessment of suitability of habitat for foraging (openness), and an assessment for competition with other species, not just the two factors considered originally by the Service (suitability and competition). Therefore, in re-evaluating of our approach, we identified four factors in the 90 percent biomass reduction and not two as we previously considered. We believe these four factors are represented as equal proportions of the 90 percent reduction, which corresponds to an equal split of 22.5 percent for each factor. Since we have accounted previously for three of these factors in our approach (prey size, habitat suitability, and hydroperiod) and they are treated separately in our assessment, we consider a more appropriate foraging efficiency to represent the original 10 percent and the remaining 22.5 percent from the 90 percent reduction discussed above. Following this revised assessment, our competition factor would be 32.5 percent, not the initial estimate of 55 percent.

Other comments reference the methodology's lack of sensitivity to limiting factors, i.e., is there sufficient habitat available across all hydroperiods during critical life stages of wood stork nesting and does this approach over emphasize the foraging biomass of long hydroperiod wetlands with a corresponding under valuation of short hydroperiod wetlands. The Service is aware of these questions and is examining alternative ways to assess these concerns. However, until further research is generated to refine our approach, we continue to support the assessment tool as outlined.

Following this approach, Table 10 has been adjusted to reflect the competition factor and represents the amount of biomass consumed by wood storks and is the basis of our effects assessments ( Class 1 hydroperiod with a biomass 0.26 g, multiplied by 0.325, results in a value of 0.08 g [0.25\*.325=0.08]) (Table 10).

**Table 10 Actual Biomass Consumed by Wood Storks**

Hydroperiod Class	Days Inundated	Fish Biomass
Class 1	0-60	0.08 gram/m <sup>2</sup>
Class 2	60-120	0.17 gram/m <sup>2</sup>
Class 3	120-180	0.39 grams/m <sup>2</sup>
Class 4	180-240	0.71 grams/m <sup>2</sup>
Class 5	240-300	0.88 grams/m <sup>2</sup>
Class 6	300-330	1.01 grams/m <sup>2</sup>
Class 7	330-365	1.10 grams/m <sup>2</sup>

**Sample Project of Biomass Calculations and Corresponding Concurrence Determination**

***Example 1:***

An applicant is proposing to construct a residential development with unavoidable impacts to 5 acres of wetlands and is proposing to restore and preserve 3 acres of wetlands onsite. Data on the onsite wetlands classified these systems as exotic impacted wetlands with greater than 50

percent but less than 75 percent exotics (Table 3) with an average hydroperiod of 120-180 days of inundation.

The equation to calculate the biomass lost is: The number of acres, converted to square-meters, times the amount of actual biomass consumed by the wood stork (Table 10), times the exotic foraging suitability index (Table 3), equals the amount of grams lost, which is converted to kg.

Biomass lost  $(5 * 4,047 * 0.39 \text{ (Table 10)} * 0.37 \text{ (Table 3)}) = 2,919.9 \text{ grams or } 2.92 \text{ kg}$

In the example provided, the 5 acres of wetlands, converted to square-meters (1 acre = 4,047 m<sup>2</sup>) would provide 2.9 kg of biomass ( $5 * 4,047 * 0.39 \text{ (Table 10)} * 0.37 \text{ (Table 3)} = 2,919.9 \text{ grams or } 2.9 \text{ kg}$ ), which would be lost from development.

The equation to calculate the biomass from the preserve is the same, except two calculations are needed, one for the existing biomass available and one for the biomass available after restoration.

Biomass Pre:  $(3 * 4,047 * 0.39 \text{ (Table 10)} * 0.37 \text{ (Table 3)}) = 1,751.95 \text{ grams or } 1.75 \text{ kg}$

Biomass Post:  $(3 * 4,047 * 0.39 \text{ (Table 10)} * 1 \text{ (Table 3)}) = 4,734.99 \text{ grams or } 4.74 \text{ kg}$

Net increase:  $4.74 \text{ kg} - 1.75 \text{ kg} = 2.98 \text{ kg Compensation Site}$

Project Site Balance  $2.98 \text{ kg} - 2.92 \text{ kg} = 0.07 \text{ kg}$

The compensation proposed is 3 acres, which is within the same hydroperiod and has the same level of exotics. Following the calculations for the 5 acres, the 3 acres in its current habitat state, provides 1.75 kg ( $3 * 4,047 * 0.39 \text{ (Table 10)} * 0.37 \text{ (Table 3)} = 1,751.95 \text{ grams or } 1.75 \text{ kg}$ ) and following restoration provides 4.74 kg ( $3 * 4,047 * 0.39 \text{ (Table 10)} * 1 \text{ (Table 3)} = 4,734.99 \text{ grams or } 4.74 \text{ kg}$ ), a net increase in biomass of 2.98 kg ( $4.74 - 1.75 = 2.98$ ).

Example 1: 5 acre wetland loss, 3 acre wetland enhanced – same hydroperiod - NLAA

Hydroperiod	Existing Footprint		On-site Preserve Area				Net Change*	
			Pre Enhancement		Post Enhancement			
	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams
Class 1 - 0 to 60 Days								
Class 2 - 60 to 120 Days								
Class 3 - 120 to 180 Days	5	2.92	3	1.75	3	4.74	(5)	0.07
Class 4 - 180 to 240 Days								
Class 5 - 240 to 300 Days								
Class 6 - 300 to 330 Days								
Class 7 - 330 to 365 days								
<b>TOTAL</b>	<b>5</b>	<b>2.92</b>	<b>3</b>	<b>1.75</b>	<b>3</b>	<b>4.74</b>	<b>(5)</b>	<b>0.07</b>

\*Since the net increase in biomass from the restoration provides 2.98 kg and the loss is 2.92 kg, there is a positive outcome (4.74-1.75-2.92=0.07) in the same hydroperiod and Service concurrence with a NLAA is appropriate.

**Example 2:**

In the above example, if the onsite preserve wetlands were a class 4 hydroperiod, which has a value of 0.71. grams/m<sup>2</sup> instead of a class 3 hydroperiod with a 0.39 grams/m<sup>2</sup> [Table 10]), there would be a loss of 2.92 kg of short hydroperiod wetlands (as above) and a net gain of 8.62 kg of long-hydroperiod wetlands.

Biomass lost: (5\*4,047\*0.39 (Table 10)\*0.37 (Table 3)=2,919.9 grams or 2.92 kg)

The current habitat state of the preserve provides 3.19 kg (3\*4,047\*0.71 (Table 10)\*0.37 (Table 3)=3,189.44 grams or 3.19 kg) and following restoration the preserve provides 8.62 kg (3\*4,047\*0.71 (Table 10)\*1(Table 3)= 8,620.11 grams or 8.62 kg, thus providing a net increase in class 4 hydroperiod biomass of 5.43 kg (8.62-3.19=5.43).

Biomass Pre: (3\*4,047\*0.71(Table 10)\*0.37 (Table 3) = 3,189.44 grams or 3.19 kg)

Biomass Post: (3\*4,047\*0.71 (Table 10)\*1(Table 3)=8,620.11 grams or 8.62 kg)

Net increase: 8.62 kg-3.19 kg = 5.43 kg

Project Site Balance 5.43 kg- 2.92 kg = 2.51 kg

Example 2: 5 acre wetland loss, 3 acre wetland enhanced – different hydroperiod – May Affect

Hydroperiod	Existing Footprint		On-site Preserve Area				Net Change*	
			Pre Enhancement		Post Enhancement			
	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams	Acres	Kgrams
Class 1 - 0 to 60 Days								
Class 2 - 60 to 120 Days								
Class 3 - 120 to 180 Days	5	2.92					(5)	-2.92
Class 4 - 180 to 240 Days			3	3.19	3	8.62	0	5.43
Class 5 - 240 to 300 Days								
Class 6 - 300 to 330 Days								
Class 7 - 330 to 365 days								
<b>TOTAL</b>	<b>5</b>	<b>2.92</b>	<b>3</b>	<b>3.19</b>	<b>3</b>	<b>8.62</b>	<b>(5)</b>	<b>2.51</b>

In this second example, even though there is an overall increase in biomass, the biomass loss is a different hydroperiod than the biomass gain from restoration, therefore, the Service could not concur with a NLAA and further coordination with the Service is appropriate.

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# Standard Sea Turtle and Smalltooth Sawfish Construction Conditions



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE**  
Southeast Regional Office  
263 13th Avenue South  
St. Petersburg, FL 33701

## **SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS**

The permittee shall comply with the following protected species construction conditions:

- a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.
- b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
- e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
- f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
- g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006

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# Standard Manatee Conditions for In-Water Work

## STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

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The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at [ImperiledSpecies@myFWC.com](mailto:ImperiledSpecies@myFWC.com)
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8 ½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at [MyFWC.com/manatee](http://MyFWC.com/manatee). Questions concerning these signs can be sent to the email address listed above.

# CAUTION: MANATEE HABITAT

All project vessels

**IDLE SPEED / NO WAKE**

When a manatee is within 50 feet of work  
all in-water activities must

**SHUT DOWN**

Report any collision with or injury to a manatee:



**Wildlife Alert:**

**1-888-404-FWCC(3922)**

cell \*FWC or #FWC

