

12 Appendices

12.1 Lease Agreement

12.1.1 Lease Number 4612

SAL3

2,937.92± Acres

FDACS CONTRACT #

019755

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT
TRUST FUND OF THE STATE OF FLORIDA

MULTIPLE AGENCY LEASE AGREEMENT

ANDREWS WILDLIFE MANAGEMENT AREA

Lease Number 4612

This lease is made and entered in this 4th day of
DECEMBER 2012, between the BOARD OF TRUSTEES OF THE INTERNAL
IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, hereinafter referred
to as "LESSOR", and FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION,
hereinafter referred to as the "LEAD AGENCY", and STATE OF FLORIDA
DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES, FLORIDA FOREST
SERVICE, hereinafter referred to as the "COOPERATING AGENCY", and
hereinafter collectively referred to as the "MANAGING AGENCIES".

WITNESSETH:

WHEREAS, the LESSOR holds title to certain lands and property
being utilized by the State of Florida for public purposes; and

WHEREAS, the LESSOR is authorized in Section 253.03, Florida
Statutes, to enter into leases for the use, benefit, and possession of
public lands by state agencies which may properly use and possess them
for the benefit of the people of the State of Florida.

NOW, THEREFORE, for and in consideration of the mutual covenants
and agreements hereinafter contained, LESSOR leases the below
described premises to the MANAGING AGENCIES subject to the following
terms and conditions:

1. DELEGATIONS OF AUTHORITY: LESSOR'S responsibilities and
obligations herein shall be exercised by the Division of State
Lands, State of Florida Department of Environmental Protection.

3. TERM: The term of this lease shall be for a period of fifty years commencing on DECEMBER 4, 2012 and ending on DECEMBER 3, 2062, unless sooner terminated pursuant to the provisions of this lease.

4. PURPOSE: The MANAGING AGENCIES shall manage the leased premises only for the conservation and protection of natural and historical resources and resource based public outdoor recreation which is compatible with the conservation and protection of these public lands, as set forth in subsection 259.032(11), Florida Statutes, along with other related uses necessary for the accomplishment of this purpose as designated in the Management Plan required by paragraph 8 of this lease.

5. QUIET ENJOYMENT AND RIGHT OF USE: The MANAGING AGENCIES shall have the right of ingress and egress to, from and upon the leased premises for all purposes necessary to the full quiet enjoyment by said MANAGING AGENCIES of the rights conveyed herein.

6. UNAUTHORIZED USE: The LEAD AGENCY shall, through their agents and employees, prevent the unauthorized use of the leased premises or any use thereof not in conformance with this lease.

7. LEAD AGENCY RESPONSIBILITIES: The LEAD AGENCY shall coordinate and oversee all activities on the leased premises; initiate appropriate management programs to meet the intent of the goals and objectives stated herein; coordinate preparation and periodic revision of the Management Plan; coordinate and monitor all management activities undertaken by others; and, compile and submit such reports as may be required of the MANAGING AGENCIES. The LEAD AGENCY shall provide permanent staff, as funding is acquired, for management on a day-to-day basis.

8. MANAGEMENT PLAN: The LEAD AGENCY with assistance from the

for approval through the Division of State Lands, State of Florida Department of Environmental Protection. The leased premises shall not be developed or physically altered in any way other than what is necessary for security and maintenance of the leased premises without the prior written approval of LESSOR until the Management Plan is approved. The Management Plan shall emphasize the original management concept as approved by LESSOR at the time of acquisition which established the primary purpose for which the leased premises were acquired. The approved Management Plan shall provide the basic guidance for all management activities and shall be reviewed jointly by the LEAD AGENCY, COOPERATING AGENCY, Acquisition and Restoration Council, and LESSOR. The MANAGING AGENCIES shall not use or alter the leased premises except as provided for in the approved Management Plan without the prior written approval of LESSOR. The Management Plan prepared under this lease shall identify management strategies for exotic species, if present. The introduction of exotic species is prohibited, except when specifically authorized by the approved Management Plan.

9. RIGHT OF INSPECTION: LESSOR or its duly authorized agents shall have the right at any and all times to inspect the leased premises and the works and operations thereon of the MANAGING AGENCIES, in any matter pertaining to this lease.

10. INSURANCE REQUIREMENTS: The LEAD AGENCY shall procure and maintain fire and extended risk insurance coverage in accordance with Chapter 284, Florida Statutes, for any buildings and improvements located on the leased premises by preparing and delivering to the Division of Risk Management, State of Florida Department of Insurance, a completed Florida Fire Insurance Trust Fund Coverage Request Form and a copy of this lease immediately upon erection of any structures

changes affecting the value of the improvements shall be submitted to the following: Bureau of Public Land Administration, Division of State Lands, State of Florida Department of Environmental Protection, Mail Station 130, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000.

11. LIABILITY: The MANAGING AGENCIES shall assist in the investigation of injury or damage claims either for or against LESSOR or the State of Florida pertaining to the LEAD AGENCY'S or COOPERATING AGENCY'S respective areas of responsibility under this lease agreement or arising out of the LEAD AGENCY'S or COOPERATING AGENCY'S respective management programs or activities and shall contact LESSOR regarding the legal action deemed appropriate to remedy such damage or claims. The MANAGING AGENCIES are responsible for all personal injury and property damage attributable to the negligent acts or omissions of the MANAGING AGENCIES and their officers, employees, and agents.

12. ARCHAEOLOGICAL AND HISTORIC SITES: Execution of this lease in no way affects any of the parties' obligations pursuant to Chapter 267, Florida Statutes. The collection of artifacts or the disturbance of archaeological and historic sites on state-owned lands is prohibited unless prior authorization has been obtained from the State of Florida Department of State, Division of Historical Resources. The Management Plan prepared pursuant to Section 253.034, Florida Statutes, shall be reviewed by the State of Florida Department of State, Division of Historical Resources to insure that adequate measures have been planned to locate, identify, protect and preserve the archaeological and historic sites and properties on the leased premises.

13. EASEMENTS: All easements of any nature including, but not limited to, utility easements are required to be granted by LESSOR.

14. SUBLEASES: This lease is for the purposes specified herein and subleases of any nature are prohibited, without the prior written approval of LESSOR. Any sublease not approved in writing by LESSOR shall be void and without legal effect.

15. POST CLOSING RESPONSIBILITIES: In an effort to define responsibilities of the LESSOR and MANAGING AGENCIES with regard to resolving post closing management issues, the parties agree to the following:

- a. After consultation with the LEAD AGENCY, LESSOR agrees to provide the LEAD AGENCY with the title, survey and environmental products procured by the LESSOR, prior to closing.
- b. LESSOR will initiate surveying services to locate and mark boundary lines of specific parcels when necessary for immediate agency management and will provide a boundary survey of the entire acquisition project at the conclusion of all acquisition within the project boundary. Provided, however, the LEAD AGENCY may request individual parcel boundary surveys, if necessary, prior to the conclusion of acquisition activities within the project boundaries.
- c. Unless otherwise agreed to by LEAD AGENCY, LESSOR shall at its sole cost and expense, make a diligent effort to resolve all issues pertaining to all title defects, survey matters or environmental contamination associated with the leased premises, including but not limited to trash and debris, which were either known or should have been reasonably known by LESSOR at the time LESSOR acquired the leased premises. Notwithstanding the

issue in which the MANAGING AGENCIES are named as a party in any litigation or other legal or administrative proceeding.

d. With regard to all title defects, survey matters, or environmental contamination associated with the leased premises which were not known or could not have been reasonably known by LESSOR at the time LESSOR acquired the leased premises, LESSOR and LEAD AGENCY agree to cooperate in developing an appropriate strategy for jointly resolving these matters. LESSOR acknowledges and understands that LEAD AGENCY is unable to commit any substantial amount of its routine operating funds for the resolution of any title defect, survey matter, or environmental contamination associated with the lease premises. Notwithstanding the foregoing, LESSOR will not be responsible for any of MANAGING AGENCIES' attorney fees, costs, or liability or damages incurred by the MANAGING AGENCIES in resolving any issue in which the MANAGING AGENCIES are named as a party in any litigation or other legal or administrative proceeding.

16. SURRENDER OF PREMISES: Upon termination or expiration of this lease, the LEAD AGENCY shall surrender the leased premises to LESSOR. The LEAD AGENCY hereby agrees that in the event no further use of the leased premises or any part thereof is needed, written notification shall be made to the Bureau of Public Land Administration, Division of State Lands, State of Florida Department of Environmental Protection, Mail Station 130, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, at least six months prior to the release of all or any part of the leased premises.

with the same formality as this lease upon release of all or any part of the leased premises or upon termination or expiration of this lease, all permanent improvements, including both physical structures and modifications to the leased premises, shall become the property of LESSOR, unless LESSOR gives written notice to the LEAD AGENCY to remove any or all such improvements at the expense of the LEAD AGENCY. The decision to retain any improvements upon termination of this lease shall be at LESSOR'S sole discretion. Prior to surrender of all or any part of the leased premises, a representative of the State of Florida Department of Environmental Protection, Division of State Lands shall perform an on-site inspection and the keys to any buildings on the leased premises shall be turned over to the State of Florida Department of Environmental Protection, Division of State Lands. If the leased premises do not meet all conditions as set forth in paragraphs 19 and 22 herein, the MANAGING AGENCIES shall pay all costs necessary to meet the prescribed conditions.

17. BEST MANAGEMENT PRACTICES: LEAD AGENCY shall implement applicable Best Management Practices for all activities conducted under this lease in compliance with Paragraph 18-2.018(2)(h), Florida Administrative Code, which have been selected, developed, or approved by LESSOR, LEAD AGENCY or other land MANAGING AGENCY for the protection and enhancement of the leased premises.

18. PUBLIC LANDS ARTHROPOD CONTROL PLAN: The LEAD AGENCY shall identify and subsequently designate to the respective arthropod control district or districts within one year of the effective date of this lease all of the environmentally sensitive and biologically highly productive lands contained within the leased premises, in accordance with Section 388.4111, Florida Statutes and Chapter 10D-54, Florida Administrative Code, for the purpose of obtaining a public

and other public utilities to the leased premises and for having all utilities turned off when the leased premises are surrendered.

20. ASSIGNMENT: This lease shall not be assigned in whole or in part, without the prior written consent of LESSOR. Any assignment made either in whole or in part without the prior written consent of LESSOR shall be void and without legal effect.

21. PLACEMENT AND REMOVAL OF IMPROVEMENTS: All buildings, structures, improvements, and signs shall be constructed at the expense of the LEAD AGENCY. Removable equipment placed on the leased premises by the LEAD AGENCY which does not become a permanent part of the leased premises will remain the property of the LEAD AGENCY and may be removed by the LEAD AGENCY upon termination of this lease agreement.

22. MAINTENANCE OF IMPROVEMENTS: The LEAD AGENCY shall maintain the real property contained within the leased premises and any improvements located thereon, in a state of good condition, working order and repair including, but not limited to, removing all trash or litter, maintaining all planned improvements as set forth in the approved Management Plan, and meeting all building and safety codes. The LEAD AGENCY shall maintain any and all existing roads, canals, ditches, culverts, risers and the like in as good condition as the same may be on the effective date of this lease.

23. ENTIRE UNDERSTANDING: This lease sets forth the entire understanding between the parties and shall only be amended with the prior written approval of LESSOR.

24. BREACH OF COVENANTS, TERMS, OR CONDITIONS: Should the MANAGING AGENCIES breach any of the covenants, terms, or conditions of this lease, LESSOR shall give written notice to the MANAGING AGENCIES to remedy such breach within sixty days of such notice. In the event the MANAGING AGENCIES fail to remedy the breach to the satisfaction of

limited to, the cost of recovering the leased premises or maintain this lease in full force and effect and exercise all rights and remedies herein conferred upon LESSOR.

25. NO WAIVER OF BREACH: The failure of LESSOR to insist in any one or more instances upon strict performance of any one or more of the covenants, terms and conditions of this lease shall not be construed as a waiver of such covenants, terms and conditions, but the same shall continue in full force and effect, and no waiver of LESSOR of any one of the provisions hereof shall in any event be deemed to have been made unless the waiver is set forth in writing, signed by LESSOR.

26. PROHIBITIONS AGAINST LIENS OR OTHER ENCUMBRANCES: Fee title to the leased premises is held by LESSOR. The MANAGING AGENCIES shall not do or permit anything to be done which purports to create a lien or encumbrance of any nature against the real property contained in the leased premises including, but not limited to, mortgages or construction liens against the leased premises or against any interest of the LESSOR therein.

27. CONDITIONS AND COVENANTS: All of the provisions of this lease shall be deemed covenants running with the land included in the leased premises, and construed to be "conditions" as well as "covenants" as though the words specifically expressing or imparting covenants and conditions were used in each separate provision.

28. NOTICE: All notices given under this lease shall be in writing and shall be served by certified mail including, but not limited to, notice of any violation served pursuant to Section 253.04, Florida Statutes, to the last address of the party to whom notice is to be given, as designated by such party in writing. LESSOR and MANAGING AGENCIES hereby designate their address as follows:

LESSOR:

LEAD AGENCY:

Florida Fish and Wildlife Conservation Commission
Attn: Section Leader, HSC/WHM
620 South Meridian Street
Tallahassee, Florida 32399-1600

COOPERATING AGENCY:

State of Florida Department of
Agriculture and Consumer Services
3125 Conner Blvd., C-25
Tallahassee, Florida 32399-1650

29. DAMAGE TO THE PREMISES: (a) MANAGING AGENCIES shall not do, or suffer to be done, in, on, or upon the leased premises or as affecting said leased premises or adjacent properties, any act which may result in damage or depreciation of value to the leased premises or adjacent properties, or any part thereof. (b) MANAGING AGENCIES shall not generate, store, produce, place, treat, release or discharge any contaminants, pollutants or pollution, including, but not limited to, hazardous or toxic substances, chemicals or other agents on, into, or from the leased premises or any adjacent lands or waters in any manner not permitted by law. For the purposes of this lease, "hazardous substances" shall mean and include those elements or compounds defined in 42 USC Section 9601 or which are contained in the list of hazardous substances adopted by the United States Environmental Protection Agency (EPA) and the list of toxic pollutants designated by the United States Congress or the EPA or defined by any other federal, state or local statute, law, ordinance, code, rule, regulation, order or decree regulating, relating to, or imposing liability or standards of conduct concerning any hazardous, toxic, or dangerous waste, substance, material, pollutant or contaminant. "Pollutants" and "pollution" shall mean those products or substances defined in Chapters 376 and 403, Florida Statutes, and the rules promulgated there under, all as amended or updated from time to time.

closure, investigation, assessment, cleanup, decontamination, remediation, restoration and monitoring of (1) the leased premises, and (2) all off-site ground and surface waters and lands affected by MANAGING AGENCIES' failure to comply, as may be necessary to bring the leased premises and affected off-site waters and lands into full compliance with all applicable federal, state or local statutes, laws, ordinances, codes, rules, regulations, orders and decrees, and to restore the damaged property to the condition existing immediately prior to the occurrence which caused the damage. MANAGING AGENCIES' obligations set forth in this paragraph shall survive the termination or expiration of this lease. Nothing herein shall relieve MANAGING AGENCIES of any responsibility or liability prescribed by law for fines, penalties and damages levied by governmental agencies, and the cost of cleaning up any contamination caused directly or indirectly by MANAGING AGENCIES' activities or facilities. Upon discovery of a release of a hazardous substance or pollutant, or any other violation of local, state or federal law, ordinance, code, rule, regulation, order or decree relating to the generation, storage, production, placement, treatment, release, or discharge of any contaminant, LEAD AGENCY shall report such violation to all applicable governmental agencies having jurisdiction, and to LESSOR, all within the reporting period of the applicable governmental agencies.

30. PAYMENT OF TAXES AND ASSESSMENTS: LEAD AGENCY shall assume full responsibility for and shall pay all liabilities that accrue to the leased premises or to the improvements thereon, including any and all drainage and special assessments or taxes of every kind and all mechanic's or material man's liens which may be hereafter lawfully assessed and levied against the leased premises.

31. RIGHT OF AUDIT: LEAD AGENCY shall make available to LESSOR all

This lease may be terminated by LESSOR should the LEAD AGENCY fail to allow public access to all documents, papers, letters or other materials made or received in conjunction with this lease, pursuant to Chapter 119, Florida Statutes.

32. NON-DISCRIMINATION: MANAGING AGENCIES shall not discriminate against any individual because of that individual's race, color, religion, sex, national origin, age, handicap, or marital status with respect to any activity occurring within the leased premises or upon lands adjacent to and used as an adjunct of the leased premises.

33. COMPLIANCE WITH LAWS: LEAD AGENCY agree that this lease is contingent upon and subject to the LEAD AGENCY obtaining all applicable permits and complying with all applicable permits, regulations, ordinances, rules, and laws of the State of Florida or the United States or of any political subdivision or agency of either.

34. TIME: Time is expressly declared to be of the essence of this lease.

35. GOVERNING LAW: This lease shall be governed by and interpreted according to the laws of the State of Florida.

36. SECTION CAPTIONS: Articles, subsections and other captions contained in this lease are for reference purposes only and are in no way intended to describe, interpret, define, or limit the scope, extent or intent of this lease or any provisions thereof.

37. ADMINISTRATIVE FEE: LEAD AGENCY shall pay LESSOR an annual administrative fee of \$300. The initial annual administrative fee shall be payable within thirty days from the date of execution of this lease agreement and shall be prorated based on the number of months or fraction thereof remaining in the fiscal year of execution. For purposes of this lease agreement, the fiscal year shall be the period extending from July 1 to June 30. Each annual payment

IN WITNESS WHEREOF, the parties have caused this lease to be executed on the day and year first above written.

BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA

Dave Fewell
Witness

DAVE FEWELL
Print/Type Witness Name

Victoria F. Thompson
Witness

Victoria F. Thompson
Print/Type Witness Name

By: [Signature] (SEAL)

SCOTT E. WOOLAM, CHIEF
BUREAU OF PUBLIC LAND
ADMINISTRATION, DIVISION OF
STATE LANDS, STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

"LESSOR"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 4th day of December 2012, by Scott E. Woolam, Chief, Bureau of Public Land Administration, Division of State Lands, State of Florida Department of Environmental Protection, as agent for and on behalf of the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida. He is personally known to me.

Victoria F. Thompson
Notary Public, State of Florida

Print/Type Notary Name

Commission Number

Commission Expires



Approved as to Form and Legality

By: [Signature]
DEP Attorney

FLORIDA FISH AND WILDLIFE CONSERVATION
COMMISSION

K. Amos
Witness
K. Amos
Print/Type Witness Name
Robin P. Stetler
Witness
Robin P. Stetler
Print/Type Witness Name

By: Karen Ventimiglia (SEAL)
KAREN VENTIMIGLIA
Print/Type Name

Title: CHIEF OF STAFF

"LEAD AGENCY"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this 15th
day of November, 2012, by Karen Ventimiglia as
Chief of Staff, on behalf of Florida Fish and Wildlife
Conservation Commission. He/she is personally known to me or has
produced _____ as identification.

Anna Yawn
Notary Public, State of Florida
Anna Yawn
Print/Type Notary Name

Commission Number:
Commission Expires:

 ANNA YAWN
NOTARY PUBLIC
STATE OF FLORIDA
Comm# DD0927975
Expires 10/26/2013

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY
Anthony P. ...
Commission Attorney

STATE OF FLORIDA DEPARTMENT OF
AGRICULTURE AND CONSUMER SERVICES,
FLORIDA FOREST SERVICE

Linda J. Joynes
Witness

Linda J. Joynes
Print/Type Witness Name

[Signature]
Witness

Cory Pierce
Print/Type Witness Name

By: Mike Gresham (SEAL)

Mike Gresham
Type/Print Name

Title: Director of Administration

"COOPERATING AGENCY"

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this
28th day of November 2012, by Mike Gresham as
Dir. of Administration, on behalf of the Florida Forest Service,
State of Florida Department of Agriculture and Consumer Services,
He is personally known to me or who has produced _____
as identification.

Karen A. Meyer
Notary Public, State of Florida

KAREN A. MEYER
Print/Type Notary Name

Commission Number:

Commission Expires:



EXHIBIT "A"

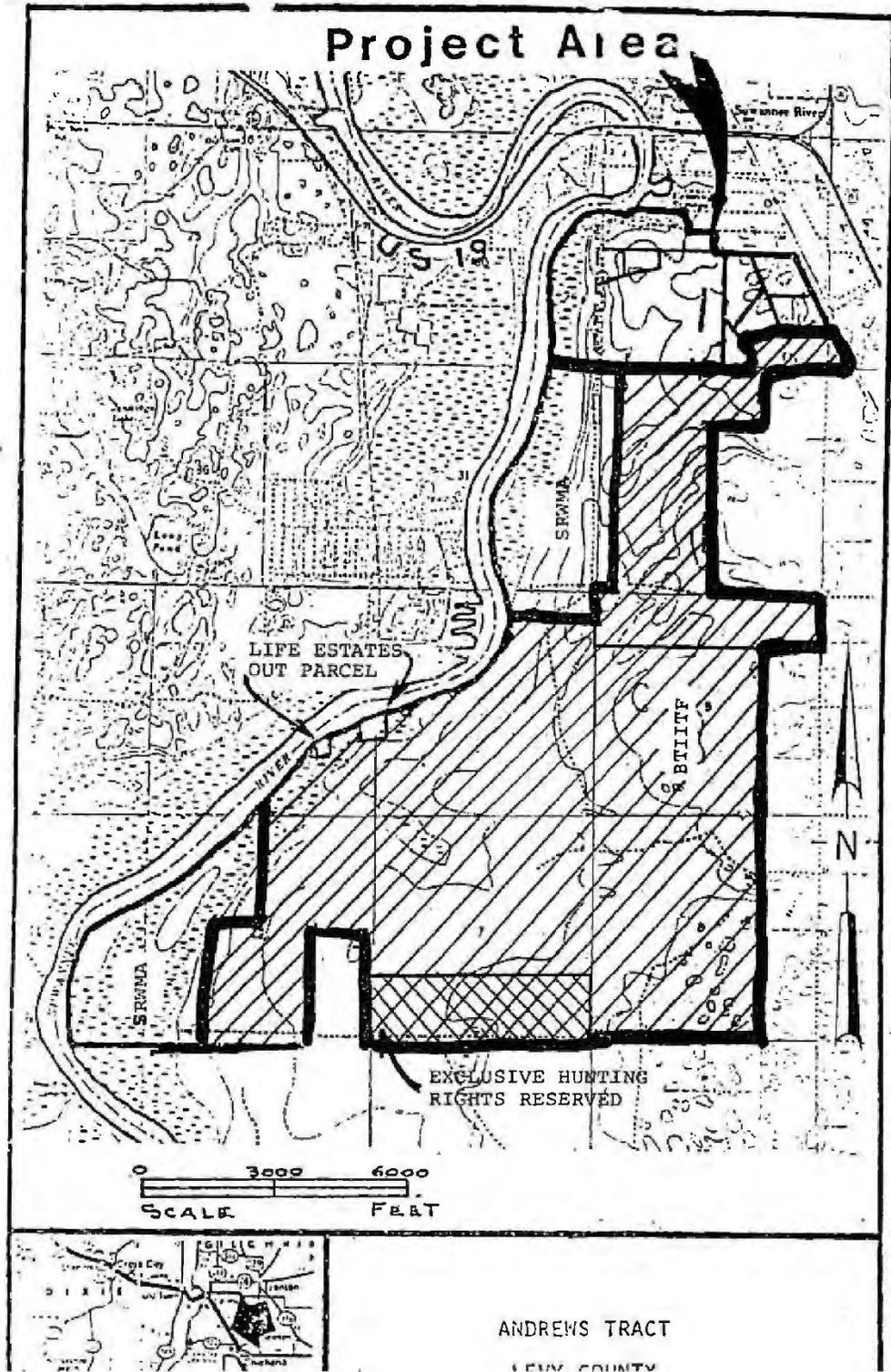


EXHIBIT "A"

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This instrument was prepared by: John M. Steadham, Esquire
WATSON, FOLDS, STEADHAM,
CHRISTMANN & BRASHEAR
527 East University Avenue
Gainesville, Florida 32601

WARRANTY DEED

THIS INDENTURE, made this 21st day of June, A.D. 1985, between MABEL E. ANDREWS, an unmarried widow, individually and MABEL E. ANDREWS, as Trustee under that certain Trust Agreement Dated February 1, 1984, executed by Andy Dennis Andrews, a/k/a A.D. Andrews, recorded in Official Record Book 249, Page 112, Public Records of Levy County, Florida; and ANDY DENNIS ANDREWS, a/k/a A.D. Andrews, as Trustor and sole beneficiary under the provisions of said Trust Agreement, of the County of Levy, State of Florida, hereinafter referred to as "Grantors," and THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, whose post office address is 3901 Community College Blvd Tallahassee, Florida, herein referred to as "Grantee,"

W I T N E S S E T H:

That said Grantors, for and in consideration of the sum of Ten Dollars (\$10.00), and other good and valuable considerations to said Grantors in hand paid by said Grantee, the receipt whereof is hereby acknowledged, have granted, bargained and sold to the said Grantee, and Grantee's successors and assigns forever, the following described land, situate, lying and being in Levy County, Florida, to-wit:

PARCEL 1

ALL BLOCK "B", U.S. 19 NO. 7 ADDITION, according to the plat thereof as recorded in Plat Book 2, page 66, public records of Levy County, Florida.

LESS THEREFROM that portion of Block "B", U.S. 19 NO. 7 ADDITION, recorded in Plat Book 2, page 66, described in O.R. Book 183, page 12, public records of Levy County, Florida.

PARCEL 2

A parcel of land lying in the SE 1/4 of Section 29, Township 10 South, Range 14 East, Levy County, Florida, being more particularly described as follows:

Begin at the Southwest corner of Section 28, Township 10 South, Range 14 East, Levy County, Florida; thence along the South line of said Section 28, North 88 degrees 40'15" East, 668.72 feet to a concrete monument on the Westerly right of way line of Levy County Road No. 207; thence North 28 degrees 20'50" West along said right of way line, 1102.22 feet; thence South 89 degrees 49'27" West, 1102.91 feet; thence North 28 degrees 20'50" West parallel with the aforementioned right of way line 56.26 feet; thence South 67 degrees 48'35" West, 1122.08 feet to a concrete monument on a curve concave Northeasterly; thence along the arc of said curve having a radius of 1136.28 feet, a central angle of 22 degrees 54'58" a chord bearing and distance of South 32 degrees 46'28" East, 451.31 feet for 454.34 feet; thence South 45 degrees 46'03" West along a radial line 60.00 feet to a concrete monument being the point of curvature of a curve concave Southwesterly; thence along the arc of said curve having a radius of 25.00 feet, a central angle of 82 degrees 59'12", a chord bearing and distance of South 02 degrees 44'21" East, 72.12 feet for 76.21 feet

EXHIBIT "A"

LESS THEREFROM Block "B", U.S. 19 NO. 7 ADDITION, according to the plat thereof as recorded in Plat Book 2, page 66, of the public records of Levy County, Florida.

PARCEL 3

The West 1/2 and the NW 1/4 of NE 1/4 of Section 32, Township 10 South, Range 14 East, Levy County, Florida, EXCEPT the West 221.85 feet of Section 32, Township 10 South, Range 14 East.

PARCEL 4

The North 1/2 of North 1/2 of Section 5, Township 11 South, Range 14 East, LESS the South 60 feet of the NE 1/4 of NE 1/4 and LESS the South 60 feet of the East 60 feet of the NW 1/4 of NE 1/4 thereof.

Containing 542.58 acres, more or less.

The foregoing described property is not homestead property.

SUBJECT TO real property taxes accruing subsequent to the date of this conveyance.

SUBJECT TO OIL, GAS LEASE from HABEL E. ANDREWS, a widow and A.D. ANDREWS, to PENNZOIL PRODUCING CO., dated February 23, 1981, filed August 6, 1981, and recorded in O.R. Book 178, Page 602, public records of Levy County, Florida.

SUBJECT TO EASEMENTS over and across an existing 60 foot access road traversing Parcels 1 and 2 as described above granted by A.D. ANDREWS to:

- a. JAMES ROLLIN HUDSON, et al, recorded in O.R. Book 184, page 95.
- b. THOMAS J. CRITTENDEN, recorded in O.R. Book 181, Page 305, and re-recorded in O.R. Book 181, Page 700.
- c. W.O. BEAUCHAMP, SR., et ux, recorded in ^{M.C.A. P.C.C.} 183, Page 47.
- d. FT. FANNING, INC., recorded in O.R. Book 184, Page 442.

SUBJECT TO MINERAL DEED from CHARLES E. RAILEY and wife to BILL MCBIRNEY, dated September 29, 1944, filed November 29, 1944, and recorded in Deed Book 41, page 429, conveying an UNDIVIDED 1/2 INTEREST in all oil, gas and minerals in, on or under that part of the above described lands lying in the SW 1/4 of Section 28, Township 10 South, Range 14 East, and all subsequent conveyances thereof by the said BILL MCBIRNEY, his heirs or assigns.

SUBJECT TO MINERAL RIGHT AND ROYALTY TRANSFER from R.D. HOGUE and M.D. HOGUE, his wife, to PRES COCHRANE, dated September 1, 1944, filed September 15, 1944, and recorded in Deed Book 41, page 217, conveying an UNDIVIDED 1/2 INTEREST in and to all of the oil, gas and other minerals of every kind and character in, on or under a portion of the above described lands, and all subsequent conveyances thereof by the said PRES COCHRANE, his heirs and assigns.

SUBJECT TO MINERAL RIGHT AND ROYALTY TRANSFER from R.D. HOGUE and M.D. HOGUE, his wife, to HARRY I. MAXSON, dated May 29, 1945, filed June 12, 1945, and recorded in Deed Book 42, page 367, conveying an UNDIVIDED 1/4 INTEREST in and to all of the oil, gas and other minerals of every kind and character in, on or under a portion of the above described lands, and all subsequent conveyances thereof by the said HARRY I. MAXSON, his heirs and assigns.

EXHIBIT "A"

kind and character in, on or under a portion of the above described lands, and all subsequent conveyances thereof by the said HARRY I. MAXSON, his heirs or assigns.

SUBJECT TO EXCEPTION FOR "MINERAL RIGHTS" as set forth in deed from R.D. HOGUE and M.D. HOGUE, his wife, to M.D. ANDREWS, dated November 10, 1948, filed November 15, 1948, and recorded in Deed Book 47, page 321, with respect to all of the above described lands lying in Sections 31 and 32, Township 10 South, Range 14 East.

SUBJECT TO EASEMENT FOR INGRESS AND EGRESS conveyed by M.D. ANDREWS and wife to S.J. BUCHANAN, JR., in Warranty Deed dated February 21, 1953, filed February 23, 1953, and recorded in Deed Book 53, page 50, Public Records, Levy County, Florida.

The recitation of the foregoing restrictions, limitations and reservations shall not act to re-impose or revive any such restrictions, limitations or reservations as may have been terminated or extinguished.

and said Grantors do hereby fully warrant the title to said land, and will defend the same against the lawful claims of all persons whomsoever.

"Grantor" and "Grantee" are used for singular or plural, as the context requires. The above described Trust Agreement is herein referred to as "The Andrews Trust".

IN WITNESS WHEREOF, Grantors have hereunto set their hands and seals the day and year first above written.

Signed, sealed and delivered in our presence as witnesses:

[Handwritten signatures of witnesses]

Mabel E. Andrews (SEAL)
MABEL E. ANDREWS, Individually and as Trustee of the Andrews Trust

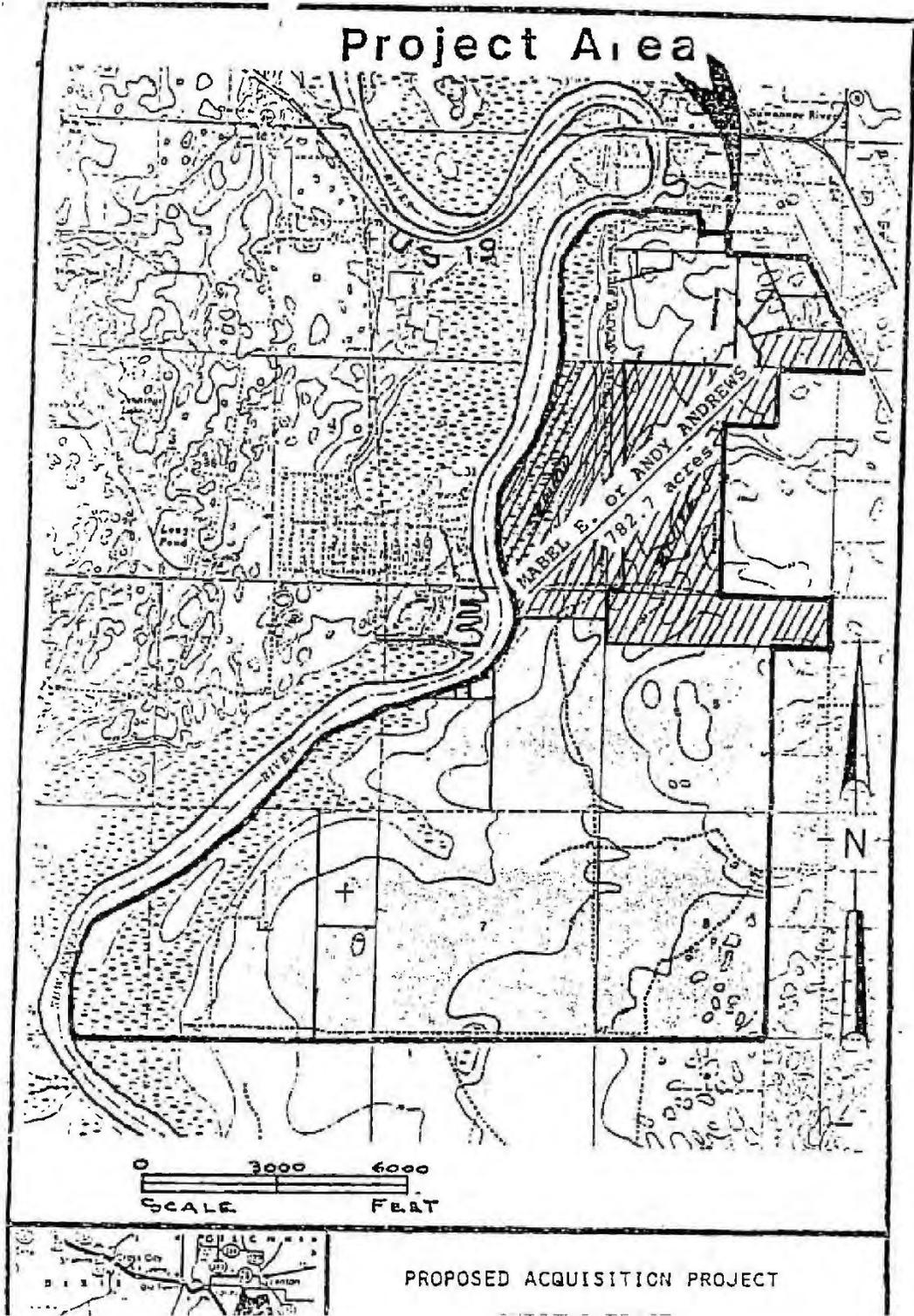
Andy Dennis Andrews (SEAL)
ANDY DENNIS ANDREWS, a/k/a A.D. Andrews, Individually and as Trustor and sole beneficiary of The Andrews Trust

STATE OF FLORIDA)
 :
COUNTY OF LEVY)

I HEREBY CERTIFY that on this day before me, an officer duly qualified to take acknowledgments, personally appeared MABEL E. ANDREWS, individually and as Trustee of The Andrews Trust, and ANDY DENNIS ANDREWS, individually and as Trustor and sole beneficiary of The Andrews Trust, to me known to be the persons described in and who executed the foregoing Warranty Deed and acknowledged before me that they executed the same.

WITNESS my hand and official seal in the County and State last

EXHIBIT "A"



U.R. 249 PAGE 242
WARRANTY DEED

This indenture, made this 14th day of May, 1985, between MARTHA A. KAY, wife of her husband, DON KAY, JR., of the County of Marion, in the State of Florida, parties of the first part, and THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, of the County of Leon, in the State of Florida, party of the second part, whose post office address is Florida Department of Natural Resources, Division of State Lands, 3900 Commonwealth Boulevard, Room 412, Tallahassee, Florida 32303.

WITNESSETH, That the said parties of the first part, for and in consideration of the sum of Ten Dollars (\$10.00), and other good and valuable considerations to them in hand paid by said party of the second part, the receipt whereof is hereby acknowledged, do grant, bargain, convey and sell to the said party of the second part, its heirs and assigns forever, the following described land, situate, lying and being in the County of Levy, State of Florida, to wit:

AN UNDIVIDED .282 PERCENT INTEREST IN THE FOLLOWING DESCRIBED LANDS:

The South 60 feet of the NE 1/4 of the NE 1/4; the South 60 feet of the East 60 feet of the NW 1/4 of NE 1/4, and the South 3/4 of the West 3/4 of Section 5;

ALSO

The South 7/8 of the E 1/2, lying South and East of the Suwannee River, LESS the North 60 feet of the South 1/2 of the NE 1/4 of NE 1/4, AND LESS the East 60 feet of the North 3/4 of the South 1/2 of the NW 1/4 of NE 1/4 of Section 5;

ALSO

The West 1/2 of East 1/2 and West 1/2 of Section 8;

All in Township 11 South, Range 14 East, Levy County, Florida, containing 1185.13 acres, net of exception.

EXCEPT the following described lands:

A parcel of land in the East one-half (1/2) of Section 6, Township 11 South, Range 14 East, Levy County, Florida, being more particularly described as follows:

Commence at a concrete monument marking the South Quarter (S 1/4) corner of Section 6, Township 11 South, Range 14 East, Levy County, Florida; thence North along the North-South Quarter Section Line of said Section 6, a distance of 3199.65 feet to a concrete monument on the bank of the Suwannee River and the Point of Beginning; thence South along said Quarter Section Line 375.00 feet; thence East perpendicular to aforesaid Quarter Section Line, 250.00 feet; thence North parallel to aforesaid Quarter Section Line, 629 feet, more or less to the waters edge of the Suwannee River; thence Southerly and Westerly along said waters edge 348 feet, more or less to a point which bears North from the Point of Beginning; thence South along aforesaid Quarter Section Line, 22 feet, more or less, to the Point of Beginning. Containing 2.89

FILED
CLERK OF LEVY COUNTY, FLORIDA
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(O.R. 249 PAGE 243)

SUBJECT TO a non-exclusive easement for ingress and egress conveyed by MARTHA A. KAY to DENNIS E. ANDREWS by Quit Claim Deed dated July 16, 1974, filed July 23, 1974, and recorded in Official Records Book 64, Page 63, public records of Levy County, Florida.

SUBJECT TO easement for ingress and egress conveyed by MARTHA A. KAY to DENNIS E. ANDREWS and TIMBER DEVELOPMENT, INC., by instrument dated April 20, 1984, filed April 26, 1984, and recorded in Official Records Book 227, Page 349, public records of Levy County, Florida.

SUBJECT TO easement granted by DENNIS E. ANDREWS and TIMBER DEVELOPMENT, INC. to WILLIAM A. NEWSOM and LAURIE K. NEWSOM, his wife, by Warranty Deed dated April 25, 1984, filed April 26, 1984, and recorded in Official Records Book 227, Page 353, public records of Levy County, Florida.

And the said parties of the first part do hereby fully warrant title to said land, and will defend the same against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, The said parties of the first part have hereunto set their hands and seals the day and year first above written.

Signed, sealed and delivered
in our presence as witnesses:

[Handwritten Signature]
[Handwritten Signature]

Martha A. Kay (SEAL)
Martha A. Kay

Don Kay, Jr. (SEAL)
Don Kay, Jr.

STATE OF FLORIDA
COUNTY OF Levy

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State and County aforesaid to take acknowledgements, personally appeared MARTHA A. KAY, joined by her husband, DON KAY, JR., to me known to be the persons described in and who executed the foregoing instrument and they acknowledged before me that they executed the same.

WITNESS my hand and official seal in the County and State last aforesaid this 14th day of May, 1985.

My Commission Expires: 7-14-87

[Handwritten Signature]
Notary Public

EXHIBIT "A"

AGENCY at LAW
P. O. Box 1148
Ocala, FL

D.K. 262 PAGE 161

WARRANTY DEED

This Indenture, made this 2nd day of January, 1986, between MARTHA A. KAY, joined by her husband, DON KAY, JR., of the County of Marion, in the State of Florida, parties of the first part, and THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, of the County of Leon, in the State of Florida, party of the second part, whose post office address is Florida Department of Natural Resources, Division of State Lands, 3900 Commonwealth Boulevard, Room 412, Tallahassee, Florida 32303.

WITNESSETH, That the said parties of the first part, for and in consideration of the sum of Ten Dollars (\$10.00), and other good and valuable considerations to them in hand paid by said party of the second part, the receipt whereof is hereby acknowledged, do grant, bargain, convey and sell to the said party of the second part, its heirs and assigns forever, the following described land, situate, lying and being in the County of Levy, State of Florida, to wit:

AN UNDIVIDED .718 PERCENT INTEREST IN THE FOLLOWING DESCRIBED LANDS:

The South 60 feet of the NE 1/4 of the NE 1/4; the South 60 feet of the East 60 feet of the NW 1/4 of NE 1/4, and the South 3/4 of the West 3/4 of Section 5;

ALSO

The South 7/8 of the E 1/2, lying South and East of the Suwannee River, LESS the North 60 feet of the South 1/2 of the NE 1/4 of NE 1/4, AND LESS the East 60 feet of the North 60 feet of the South 1/2 of the NW 1/4 of NE 1/4 of Section 6;

ALSO

The West 1/2 of East 1/2 and West 1/2 of Section 8;

All in Township 11 South, Range 14 East, Levy County, Florida, containing 1105.13 acres, net of exception.

EXCEPT the following described lands:

A parcel of land in the East one-half (1/2) of Section 6, Township 11 South, Range 14 East, Levy County, Florida, being more particularly described as follows:

Commence at a concrete monument marking the South Quarter (S 1/4) corner of Section 6, Township 11 South, Range 14 East, Levy County, Florida; thence North along the North-South Quarter Section Line of said Section 6, a distance of 3199.65 feet to a concrete monument on the bank of the Suwannee River and the Point of Beginning; thence South along said Quarter Section Line 375.00 feet; thence East perpendicular to aforesaid Quarter Section Line, 250.00 feet; thence North parallel to aforesaid Quarter Section Line, 629 feet, more or less to the waters edge of the Suwannee River; thence Southerly and Westerly along said waters edge 348 feet, more or less to a point which bears North from the Point of Beginning; thence South along

LEVY COUNTY
CLERK OF CIRCUIT COURT
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BRONSON, FLORIDA
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EXHIBIT "A"

D.R. 262 PAGE 162

SUBJECT TO a non-exclusive easement for ingress and egress conveyed by MARTHA A. KAY to DENNIS E. ANDREWS by Quit Claim Deed dated July 16, 1974, filed July 23, 1974, and recorded in Official Records Book 64, Page 63, public records of Levy County, Florida.

SUBJECT TO easement for ingress and egress conveyed by MARTHA A. KAY to DENNIS E. ANDREWS and TIMBER DEVELOPMENT, INC., by instrument dated April 20, 1984, filed April 26, 1984, and recorded in Official Records Book 227, Page 349, public records of Levy County, Florida.

SUBJECT TO easement granted by DENNIS E. ANDREWS and TIMBER DEVELOPMENT, INC. to WILLIAM A. NEWSOM and LAURIE K. NEWSOM, his wife, by Warranty Deed dated April 25, 1984, filed April 26, 1984, and recorded in Official Records Book 227, Page 353, public records of Levy County, Florida.

And the said parties of the first part do hereby fully warrant title to said land, and will defend the same against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said parties of the first part have hereunto set their hands and seals the day and year first above written.

Signed, sealed and delivered in our presence as witnesses:

Handwritten signatures of witnesses

Martha A. Kay (SEAL)
Martha A. Kay

Don Kay, Jr. (SEAL)
Don Kay, Jr.

STATE OF FLORIDA
COUNTY OF LEVY

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State and County aforesaid to take acknowledgements, personally appeared MARTHA A. KAY, joined by her husband, DON KAY, JR., to me known to be the persons described in and who executed the foregoing instrument and they acknowledged before me that they executed the same.

WITNESS my hand and official seal in the County and State last aforesaid this 2nd day of January, 1986.

My Commission Expires: *July 14, 1987*
Handwritten signature of Notary Public
Notary Public

D.R. 262 PAGE 162

EXHIBIT "A"

LANDIS V. CURRY, JR.
ARTHUR CLUSIER, CURRY, McCALL & BRUGG
ATTORNEYS AT LAW
100 W. 11th St., Tallahassee, Florida 32303

C.S. 249 PAGE 244
WARRANTY DEED

This Indenture, made this 14th day of May, 1985, between MARTHA A. KAY, joined by her husband, DON KAY, JR., of the County of Marion, in the State of Florida, parties of the first part, and THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, of the County of Leon, in the State of Florida, party of the second part, whose post office address is Florida Department of Natural Resources, Division of State Lands, 3900 Commonwealth Boulevard, Room 412, Tallahassee, Florida 32303.

WITNESSETH, That the said parties of the first part, for and in consideration of the sum of Ten Dollars (\$10.00), and other good and valuable considerations to them in hand paid by said party of the second part, the receipt whereof is hereby acknowledged, do grant, donate and convey to the said party of the second part, its heirs and assigns forever, the following described land, situate, lying and being in the County of Levy, State of Florida, to wit:

A parcel of land in the East one-half (1/2) of Section 6, Township 11 South, Range 14 East, Levy County, Florida, being more particularly described as follows:

Commence at a concrete monument marking the South Quarter (S 1/4) corner of Section 6, Township 11 South, Range 14 East, Levy County, Florida; thence North along the North-South Quarter Section Line of said Section 6, a distance of 3199.65 feet to a concrete monument on the bank of the Suwannee River and the Point of Beginning; thence South along said Quarter Section Line 375.00 feet; thence East perpendicular to aforesaid Quarter Section Line, 250.00 feet; thence North parallel to aforesaid Quarter Section Line, 629 feet, more or less to the waters edge of the Suwannee River; thence Southerly and Westerly along said waters edge 348 feet, more or less to a point which bears North from the Point of Beginning; thence South along aforesaid Quarter Section Line, 22 feet, more or less, to the Point of Beginning. Containing 2.89 acres, and described and shown on that survey prepared by Thomas C. Strickland, dated March 6, 1985, and certified April 26, 1985.

SUBJECT TO AND RESERVING UNTO GRANTORS, OR THE SURVIVOR OF THEM, A LIFE ESTATE IN THE ABOVE DESCRIBED LANDS.

SUBJECT TO Oil and Gas Lease from MARTHA A. KAY to PENNZOIL PRODUCING CO., dated February 26, 1981, filed May 6, 1981, and recorded in Official Records Book 175, Page 100, public records of Levy County, Florida.

And the said parties of the first part do hereby fully warrant title to said land, and will defend the same against the lawful claims of all persons whatsoever.

IN WITNESS WHEREOF, The said parties of the first part have hereunto set their hands and seals the day and year first above written.

Signed, sealed and delivered in our presence as witnesses:

Landis V. Curry, Jr. *Martha A. Kay* (SEAL)

By: _____
D.C.

DOUGL...
CLERK OF DISTRICT COURT
LEVY COUNTY, FLORIDA

135307

EXHIBIT "A"

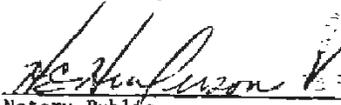
D.R. 249 PAGE 245

STATE OF FLORIDA
COUNTY OF Levy

I HEREBY CERTIFY that on this day, before me, an officer duly authorized in the State and County aforesaid to take acknowledgements, personally appeared MARTHA A. KAY, joined by her husband, DON KAY, JR., to me known to be the persons described in and who executed the foregoing instrument and they acknowledged before me that they executed the same.

WITNESS my hand and official seal in the County and State last aforesaid this 14th day of May, 1985.

My Commission Expires: 7-14-87


Notary Public

D.R. 249 PAGE 245

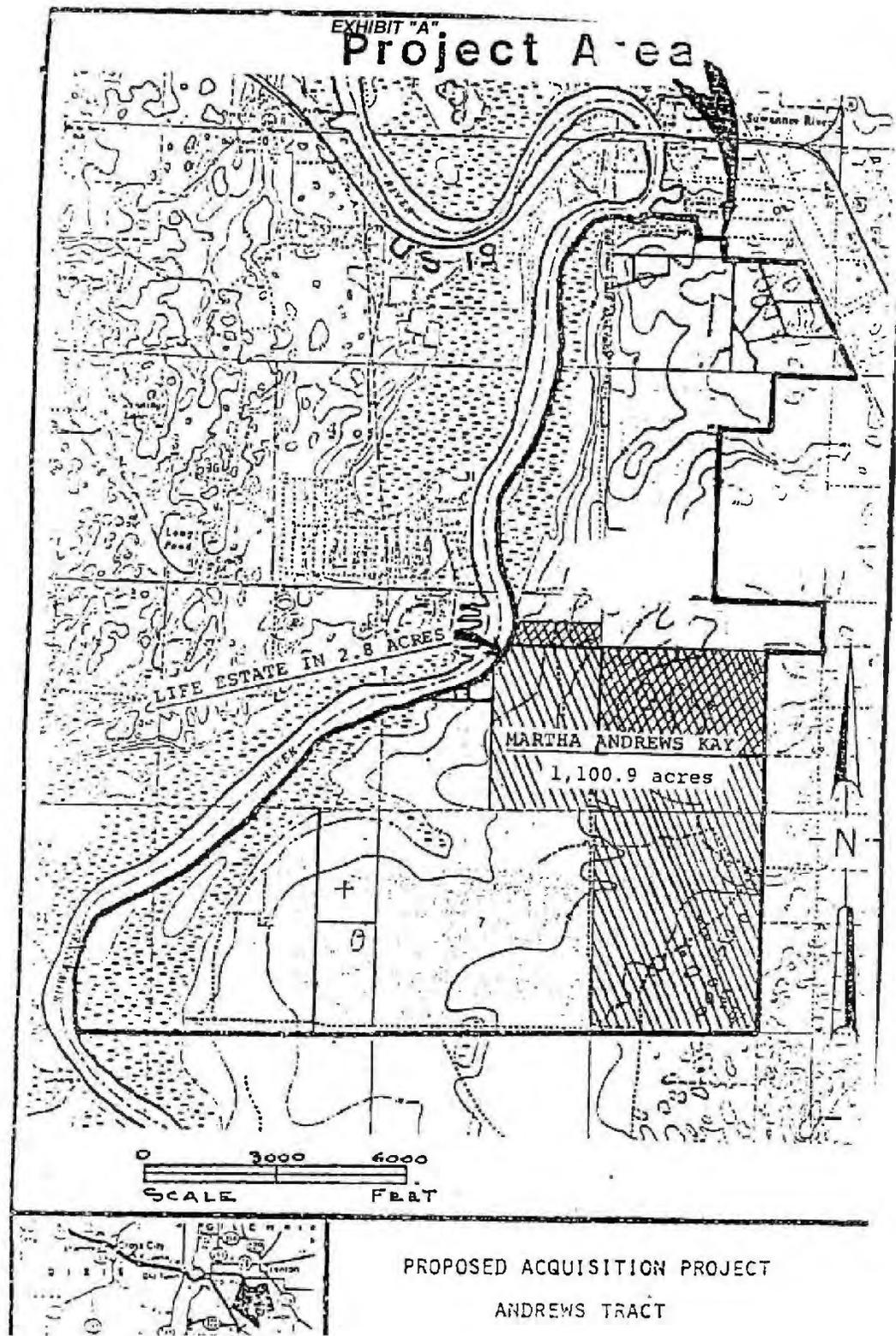


EXHIBIT "A"

WARRANTY DEED
No. 250 PAGE 697

THIS INDENTURE, made this 14 day of June, 1985, between MABEL E. ANDREWS, an unmarried widow, of the County of Levy, in the State of Florida, hereinafter called Grantor, and THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, of the County of Leon, in the State of Florida, hereinafter called Grantee, whose post office address is Florida Department of Natural Resources, Division of State Lands, 3900 Commonwealth Boulevard, Room 412, Tallahassee, Florida, 32303.

WITNESSETH:

That the said Grantor, for and in consideration of the sum of Ten and no/100 (\$10.00), and other good and valuable considerations to her in hand paid by the said Grantee, the receipt whereof is hereby acknowledged, has granted, bargained and sold to the said Grantee, its successors and assigns forever, the following described land, situate, lying and being in the County of Levy, State of Florida, to-wit:

E½ of NE¼ of Section 12, Township 11 South, Range 13 East, Levy County, Florida, containing 76.35 Acres, more or less.

TOGETHER WITH a non-exclusive easement for ingress and egress over, across and upon the following described land, to-wit:

The East 60 feet of the South 60 feet of the SE¼ of NW¼; The East and South 60 feet of the SW¼, ALL in Section 6, Township 11 South, Range 14 East,

AND

The South 60 feet of Government Lot 1 in Section 1, Township 11 South, Range 13 East.

SUBJECT to RESERVATION of all oil, gas and minerals to CONSOLIDATED NAVAL STORES COMPANY in Warranty Deed to M. D. ANDREWS, dated June 12, 1951, filed June 18, 1951, and recorded in Deed Book 50, page 478. public records of Levy

DOUGLAS M. MCKAY
CLERK OF CIRCUIT COURT
LEVY COUNTY, FLORIDA
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Doc. Stamps Pd. \$ 562.05 Date 6/14/85
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Douglas M. McKay, Clerk, Levy County
By [Signature] D.C.

EXHIBIT "A"

D. & 250 PAGE 698

AND FOR THE CONSIDERATION AFORESAID, the Grantor does hereby grant, bargain, sell, assign, transfer and set over unto the Grantee, its successors and assigns, all her right, title and interest, if any, in and to that certain Lease, including proceeds derived therefrom, given by DENNIS E. ANDREWS, Lessor, to PENNZOIL PRODUCING CO., Lessee, dated February 23, 1981, and recorded in O. R. Book 175, page 85, BUT ONLY insofar as said Lease applies to the above described property.

TOGETHER with all the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining.

TO HAVE AND TO HOLD, the same in fee simple forever.

AND the grantor hereby covenants with said grantee that the grantor is lawfully seized of said land in fee simple; that the grantor has good, right and lawful authority to sell and convey said land; that the grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances, except those mentioned herein and except taxes for the year 1985.

IN WITNESS WHEREOF, the said grantor has signed and sealed these presents the day and year first above written.

Signed, sealed and delivered in the presence of:

[Handwritten signatures of witnesses]

Mabel E. Andrews (SEAL)
Mabel E. Andrews

STATE OF FLORIDA,
COUNTY OF LEVY.

The foregoing instrument was acknowledged before me this 14 day of June, 1985, by MABEL E. ANDREWS, an unmarried widow.

(SEAL)

[Handwritten signature of Notary Public]
Notary Public

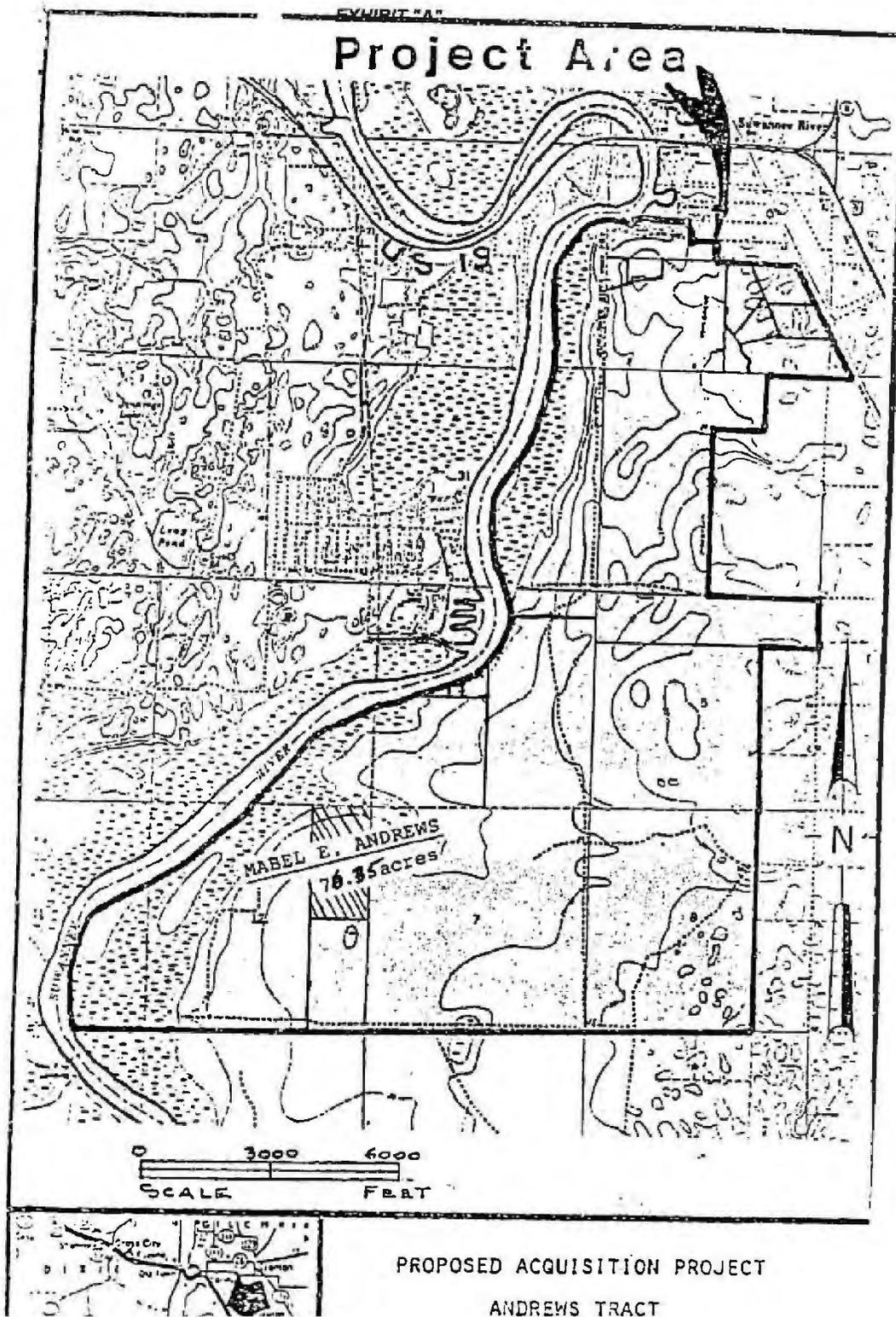


EXHIBIT "A"

WARRANTY DEED

THIS INDENTURE, made this 28 day of January A. D., 1986, between DENNIS E. ANDREWS and ROBERTA J. ANDREWS, his wife, of the County of Levy, in the State of Florida, hereinafter called Grantor, and THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, of the County of Leon, in the State of Florida, hereinafter called Grantee, whose post office address is Florida Department of Natural Resources, Division of State Lands, 3900 Commonwealth Boulevard, Room 412, Tallahassee, Florida, 32303.

(Wherever used herein the terms "grantor" and "grantee" include all the parties in this instrument and their heirs, legal representatives and assigns of individuals, and the successors and assigns of corporations.)

WITNESSETH: That the said Grantor, for and in consideration of the sum of ONE MILLION NINE HUNDRED THIRTY NINE THOUSAND, SIX HUNDRED FORTY-THREE and no/100 --- (\$1,939,643.00), to them in hand paid by the said Grantee, the receipt whereof is hereby acknowledged, has granted, bargained and sold to the said Grantee, its successors and assigns forever, the following described land, situate, lying and being in the County of Levy, State of Florida, to-wit:

IN TOWNSHIP 11 SOUTH, RANGE 13 EAST

- SECTION 1: Government Lots 1 and 2, lying East of the Suwannee River
SECTION 12: The East 164.15 feet of Government Lot 1, lying East of the Suwannee River; W 1/2 of the E 1/2 and E 1/2 of the SW 1/2

IN TOWNSHIP 11 SOUTH, RANGE 14 EAST

- SECTION 6: W 1/2, lying South and East of the Suwannee River, LESS AND EXCEPT the following parcels of land, to-wit:
1. Tract of land conveyed to S. J. BUCHANAN, JR., by deed recorded in Deed Book 51, page

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Handwritten copy

EXHIBIT "A"

Begin at Southwest corner of SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of of Section 6, Township 11 South, Range 14 East, and run thence East along the South line of said forty acre tract a distance of 4 chains; run thence North 2.5 chains, more or less, to the South edge of the waters of the Suwannee River; run thence Southwesterly along the Southern water's edge of said Suwannee River to a point in the West line of said SE $\frac{1}{4}$ of NW $\frac{1}{4}$, and run thence South along said West line of SE $\frac{1}{4}$ of NW $\frac{1}{4}$ a distance of 1.56 chains, more or less, to the point of beginning.

2. Commence at the Southwest corner of SE $\frac{1}{4}$ of NW $\frac{1}{4}$ of Section 6, Township 11 South, Range 14 East; thence run East along the South boundary of said forty, 385 feet; thence North parallel to the West boundary of said forty, 120 feet to establish a point of beginning; thence continue North parallel to the West boundary of said forty, 70 feet, more or less to a point in the water's edge of the Suwannee River, said point being hereby designated as "Point A"; thence return to the point of beginning and run East, parallel to the South boundary of said forty, 264 feet; thence run North parallel to the West boundary of said forty, 165 feet, more or less, to the water's edge of the Suwannee River; thence run Southwesterly along the water's edge of the Suwannee River, to the point of closure, hereinbefore designated as "Point A".

3. A parcel of land in the W $\frac{1}{4}$ of Section 6, Township 11 South, Range 14 East, Levy County, Florida, being more particularly described as follows:

Commence at a concrete monument marking the South Quarter (S $\frac{1}{4}$) corner of Section 6, Township 11 South, Range 14 East, Levy County, Florida; thence North along the North-South quarter section line of said Section 6, a distance of 3199.65 feet to a concrete monument on the bank of the Suwannee River and the point of beginning; thence South along said quarter section line, 375.00 feet; thence West perpendicular to aforesaid quarter section line, 250.00 feet; thence North parallel to aforesaid quarter section line, 265 feet, more or less, to the waters edge of the Suwannee River; thence North-erly and Easterly along said waters edge 283 feet, more or less, to a point which bears North from the point of beginning; thence South along aforesaid quarter section line, 22 feet, more or less, to the point of beginning, containing 1.9 acres, more or less.

SECTION 7: ALL

EXHIBIT "A"

TOGETHER WITH that easement for ingress and egress over, across and upon the following described land lying and being in Levy County, Florida, to-wit:

The South 60 feet of the NE $\frac{1}{4}$ of the NE $\frac{1}{4}$;
The South 60 feet of the East 60 feet of the NW $\frac{1}{4}$ of NE $\frac{1}{4}$;
The North 60 feet of the South $\frac{3}{4}$ of the West $\frac{3}{4}$; and
The West 60 feet of the SW $\frac{1}{4}$ of NW $\frac{1}{4}$, all in Section 5, Township 11 South, Range 14 East.

The South 60 feet of the NE $\frac{1}{4}$ of Section 6, Township 11 South, Range 14 East.

The above Easement having been conveyed to DENNIS E. ANDREWS by instrument recorded in O. R. Book 64, page 63, public records of Levy County, Florida.

RESERVING unto the Grantor, his heirs and assigns, a non-exclusive easement for ingress and egress over and across the:

- a) South 60 feet of the NE $\frac{1}{4}$ of NE $\frac{1}{4}$ and the East 60 feet of the South 60 feet of the NW $\frac{1}{4}$ of NE $\frac{1}{4}$ of Section 5, Township 11 South, Range 14 East.
- b) East 60 feet of the West $\frac{3}{4}$ of the South $\frac{3}{4}$ of Section 5, Township 11 South, Range 14 East.
- c) East and South 60 feet of West $\frac{3}{4}$ of Section 8, Township 11 South, Range 14 East.
- d) South 60 feet of Section 7, Township 11 South, Range 14 East.

FURTHER RESERVING unto DENNIS E. ANDREWS and to his guests or invitees for his life, the exclusive right to hunt during general hunting seasons established by the FLORIDA GAME AND FRESH WATER FISH COMMISSIONER, for turkey, deer and squirrel on the S $\frac{1}{4}$ of S $\frac{1}{4}$ of Section 7, Township 11 South, Range 14 East. In connection with said hunting rights, Grantor shall have the right to use the existing roads on the property herein conveyed as and for access to said property.

SUBJECT TO:

1. OIL AND GAS LEASE from DENNIS E. ANDREWS to PENNZOILL PRODUCING CO., dated February 23, 1981, filed May 18, 1981, and recorded in O. R. Book 175, page 85.
2. EASEMENTS, RESERVATIONS AND RESTRICTIONS contained in Warranty Deed and Option from M. D. ANDREWS and wife to S. J. BUCHANAN, JR., dated February 21, 1953, filed February 23, 1953, and recorded in Deed Book 53, page 50, public records of Levy County, Florida.
3. EASEMENT granted to WILLIAM A. NEWSOM and LAURIE K. NEWSOM, his wife, recorded in O. R. Book 227, page 353.

EXHIBIT "A"

AND FOR THE CONSIDERATION AFORESAID, the Grantor does here-
by grant, bargain, sell, assign, transfer and set over unto the
Grantee, its successors and assigns, all their right, title and
interest, in and to that certain Lease, including proceeds de-
rived therefrom, given by DENNIS E. ANDREWS, Lessor, to PENNZOIL
PRODUCING CO., Lessee, dated February 23, 1981, and recorded in
O. R. Book 175, page 85, public records of Levy County, Florida,
BUT ONLY insofar as said Lease applies to the above described
property.

TOGETHER with all the tenements, hereditaments and appurten-
ances thereto belonging or in anywise appertaining.

TO HAVE AND TO HOLD, the same in fee simple forever.

AND the grantor hereby covenants with said grantee that the
grantor is lawfully seized of said land in fee simple; that the
grantor has good right and lawful authority to sell and convey
said land; that the grantor hereby fully warrants the title to
said land and will defend the same against the lawful claims of
all persons whomsoever; and that said land is free of all encum-
brances, except those mentioned herein ~~and except taxes for the~~
~~year 1985.~~ ⁹⁸ *RE*

IN WITNESS WHEREOF, the said grantor has signed and sealed
these presents the day and year first above written.

Signed, sealed and delivered
in the presence of:

Kelley E. Andrews
J. E. Henderson

Dennis E. Andrews (SEAL)
Dennis E. Andrews
Roberta J. Andrews (SEAL)
Roberta J. Andrews

STATE OF FLORIDA,
COUNTY OF LEVY.

The foregoing instrument was acknowledged before me this 28
day of January, 1986, by DENNIS E. ANDREWS and ROBERTA J.
ANDREWS, his wife. *117*

EXHIBIT "A"

DOUGLAS M. MERRITT
CLERK OF COURTS
LEVY COUNTY
STATE OF FLORIDA

FILED IN OFFICE
CLERK OF CIRCUIT COURT
86 JAN 28 PM 12 1208

*149596
E. Andrews copy*

WARRANTY DEED

THIS INDENTURE, made this 28 day of January 1986, between DENNIS E. ANDREWS and ROBERTA J. ANDREWS, his wife, of the County of Levy, in the State of Florida, parties of the first part, and THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA, of the County of Leon, in the State of Florida, party of the second part, whose post office address is Florida Department of Natural Resources, Division of State Lands, 3900 Commonwealth Boulevard, Room 412, Tallahassee, Florida, 32303.

WITNESSETH, That the said parties of the first part, for and in consideration of the sum of Ten Dollars (\$10.00), and other good and valuable considerations to them in hand paid by said party of the second part, the receipt whereof is hereby acknowledged, do grant, donate and convey to the said party of the second part, its heirs and assigns forever, the following described land, situate, lying and being in the County of Levy, State of Florida, to-wit:

A parcel of land in the West 1/2 of Section 6, Township 11 South, Range 14 East, Levy County, Florida, being more particularly described as follows:

Commence at a concrete monument marking the South Quarter (S 1/4) corner of Section 6, Township 11 South, Range 14 East, Levy County, Florida; thence North along the North-South quarter Section line of said Section 6, a distance of 3199.65 feet to a concrete monument on the bank of the Suwannee River and the point of beginning; thence South along said quarter Section line, 375.00 feet; thence West perpendicular to aforesaid quarter Section line, 250.00 feet; thence North parallel to aforesaid quarter Section line, 265 feet, more or less to the waters edge of the Suwannee River; thence Northerly and Easterly along said waters edge 283 feet, more or less to a point which bears North from the point of beginning; thence South along aforesaid quarter Section line, 22 feet, more or less, to the point of beginning.

Containing 1.9 acres, more or less.

EXHIBIT "A"

SUBJECT TO OIL AND GAS LEASE from DENNIS E. ANDREWS to PENNZOIL PRODUCING CO., dated February 23, 1981, filed May 18, 1981, and recorded in O. R. Book 176, page 85, public records of Levy County, Florida.

AND the said parties of the first part do hereby fully warrant title to said land, and will defend the same against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said parties of the first part have hereunto set their hands and seals the day and year first above written.

Signed, sealed and delivered in our presence as witnesses:

Kellogg E. Andrews
W.C. Henderson

Dennis E. Andrews (SEAL)
Dennis E. Andrews

Roberta J. Andrews (SEAL)
Roberta J. Andrews

STATE OF FLORIDA,
COUNTY OF LEVY.

The foregoing instrument was acknowledged before me this 28 day of January, 1986, by DENNIS E. ANDREWS and ROBERTA J. ANDREWS, his wife.

(SEAL)

W.C. Henderson
Notary Public, State of Florida
My commission expires: July 19, 1987

EXHIBIT "A"

0465 PAGE 07

245160

Prepared by: H. C. Henderson, Jr.
LEVY ABSTRACT AND TITLE COMPANY
P. O. Box 148
Bronson, Florida 32621

DOUGLAS H. MEYER
CLERK OF DISTRICT COURT
LEVY COUNTY, FLORIDA

WARRANTY DEED

'92 JUL 13 PM 4 32

THIS WARRANTY DEED, made the 19 day of June,
A. D., 19 92, by DENNIS E. ANDREWS and ROBERTA E. ANDREWS,
his wife, hereinafter called the grantor, to the BOARD OF TRUSTEES
OF THE INTERNAL IMPROVEMENT TRUST FUND OF THE STATE OF FLORIDA,
whose post office address is Department of Natural Resources,
Division of State Lands, 3900 Commonwealth Boulevard, Mail Station
115, Tallahassee, Florida, 32399, Tax ID # _____,
hereinafter called the grantee:

(Wherever used herein the terms "grantor" and "grantee" include
all the parties to this instrument and the heirs, legal repre-
sentatives and assigns of individuals, and the successors and
assigns of corporations and public bodies.)

WITNESSETH: That the grantor, for and in consideration of
the sum of \$30,000.00 and other valuable considerations, receipt
whereof is hereby acknowledged, hereby grants, bargains, and
sells unto the grantee, all that certain land situate in Levy
County, Florida, to-wit:

Commence at the Southwest corner of SE¼ Of NW¼ of
Section 6, Township 11 South, Range 14 East; thence
run East along the South boundary of said forty,
386 feet; thence North parallel to the West boundary
of said forty, 120 feet to establish a point of be-
ginning; thence continue North parallel to the West
boundary of said forty, 70 feet, more or less to a
point in the water's edge of the Suwannee River,
said point being hereby designated as "Point A";
thence return to the point of beginning and run
East, parallel to the South boundary of said forty,
264 feet; thence run North parallel to the West
boundary of said forty, 165 feet, more or less, to
the water's edge of the Suwannee River; thence run
Southwesterly along the water's edge of the Suwannee
River, to the point of closure, hereinbefore desig-
nated as "Point A".

Property Appraiser's Parcel Account No. 574-000-00.

TOGETHER WITH all the tenements, hereditaments and appurten-
ances thereto belonging or in anywise appertaining to the same.

AND the grantor hereby covenants with said grantee that the grantor is lawfully seized of said land in fee simple; that the grantor has good right and lawful authority to sell and convey said land; that the grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances.

IN WITNESS WHEREOF, the said grantor has signed and sealed these presents the day and year first above written.

Signed, sealed and delivered in the presence of:

[Signature]
Signature of Witness

H.C. Henderson Jr
Print name of Witness

[Signature]
Signature of Witness

RAMONA BARBER
Print name of Witness

(AS TO BOTH SIGNATURES)

[Signature] (L.S.)
Dennis E. Andrews

[Signature] (L.S.)
Roberta J. Andrews
P. O. Box 282
Chiefland, Fl. 32626

(As to both Grantors)

STATE OF FLORIDA,
COUNTY OF LEVY.

The foregoing instrument was acknowledged before me this 19 day of June, 1992, by DENNIS E. ANDREWS and ROBERTA J. ANDREWS, his wife, who are personally known to me or NA has produced NA as identification, and who did/did not take an oath.

[Signature]
Signature of Notary

Doris J. Wiles
Print name of Notary

Commission expires: 6-11-95 Commission No. CC 110020

(SEAL)

EXHIBIT "A"
0479 PAGE 648

250837

Filed

Prepared by: H. C. Henderson, Jr.
LEVY ABSTRACT & TITLE CO.
P. O. Box 148
Bronson, Fl. 32621

Date: 12/31/92 Time: 9:01 AM
Clerk of Court, Levy County, Florida

35 3710
10 5 4 10

WARRANTY DEED

THIS WARRANTY DEED, made the 5 day of May,
A. D., 19 92, by DENNIS E. ANDREWS and WILLIAM A. NEWSOM and
LAURIE K. NEWSOM, his wife, hereinafter called the grantor, to
THE BOARD OF TRUSTEES OF THE INTERNAL IMPROVEMENT TRUST FUND OF
THE STATE OF FLORIDA, whose post office address is FLORIDA
DEPARTMENT OF NATURAL RESOURCES, Division of State Lands, 3900
Commonwealth Boulevard, Mail Station 115, Tallahassee, Florida,
32399, TAX ID # _____, hereinafter called the grantee:

(Wherever used herein the terms "grantor" and "grantee" include
all the parties to this instrument and the heirs, legal repre-
sentatives and assigns of individuals, and the successors and
assigns of corporations and public bodies.)

WITNESSETH: That the grantor, for and in consideration of
the sum of \$5,220.00 and other valuable considerations, receipt
whereof is hereby acknowledged, has granted, bargained and sold
to the said grantee, its successors and assigns forever, all
that certain land situate in Levy County, Florida, to-wit:

The North 90 feet of the NE $\frac{1}{4}$ of the SE $\frac{1}{4}$ of Section
12, Township 11 South, Range 13 East, Levy County,
Florida, containing 2.61 acres.

Portion of Property Appraisers Parcel Account No.
00077-003-00.

SUBJECT TO RESERVATION of all the oil, gas and minerals
contained in Deed from CONSOLIDATED NAVAL STORES COMPANY,
to M. D. ANDREWS, dated June 12, 1951, filed June 18,
1951, and recorded in Deed Book 50, page 478, public
records of Levy County, Florida.

The above is the separate property of the above grantors
and is no portion of their constitutional homestead.

TOGETHER WITH all the tenements, hereditaments and appur-
tenances thereto belonging or in anywise appertaining.

TO HAVE AND TO HOLD, the same in fee simple forever.

AND the grantor hereby covenants with said grantee that the grantor is lawfully seized of said land in fee simple; that the grantor has good right and lawful authority to sell and convey said land; that the grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances, except as herein stated.

IN WITNESS WHEREOF, the said grantor has signed and sealed these presents the day and year first above written.

Signed, sealed and delivered in the presence of:

[Signature]
Signature of Witness

Skippie Henderson
Print Name of Witness

[Signature]
Signature of Witness

Doris J. Wiles
Print Name of Witness
(AS TO DEA)

[Signature]
Signature of Witness

Margaret A. Hunt
Print Name of Witness

[Signature]
Signature of Witness

Roderick Gonzalez
Print Name of Witness
(AS TO WAN & LKN)

[Signature] (L.S.)

Dennis E. Andrews
P. O. Box 282
Chiefland, Fl. 32626

[Signature] (L.S.)

William A. Newsom
Laurie K. Newsom (L.S.)

2521 NW 41st St.
P. O. Box or Street Address
Gainesville FL 32606
City State Zip

(AS TO WAN & LKN)

STATE OF FLORIDA

COUNTY OF LEVY

The foregoing instrument was acknowledged before me this 5 day of May, 1992, by DENNIS E. ANDREWS, who is personally known to me or _____ who has produced _____ as identification and who did not

EXHIBIT "A"

RD# 0479 PAGE 1 J0

STATE OF Florida COUNTY OF Alachua

The foregoing instrument was acknowledged before me this 27th day of April, 1992, by WILLIAM A. NEWSOM and LAURIE K. NEWSOM, his wife, who is personally known to me or _____ who has produced as identification and who did not _____

Patricia S. Cox
Signature of Notary

My commission expires: _____
Commission No. _____

They missed changing this to "are" but otherwise, changes were made.



12.1.2 Cooperative Management Agreement With SRWMD

FWC Contract No. 13102

SRWMD Contract No. 12/13-218

COOPERATIVE MANAGEMENT AGREEMENT

Andrews Tract

10 **THIS COOPERATIVE MANAGEMENT AGREEMENT** is made and entered into this day of *September* 2013, between the Governing Board of the **SUWANNEE RIVER WATER MANAGEMENT DISTRICT**, a public body existing under Chapter 373, Florida Statutes, whose mailing address is 9225 County Road 49, Live Oak, Florida 32060 (herein called the "DISTRICT") and the **FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION**, a public body of the State of Florida, whose mailing address is Farris Bryant Building, 620 South Meridian Street, Tallahassee, Florida 32399-1600 (hereinafter called the "COMMISSION").

WITNESSETH

WHEREAS, the DISTRICT owns certain real property in Levy County, Florida more particularly described in Exhibit "A" (the "PROPERTY") which is commonly referred to as the Andrews Tract and

WHEREAS, pursuant to Section 373.1391, Florida Statutes, the DISTRICT is required to manage and maintain its property, to the extent practicable, in such a way as to ensure a balance between public access, general public recreational purposes, and restoration and protection of their natural state and condition; and

WHEREAS, pursuant to Section 373.1401, Florida Statutes the DISTRICT is allowed to contract with a governmental or non-governmental person or entity for the improvement, management, or maintenance of its property; and

WHEREAS, prior to the DISTRICT's acquisition of the PROPERTY, the PROPERTY was the subject of a Multiple Party Agency Lease between the Board of Trustees for the Internal Improvement Trust Fund to various agencies of the State of Florida including the COMMISSION and the DISTRICT; and

WHEREAS, the DISTRICT and the COMMISSION desire for the COMMISSION to continue to manage the PROPERTY; and

WHEREAS, the parties desire to enter into a contract by which the COMMISSION may improve, manage and maintain the PROPERTY; and

WHEREAS, the parties have reached an agreement between them concerning the matters set out herein and wish to commit such agreement to writing and thereby make an enforceable contract between them.

NOW, THEREFORE, the parties heretofore and in consideration of the premises and mutual covenants, terms and conditions hereinafter contained, hereby covenant and agree as follows:

1. Subject to the terms, conditions and limitations set forth in this Agreement, the DISTRICT hereby conveys management responsibilities to the COMMISSION and COMMISSION hereby accepts management responsibilities from the DISTRICT of the PROPERTY described in Exhibit "A" for the purposes and in the manner hereinafter set forth.
2. The initial term of this Agreement is for a period of twenty-five (25) years, commencing on Sept 10, 2013 and ending on Sept 9, 2038. Thereafter, this Agreement shall be automatically renewed in twenty-five year increments, unless terminated as otherwise set forth herein.
3. The purpose of this Agreement shall be to designate the COMMISSION as the lead management entity for the PROPERTY. The COMMISSION shall have the right to manage the habitat on the PROPERTY for the benefit of wildlife and take specific management actions including, but not limited to prescribed burning, discing, planting and mowing, along with other allowable uses as set forth in the management plan entitled "A Management Plan for Andrews Wildlife Management Area" as adopted June 28, 2012. Said plan shall be formally reviewed and approved by the COMMISSION and the DISTRICT not less than every ten years and amended as required and agreed.
4. Notwithstanding any provision contained herein to the contrary, this Agreement is subject to all applicable laws, state statutes, local ordinances and the rules and regulations pertaining thereto which may be applicable to the operation of the PROPERTY including Chapter 373.1391 and Chapter 259.101, Florida Statutes.
5. It is the intent of the COMMISSION and the DISTRICT that the PROPERTY be incorporated into, receive equal treatment and be identified as the Andrew Wildlife Management Area (WMA) managed, for land management purposes, as set forth in the WMA's management plan under the COMMISSION's constitutional and statutory authority for the conservation, management and protection of fish and wildlife. The PROPERTY will be managed for the same goals of wildlife habitat restoration, public access, recreational opportunities, hunting, and law enforcement protection as the remainder of the WMA. The COMMISSION shall assume primary management responsibilities that are consistent with the WMA's management plan, and shall include the following:
 - a. Reporting of annual activities and accomplishments will be conducted in association with normal COMMISSION reporting procedures, and activities on the PROPERTY will be included in such reports.
 - b. Posting the PROPERTY and providing routine surveillance and security for the PROPERTY.

- c. Providing recreational opportunities and public access that meet the goals and objectives of the Andrews Wildlife Management Area management plan.
 - d. Ensuring that all major signage, brochures, and pamphlets related to the PROPERTY prepared by the COMMISSION are of a design, size and content as is typical on other COMMISSION-managed land.
 - e. Controlling wildfires by employing appropriate management practices.
 - f. Controlling exotic and invasive plants at maintenance levels.
6. The DISTRICT shall partner with the COMMISSION to provide available equipment and personnel to advance resource management objectives for the PROPERTY including prescribed burning, exotic species control, natural resource and wildlife monitoring and vegetation management.
 7. Nothing contained in this Agreement shall be construed as a waiver of or contract with respect to regulatory or permitting authority of the DISTRICT as it now or hereafter exists under applicable laws, rules and regulations.
 8. It shall be the responsibility of the COMMISSION for any COMMISSION-initiated Project, and the DISTRICT for any DISTRICT-initiated Project, at its sole cost and expense, to obtain or renew any and all permits which may be required by the Suwannee River Water Management District, the State of Florida Department of Environmental Protection, and other applicable governmental agencies for activities conducted by such initiating party hereunder.
 9. The COMMISSION acknowledges that the use authorized herein does not convey to COMMISSION any real property rights or interests to the PROPERTY nor any duties, interests, rights, or privileges other than those specified herein.
 10. The COMMISSION shall pay all lawful debts incurred by it with respect to the PROPERTY and shall satisfy all liens of contractors, sub-contractors, mechanics, laborers, and materialmen in respect to any construction, alteration, and repair ordered by it in and on the PROPERTY, and any improvements thereon. Furthermore, the COMMISSION shall not have authority to create any mortgages on the PROPERTY or liens for labor or material on or against the PROPERTY and all persons contracting with the COMMISSION for the construction or removal of any structure, or for the erection, installation or repair of any structure or improvement on the PROPERTY, including materialmen, contractors, mechanics and laborers involved in such work, shall be notified that they must look to the COMMISSION solely to secure the payment of any bill or account for work done, material furnished, or money owed during the term of this Agreement.

11. All structures, improvements or personal property placed upon, or moved in or upon the PROPERTY by the COMMISSION shall be at the sole risk of the COMMISSION and the DISTRICT shall not be liable for any damage to said personal property, structures, or improvements, unless said damage is due to the actions of the DISTRICT.
12. All structures and improvements existing on the PROPERTY prior to the execution of this Agreement or placed upon the PROPERTY by the DISTRICT shall remain the property of the DISTRICT. All structures and improvements placed upon or moved in or upon the PROPERTY after the execution of this Agreement by the COMMISSION shall be deemed personal property of the COMMISSION and shall not be considered attached to the land as a fixture unless otherwise agreed upon in writing between the parties.
13. The COMMISSION takes possession of the PROPERTY with full knowledge of the existing condition of the PROPERTY and accepts the PROPERTY in an "as is" condition. The DISTRICT makes no representation or warranties as to the fitness of the PROPERTY for any particular use.
14. The COMMISSION possesses no knowledge of or expertise in the state of any pollutants, if they exist on the PROPERTY. Therefore, notwithstanding any other provision hereof, the COMMISSION shall in no way be liable for any claims or damages based, in whole or in part on the presence of pollutants or toxins, of any sort, on the PROPERTY as of the first date of this Agreement.
15. The COMMISSION and the DISTRICT shall, throughout the term of this Agreement, provide, maintain, and keep in force a program of insurance or self-insurance covering its liabilities as prescribed by Section 768.28, Florida Statutes. Nothing contained herein shall constitute a waiver by either party of its sovereign immunity or the provisions of Section 768.28, Florida Statutes. In addition, nothing contained herein shall be construed as a waiver of limitation of liability which may be enjoyed by the DISTRICT as a landowner providing land to the public for outdoor recreational purposes, as provided in Section 373.1395, Florida Statutes, or any other law providing limitations on claims against the landowner.
16. This Agreement and any and all rights and privileges contained herein are for the sole use of the DISTRICT and the COMMISSION and shall not be assigned or transferred to another party without the written consent of both the DISTRICT and the COMMISSION.
17. The COMMISSION shall not use or permit the PROPERTY to be used in violation on any valid present or future laws, ordinances, rules or regulations of any public or governmental authority at any time applicable thereto relating to sanitation or the public health, safety or welfare, or relating to the COMMISSION's activities in, and use of, the PROPERTY. It is understood and

agreed by the parties that there shall be no facilities constructed or placed on the PROPERTY except those directly related to the operation and maintenance of the PROPERTY for public recreational purposes or as set forth in the approved management plan and future restoration plan.

18. The DISTRICT reserves the right for itself, its agents, consultants and employees, to enter upon the PROPERTY for the purpose of inspecting the PROPERTY, conducting other water management activities, and determining compliance with the terms of this Agreement, so long as such entry or use does not unreasonably interfere with the COMMISSION's use of the PROPERTY for the purpose set forth herein.
19. Either party may terminate this Agreement, with or without cause, at any time upon ninety (90) days written notice to the other party.
20. All notices, consents, approvals, waivers and elections which any party shall be required or shall desire to make or give under this Agreement shall be in writing and/or shall be sufficiently made or given only when mailed by Certified Mail, postage prepaid, return receipt requested, addressed as follows to the parties listed below or to such other address as any party hereto shall designate by like notice given to the other parties hereto:

DISTRICT: SUWANNEE RIVER WATER
MANAGEMENT DISTRICT
9225 COUNTY ROAD 49
LIVE OAK, FLORIDA 32060
ATTENTION: EXECUTIVE DIRECTOR

COMMISSION: FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION
FARRIS BRYANT BUILDING
620 SOUTH MERIDIAN STREET
TALLAHASSEE, FLORIDA 32399-1600
ATTENTION: HSC / WHM SECTION
LEADER

Notices, consents, approvals, waivers and elections given or made as aforesaid shall be deemed to have been given and received on the date of mailing hereof as aforesaid.

21. Wherever used herein, the terms "DISTRICT" and "COMMISSION" include all parties to this instrument, their employees, legal representatives and assigns of individuals, and the successors and assigns of corporations, partnerships, public bodies, and quasi-public bodies.
22. This Agreement constitutes the entire agreement of the parties, and there are no understandings dealing with the subject matter of this Agreement other than

those contained herein. This Agreement may not be modified, changed or amended, except in writing signed by the parties hereto or their authorized representatives.

23. This Agreement shall be construed and interpreted according to the laws of the State of Florida. Wherever possible, each provision of this Agreement shall be interpreted in such manner as to be effective and valid under applicable law, but if any provision of this Agreement shall be prohibited or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Agreement.
24. As a condition of this Agreement the DISTRICT and COMMISSION hereby covenant and agree not to discriminate against any individual because of that individual's race, color, religion, sex, national origin, age, handicap, or marital status with respect to any activity occurring pursuant to this Agreement.
25. The DISTRICT and COMMISSION reserve the right to unilaterally cancel this Agreement for refusal by either to allow public access to all documents, papers, letters, or other material subject to the provisions of Chapter 119, Florida Statutes, and made or received by the DISTRICT and the COMMISSION in conjunction with this Agreement.
27. For all purposes of this Agreement, the Effective Date hereof shall mean the date when the last of the DISTRICT or the COMMISSION has executed the same, and that date shall be inserted at the top of the first page hereof.

[Signature/Acknowledgment pages follow]

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement, on the date and year first above written.

Signed, sealed, and delivered in the presence of:

SUWANNEE RIVER WATER MANAGEMENT DISTRICT

Swendolyn A. Lord
WITNESS
Swendolyn A. Lord
PRINT/TYPE WITNESS NAME

By: [Signature]
Don Quincey, Jr.
Chairman

Robert Hecke
WITNESS
Robert Hecke
PRINT/TYPE WITNESS NAME

Attest: [Signature]
Donald R. Curtis, III
Secretary

Approved as to form and legality:

By: [Signature]
George T. Reeves
Legal Counsel

**STATE OF FLORIDA
COUNTY OF SUWANNEE**

The foregoing agreement was acknowledged before me this 10th day of September, 2013, by Don Quincey, Jr. and Donald R. Curtis III, as Chairman and Secretary/Treasurer, respectively, of the Suwannee River Water Management District, a Florida Statutes Chapter 373 Water Management District, on behalf of said District, who are personally known to me, or who produced Florida Driver's License as identification.

[Signature]
Print Name: Lisa M. Cheshire
Notary Public, State of Florida

Commission No. _____
My Commission Expires: 

Signed, sealed, and delivered
in the presence of:

**STATE OF FLORIDA FISH AND
WILDLIFE CONSERVATION
COMMISSION**

K. Amosch
WITNESS

By: Gregory I. Holder
Nick Wiley
Executive Director

Katrina Amosch
PRINT/TYPE WITNESS NAME

Kristina Butler
WITNESS

KRISTINA BUTLER
PRINT/TYPE WITNESS NAME

Approved as to form and legality:

By: Anthony Pizzino
Print Name: Anthony Pizzino
FWC Attorney

**STATE OF FLORIDA
COUNTY OF LEON**

The foregoing agreement was acknowledged before me this 20th day of August, 2013 by Gregory I Holder, as Asst. Executive Director of the Florida Fish and Wildlife Conservation Commission,
 who is personally known to me, or who produced Florida Driver's License as identification.

Print Name: _____
Notary Public, State of Florida
Commission No. _____
My Commission Expires _____



EXHIBIT "A"

LEGAL DESCRIPTION

The following lands, lying and being in Levy County, State of Florida.

TOWNSHIP 10 SOUTH, RANGE 14 EAST

SECTION 31: Government Lots 1, 6, 7, and 11 lying East of the ordinary high water mark of the Suwannee River;

SECTION 32: West 221.85 feet.

TOWNSHIP 11 SOUTH, RANGE 14 EAST

SECTION 6: The North $\frac{1}{2}$ of the NW $\frac{1}{4}$ of the NE $\frac{1}{4}$ lying East of the ordinary high water mark of the Suwannee River; North $\frac{1}{2}$ of the NE $\frac{1}{4}$ of NE $\frac{1}{4}$; North 60 feet of the South $\frac{1}{2}$ of NE $\frac{1}{4}$ of NE $\frac{1}{4}$; The East 60 feet of North 60 feet of the South $\frac{1}{2}$ of NW $\frac{1}{4}$ of NE $\frac{1}{4}$.

TOWNSHIP 11 SOUTH, RANGE 13 EAST

SECTION 11: Government Lots 1 and 2, lying East of the Suwannee River;

SECTION 12: Government Lots 1, 2 and 3, lying East of the Suwannee River, EXCEPT the East 164.15 feet of Government Lot 1, Section 12, Township 11 South, Range 13 East.

Containing 577.2 acres, more or less.

12.2 Terms Used in This Management Plan

Management Plan Goals and Objectives

Terms and Definitions

Assessment: Assessment—when a historic resource professional determines the possible effects—positive or negative—that an action or inaction may have on a historical resource (e.g., site, building, object or structures) by analyzing its current condition and documenting any modifications and changes to its original state as well as identifying any potential human or natural threats to its existence.

Capital Improvement: Capital improvement" or "capital project expenditure" means those activities relating to the acquisition, restoration, public access, and recreational uses of such lands, water areas, and related resources deemed necessary to accomplish the purposes of this chapter. Eligible activities include, but are not limited to: the initial removal of invasive plants; the construction, improvement, enlargement or extension of facilities' signs, firelanes, access roads, and trails; or any other activities that serve to restore, conserve, protect, or provide public access, recreational opportunities, or necessary services for land or water areas. Such activities shall be identified prior to the acquisition of a parcel or the approval of a project. The continued expenditures necessary for a capital improvement approved under this subsection shall not be eligible for funding provided in this chapter.

Desired future condition: Desired Future Condition is a description of the land or resource conditions that are believed necessary if management goals and objectives are fully achieved. Desired Future Condition varies by specific habitat and ecosystem. It can also vary, based upon a specific agency's management goals.

Evaluation: Review by a professional in archaeology, history or architecture as to the integrity and significance of the site, building or structure. The criteria of the National Register of Historic Places will be applied.

Facility: all developed structures and improvements provided for a specific purpose or contained within a clearly defined area.

Fire management plan: An element of the land management plan or an independent document that outlines the goals and objectives of a fire management program (prescribed and wildfire) for a predetermined period of time.

Historic: An object, site or structure that is 50 years or older.

Hydrological assessment: A documented, systematic evaluation by a qualified professional of the existing and historical quantity, quality, movement and function of water resources (e.g., computer modeling).

Imperiled species: A species or subspecies that is listed by the U.S. Fish and Wildlife Service as Endangered or Threatened; Florida Fish and Wildlife Conservation Commission (FWC) as Endangered, Threatened, or Special Concern; Florida Department of Agriculture and Consumer Services (FDACS) as Endangered or Threatened; or is tracked by Florida Natural Areas Inventory (FNAI) as globally or state Critically Imperiled or Imperiled. Imperiled Species does NOT refer to species that are on the FDACS list of commercially exploited plants that are not Endangered or Threatened.

Improve: the enhancement or expansion of facilities, roads and trails.

Maintenance: the daily or regular work of keeping facilities, roads and trails in proper condition.

Monitoring: Periodic examination of the site, building or structure to determine the current condition and threats such as erosion, structural deterioration, vegetation intrusion, poaching or vandalism. An updated Florida Master Site File form is used to complete this assessment.

Natural community/habitat/ecological improvement: Similar to restoration but on a smaller less intense scale. Typically includes small scale vegetation management activities, spot treatments of exotic plants, or minor habitat manipulations. Any habitat alteration that increases the diversity of a habitat or increases the population of a particular species.

Natural community/habitat/ecological restoration: The process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegetation structure, and physical characters. Activities may include vegetative treatments (e.g., hardwood removal, mechanical treatment, pine tree thinning, etc.), groundcover establishment, non-commercial tree plantings, erosion control, hydrological manipulation (filling ditches), and beach management.

Not in maintenance condition: Species composition and/or structure is outside the targeted range. The natural community is in need of more frequent or recurring management treatments that are beyond maintenance activities. Examples include natural communities with exotic plant or animal infestations that are at levels requiring significant treatment, natural communities that have exceeded maximum targeted fire return intervals, and natural communities in need of restoration treatments.

Poor, fair, good condition: Evaluating the condition of cultural resources is accomplished using a three-part evaluative scale, expressed as good, fair and poor. These terms describe the present condition, rather than comparing what exists against the ideal. “Good” describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. “Fair” describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A “fair” assessment is cause for concern. “Poor” describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action is needed to reestablish physical stability.

Population survey: Using broadly accepted methodologies to detect changes in population trends over time.

Public access: access by the general public to state lands and water, including vessel access made possible by boat ramps, docks, and associated support facilities, where compatible with conservation and recreation objectives.

Recorded: A Florida Master Site File form has been completed and filed with the Florida Department of State, Division of Historical Resources.

Recreational/visitor opportunity: measure of potential number of users based on existing resource conditions and developed facilities.

Repair (major): the restoration of facilities, road and trails to proper condition after damage or failure.

Restoration underway: restoration planning/design, executing, evaluating and reporting.

Restored/Maintenance condition: (refers to natural community) - within the range of target species composition and structure such that no significant, non-recurring alterations to structure or species composition are needed for ecological restoration. Invasive exotic plants or animals are absent or at levels requiring minimal recurring treatments, and prescribed fire rotations are within target intervals. Refers to Natural Communities. Includes NCs that meet DFC, and NCs that have received restoration action (such as thinning, clear-cut and native species planting) and only require time and recurring maintenance actions such as prescribed fire, maintenance level exotics control, or sustainable forestry practices if applicable.

Road: a paved or unpaved motor vehicle route unless identified and managed as a trail.

Significant: Listed in or determined eligible for listing in the National Register of Historic Places as an individual property, element of a multiple listing or in an historic district. Cultural resource professionals are able to make the determination, but final determination rests with the Director of the Division of Historical Resources.

Sustainable forestry: The stewardship and harvest of forest products in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality, and potential to fulfill, now and in the future, relevant ecological, economic, and social functions at local, national and global levels, and that does not cause damage to other ecosystems.

Systematic survey: A sampling protocol designed to assess the occurrence or population status of a species or a suite of species (e.g., presence/absence, mark and recapture, transect survey, etc.).

Trail: a linear route or path which has been specifically prepared or designed for one or more recreational functions such as hiking, biking, horseback riding or multiple use. In many cases, unimproved service roads are also designated as trails.

Treatment: A mechanical, chemical, biological or manual action that changes the structure or composition of an area in order to facilitate restoration or improvement.

Visitor carrying capacity: An estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site.

Wildlife activities: wildlife-associated recreation such as birdwatching, fishing, hunting, etc.

12.3 Public Input

12.3.1 Management Advisory Group Meeting Results

Andrews Wildlife Management Area (AWMA)
Management Advisory Group (MAG)
Consensus Meeting Results

September 12, 2018 in Fanning Springs, Florida

The intent of convening a consensus meeting is to involve a diverse group of stakeholders in assisting the Florida Fish and Wildlife Conservation Commission (FWC) in development of a rational **management concept for lands within the agency's managed area system**. FWC does this by asking spokespersons for these stakeholders to participate in a half-day meeting to provide ideas about how FWC-managed lands should be protected and managed.

The MAG consensus meeting was held on the morning of *September 12, 2018* at Fanning Springs State Park, in Fanning Springs, Florida in Levy County. The ideas found below were provided by stakeholders for consideration in the 2019 - 2029 Management Plan (MP) with priority determined by vote. These ideas represent a valuable source of information to be used by biologists, planners, administrators, and others during the development of the MP. Upon approval by FWC, the Acquisition and Restoration Council (ARC), and the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), the MP will guide the activities of FWC personnel over the ten-year duration of the management plan and will help meet agency, state, and federal planning requirements.

Numbers to the left of bold-faced ideas listed below represent the total number of votes and the score of each idea. Rank is first determined by the number of votes (vote cards received for each idea) and then by score. Score is used to break ties when two or more ideas have the same number of votes. A lower score indicates higher importance because **each voter's most important idea (recorded on card #1) received a score of 1, and their fifth most important idea (recorded on card #5) received a score of 5**. Ideas not receiving any votes are listed, and were considered during the development of the MP, but carry no judgment with regard to priority.

Statements following the bold-faced ideas represent a synopsis of the clarifying discussion of ideas as transcribed and interpreted by the FWC recorder at the meeting. As indicated above, the ideas below are presented in priority order:

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
1.	[9]	[13]	1. Funding opportunities for land acquisitions. Ensure the FWC has funding available for properties that may become available for acquisition.
2.	[6]	[18]	2. Control feral hogs. There is a challenge with losing hunters, and they are an important tool for management, especially for wild hogs. A strategy could be providing additional youth hunts for hog control. By expanding hunter opportunities, there can be an impact made to local hog population.
3.	[4]	[8]	11. Preserve hunting opportunities.
4.	[4]	[12]	27. Improve entrance facility. Currently in the planning process, ensure to incorporate plans into the updated management plan.
5.	[4]	[16]	14. Continue natural community restoration. There is a plantation on the area that should be restored to historic natural communities, and other areas that can be further restored. This is being done, but ensure work continues to be done.
6.	[3]	[6]	7. Re-survey and treat for exotic plants. There are some exotics on the area, ensure we have identified those. Once survey is completed, treat exotic plants found.

Two Items of Equal Rank:

7.	[3]	[15]	19. Maintain natural fire communities. If there isn't a good buffer for highly developed areas, it will make it difficult for proper burning. Fire can promote the native vegetation and maintain the inventory of native plants.
	[3]	[15]	22. Active forest management where needed. Through timber thinning, Timber Management Plan, RX fire, mechanical, and other management activities, where needed and appropriate.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
9.	[2]	[2]	9. Maintain access for traditional recreational uses. Majority of state owned areas have mission statements. Maintaining non consumptive types of recreation, and encourage appropriate uses of lands. Also, work towards encouraging compatibility of user groups. Mission statement protects user groups utilizing the area.
10.	[2]	[5]	4. Update Timber Assessment. Last assessment was done in 2011, so in the scope of this management plan, an update should be completed to ensure appropriate management activities are taking place.
11.	[2]	[6]	12. Continue to maintain trail network including interpretative signage. With limited staff, it can become difficult to maintain trail systems. Recommend increase trail connectivity between surrounding conservation lands.
12.	[2]	[8]	28. Construct restroom facility at river. During previous LMR, some were not familiar with the uses. There is a dock on the area used for access, look towards trying to install a restroom in this area.

Two Items of Equal Rank:

13.	[1]	[2]	16. Ensure adequate staffing. Ensure sufficient funding for adequate staffing.
	[1]	[2]	26. Explore connectivity with Fanning Springs and promote retreat opportunities. Secondary management concerns are recreation and generating funding. However, continue to obtain community involvement, coordinating with other agencies and promoting educational opportunities. There are new ways groups are doing various retreats. So connecting Fanning Springs and Andrews can further opportunities.

Two Items of Equal Rank:

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
15.	[1]	[3]	8. Adjacent landowner engagement and education. Work towards mitigating future conflicts with adjacent landowners. County can also help inform landowners, however coordinating with adjacent landowners regarding future land use and educating landowners for habitat management is important.
	[1]	[3]	21. Encourage youth involvement on the area. Continue to get youth involved on the area, explore ideas to accomplish this.

Three Items of Equal Rank:

17.	[1]	[4]	13. Work with SWCD for educational programs. Pursue a partnership with the SWCD, which will assist with educational and financial resources.
	[1]	[4]	20. Compatible resource based recreation. Ensure that the recreational activities occurring on the area are not impactful to the natural resources on the property. The district is seeing increase of recreation sites, that are causing some erosion problems. Look towards developing preventative infrastructure that can further enhance public recreation opportunities.
	[1]	[4]	29. Open roads for hunting access. There is an available network of roads on the area which can provide an extensive amount of access. Currently it is difficult to get to far side of the area for hunting. Consider opening roads during hunts to ease of access.
20.	[1]	[5]	25. Consider climate change during management activities. In the future climate change will become an issue that will impact native vegetation and wildlife, which can create issues. Aware it is not a pure science, but over the years the area continues to change.

The following item received no votes. All ideas represent valuable input, and are considered in development of the MP, but carry no rank with regard to the priority perceptions of the MAG.

<u>Rank</u>	<u># of Votes</u>	<u>Score</u>	<u>Idea</u>
	[]	[]	6. Encourage interaction with conservation organizations. Continue to work with other organizations and develop opportunities for further community interactions.
	[]	[]	15. Mark sinkholes and identify other hazards. There are several depressions around trees and other areas that are hard to see and can be hazardous and dangerous. So some type of survey or permit to go in on a daily basis and assess hazards.
	[]	[]	17. Encourage volunteer participation. Coordinate with park service and enact a volunteer program for assisting with management activities.
	[]	[]	23. Survey and prevent pests and disease. In the management plan, under the exotic section, would like to see more detailed discussion. Possible upcoming issues with emerald ashborer. County mosquito plan should be included and continue to maintain control of pests.
	[]	[]	24. Ensure adequate parking. The public can utilize designated parking. However, look towards clearing areas where people regularly park to avoid hazards. Parking areas have fallen trees that further limit parking opportunities. Would be optimal to have trees removed.
	[]	[]	30. Monitor and prosecute looters and vandals. Continue to protect natural and historic resources.

Andrews Wildlife Management Area

MAG Meeting Participants

<u>Name</u>	<u>Affiliation</u>
Active Participants	
Jayde Roof	FWC Area Biologist
Officer Jordan Hillard	FWC Law Enforcement
Bill McKinstry	Suwannee River Water Management District
Shenley Neely	Levy County Planning Department
Michael Edwards	Florida Forest Service
Mark Abrizenski	Department of Environmental Protection
Chakesha Harvey	Natural Resources Conservation Service
Mitch Sapp	Florida Trail Association
Karen Garren	Florida Natural Areas Inventory
John Small	Local Hunter
Brack Barker	Wild Florida Adventures
Steve Barlow	Adjacent Private Landowner
Supportive Participants	
Matt Pollock	FWC Habitat and Species Conservation (HSC), Regional Biologist
David Nicholson	FWC HSC, District Biologist
Scotland Talley	FWC HSC, Regional Conservation Biologist
Katherine Burke	FWC Office of Public Access Services Office (PASO)
Tom M. Matthews	FWC PASO
Matt Chopp	FWC Division of Hunting and Game Management
Invited but Unable to Attend	
Jason O'Donoghue	Division of Historical Resources
Dan Hipes	Florida Natural Areas Inventory

Lilly Rooks
Ricky Lackey
Tony Beaver
Deborah Anderson

Levy County Commissioner
National Wild Turkey Federation
Suwannee Bicycle Association
Cedar Keys Audubon

FWC Planning Personnel

Lance Jacobson
Lindsay Slautterback
Dylan Imlah

Land Conservation Planner, Facilitator
Recorder
Recorder

12.3.2 Public Hearing Report

PUBLIC HEARING REPORT
FOR
ANDREWS WILDLIFE MANAGEMENT AREA
MANAGEMENT PLAN
HELD BY THE
ANDREWS WILDLIFE MANAGEMENT AREA MANAGEMENT ADVISORY
GROUP
AND THE
FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
NOVEMBER 1, 2018 – LEVY COUNTY, FLORIDA

The following report documents the public input that was received at the Andrews Wildlife Management Area (AWMA) Management Advisory Group's (MAG) public hearing for the update to the Management Plan for AWMA that was held at 7:00-9:00 PM, on November 1, 2018 at the Levy County Board of County Commissioners Board Room in Bronson, FL.

AWMA Management Advisory Group Introduction:

The meeting was introduced by Ms. Karen Garren, a AWMA Management Advisory Group participant, who represented the AWMA MAG. Ms. Garren indicated that she was one of 13 stakeholders that attended the Florida Fish and Wildlife Conservation Commission (FWC) facilitated AWMA MAG meeting held on September 12, 2018. Ms. Garren stated that the Draft Management Plan was being presented tonight by FWC staff, and that hardcopies of the draft plan and the AWMA MAG meeting report were available at the front door for the public's review. Ms. Garren thanked everyone for attending and then introduced Mr. Lance Jacobson, Land Conservation Planner, FWC, to facilitate and coordinate the presentation of an overview of AWMA, FWC's planning process, and the draft components of the AWMA Draft Management Plan.

Presentation on an Overview of AWMA and the FWC Planning Process:

Mr. Jacobson welcomed everyone and thanked the public for their attendance. Mr. Jacobson then went over an orientation of the material and explained that the purpose of the public hearing was to solicit public input regarding the Draft Management Plan for the AWMA, and not hunting and fishing regulations, indicating there is a separate public input process for FWC rule and regulation development. Mr. Jacobson then described the materials that were available at the door for public review, including the AWMA Draft

Management Plan and the MAG Meeting Report and Accomplishment Report. Mr. Jacobson then presented the agenda for the public hearing and facilitated the introduction of all FWC staff in attendance to the audience. Mr. Jacobson then presented an overview and orientation of the AWMA, including a description of the natural communities, data about the AWMA visitation, revenue and economic benefits generated for the state and region by the area, wildlife species, recreational opportunities found on the area, surrounding conservation lands, surrounding Florida Forever Program Land Acquisition Projects, acquisition history, etc. He also explained FWC's planning process for the management of the public conservation land and asked if there were any questions regarding that process.

Questions, Answers and Discussion on the AWMA Overview and FWC's Planning Process:

Mr. Jacobson facilitated an informal question and answers session where members of the public in attendance, without necessarily identifying themselves, could ask questions of the FWC staff, and discuss the answers. Mr. Jacobson again emphasized that the exclusive purpose for the public hearing was to collect public input regarding the Draft Management Plan for AWMA, and not to discuss area hunting, fishing and use regulations since, as was noted earlier, FWC has a separate process for input on hunting and fishing regulations.

Public Question #1: An unidentified member of the audience provided the following comments and questions:

How can you have comments about a draft management plan that is just now being presented?

FWC Response: Mr. Lance Jacobson, Land Conservation Planner, responded:

The draft management plan has been available online, along with the goals and objectives. We don't actually take action on anything tonight, and we'll continue to take comments through the entire process.

No (further) questions or comments were received at this stage of the AWMA public hearing meeting.

Presentation of the AMWA Draft Management Plan:

At this point, Mr. Jacobson began the presentation of the AWMA Draft Management Plan. Mr. Jacobson then completed and concluded the presentation of the AWMA Draft Management Plan.

Questions and Comments on the AWMA Draft Management Plan Presentation:

Mr. Jacobson asked if there were any comments or questions from the public regarding the Draft Management Plan and encouraged everyone to fill out a speaker card for public testimony. He informed them that all comments, questions, and public testimony will be duly considered equally by FWC.

Public Question #1: An unidentified member of the audience provided the following comments and questions:

Are there any known tickborne diseases visitors have gotten from the area?

FWC Response: Mr. Jayde Roof, Area Biologist, responded:

I've had Rocky Mountain Spotted Fever and my wife has had lime disease from Andrews.

Public Question #2: An unidentified member of the audience provided the following comments and questions:

You said there's a website where we can give comments?

FWC Response: Mr. Lance Jacobson, Land Conservation Planner, responded:

Comments can be sent directly to me, and my information is on the website; I'll also give you my business card so you'll have my contact information.

Public Question #2: An unidentified member of the audience provided the following comments and questions:

You did a great job of going through everything step by step; could you clarify what the Prospectus is?

FWC Response: Mr. Lance Jacobson, Land Conservation Planner, responded:

The Prospectus is basically a present overview of the area itself, so the final version of the draft plan is the Prospectus and draft plan combined, along with other various materials.

No further questions or comments were received at this stage of the AWMA public hearing meeting.

Public Testimony on the AWMA Draft Management Plan:

Zero members of the public audience submitted speaker card(s) indicating their intention to provide formal public testimony. Mr. Jacobson again emphasized that the public hearing was for taking input regarding the AWMA Draft Management Plan, and called the first speaker to the podium.

Public Testimony #1: Karen Garren provided the following public testimony:

I worked for six months as an OPS biologist at Andrews in 93' and my overall impression of the management at the time was, I thought it was really well done. There seemed to be more of a hunting aspect to it; since I was fresh out of school at that point, I understood you had to get income for the area. I think Andrews does a good job of balancing conservation and public access with all the programs there. I don't know if the kid's hunting days or things like that are there now though.

FWC Response: Jayde Roof, Area Biologist, responded:

We have youth hunts on Andrews; we were one of only two areas in the state that had youth hunts at one point in time, and we've added a lot of other things. We want to encourage kids to get in the woods. That's something we really need to do.

Adjournment:

Mr. Jacobson asked if there were any other members of the public that wished to give public testimony.

No other speakers offered further comments.

Then Mr. Jacobson declared the public hearing adjourned.

12.4 Soil Series Descriptions

Map Unit Description

Levy County, Florida

[Minor map unit components are excluded from this report]

Map unit: 3 - Orsino fine sand, 0 to 8 percent slopes

Component: Orsino (88%)

The Orsino component makes up 88 percent of the map unit. Slopes are 0 to 8 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 54 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 12 - Otela-Candler complex, 1 to 5 percent slopes

Component: Otela (56%)

The Otela component makes up 56 percent of the map unit. Slopes are 1 to 5 percent. This component is on rises on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Candler (33%)

The Candler component makes up 33 percent of the map unit. Slopes are 1 to 5 percent. This component is on ridges on karstic marine terraces on coastal plains. The parent material consists of eolian deposits and/or sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 14 - Shadeville-Otela complex, 1 to 5 percent slopes

Component: Shadeville (50%)

The Shadeville component makes up 50 percent of the map unit. Slopes are 1 to 5 percent. This component is on ridges on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 40 to 72 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Otela (31%)

The Otela component makes up 31 percent of the map unit. Slopes are 1 to 5 percent. This component is on rises on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map Unit Description

Levy County, Florida

Map unit: 15 - Holopaw-Pineda complex, frequently flooded

Component: Holopaw, frequently flooded (55%)

The Holopaw, frequently flooded component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Pineda, frequently flooded (30%)

The Pineda, frequently flooded component makes up 30 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 16 - Chobee-Gator complex, frequently flooded

Component: Chobee (45%)

The Chobee component makes up 45 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 68 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Gator (43%)

The Gator component makes up 43 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces, coastal plains. The parent material consists of herbaceous organic material over loamy and sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during January, February, March, April, May, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 68 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 29 - Chobee-Bradenton complex, frequently flooded

Component: Chobee (53%)

The Chobee component makes up 53 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of loamy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is moderate. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map Unit Description

Levy County, Florida

Map unit: 29 - Chobee-Bradenton complex, frequently flooded

Component: Bradenton (38%)

The Bradenton component makes up 38 percent of the map unit. Slopes are 0 to 1 percent. This component is on flood plains on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 5w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 31 - Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes

Component: Jonesville (48%)

The Jonesville component makes up 48 percent of the map unit. Slopes are 1 to 5 percent. This component is on rises on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits over limestone. Depth to a root restrictive layer, bedrock, lithic, is 24 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Otela (25%)

The Otela component makes up 25 percent of the map unit. Slopes are 1 to 5 percent. This component is on rises on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, bedrock, lithic, is 60 to 80 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Seaboard (16%)

The Seaboard component makes up 16 percent of the map unit. Slopes are 1 to 3 percent. This component is on flats on karstic marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer, bedrock, lithic, is 4 to 20 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 51 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 32 - Otela-Tavares complex, 1 to 5 percent slopes

Component: Otela (50%)

The Otela component makes up 50 percent of the map unit. Slopes are 1 to 5 percent. This component is on rises on karstic marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Tavares (39%)

The Tavares component makes up 39 percent of the map unit. Slopes are 1 to 5 percent. This component is on ridges on karstic marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater

Map Unit Description

Levy County, Florida

Map unit: 32 - Otela-Tavares complex, 1 to 5 percent slopes

Component: Tavares (39%)

than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 60 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 42 - Ousley-Albany complex, occasionally flooded

Component: Ousley (50%)

The Ousley component makes up 50 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains, stream terraces on marine terraces on coastal plains. The parent material consists of sandy alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during June, July, August, September. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Component: Albany (40%)

The Albany component makes up 40 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains on marine terraces on coastal plains, stream terraces on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a slightly sodic horizon within 30 inches of the soil surface.

Map unit: 99 - Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

12.5 Timber Assessment

TIMBER ASSESSMENT

ANDREWS WILDLIFE MANAGEMENT AREA

PREPARED BY

DOUG LONGSHORE

SENIOR FORESTER, OTHER PUBLIC LANDS REGION 2

FLORIDA DIVISION OF FORESTRY

FEBRUARY 2011

PURPOSE

This document is intended to fulfill the timber assessment requirement for the Andrews Wildlife Management Area (WMA) as required by Section 253.036, Florida Statutes. The goal of this *Timber Assessment* is to evaluate the potential and feasibility of managing timber resources for conservation and revenue generation purposes.

BACKGROUND

This property was bought by the Andrews family of Levy County in 1945. They managed the property primarily for hunting and other recreational activities. The state purchased the property in 1985 through the Save Our Rivers and Conservation and Recreation Lands Program.

It is believed that Andrews WMA contains the largest tract of relatively undisturbed upland hardwood forest remaining in Florida.

Due in large part to this healthy hardwood forest, Andrews WMA is considered to be one of the top five management areas in the state to hunt.

GOALS AND OBJECTIVES

The primary management goal for the Andrews WMA is to conserve the old growth upland hardwood forest for recreational and educational purposes.

TIMBER MANAGEMENT

Due to the environmental significance of the upland hardwood forest, timber management on Andrews WMA will be restricted to the pine plantations. Only 80 acres is presently in pine plantation. This stand is on marginally productive land and the objective is removal of slash pine and reestablishment of longleaf pine.

EXISTING TIMBER RESOURCES

MIXED SLASH AND LONGLEAF PINE PLANTATION

Present Condition

This stand is comprised of approximately 80 acres of a mixed slash and longleaf pine plantation approximately 16 years old. The slash pine stand exhibits fair to poor growth, averaging 432 trees per acre with an average diameter of 5 inches. The longleaf pine growing on the south one third of this stand, exhibits poor growth and in general, exhibits an unhealthy appearance with short, thin, yellowing needles and little height growth considering the age of the trees. Stocking in the longleaf pine area averages 50 trees per acre with an average diameter of 4 inches. The soils found in this portion of the stand appear to be quite sandy and marginally suited for longleaf pine.

Current Recommendations

Temporarily stop planting wiregrass plugs.

Within 3 to 5 years clear-cut slash pine. If market conditions are favorable, fuelwood chip hardwood and non-merchantable longleaf with the goal of reducing the number of longleaf stems to approximately 15 trees per acre.

At least one year following harvest, chemically site prepare the former slash pine stand with an approved forestry herbicide. Following herbicide treatment, hand plant longleaf tubelings at approximately 8 x 11 foot spacing for 500 trees per acre.

Continue groundcover restoration work.

CLEARCUT

Present Condition

This site is a 33 acre clear-cut slash pine plantation that has been prescribed burned at least once since harvest was completed. There is very little hardwood encroachment.

Current Recommendations

Curtail prescribe burning on this stand until fall or early winter prior to tree planting operations. In the winter of 2011-2012, hand plant containerized longleaf on an approximate spacing of 8x11 feet for 500 trees per acre. Current hand planting costs (winter of 2011) at this planting density average \$35.00 per acre. The tubeling cost would be in addition to this planting cost. Suspend burning efforts in this stand for 2 to 3 years following the planting operation. The initial burn after the planting should be a cool, damp, winter burn.

In summary, active timber management on Andrews WMA will be limited to the pine areas; however the few recommended activities will further enhance sandhill restoration efforts planned for this property.

12.6 FNAI Element Occurrence Data Usage Letter



1018 Thomassville Road
Suite 200-C
Tallahassee, FL 32305
850-224-8207
fax 850-681-9264
www.fnai.org

April 11, 2014

David Alden
Land Conservation & Planning
Florida Fish and Wildlife Conservation Commission
Tallahassee, FL

Dear David,

By virtue of this letter we are updating and continuing our agreement that it is unnecessary for your office to request FNAI element occurrence data for each land management plan you prepare, under the following conditions:

- FNAI will continue to provide our Florida Element Occurrence GIS database to FWC on a quarterly update basis;
- The FNAI GIS data will be available to FWC staff for reference and incorporation as required in management plan review and preparation.

Our database manager, Frank Price, currently provides this update via ftp to FWC staff on a quarterly basis. Current FWC contacts for the quarterly update are Beth Stys and Ted Hoehn. We are pleased to continue this beneficial collaboration with the Florida Fish and Wildlife Conservation Commission.

Sincerely,

Gary Knight
Director
Florida Natural Areas Inventory



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

Tracking Florida's Sustainability

12.7 FWC Agency Strategic Plan

Florida Fish and Wildlife Conservation Commission Agency Strategic Plan 2014 – 2019

Theme One – Florida’s Fish and Wildlife Populations and Their Habitats

Goal 1: Ensure the sustainability of Florida’s fish and wildlife populations.

Strategies:

1. Manage listed species so they no longer meet Florida’s endangered and threatened listing criteria.
2. Manage species to keep them from meeting Florida’s endangered and threatened listing criteria.
3. Anticipate and address fish and wildlife species’ conservation needs in light of adaptation to long-term environmental changes.
4. Develop, acquire and apply the appropriate biological and sociological science to inform fish and wildlife conservation decisions.
5. Inform and guide partners regarding how their regulations, policies, procedures and other actions affect fish and wildlife conservation.
6. Protect fish and wildlife species through effective outreach and enforcement.

Goal 2: Ensure sufficient habitats exist to support healthy and diverse fish and wildlife populations.

Strategies:

1. Use science to determine quantity, quality and location of the habitats most critical to sustain healthy and diverse fish and wildlife populations.
2. Protect lands and waters critical to sustaining healthy and diverse fish and wildlife populations through diverse incentive programs.
3. Manage habitats to sustain healthy and diverse fish and wildlife populations.

Theme Two – Interactions with Fish and Wildlife, including Fishing, Hunting, Boating and Wildlife Viewing Opportunities

Goal 1: Provide residents and visitors with quality fishing, hunting, boating and wildlife viewing opportunities that meet their needs and expectations while providing for the sustainability of those natural resources.

Strategies:

1. Develop, acquire and use the appropriate biological and sociological science necessary to provide sustainable fishing, hunting, boating and wildlife viewing opportunities that meet the needs and expectations of user groups while providing for the sustainability of those resources.
2. Manage fish and wildlife populations to provide sustainable fishing, hunting, and wildlife viewing opportunities.
3. Develop and maintain widely available, diverse and accessible fishing, hunting, boating and wildlife viewing opportunities that meet the needs and expectations of residents and visitors while providing for the sustainability of those resources and emphasizing partnerships with both public and private landowners.
4. Recruit and manage sustainable levels of resident and visitor participation in fishing, hunting, boating and wildlife viewing.
5. Provide targeted fishing, hunting, boating and wildlife viewing programs for youth, the disabled and veterans.

Goal 2: Enhance the safety and outdoor experience of those who hunt, fish, boat and view wildlife.

Strategies:

1. Provide and promote opportunities for residents, and visitors to learn safety practices for fishing, hunting, boating and wildlife viewing.
2. Enhance the boating safety and waterway experience of residents and visitors through improved access, management, education and enforcement.
3. Promote Florida's outdoor environment as a safe and healthy recreational option for residents and visitors.
4. Address the growing disconnect between people and nature by marketing and providing opportunities and education for diverse age, race, gender, ethnic and other demographic sectors.

Goal 3: Use minimal regulations to manage sustainable fish and wildlife populations, manage access to fish and wildlife resources, and protect public safety.

Strategies:

1. Continually evaluate proposed and existing regulations, based on resource management benefits, public safety concerns, and economic and social impacts, to improve or eliminate regulations as warranted.
2. Coordinate with partners and stakeholders to ensure that appropriate authorities and regulations exist to maintain sustainable fish and wildlife populations.
3. Implement and enforce regulations in an informative, proactive and influential manner to enrich resident and visitors' outdoor experience while safeguarding the natural resources.

Goal 4: Minimize adverse environmental, social, economic and health and safety impacts from fish, wildlife and plants that are known, or have a potential, to cause adverse impacts.

Strategies:

1. Manage species and their habitats, as well as species and human interactions, to eliminate or reduce the adverse environmental, social, economic and health and safety impacts from native and non-native fish, wildlife and plants.
2. Effectively communicate to residents, visitors and businesses how to be safe and act responsibly when interacting with or possessing fish, wildlife and plants.
3. Manage captive and non-native wildlife movement and trade through proactive and responsive enforcement, regulation and education, with an emphasis on species that pose a high risk to our native fish and wildlife.
4. Enhance partnerships to address adverse environmental, social, economic and health and safety impacts from fish, wildlife and plants and ensure a consistent and integrated approach with FWC.

Theme Three – Sharing Responsibility for Fish and Wildlife Conservation and Management with an emphasis on developing conservation values in our youth

Goal 1: Ensure current and future generations support fish and wildlife conservation.

Strategies:

1. Expand and promote the Florida Youth Conservation Centers Network through leveraging FWC programs and staff, and developing public and private partnerships and sponsorships.
2. Develop and deliver standardized youth conservation curricula and fishing, hunting, boating and wildlife viewing outdoor activity programs, and assist with adapting programs and curricula to meet the needs of diverse communities.
3. Foster stewardship and shared responsibility for fish and wildlife conservation through conservation education programs.
4. Expand marketing and outreach to reach diverse audiences and engage all staff in priority outreach initiatives.

Goal 2: Ensure residents, visitors, stakeholders and partners are engaged in the processes of developing and implementing conservation programs.

Strategies:

1. Foster a common vision among partners and the FWC to maintain and enhance fish and wildlife populations and their habitats through interagency coordination, mutually beneficial goals and initiatives.
2. Engage residents, visitors, stakeholders and partners to understand their perspectives, develop and implement conservation programs, and implement fishing, hunting, boating and wildlife viewing management activities.
3. Use citizen science to enhance conservation programs.

Goal 3: Increase opportunities for residents and visitors, especially youth, to actively support and practice fish and wildlife conservation stewardship.

Strategies:

1. Inform residents and visitors about conservation stewardship and encourage their active involvement in achieving conservation of fish and wildlife.
2. Provide and promote opportunities for residents and visitors, especially youth, to participate in conservation stewardship activities, including FWC volunteer opportunities.

Goal 4: Encourage communities to conserve lands and waters critical to sustaining healthy and diverse fish and wildlife populations.

Strategies:

1. Provide communities with the necessary assistance to help them obtain the social and economic benefits of local conservation lands.
2. Provide residents and visitors with relevant information on the social and economic benefits of conservation, fishing, hunting, boating, and wildlife viewing.
3. Support community events and programs that promote fish and wildlife conservation.

Theme Four – Responsive Organization and Quality Operations

Goal 1: Integrate our commitment to benefit the community and enhance the economy through our conservation efforts and public service.

Strategies:

1. Identify and implement ways to support Florida businesses and job growth while managing fish and wildlife.
2. Identify and promote opportunities for staff to benefit local communities through participation in approved activities where FWC resources can be used (for example, the Florida State Employees' Charitable Campaign, the Guardian ad Litem Program, mentoring programs, FWC Disaster Response Teams, and American Red Cross Disaster Services).
3. Provide residents and visitors with reliable and current information on Florida's fish and wildlife.
4. Continue to attract visitors by providing top-quality fishing, hunting, boating and wildlife viewing opportunities.

Goal 2: Provide resources and support for the safety and protection of residents and visitors, our natural and cultural resources, and for emergency responses to critical incidents and environmental disasters.

Strategies:

1. Identify existing and emerging risks to the safety of residents and visitors and foster internal collaboration and external partnerships necessary to effectively manage, reduce or eliminate those risks.
2. Provide immediate and effective disaster response and recovery through mutual-aid efforts with local, state and federal partners.
3. Provide search, rescue, and recovery services in coordination with local, state and federal entities to ensure the safety of residents and visitors.

4. Protect natural and cultural resources through proactive and responsive enforcement efforts.

Goal 3: Ensure the FWC has highly effective and adaptive business practices.

Strategies:

1. Address emerging biological, social and economic trends, anticipate impacts and take advantage of opportunities to accomplish FWC's mission.
2. Expect each employee to be an ambassador for FWC and its mission to Florida's diverse residents and visitors.
3. Provide efficient and effective service to Florida's diverse residents, visitors, and FWC staff.
4. Foster a diverse, accountable, responsive and skilled workforce who effectively serves Florida's residents and visitors.
5. Manage existing and secure additional resources necessary to achieve fish and wildlife conservation and meet residents, visitor and stakeholder needs.
6. Create and maintain an effective business model that supports the FWC's mission by using continuous improvement approaches that foster a collaborative and professional culture.

12.8 Land Management Review Report

2018 Land Management Review Team Report for Andrews Wildlife Management Area

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- **1. Introduction**

Section 259.036, F.S. requires a periodic on-site review of conservation and recreation lands titled in the name of the Board of Trustees to determine (1) whether the lands are being managed for the purposes for which they were acquired and (2) whether they are being managed in accordance with their land management plan adopted pursuant to s. 259.032, F.S. In case where the managed areas exceed 1,000 acres in size, such a review must be scheduled at least every five years. In conducting this review, a statutorily constructed review team “shall evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions or archaeological features. The review shall also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan.”

The land management review teams are coordinated by the Division of State Lands and consist of representatives from the Division of Recreation and Parks (DEP), the Florida Forest Service (DACS), the Fish and Wildlife Conservation Commission, the local government in which the property is located, the DEP District in which the parcel is located, the local soil and water conservation district or jurisdictional water management district, a conservation organization member, and a local private land manager.

Each Land Management Review Report is divided into three sections. Section 1 provides the details of the property being reviewed as well as the overall results of the report. Section 2 provides details of the Field Review, in which the Review Team inspects the results of management actions on the site. Section 3 provides details of the Land Management Plan Review, in which the team determines the extent to which the Management Plan provides for and documents adequate natural and recreational resource protection.

Finally, each report may also contain an Appendix that lists individual team member comments. This is a compilation of feedback, concerns or other thoughts raised by individual team members, but not necessarily indicative of the final consensus reached by the Land Management Review Team.

• **1.1. Property Reviewed in this Report**

Name of Site: Andrews Wildlife Management Area

Managed by: Florida Fish & Wildlife Conservation Commission

Acres: 3,582.03

County: Levy

Purpose(s) for Acquisition: to protect and restore the natural and cultural values of the property and provide the greatest benefit to the citizens of the state.

Acquisition Program(s): CARL/SOR/P2000/Florida Forever

Original Acquisition Date: 03/14/85

Area Reviewed: Entire Property

Last Management Plan Approval Date: 6/28/12

Review Date: 6/6/18

Agency Manager and Key Staff Present:

- Jayde Roof, Area Manager
- David Nicholson, FWC

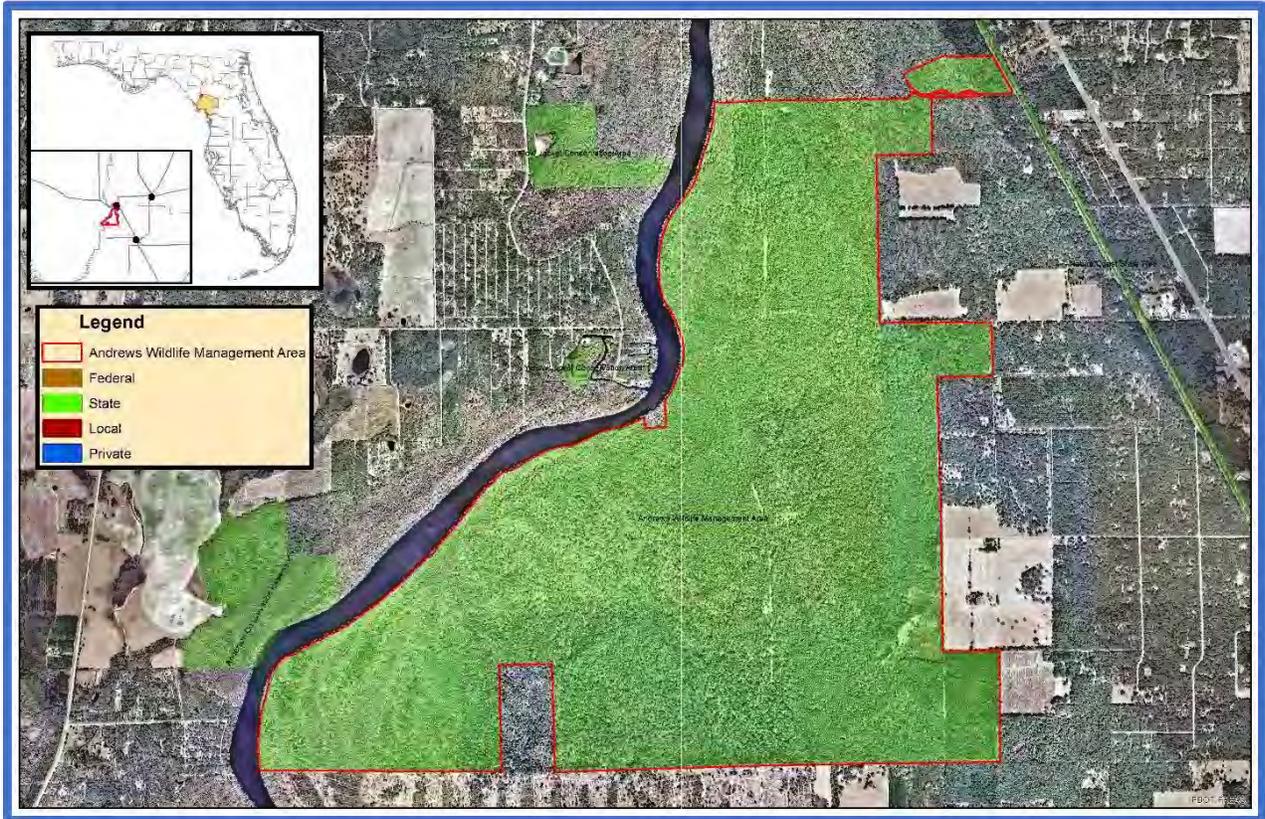
Review Team Members Present (voting)

- Carmine Oliverio, DEP District
- Greg Driskell, Private Land Manager
- Dan Pearson, DRP District
- William Irby, WMD
- Michael Edwards, FFS
- Scotland Talley, FWC
- Michael Bubb, Conservation Org.
- Local Gov't., None

Other Non-Team Members Present (attending)

- James Parker, FDEP/DSL
- Keith Singleton, FDEP/DSL

• **1.2 Property Map**



• **1.3. Overview of Land Management Review Results**

Is the property managed for purposes that are compatible with conservation, preservation, or recreation?

Yes = 7, No = 0

Are the management practices, including public access, in compliance with the management plan?

Yes = 7, No = 0

Table 1 shows the average scores received for each applicable category of review. *Field Review* scores refer to the adequacy of management actions in the field, while *Management Plan Review* scores refer to adequacy of discussion of these topics in the management plan. Scores range from 1 to 5 with 5 signifying excellence. For a more detailed key to the scores, please see *Appendix A*.

Table 11: Results at a glance.

Major Land Management Categories	Field Review	Management Plan Review
Natural Communities / Forest Management	4.44	3.98
Prescribed Fire / Habitat Restoration	4.34	4.44
Hydrology	4.18	4.43
Imperiled Species	4.24	4.29
Exotic / Invasive Species	4.02	3.94
Cultural Resources	4.79	4.57
Public Access / Education / Law Enforcement	4.28	3.91
Infrastructure / Equipment / Staffing	3.62	N/A

Color Code (See Appendix A for detail)

Excellent	Above Average	Below Average	Poor
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• **1.3.1 Consensus Commendations for the Managing Agency**

The following commendations resulted from discussion and vote of the review team members:

1. The team commends the Florida Fish and Wildlife Conservation Commission (FWC) for re-mapping of upland mixed woodland to distinguish it from xeric hammock and the significant restoration efforts and prescribed fires in upland mixed woodland. (7+, 0-)
2. The team commends the FWC for restoration efforts and recent success in the northeastern upland mixed woodland restoration. (7+, 0-)
3. The team commends the FWC for efforts to encourage youth and disabled hunter participation, as well as, other recreation uses. (7+, 0-)
4. The team commends the FWC for successfully maintaining access to all areas of the WMA for recreation following recent storm/tropical events. (7+, 0-)

• **1.3.2. Consensus Recommendations to the Managing Agency**

The following recommendations resulted from a discussion and vote of review team members. The next management plan update should include information about how these recommendations have been addressed:

1. The team recommends the FWC increase/diversify interpretive elements with information on bat surveys, bat house construction, and locations. (7+, 0-)

Managing Agency Response: The FWC will work to improve interpretive information regarding ongoing bat management efforts, as well as interpretive information regarding the bat houses at Andrews WMA.

- **2. Field Review Details**

- **2.1 Field Review Checklist Findings**

The following items received high scores on the review team checklist, which indicates that management actions exceeded expectations.

1. **Natural communities, specifically upland hardwood forest, xeric hammock, floodplain swamp, alluvial forest, and sinkhole.**
2. **Listed species: Protection & Preservation, specifically animals and plants.**
3. **Natural resources survey/monitoring, specifically listed species or their habitat monitoring, other non-game species or their habitat monitoring, fire effects monitoring, and invasive species survey/monitoring.**
4. **Cultural resources, specifically cultural resource survey and protection and preservation.**
5. **Resource management (prescribed fire), specifically area being burned, frequency, and quality.**
6. **Restoration, specifically habitat restoration (33 acre clear cut) SE corner and NE restoration (35 acres).**
7. **Forest management, specifically timber inventory/assessment, reforestation/afforestation, and site preparation.**
8. **Non-native, invasive, and problem species, specifically prevention of plants, animals, pest/pathogens and control of plants.**
9. **Hydrologic/geologic function Hydro alteration, specifically roads/culverts.**
10. **Resource protection, specifically boundary survey, gates and fencing, signage, and law enforcement presence.**
11. **Adjacent property concerns, specifically expanding development.**
12. **Public access and education, specifically roads, parking, and boat access.**
13. **Environmental education and outreach, specifically wildlife, invasive species, habitat management activities, recreational opportunities, and management of visitor impacts.**
14. **Management Resources, specifically equipment.**

- **2.2. Items Requiring Improvement Actions in the Field**

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 3.0 score on average). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. **The management plan update should include information on how these items have been addressed:**

1. Management Resources, specifically sanitary facilities received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether management resources are sufficient.

Managing Agency Response: The FWC will investigate the feasibility of upgrading the current sanitary facilities to a vault toilet system, as well as providing additional public sanitary facilities as part of planned improvements to the administrative office location.

• **2.3. Field Review Checklist and Scores**

Field Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Upland Hardwood Forest	I.A.1	5	5	5	5	5	5	5	5	5.00
Xeric Hammock	I.A.2	5	5	5	4	4	5	5		4.71
Floodplain Swamp	I.A.3	5	5	5	5	5	5	5		5.00
Alluvial Forest	I.A.4	5	5	5	5	5	5	5		5.00
Sinkhole	I.A.6	5	5	5	5	5	5	5		5.00
Upland Mixed Woodland	I.A.7	4	3	4	4	3	4	4		3.71
Natural Communities Average Score										4.74
Listed species:Protection & Preservation (I.B)										
Animals	I.B.1	4	5	x	4	4	5	4		4.33
Plants	I.B.2	4	5	4	4	4	4	4		4.14
Listed Species Average Score										4.24
Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	4	5	5	4	4	4	5		4.43
Other non-game species or their habitat monitoring	I.C.3	4	5	4	4	4	5	5		4.43
Fire effects monitoring	I.C.4	4	4	4	4	5	4	5		4.29
Other habitat management effects monitoring	I.C.5	4	4	3	4	2	4	5		3.71
Invasive species survey / monitoring	I.C.6	4	5	4	5	4	5	4		4.43
Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	4	5	5	5	5	5	5		4.86
Protection and preservation	II.B	3	5	5	5	5	5	5		4.71
Cultural Resources Average Score										4.79
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A1		5	5	4	5	5	5		4.83
Frequency	III.A.2	4	5	5	4	5	5	5		4.71
Quality	III.A.3		5	4	4	4	5	5		4.50

Resource Management, Prescribed Fire Average Score										4.68
Restoration (III.B)										
Pine Plantation	III.B.1	3	5	3	4	3	4	3		3.57
Habitat Restoration (33 acre clearcut) SE Corner	III.B.2	4	4	4	4	4	4	4		4.00
NE Restoration (35 Acres)	III.B.3	4	4			5	5	4		4.40
Restoration Average Score										3.99
Forest Management (III.C)										
Timber Inventory/assessment	III.C.1	4	5	3	4	4	5	5		4.29
Reforestation/Afforestation	III.C.3	4	5	4	4	4	4	4		4.14
Site Preparation	III.C.4	3	4	3	4	5	4	5		4.00
Forest Management Average Score										4.14
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	4	5	5	5	4	4	3		4.29
prevention - animals	III.D.1.b	4	5	4	4	4	4	3		4.00
prevention - pests/pathogens	III.D.1.c	x	5	4	4		3	4		4.00
Control										
control - plants	III.D.2.a	4	5	5	4	4	5	3		4.29
control - animals	III.D.2.b	4	5	3	4	4	4	3		3.86
control - pest/pathogens	III.D.2.c	x	5	3	4	4	3	3		3.67
Non-Native, Invasive & Problem Species Average Score										4.02
Hydrologic/Geologic function Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	4	5	5	5	5	5	5		4.86
Hydrologic/Geologic function, Hydro-Alteration Average Score										4.86
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	x	4	x	4	3	4	3		3.60
Ground water quantity	III.E.2.b	x	4	x	4	2	4	3		3.40
Ground Water Monitoring Average Score										3.50
Resource Protection (III.F)										
Boundary survey	III.F.1	3	5	x	5	5	4	5		4.50
Gates & fencing	III.F.2	3	5	3	5	5	4	3		4.00
Signage	III.F.3	3	5	4	4	5	4	4		4.14
Law enforcement presence	III.F.4	4	5	5	4	4	4	5		4.43
Resource Protection Average Score										4.27
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.G.1.a	4	4	5	4	4	4	3		4.00
Inholdings/additions	III.G.2	3	3	4	5	4	4	4		3.86

Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	4	5	5	5	5	5	4		4.71
Parking	IV.1.b	4	5	5	5	5	4	4		4.57
Boat Access	IV.1.c	3	5	4	5	5	4	4		4.29
Environmental Education & Outreach										
Wildlife	IV.2.a	4	4	5	5	4	4	4		4.29
Invasive Species	IV.2.b	4	4	5	5	4	3	4		4.14
Habitat Management Activities	IV.2.c	4	4	4	5	4	3	4		4.00
Interpretive facilities and signs	IV.3	3	4	3	5	4	4	4		3.86
Recreational Opportunities	IV.4	4	5	4	5	4	5	4		4.43
Management of Visitor Impacts	IV.5	4	5	4	5	4	4	4		4.29
Public Access & Education Average Score										4.29
Management Resources (V.1, V.2, V.3, V.4)										
Maintenance										
Waste disposal	V.1.a	3	5	4	4	4	3	4		3.86
Sanitary facilities	V.1.b	3	5	1	3	2	3	3		2.86
Infrastructure										
Buildings	V.2.a	3	4	3	4	5	3	3		3.57
Equipment	V.2.b	3	4	4	4	5	4	4		4.00
Staff	V.3	3	4	4	4	4	3	4		3.71
Funding	V.4	3	4	4	4	4	3	4		3.71
Management Resources Average Score										3.62

Color Code:

Excellent	Above Average	Below Average	Poor
	Missing Vote	Insufficient Information	

See Appendix A for detail

- **3. Land Management Plan Review Details**

- **3.1 Items Requiring Improvements in the Management Plan**

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than 3.0 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The next management plan update should address the checklist items identified below:

The review team scores did not identify items requiring improvement in the management plan.

• **3.2 Management Plan Review Checklist and Scores**

Plan Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Upland Hardwood Forest	I.A.1	4	4	5	4	5	5	3		4.29
Xeric Hammock	I.A.2		4	5	4	4	4	3		4.00
Floodplain Swamp	I.A.3		4	5	4	4	5	3		4.17
Alluvial Forest	I.A.4		4	5	4	4	5	3		4.17
Sinkhole	I.A.6		1	2	4	4	4	3		3.00
Upland Mixed Woodland	I.A.7		1	5	4	4	4			3.60
Natural Communities Average Score										3.87
Listed species: Protection & Preservation (I.B)										
Animals	I.B.1	5	5	4	4	4	5	3		4.29
Plants	I.B.2	4	5	5	4	4	5	3		4.29
Listed Species Average Score										4.29
Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	5	5	5	4	4	5	5		4.71
Other non-game species or their habitat monitoring	I.C.3	4	5	5	4	4	5	5		4.57
Fire effects monitoring	I.C.4	4	5	3	4	5	4	5		4.29
Other habitat management effects monitoring	I.C.5	4	5	3	4	2	4	3		3.57
Invasive species survey / monitoring	I.C.6	4	5	5	4	4	5	3		4.29
Cultural Resources (Archeological & Historic sites) (II.A,II.B)										
Cultural Res. Survey	II.A	4	5	5	5	5	5	3		4.57
Protection and preservation	II.B	4	5	5	5	5	4	4		4.57
Cultural Resources Average Score										4.57
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1		5	5	4	5	5	5		4.83
Frequency	III.A.2	4	5	5	4	5	5	5		4.71
Quality	III.A.3		3	4	4	4	4	5		4.00
Resource Management, Prescribed Fire Average Score										4.52
Restoration (III.B)										
Pine Plantation	III.B.1	3	5	5	4	2	5	5		4.14
Habitat Restoration (33 acre clearcut) SE Corner	III.B.2	4	5	5	4	4	5	5		4.57

NE Restoration (35 Acres)	III.B.3	4	5			4	4	5		4.40
Restoration Average Score										4.37
Forest Management (III.C)										
Timber Inventory/assessment	III.C.1	4	5	3	4	4	5	5		4.29
Reforestation/Afforestation	III.C.3	4	4	3	4	4	4	5		4.00
Site Preparation	III.C.4	4	4	3	4	4	4	5		4.00
Forest Management Average Score										4.10
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.E.1.a	4	5	4	5	4	5	2		4.14
prevention - animals	III.E.1.b	4	4	3	5	4	3	2		3.57
prevention - pests/pathogens	III.E.1.c	4	4	4	4	4	2			3.67
Control										
control - plants	III.E.2.a	4	5	5	4	4	4	4		4.29
control - animals	III.E.2.b	4	4	5	4	4	3	4		4.00
control - pest/pathogens	III.E.2.c		4	5	4	4	3			4.00
Non-Native, Invasive & Problem Species Average Score										3.94
Hydrologic/Geologic function, Hydro-Alteration (III.E.1)										
Roads/culverts	III.F.1.a	4	5	5	5	5	4	5		4.71
Hydrologic/Geologic function, Hydro-Alteration Average Score										4.71
Ground Water Monitoring (III.E.2)										
Ground water quality	III.F.2.a	4	5	4	4	3	4	4		4.00
Ground water quantity	III.F.2.b	4	5	4	4	5	4	4		4.29
Ground Water Monitoring Average Score										4.14
Resource Protection (III.F)										
Boundary survey	III.G.1	4	5	1	4	5	4	1		3.43
Gates & fencing	III.G.2	4	5	3	4	5	4	1		3.71
Signage	III.G.3	4	5	3	4	5	4	1		3.71
Law enforcement presence	III.G.4	4	5	3	4	4	4	1		3.57
Resource Protection Average Score										3.61
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.H.1.a	4	5	5	4	4	4	3		4.14
Inholdings/additions	III.H.2	3	5	5	5	4	5	5		4.57
Discussion of Potential Surplus Land Determination	III.H.3	4	5	5	4	5	5	2		4.29
Surplus Lands Identified?	III.H.4	4	5	5	4	5	5	5		4.71
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										

Roads	IV.1.a	4	5	5	4	5	5	4		4.57
Parking	IV.1.b	4	5	5	4	5	4	4		4.43
Boat Access	IV.1.c	4	5	4	4	5	4	4		4.29
Environmental Education & Outreach										
Wildlife	IV.2.a	4	5	5	4	4	4	5		4.43
Invasive Species	IV.2.b	4	5	3	4	4	4	1		3.57
Habitat Management Activities	IV.2.c	4	5	5	4	4	4	1		3.86
Interpretive facilities and signs	IV.3	4	5	4	4	4	4	5		4.29
Recreational Opportunities	IV.4	4	5	5	4	4	5	5		4.57
Management of Visitor Impacts	IV.5	4	5	3	4	4	4	4		4.00
Public Access & Education Average Score										4.22

Managed Area Uses (VI.A, VI.B)										
Existing Uses										
Wildlife Viewing	VI.A.1	4	5	5	4	5	5	5		4.71
Hunting/Fishing	VI.A.2	5	5	5	5	5	5	5		5.00
Boating	VI.A.3	3	5	4	4	5	5	5		4.43
Hiking	VI.A.4	4	5	5	5	5	5	5		4.86
Bicycling	VI.A.5	4	5	4	4	5	4	5		4.43
Geocaching	VI.A.7	3	5	5	4	5	5	5		4.57

Color Code:

Excellent	Above Average	Below Average	Poor	See Appendix A for detail
	Missing Vote	Insufficient Information		

Appendix A: Scoring System Detail

Explanation of Consensus Commendations:

Often, the exceptional condition of some of the property’s attributes impress review team members. In those instances, team members are encouraged to offer positive feedback to the managing agency in the form of a commendation. The teams develop commendations generally by standard consensus processes or by majority vote if they cannot obtain a true consensus.

Explanation of Consensus Recommendations:

Subsection 259.036(2), F.S., specifically states that the managing entity shall consider the findings and recommendations of the land management review. We ask team members to provide general recommendations for improving the management or public access and use of the property. The teams discuss these recommendations and develop consensus recommendations as described above. We provide these recommendations to the managing agency to consider when finalizing the required ten-year management plan update. We encourage the manager to respond directly to these recommendations and include their responses in the final report when received in a timely manner.

Explanation of Field Review Checklist and Scores, and Management Plan Review Checklist and Scores:

We provide team members with a checklist to fill out during the evaluation workshop phase of the Land Management Review. The checklist is the uniform tool used to evaluate both the management actions and condition of the managed area, and the sufficiency of the management plan elements. During the evaluation workshop, team members individually provide scores on each issue on the checklist, from their individual perspective. Team members also base their evaluations on information provided by the managing agency staff as well as other team member discussions. Staff averages these scores to evaluate the overall conditions on the ground, and how the management plan addresses the issues. Team members must score each management issue 1 to 5: 1 being the management practices are clearly insufficient, and 5 being that the management practices are excellent. Members may choose to abstain if they have inadequate expertise or information to make a cardinal numeric choice, as indicated by an “X” on the checklist scores, or they may not provide a vote for other unknown reasons, as indicated by a blank. If a majority of members failed to vote on any issue, that issue is determined to be irrelevant to management of that property or it was inadequately reviewed by the team to make an intelligent choice. In either case staff eliminated the issue from the report to the manager.

Average scores are interpreted as follows:

Scores 4.0 to 5.0 are *Excellent*

Scores 3.0 to 3.99 are *Above Average*

Scores 2.0 to 2.99 are *Below Average*

Scores 1.0 to 1.99 are considered *Poor*

12.9 AWMA Prescribed Burn Plan

ANDREWS WMA Prescribed Burning Plan

INTRODUCTION

Fires, naturally occurring or man-induced, are an integral part of the ecology of the southern pine (Pinus spp.) region (Miller 1963) and have maintained a fire-dependent plant community in the southeast for countless years. Exclusion of fire results in the growth of dense brush and eventual succession toward a climax hardwood community. Areas covered by dense brush lose much of their value to wildlife. For example, food and browse plants are less palatable, access is restricted and predator's ability to capture prey is hampered. Additionally, heavy fuel accumulation results in increased wildfire hazard.

Prescribed burning is used extensively in forestry and wildlife management for fuel reduction, brush control, disease and insect control, site preparation and wildlife habitat improvement. It is a recommended tool for management of such game animals as white-tailed deer (Odocoileus virginianus), bobwhite quail (Colinus virginianus), mourning dove (Zenaida macroura) and wild turkey (Meleagris gallopavo) (U. S. Forest Service 1969, Stoddard 1971). The value of prescribed fire to these and other animals, such as raptors and some songbirds, are well documented (Givens 1962, Miller 1963, Stoddard 1963). Prescribed fire benefits wildlife by reducing underbrush density, thus improving access, promoting the growth of succulent vegetation and lowering browse to feeding height of deer. Additionally, it benefits aesthetic values and enhances growth and fruiting of important wildlife food plants, such as dewberries (Rubus spp.) and blueberries (Vaccinium spp.) (Halls 1977).

The primary objectives of prescribed burning on fire adapted communities in Andrews WMA are to (1) improve wildlife habitat, (2) maintain fire-dependent plant communities, (3) improve hunter access, (4) reduce fuel accumulation and wildfire hazard, (5) enhance aesthetics, and (6) control undesirable vegetation. The purpose of this plan is to ensure that all aspects of

the burn are well considered and that the burning is conducted in an orderly manner so impacts of smoke and other environmental hazards are minimized.

DESCRIPTION OF AREA

The Andrews Wildlife Management Area (AWMA) comprises 3,582 acres in western Levy County between Fanning Springs and Chiefland. The Suwannee River is the western boundary. Manatee Springs State Park is located approximately two miles downriver and south of the southern boundary. Fanning Springs State Park, owned by the State and maintained by the Department of Environmental Protection (DEP) and Office of Greenways and Trails (OGT), is located west of U.S. 19, one mile north of Andrews WMA.

High intrinsic wildlife value, relatively unspoiled mature hardwood forest and the importance of the area's floodplain to the Suwannee River were primary reasons for acquiring the Andrews WMA. The tract is one of the few remaining large contiguous areas of old-growth hardwood forest. "Save Our Rivers" (SOR) legislation calls for the management and maintenance of lands acquired with SOR funds "in an environmentally acceptable manner, and to the extent practicable, in such a way as to restore and protect their natural state and condition. These lands shall also be used for general public recreational purposes to the maximum extent possible considering the environmental sensitivity and suitability of those lands." The primary management intent for the CARL lands, as expressed in the CARL assessment, is: (1) to provide protection to significant ecological and historical components, and (2) to manage the area's intrinsically high floral and faunal resources for public outdoor recreation.

Currently, the AWMA is being used for quality-oriented public hunting, non-consumptive wildlife recreation and access for river fishing. Public hunting has been conducted for the past 25 years. All hunting has been managed by restricting the number of hunt periods, maintaining daily hunter quotas and conducting only special hunts for deer, hogs, turkeys and small game.

PRESCRIBED BURNING PROGRAM

A. Firelines

Natural features (e.g., roads) are utilized as firelines to facilitate prescribed fire whenever feasible. These roads are located on our eastern and southern boundaries. Many of the roads that are utilized as firebreaks require disking to maintain functional firebreaks before use. Firelines will be re-worked by FWC personnel and maintained by mowing and/or disking. There are no western firelines and fire will be allowed to spread west until it encounters the upland hardwood forest within AWMA where it will naturally extinguish.

B. Size and Arrangement of Compartments

Three burning compartments have been delineated in Figure 1 by FNAI habitat type: xeric hammock, clear cut and pine plantation. These three compartments are in different stages of restoration and fire behavior will be different in each one.

First there is approximately 485 acres of xeric hammock. Xeric hammocks are characterized as either a shrubby, dense, low canopied forest with little understory other than palmetto, or a multi-storied forest of tall trees with an open or closed canopy. Xeric hammocks are an advanced successional stage of scrub or sandhill. The variation in vegetation structure is predominantly due to the original community from which it developed. Soils consist primarily of deep, excessively-drained soils that were derived from old dune systems. Xeric hammocks are often considered the climax community on sandy uplands. At Andrews WMA, xeric hammock covers patches within the south and east sections. The canopy typically has sand live oak (*Quercus geminata*), sand laurel oak (*Quercus hemisphaerica*), and scattered longleaf pine (*Pinus palustris*) as the dominants. A long leaf pine survey was conducted in 2008 on this area and found 4,046 trees that were 12 DBH or larger spread throughout the area. The heaviest concentration of longleaf pine trees is in the central and southern portions of the survey area. Very few longleaf pine less than 12 inches DBH were observed, likely due to the past absence of prescribed fire. Longleaf pine ages ranged from 52 to 120 years old with the majority in the 70-90 year old range based on a sample of 25 trees. Southern red oak (*Quercus falcata*) is common in some locations. The tall shrubs include sparkleberry (*Vaccinium arboreum*), wild olive (*Osmanthus americanus*), and rusty staggerbush (*Lyonia ferruginea*). The short shrubs

include deerberry (*Vaccinium stamineum*), staggerbush (*Lyonia fruticosa*) and occasional saw palmetto (*Serenoa repens*). Some sections have numerous shrubby red bay (*Persea borbonia*) and occasional horse-sugar (*Symplocos tinctoria*). The groundcover is relatively sparse, with large-fruited beakrush (*Rhynchospora megalocarpa*), panic grass (*Dichanthelium* spp.), and tall nutsedge (*Scleria triglomerata*) being the most abundant.

The second compartment is a 33 acre clear-cut (Figure 1) harvested in March 2008 located within the first xeric hammock compartment. This clear cut has not been replanted with longleaf pine yet but will be in the near future. The existing ground cover has been burned and left to reestablish itself.

Lastly, there are 82 acres of pine plantation (Figure 1) approximately 16 years old in the extreme southeastern corner of the area. This plantation has been planted with approximately half slash pine and half longleaf pine. The southern 45 acres was planted with wiregrass plugs at a rate of 1,178 per acre in January of 2011. This wiregrass will help support a fire when the pines are thinned in the future.

The compartments can all be burned at one time or separated out according to restoration need timetables, weather conditions, and personnel availability. Ideally, burns should be conducted at 2-3 year intervals.

C. Type of Burn

All three compartments have been burned and are currently in a 2-3 year burn rotation. The pine plantation should be backfired or strip headfired to keep intensity down and reduce pine mortality. The plantation was first burned in the 2010 dormant season. The remaining areas have been head fired from east to west with great success in both dormant and growing season. Great care should be given to having enough fine fuel moisture (rain a few days before burning) to keep the intensity down and reduce the spread into the upland hardwood forest.

D. Season and Time of Day

Growing season burning will be preferred but dormant season burns should be allowed when needed. Burning will be conducted primarily during daylight hours; night burning will be avoided due to problems associated with smoke dispersal. However, if favorable conditions exist and permits can be obtained, burning will be continued into the night, if necessary.

E. Optimal Weather Conditions

Optimal dormant season burning conditions exist 1-3 days after passage of a cold front that has brought 0.5-1.5 inches of rain, and require relative humidity of from 30-60%, air temperature of 20-60°F and easterly winds (4-8 mph in the stand) (Mobley et al. 1973, Crow and Shilling 1983). Growing season burns should be conducted 5-7 days after a rain and require relative humidity of from 30-60%, air temperature of 60-95°F and easterly winds (4-10 mph in the stand). Some internal pine stand ignition may be required as a follow-up the next day to ensure a complete burn.

SMOKE MANAGEMENT

Direction, volume and dissipation of smoke from prescribed burning on AWMA are of concern due to the proximity of smoke-sensitive areas. Areas that may be affected by smoke (or particulates carried by smoke) under optimum burning conditions are Highway 19 (2 miles to the east and north), and Chiefland (5 miles to the southeast). To minimize smoke problems, burning should be conducted when the atmosphere is slightly unstable, with mixing height a minimum of 1,500 feet and transport wind speed of 5-15 mph (Southern Forest Fire Laboratory 1976, Crow and Shilling 1983). Additionally, use of backfires, as needed, will produce less smoke and consume fuel more completely than headfiring (Mobley et al. 1973, Southern Forest Fire Laboratory 1976, Crow and Shilling 1983).

Preferred wind direction is a strong easterly component to carry smoke away from smoke sensitive areas and into AWMA. Past burns have produced limited smoke due to low fuel loads and small acreage burned.

PERSONNEL AND EQUIPMENT NEEDED

A. Personnel

Under ideal conditions, burning of any compartment can be conducted with a minimum crew of three; however, a crew of four to five personnel is optimal. If strip firing the pine plantation is the selected firing technique, additional personnel will prove helpful to reduce the distance each has to walk. Commission personnel who are DOF-certified for prescribed burning will conduct the burning. All participating staff will be required to wear PPE identified in the agency's prescribed burn policy.

B. Equipment

Fire flaps, fire rakes, drip torches, burn fuel, four-wheeled ATVs, hand held radios, and a Type VI engine are required equipment. Smoke caution signs for Highway 19 and fire hazard signs should be available if needed.

C. Fire Weather Monitoring

One person will be assigned to be the fire weather monitor on each burn. This person will monitor and record wind speed, wind direction and humidity hourly during the burn with a kestrel. If conditions stray outside of the burn prescription the burn boss will be notified and corrective measures can be taken.

PERMITS AND NOTIFICATIONS

A permit will be obtained from the DOF on the morning of the burn. Notification of burning will be given to:

1. Adjacent private land owners
2. Levy County Sheriff's Department

EVALUATION OF BURN

Initial evaluation of the fire will be conducted within one week and include: percent crown scorch, bark char (height), fuel consumption, flame height, fire behavior, smoke dispersion, any escape, adverse publicity, objectives reached and other observations. A follow-up evaluation will be completed within one month and will include crown scorch, understory kill, adverse insect activity and other observations. Observations of the results will be incorporated into future burn prescriptions.

SPECIAL CONSIDERATIONS

Care will be taken to protect environmentally sensitive areas. Bald eagle (Haliaeetus leucocephalus) nests will be excluded from winter burning if any are found. Firebreaks will circumvent the nest by a 750-foot radius. The tract surrounding the nest tree may be burned with the following considerations: (1) the tract is not to be burned between 1 October and 15 May (nesting season); and (2) the nest tree is to be excluded from burning to prevent fire-induced mortality (D. Wood, FGFWFC, pers. commun.).

Gopher tortoises (Gopherus polyphemus) are dependent on vegetation responses to fire, and research has shown no adverse effects on this species from prescribed burning (Means and Campbell 1981). Although individual tortoises may be destroyed by fire on rare occasions, prescribed burning provides better habitat for tortoise populations than unburned areas (J. Diemer, FGFWFC, pers. commun.).

Summer burning may affect various wildlife species which are highly active during this period. Moreover, other nesting reptiles, birds and mammals may also be adversely impacted by summer burns, particularly by fast-moving headfires. Consideration for summer burning will be given to areas having desirable burning conditions.

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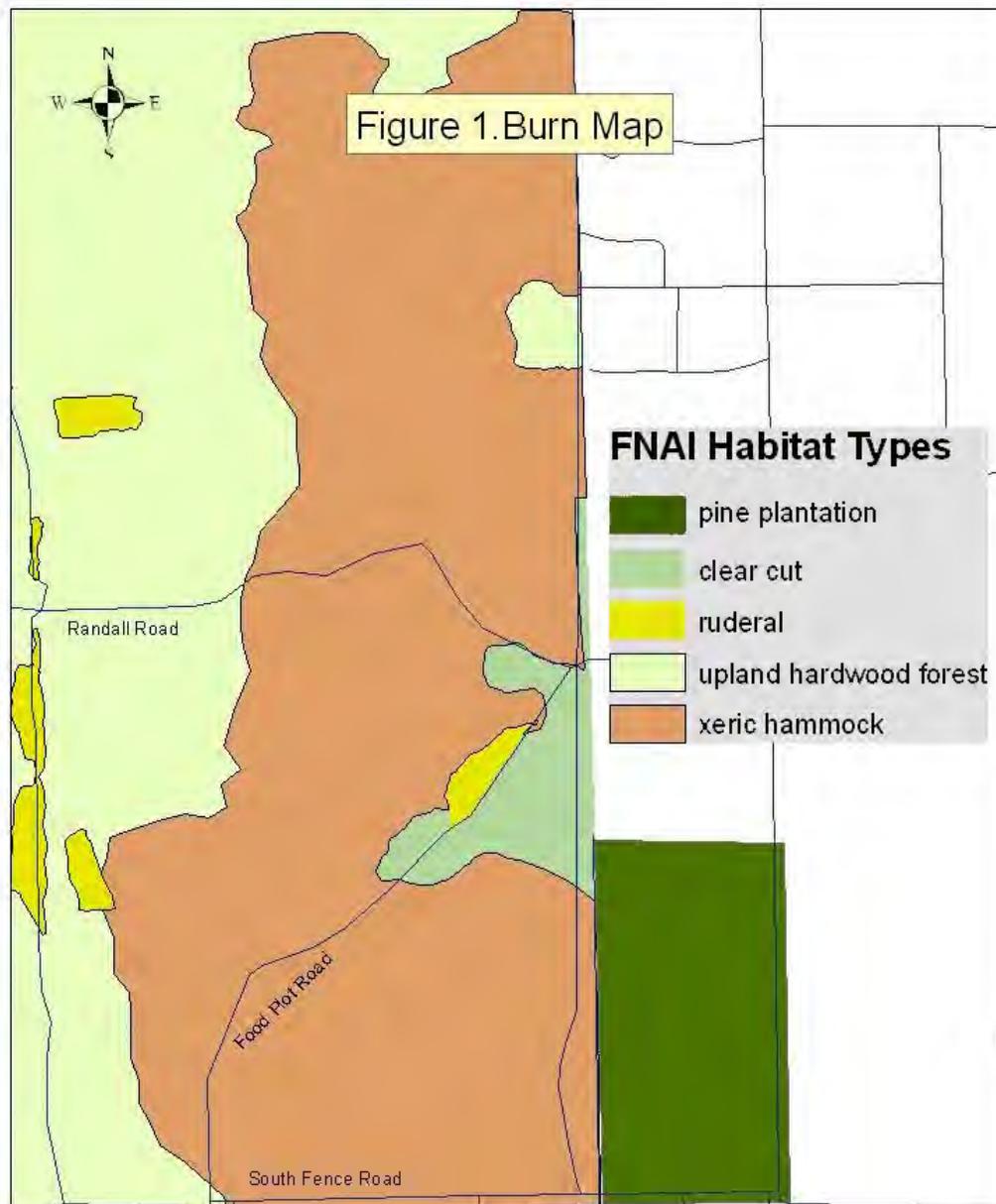


Figure 1. Relative location of burn compartments on Andrews Wildlife Management Area (AWMA), Levy County, Florida.

Andrews Wildlife Management Area Restoration Plan

February 2016

Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Wildlife and Habitat Management Section

Prepared by:
Mr. Jayde Roof, Lead Area Biologist
Andrews Wildlife Management Area



INTRODUCTION

The goal of this restoration plan is to guide management actions to restore 153.6 acres of silviculturally altered land on the Andrews Wildlife Management Area (AWMA) to historical natural communities. Strategies and techniques for altered community restoration are ever evolving; therefore, we intend to apply an adaptive management approach. As such, this restoration plan should be viewed as a recommendation for restoration actions at the time it was developed. Depending on response of trees and groundcover to management, environmental factors, or updated information, actual restoration actions or timelines may differ from those described in this document.

This document will also fulfill the restoration plan objective contained within the Wildlife Conservation, Prioritization, and Recovery (WCPR) Species Management Strategy for AWMA.

- **LOCATION, ACQUISITION AND OVERALL PLAN GOAL**

AWMA comprises 3,582 acres in western Levy County between Fanning Springs and Chiefland. The Suwannee River forms the western boundary, and Fanning Springs State Park (FSSP) borders AWMA to the north. AWMA is 5 miles north of Chiefland, less than 1 mile south of Fanning Springs, and approximately 2.5 miles southeast of Old Town.

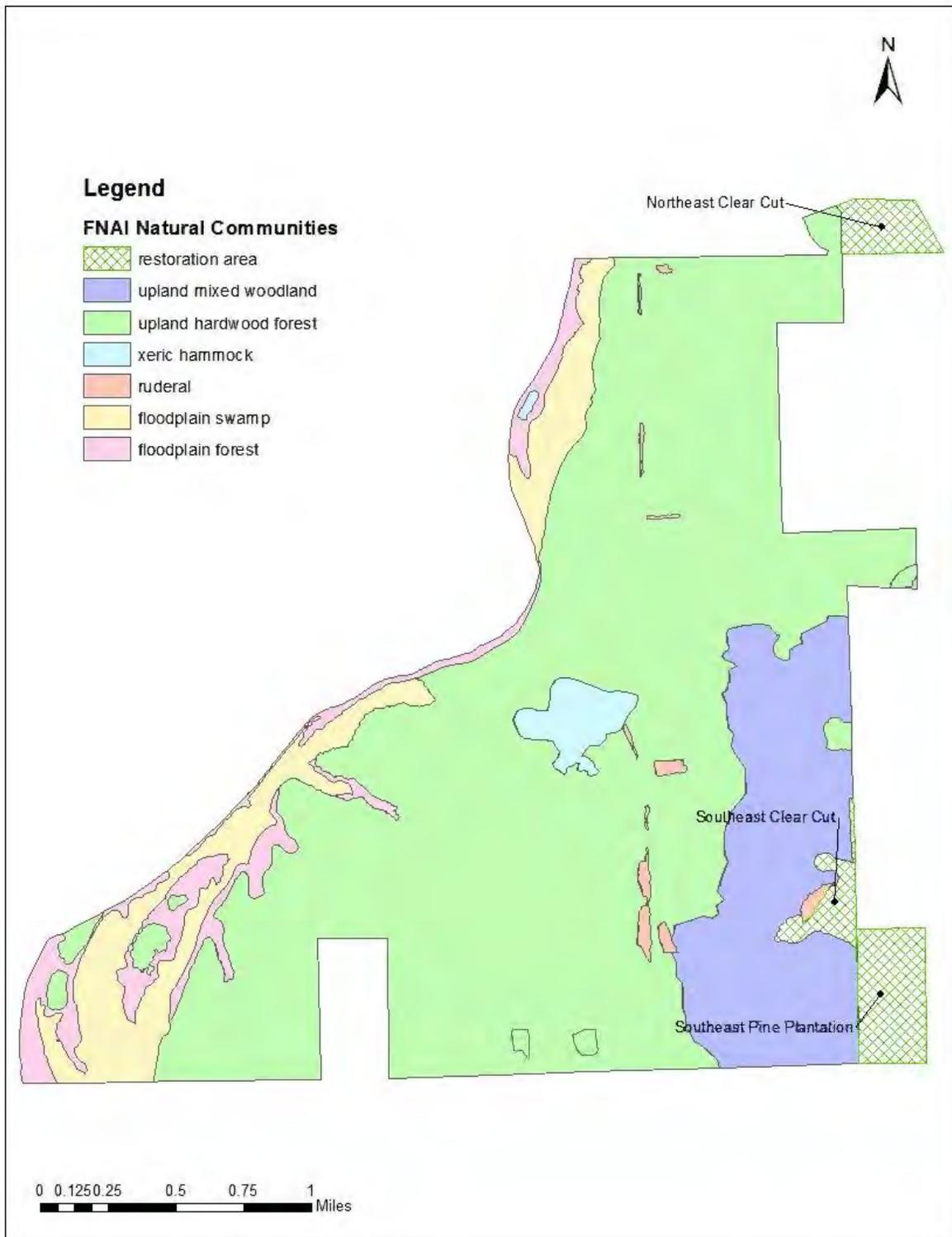
The Andrews family of Levy County bought this property in 1945. They managed the property primarily for hunting and other recreational activities. The State of Florida purchased the bulk of the property in 1985 through the Save Our Rivers and Conservation and Recreation Lands Program.

The primary purpose for acquiring the AWMA is to conserve a large tract of relatively undisturbed old-growth upland hardwood forest, one of the largest remaining in Florida. The primary Habitat Restoration and Improvement management goal included in the 2012-2022 AWMA Management Plan is to “maintain the old-growth characteristics of the extant floodplain swamp, floodplain forest, xeric hammock, upland hardwood forest, and remnant sandhill/upland mixed woodland communities. Improve extant habitat for fire adapted communities.” For more information on the AWMA see the [AWMA Management Plan](#) or the [AWMA Species Management Strategy](#).

RESTORATION AREAS

Past silvicultural activities altered 3 areas on AWMA, and FWC staff plan to restore these areas to the historic natural communities of upland mixed woodland and sandhill, as appropriate. These sites include a 37.6 acre clear-cut within the southeast corner of the property, a 80.1 acre mixed longleaf pine (*Pinus palustris*) and slash pine (*P. elliotii*) plantation within the southeast corner of the property, and a 35.9 acre clear-cut within the northeast corner of the property (Figure 1). Florida Natural Areas Inventory (FNAI) did not map historical natural communities on AWMA, but they did reference historical information for some of these sites as described for each below.

Figure 1. Map depicting natural communities and the locations of restoration sites within Andrews WMA.



FWRI Upland Habitat Researchers will visit all 3 AWMA restoration blocks in spring 2016 to obtain data about the current species composition in each block. This information will be used as a baseline, and to inform management decisions. FWRI researches may make different management recommendations based on the results of the survey effort. As such, all recommendation in the plan are tentative and subject to change pending the results of the initial inventory.

Southeast Clear Cut (37.6 acres):

The previous landowner converted this 37.6 acre site to a slash pine plantation. While the FNAI did not map historical natural communities on AWMA, they did make reference that the majority of this site was historically upland mixed woodland, with the southernmost portions potentially containing sandhill. Prior to 2008, the closed canopy and lack of fire suppressed the native ground cover.

In 2008, this slash pine stand was clear-cut after a pine beetle (*Ips spp.*, *Dendroctonus spp.*) outbreak. After clearing, staff burned the stand to reduce logging slash and promote recovery of native groundcover. In 2009, contractors used a Gyrotrac to mulch trees and brush to less than 6 inches high. Staff observed that the ground cover responded to the removal of the canopy and the re-introduction of fire, and the stand appears to be recovering.

Based on the recommendations of a Florida Forest Service (FFS) timber assessment conducted in 2011, staff replanted the clear-cut with longleaf pines in 2011 at a rate of 500 trees per acre. A survival check conducted in March 2013 estimated average survival to be 203 longleaf per acre. While this is a low density for establishing a longleaf stand, it is sufficient for managing this stand at this time without supplemental planting.

Prescribed fire has been applied 5 times (February 2009, June 2010, February 2011, November 2011, January 2014) since the timber harvest in 2008. The site was mowed (2 foot high to avoid grass phase pines) in June 2013 to reduce competition for the planted longleaf pines.

The longleaf pines have begun to emerge from the grass stage and are currently vulnerable to growing season fire at current fuel loads. Staff will use dormant season burns to control shrub growth and fuel loading until seedlings have become more established. As soon as the majority of longleaf pine seedlings stem diameter at 6 inches above ground level exceed 2 inches and/or tree height exceeds 5 feet, staff should shift prescribed burning to the growing season to help control hardwood encroachment and further promote herbaceous groundcover. Periodic dormant season fires may be required because of weather during the previous growing season and/or to encourage plant diversity. If weather or other factors prevent burning within the recommended fire return regime, staff should evaluate the need to mechanically treat vegetation.

The targeted fire return interval will need to be 2–3 years to help control undesirable hardwood encroachment while the young longleaf pines are vulnerable to growing season fire. Once pines are beyond the vulnerable phase, the fire return interval for this stand will be 3-5. Because the majority of this area is historically upland mixed woodland, some hardwood species are part of

the natural community, including southern red oak (*Quercus falcata*), bluff oak (*Q. austrina*), mockernut hickory (*Carya tomentosa*), and dogwood (*Cornus florida*). Staff should not take action to eliminate these desirable species. If prescribed fire is not sufficient to keep undesirable species under adequate control and excessive numbers of water oak (*Q. nigra*), laurel oak (*Q. laurifolia*), sweet gum (*Liquidambar styraciflua*), or black cherry (*Prunus serotina*) persist, targeted chemical or chainsaw treatments may be needed.

During FY 2021-22 (10 years post longleaf planting), we recommend staff reevaluate longleaf pine survival and density. If necessary, plant longleaf pine seedlings within gaps and openings to create a second age class of longleaf pines within the stand. Future longleaf pine planting should seek to achieve an uneven aged and uneven spacing to mimic a natural stand. The target pine basal area is 30 ft² per acre in those portions of the site that were historically upland mixed woodland, with pine basal area increasing to 40–60 ft² per acre in those portions that were historically sandhill. Currently, the ground cover has an adequate native grass component to carry fire that is improving with each burn. There is a good diversity of forbs and legumes present, so supplementation of the native ground cover is not necessary in this area.

Southeast Pine Plantation (80.1 acres):

FWC used Florida Forever Inholdings and Additions Program funds to acquire this portion in 2008. This plantation is densely planted and consists of slash pine in the northern half and a mix of longleaf and slash in the southern half. While the FNAI did not map historical natural communities on AWMA, they did indicate this site included both upland mixed woodland (northern portions) and sandhill (southern portions) historically. However, FNAI did not provide guidance on the delineation of the two natural communities.

Based upon interpretation of historical aerial photographs, the previous landowner planted the plantation during 1995-1996 and thus, the plantation is approximately 20 years old. In 2011, staff planted 53,000 wiregrass plugs in the southern longleaf portion, but this planting had marginal survival. Managers burned the area in January 2010 and May 2013.

The 2011 FFS timber assessment has the following description of the stand:

“This stand is comprised of approximately 80 acres of a mixed slash and longleaf pine plantation approximately 16 years old. The slash pine stand exhibits fair to poor growth, averaging 432 trees per acre with an average diameter of 5 inches. The longleaf pine growing on the south one third of this stand, exhibits poor growth and in general, exhibits an unhealthy appearance with short, thin, yellowing needles and little height growth considering the age of the trees. Stocking in the longleaf pine area averages 50 trees per acre with an average diameter of 4 inches. The soils found in this portion of the stand appear to be quite sandy and marginally suited for longleaf pine.”

During August 2015, we requested FFS to reevaluate the longleaf portion of the stand as we felt the 50 trees per acre cited in the 2011 timber assessment was incorrect. After a reevaluation of

the stand, FFS found that the density of trees was highly variable throughout the stand with density ranging from 50 to 300 trees per acre. FFS also found pockets of slash pine throughout the stand. Subsequent conversations with Mr. Dennis Andrews confirmed that they planted slash pines in pockets where longleaf survival was low.

The FFS timber assessment recommended clear-cutting the slash pines and thinning the longleaf when sufficient volume is available to attract timber buyers. The assessment recommends that following the timber harvest, FWC should plant longleaf pine at 500 trees per acre in the newly clear-cut area.

FWC staff agree with most of the FFS timber assessment; however, FWC staff plan to thin both the slash pine and longleaf pines. Retaining some of the slash pines in the northern portion of the stand will ensure a source of needle cast that will facilitate prescribed burning until planted longleaf pine and an herbaceous understory become more developed. Additionally, retaining some slash pines in the northern portion of this stand will provide vertical structure for wildlife. Prescribed fires applied to the pine plantation will help control midstory shrubs and may contribute to mortality in stressed or diseased pines, which will help promote herbaceous ground cover over time.

Until sufficient timber volume is available for harvest, continue prescribed burning the stand on a 2-3 year fire return, given sufficient fuels are present. Target the growing season, but depending on fuels and weather, burn during the dormant season if necessary.

Within 3-5 years (2018–2020), thin slash and longleaf pine to a basal area of 40-60 ft² per acre leaving enough trees to carry prescribed fire. Where slash and longleaf are mixed, the harvest will remove slash pines. At least one year following timber harvest, burn the pine stand, preferably during the early growing season. Due to the poor health of this stand, we anticipate the stress of thinning and subsequent prescribed fire will further reduce the basal area of the stand. After application of the second burn following the timber harvest, managers should plant longleaf pine seedlings within harvest rows and other gaps/openings across the entire plantation. Managers should consider using cluster planting techniques within larger openings to replicate natural regeneration.

Currently, the ground cover has a suppressed grass component, but will carry fire with needle cast. There is also a good diversity of forbs and legumes. This ground cover component has been improving with each prescribed burn, and we do not believe supplementation of the native ground cover is necessary in this area. However, after conducting 2 prescribed burns subsequent to the timber harvest, staff should work with the Fish and Wildlife Research Institute (FWRI) Upland Habitat Research and Monitoring program to evaluate groundcover species diversity and establishment to determine if there is a need for further action.

Managers should maintain a 2-3 year fire return interval, utilizing growing season fire when possible. Periodic dormant season fires may be required because of weather during the previous growing season and/or to allow more plant diversity. If weather or other factors prevent burning

within the recommended fire return interval, staff should evaluate the need to mechanically treat vegetation.

Northeast Clear-Cut (35.9 acres):

This site was a 35.9-acre loblolly pine (*Pinus taeda*) plantation that was historically upland mixed woodland. The stand was salvage clear-cut in 1997 after a southern pine beetle (*Dendroctonus frontalis*) outbreak damaged the trees. Staff had the site replanted with longleaf pine in 1998, and have applied prescribed fire in 1997, 2003, and 2015. Due to the lack of fine fuels within this site, effective burning of this site is problematic and may not be sufficient to control hardwoods. Managers applied a hack and squirt herbicide treatment to undesirable oak species (primarily water oak and laurel oak) during February 2014. This was followed by a burn conducted in March 2015, during which emphasis was placed on burning each individual pocket of pine within the stand. Longleaf (from the plantings completed in 1998) and loblolly pines (regenerating from seed bank) are scattered but are denser in the interior of the site.

Managers should continue prescribed burns on this area on a 1-3 year fire return interval, as fuels allow. Target the growing season with moderate fire intensity initially to help control hardwoods, but be willing to burn during the dormant season to maintain frequency when conditions do not allow for a growing season burn. When burning, managers should target interior pockets of pine to allow these pockets to increase in size over time.

At 5-year intervals, managers should evaluate for need to conduct further herbicide or mechanical treatments to control undesirable hardwood species, and include sweetgum in any future control efforts. During FY 2025-2026, work with the FWRI Upland Habitat Research and Monitoring program to evaluate groundcover species diversity and establishment to determine need to supplement through native seeding or other means. At this time, managers should identify gaps/openings suitable for longleaf pine plantings. Planted longleaf pine seedlings will create an uneven aged stand and provide more dispersion of pines throughout the site to favor future prescribed burning.

12.11 AWMA Hydrologic Assessment

**Hydrologic Assessment
for the Andrews
Wildlife Management Area**



October 2017





**Hydrologic Assessment
for the Andrews Wildlife Management Area**

Submitted to:
Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
620 South Meridian Street
Tallahassee, FL 32399-1600

Submitted by:
Amec Foster Wheeler Environment & Infrastructure, Inc.
404 SW 140th Terrace
Newberry, FL 32669

A handwritten signature in black ink, appearing to read "Charlene Stroehlein".

Charlene Stroehlein, PE
Senior Principal Engineer

A handwritten signature in black ink, appearing to read "Dustin Atwater".

Dustin Atwater, GISP
GIS Manager

Amec Foster Wheeler Project No.: 6063-17-0289
October 2017

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1.0 Introduction

1.1 Purpose

Amec Foster Wheeler Environment & Infrastructure, Inc. was authorized by the Florida Fish and Wildlife Conservation Commission (FWC) under Contract Number FWC 15/16-026-25 to perform a hydrologic assessment and develop recommendations to restore the historic hydrology for the Andrews Wildlife Management Area (WMA) located in Levy County, Florida. See Figure 1 for the project location. The objective of this hydrologic assessment was to provide site-specific information regarding the historical drainage pathways, current drainage divide locations, current natural drainage pathways, and existing man-made drainage structures. Additionally, Amec Foster Wheeler was to propose changes to existing site features in an effort to assist FWC personnel in returning the Andrews WMA to a more historic condition.

1.2 Site Setting

The Andrews WMA is located in northwestern Levy County with the site entrance at latitude 29°33'42.13"N, longitude -82°55'23.57"W at the corner of NW 90th Ave and NW 160th St. The project area is adjacent to the Suwannee River which defines the western property boundary and Fanning Springs State Park which defines the northern property boundary. According to the Andrews WMA Management Plan, the total area of the Andrews WMA is approximately 3,582 acres. The location of the Andrews WMA in reference to the surrounding area is illustrated in Figure 3. Site photographs are provided in Appendix A and the photo locations are shown on Figure 14. Site roads are shown on Figures 11 and 14.

The Andrews WMA was purchased by the State of Florida in 1985 as part of the Save Our Rivers and Conservation and Recreation Land programs (FWC, 2012). The project site provides habitat for a variety of wildlife including the Rafinesque's big-eared bats, gopher tortoises, white-tailed deer, and several bird species (FWC, 2017). The project site also provides water quality benefits for the Suwannee River (FWC, 2012). The area supports a variety of natural communities but is predominately old-growth upland hardwood forest and mixed wetland hardwood forest as shown in Figure 5 (FWC, 2012).

1.3 Summary of Site Activities

In order to assess the historical and current drainage patterns and produce conceptual restoration plans, the following tasks were performed:

- Historical aerial photography from 1952 was downloaded and georeferenced.
- Historical and current drainage subbasins and patterns were assessed using the 1952 aerial photography and current Digital Elevation Model (DEM) (NAVD88).
- Amec Foster Wheeler personnel conducted two on-site surveys to confirm the location and status of existing structures, define current flow directions (where possible), and determine possible restoration areas. One of these visits occurred after a large storm event (Hurricane Irma) so that areas of need could be confirmed.
- Three populated shape files with metadata were produced for the Andrews WMA:
 - Subbasin delineation
 - Natural drainage ways and flow directions
 - Existing water control structures

2.0 Study Area Topography, Drainage and Subbasin Delineation

2.1 Topography

The topography of the Andrews WMA gradually slopes toward the Suwannee River. Onsite elevations vary from approximately 40 feet to 5 feet NAVD88. The site is generally higher in the east and lower in the west and southwest as the project area extends to the Suwannee River as shown in Figures 10 and 11. According to the Andrews WMA Management Plan, “uplands are fairly uniform with slopes generally less than five percent, whereas the riparian portion of the tract consists of low river bluffs (15 feet high by one-half mile long), sloughs, and floodplain swamps. Numerous sinkholes are scattered throughout AWMA.”

2.2 Soil Characterization

Nine soil map units were identified at the Subject Property based on a review of the NRCS Soil Survey of Levy County, Florida and Figure 8. The soil types are briefly described below:

- ***Orsino Fine Sand, 0 to 8 percent slopes, MU Symbol 3*** – Orsino Fine Sand is moderately well drained. Slopes range from 0 to 8 percent. This soil group represents approximately 0.2 percent of the site.
- ***Otela-Candler Complex, 1 to 5 percent slopes, MU Symbol 12*** – Otela-Candler Complex is moderately well drained. Slopes range from 1 to 5 percent. This soil group represents approximately 59.0 percent of the site.
- ***Shadeville-Otela Complex, 1 to 5 percent slopes, MU Symbol 14*** – Shadeville-Otela Complex is moderately well drained. Slopes range from 1 to 5 percent. This soil group represents approximately 0.4 percent of the site.
- ***Holopaw-Pineda Complex, frequently flooded, MU Symbol 15*** – Holopaw-Pineda Complex is poorly drained. Slopes range from 0 to 2 percent. This soil group represents approximately 1.8 percent of the site.
- ***Chobee-Gator Complex, frequently flooded, MU Symbol 16*** – Chobee-Gator Complex is very poorly drained. Slopes range from 0 to 1 percent. This soil group represents approximately 6.8 percent of the site.
- ***Chobee-Bradenton Complex, frequently flooded, MU Symbol 29*** – Chobee-Bradenton Complex is very poorly drained. Slopes range from 0 to 1 percent. This soil groups represents approximately 2.7 percent of the site.
- ***Jonesville-Otela-Seaboard Complex, 1 to 5 percent slopes, MU Symbol 31*** – Jonesville-Otela-Seaboard Complex is well drained. Slopes range from 1 to 5 percent. This soil group represents approximately 22.6 percent of the site.
- ***Otela-Tavares Complex, 1 to 5 percent slopes, MU Symbol 32*** – Otela-Tavares Complex is moderately well drained. Slopes range from 1 to 5 percent. This soil group represents approximately 4.8 percent of the site.
- ***Ousley-Albany Complex, occasionally flooded, MU Symbol 42*** – Ousley-Albany Complex is somewhat poorly drained. Slopes range from 0 to 2 percent. This soil group represents approximately 1.7 percent of the site.

Soils are classified into one of four hydrologic soil groups depending on their runoff potential. The four hydrologic soil groups are A through D, where Group A has the smallest runoff potential, and Group D has the highest runoff potential. The soils at the Andrews WMA are reported as group A, A/D, B, and C/D (NRCS, 2017). The hydrologic soil groups and hydric soil locations are shown in Figure 9. Brief descriptions of the identified hydrologic soil groups are discussed below:

- **Group A** Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.
- **Group B** Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.
- **Group C** Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.
- **Group D** Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.
- If a soil is assigned to a dual hydrologic group (A/D B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

2.3 Drainage

The project site lies within the Lower Suwannee River Basin and generally drains to the west toward the Suwannee River. The majority of rainfall either infiltrates into well-drained sandy soils, or sheet flows towards the river. In times of heavy rainfall, the Suwannee River stages up and inundates a significant area along the western boundary of the site.

2.4 Subbasin Delineation

A drainage basin is defined as a region or area bounded by drainage divide and occupied by a drainage system. Drainage basins tend to cover large areas and are typically controlled by topography. As a result of their size, basins are frequently divided into subbasins. According to information provided by the FWC, the Andrews WMA is approximately 3,582 acres. Within the Andrews WMA there are 9 subbasins ranging from 10 acres to 990 acres as shown in Table 1, as well as Figures 12 and 13. The total acreage reported in Table 1 is 3,512 acres which reflects the total acreage of the most recent project area shapefile provided by FWC. The total acreage reported in the figures matches the project area shapefile acreage.

Table 1. Subbasin Acreage

Watershed Basin	Subbasin ID	Acreage
Suwannee River Basin	3175	40
	3177	650
	3182	661
	3187	640
	3190	990
	3196	388
	3275	94
	3306	39
	3313	10

Created by: NP
 Checked by: GRG

3.0 Drainage Patterns and Restoration Recommendations

FWC and Amec Foster Wheeler personnel mobilized to the site to perform the on-site surveys in August and September 2017. During the surveys, FWC and Amec Foster Wheeler personnel analyzed the drainage patterns within the project boundary and identified four existing water control structures onsite. The project area generally drains to the west as shown in Figure 13.

In the office, a historical aerial photograph (1952) was utilized to analyze historical drainage patterns, Figure 12. Land elevation, vegetation patterns, and other visual data were used to determine current subbasins and flow directions. Drainage flow lines are generalized and represent overall flow within each subbasin. They do not represent specific flow patterns. Some onsite access roads are present in the historic photography and current onsite access roads are at existing grade. Therefore, the historic and current drainage subbasins and flow patterns are the same.

The project area is largely undisturbed and besides the existing at-grade access roads, few modifications have been made to the site that could significantly alter the onsite hydrology. After the initial site visit in August 2017, Amec Foster Wheeler returned to the site in September 2017 to document the effects of rainfall from Hurricane Irma and the associated onsite flooding from the Suwannee River, Appendix A. The locations of interest included the 4 existing onsite culverts, the boardwalk, the western access roads, the dock, and the low point in Dick's Slough Road. During the initial site visit, only a few inches of water were present in the culverts. After the storm, the 4 culverts were completely inundated, but appeared to be functioning properly. The boardwalk was still usable even with the flooding from the Suwannee River. The western access roads remained above the flooding and appeared to be undamaged from the storm. The dock was underwater, but the structure appeared to be in good condition. The low point in Dick's Slough Road did not have standing water nearby, nor did it appear to have any signs of flow crossing the road during the storm. After conversations with FWC staff and the two site visits, Amec Foster Wheeler does not see the need to recommend any proposed restoration. Likewise, there are currently no specific problem areas onsite that would benefit from proposed modifications.

While Amec Foster Wheeler does not have any restoration recommendations, the following are recommended best management practices according to site location:

Culverts (photo points 4,5,6,7, and 12):

- The culverts should be regularly inspected for cracks or damage.
- During the site visit, approximately 2 inches of sediment was observed on the bottom of each culvert, along with small tree branches. Despite the sediment and debris, the culverts appeared to function well during the September site visit when the culverts were completely submerged. However, periodic removal of sediment and debris will benefit future operation.

Boardwalk (photo points 2,3,14, and 15):

- The boardwalk and its support structure should be frequently inspected for damage especially after flood events.

Access Roads:

- Small isolated areas of the access roads may benefit from the installation of geoweb filled with soil or gravel. No road sections observed during the site visits warranted this modification, but some areas had the potential for becoming difficult to traverse because of the presence of very fine sand.

Dock (photo points 8,9, and 16):

- The dock and support structure should be inspected regularly and after flood events, for damage.

Low Point in Dick's Slough Road (photo point 11):

- While no water was observed in this area during the site visits, FWC reported that at times this area becomes difficult to cross. There are alternate routes around this location, but should the need ever arise, this location may benefit from the addition of geoweb filled with gravel for a low water crossing.

4.0 Conclusions

Much of the Andrews WMA appears to resemble historic conditions. Some onsite access roads are present in the 1952 historic photography and some existing at-grade access roads were added more recently. The project area is largely undisturbed and the onsite hydrology has not been significantly altered by the modifications made to the area.

Amec Foster Wheeler visited the site during normal conditions in August 2017 and after a large storm event (Hurricane Irma) in September 2017. Approximately 6.52 inches of rain fell in this area during Hurricane Irma (NOAA, 2017). Many cities in the region received more than 10 inches of rainfall.

Areas of interest were identified during the initial site visit and were reassessed during the second site visit. During both site visits, the existing onsite culverts were observed to be functioning properly. Flooding from the Suwannee River was observed during the second visit in the western portion of the site. While the area under the boardwalk was completely inundated, the boardwalk deck remained above water. Dick's Slough Road and the western access roads were unaffected by the flooding. Flooding did cause the water level at the dock to rise above the lower deck, however the dock did not appear to be damaged.

While no proposed restoration is suggested, Amec Foster Wheeler recommends following the best management practices outlined in Section 3.0 to help maintain the current conditions of the WMA and assist FWC personnel with management of the project site. This includes regularly inspecting the culverts, boardwalk, and dock, as well as monitoring the access roads for problem areas. Sediment and debris should be periodically removed from the culverts and geoweb can be used as an economical solution for any access road issues.

5.0 References

- FWC. 2012. *A Management Plan for the Andrews Wildlife Management Area 2012-2022*. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. Website accessed September 27, 2017: <http://myfwc.com/media/2995667/CMP-Andrews-2012-2022.pdf>
- FWC. 2017. *Andrews – Wildlife*. Florida Fish and Wildlife Conservation Commission, Tallahassee, Florida. Website accessed September 27, 2017: <http://myfwc.com/viewing/recreation/wmas/lead/andrews/wildlife/>
- NOAA. 2017. *Record of Climatological Observations. Station: Trenton 4.0 NW, FL US US1FLGC0008*. National Centers for Environmental Information, Asheville, North Carolina.
- NRCS Soil Conservation Survey. 2017. *Soil Survey of Levy County, Florida*. United States Department of Agriculture, Washington, D.C.

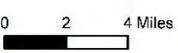
Figures



Data Sources: CSRI 2013; AMEC FW 2017

Legend

-  Project Location
-  County Boundary

FWC Andrews WMA Project		
Site Vicinity Map		
		
		 Figure 1

Path: P:\EAT\2117\Projects\FWC Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 1 Site Vicinity Map.mxd

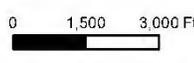
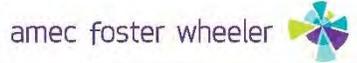
Project # 6063-17-0289



Data Sources: USGS 2017 (1982 Aerial); FWC 2017; AMEC FW 2017

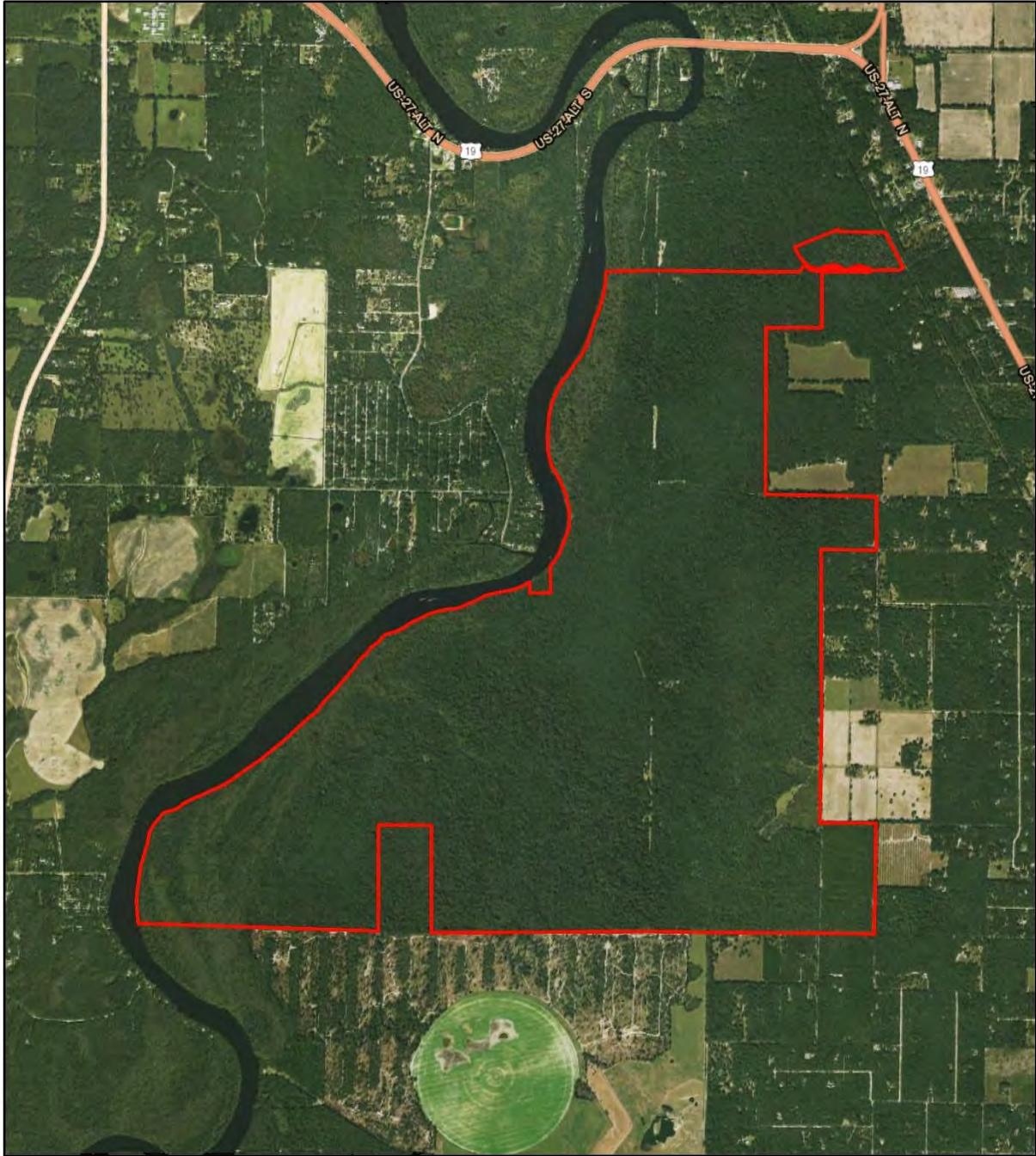
Legend

 Project Boundary - 3,512 Acres

FWC Andrews WMA Project		
1952 Historic Aerial Map		
		
		Figure 2

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Project # 6063-17-0789



Data Sources: ESRI 2014, FWCC 2016, AMEC FW 2017

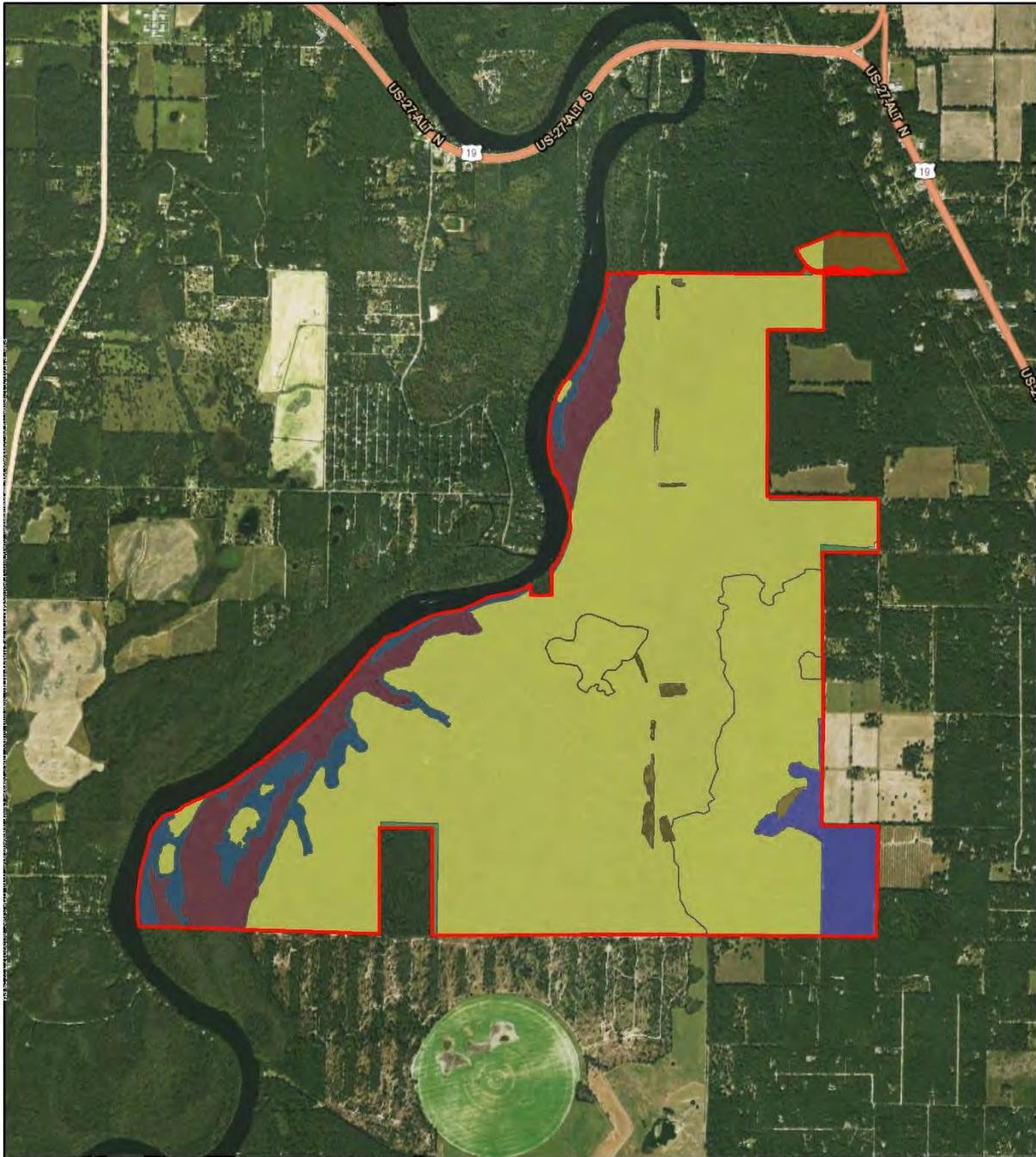
Legend

 Project Boundary - 3,512Acres

FWC Andrews WMA Project		
Current Aerial Map		
 0 1,500 3,000 Ft 		Figure 3 

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Project # 6003-17-0709



Legend

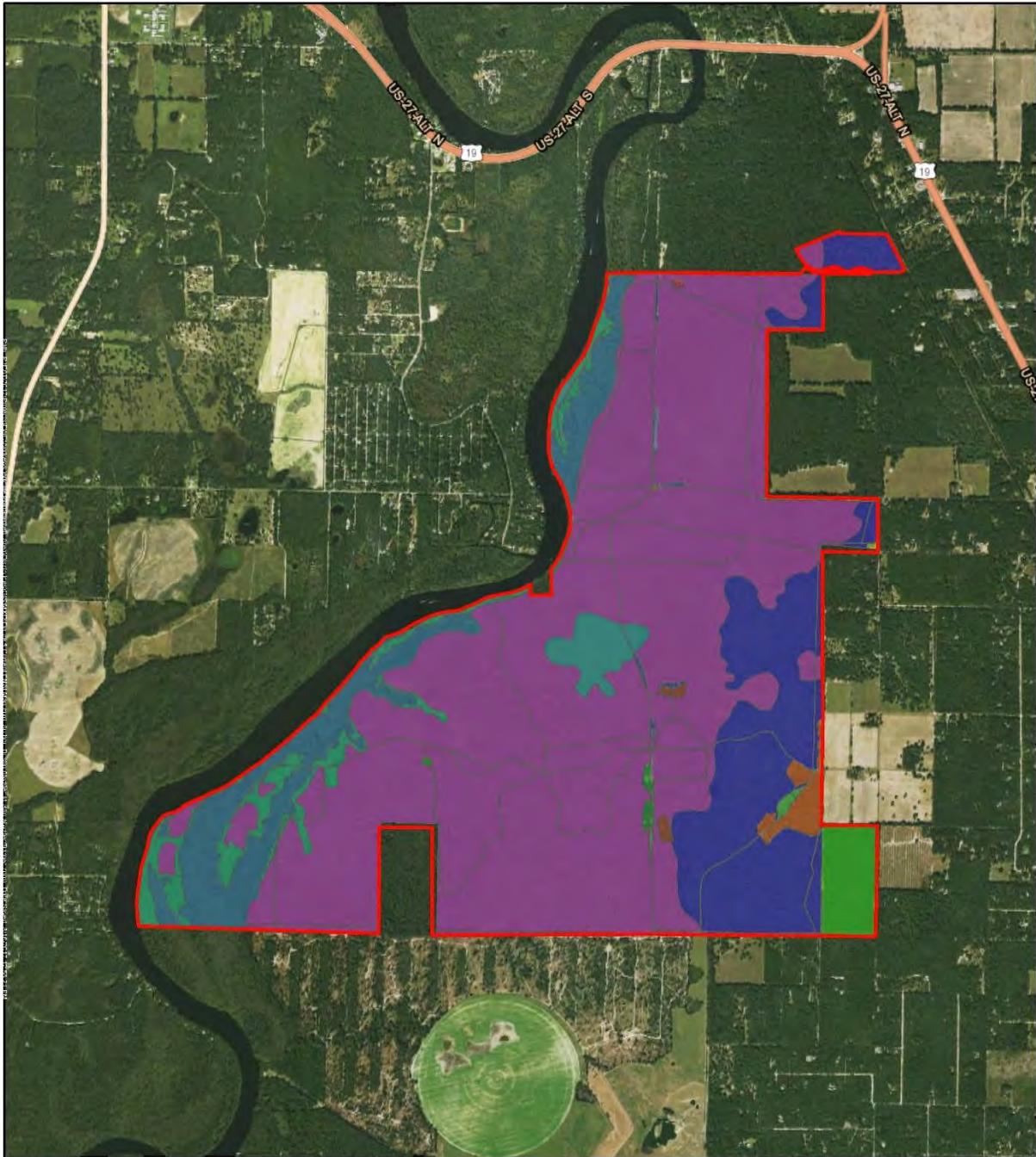
- Project Boundary - 3,512 Acres
- 11 - Hardwood Forested Uplands
- 14 - Mixed Hardwood-Coniferous
- 15 - Shrub and Brushland
- 1822 - High Intensity Urban
- 183 - Rural Lands
- 183214 - Unimproved/Woodland Pasture
- 18323 - Tree Plantations
- 221 - Cypress/Tupelo
- 223 - Mixed Wetland Hardwoods
- 41 - Natural Rivers and Streams

Data Source: ESRI 2014; FWC 2016; AMEC FW 2017; FNAI 2016

FWC Andrews WMA Project	
Historical FNAI Map	
Figure 4	

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Project # 6003-17-0709

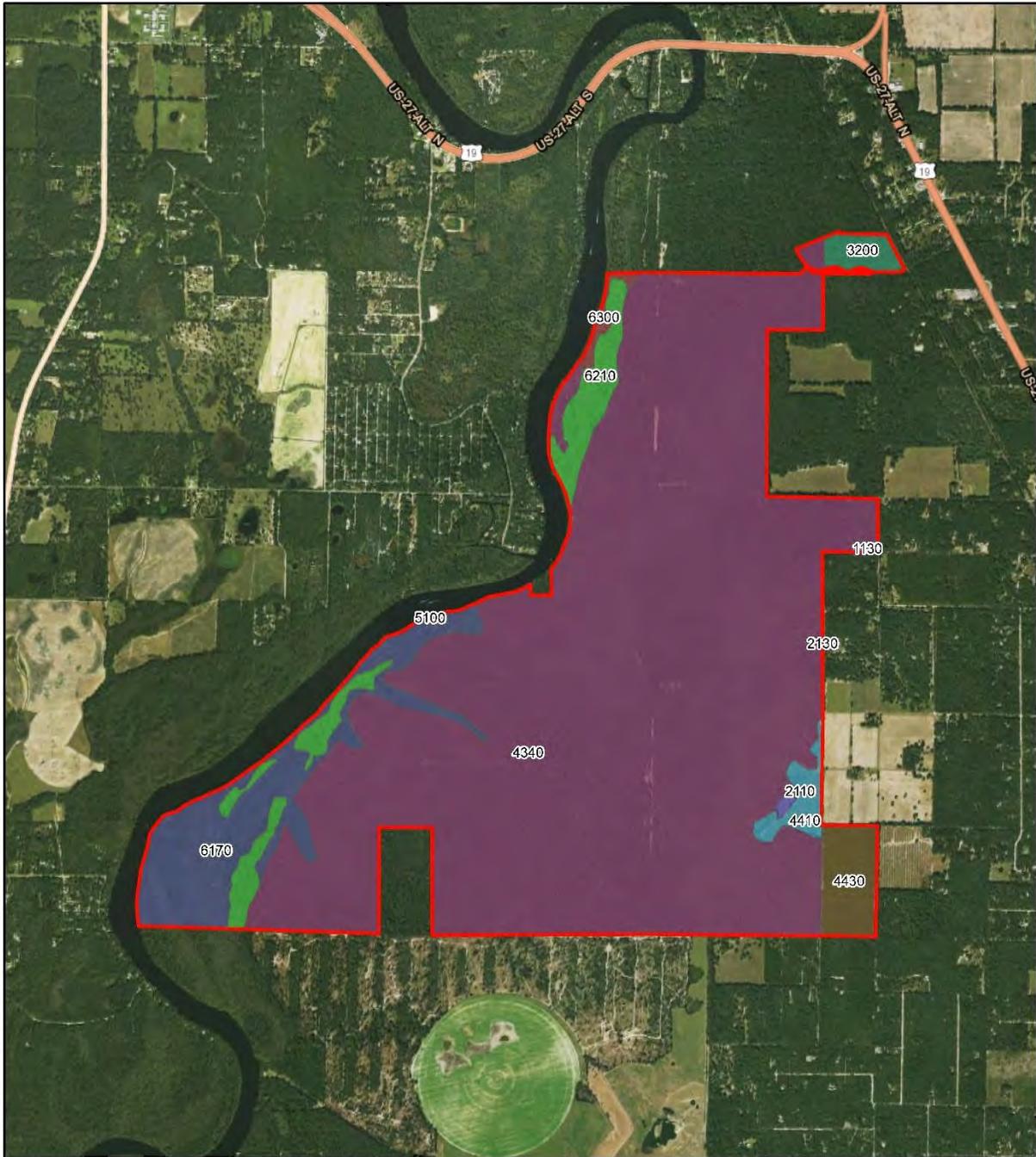


- Legend**
- █ Project Boundary - 3,512 Acres
 - █ ABANDONED FIELD/ABANDONED PASTURE
 - █ ALLUVIAL FOREST
 - █ BORROW AREA
 - █ CLEARING
 - █ DEVELOPED
 - █ FLOODPLAIN SWAMP
 - █ PINE PLANTATION
 - █ RESTORATION UPLAND MIXED WOODLAND
 - █ ROAD
 - █ UPLAND HARDWOOD FOREST
 - █ UPLAND MIXED WOODLAND
 - █ WILDLIFE FOOD PLOT
 - █ XERIC HAMMOCK

Data Sources: FSRI 2014; FWC 2016; AMFC FW 2017; FNAI 2016

FWC Andrews WMA Project	
Current FNAI Map	
0 1,500 3,000 Ft	
Figure 5	

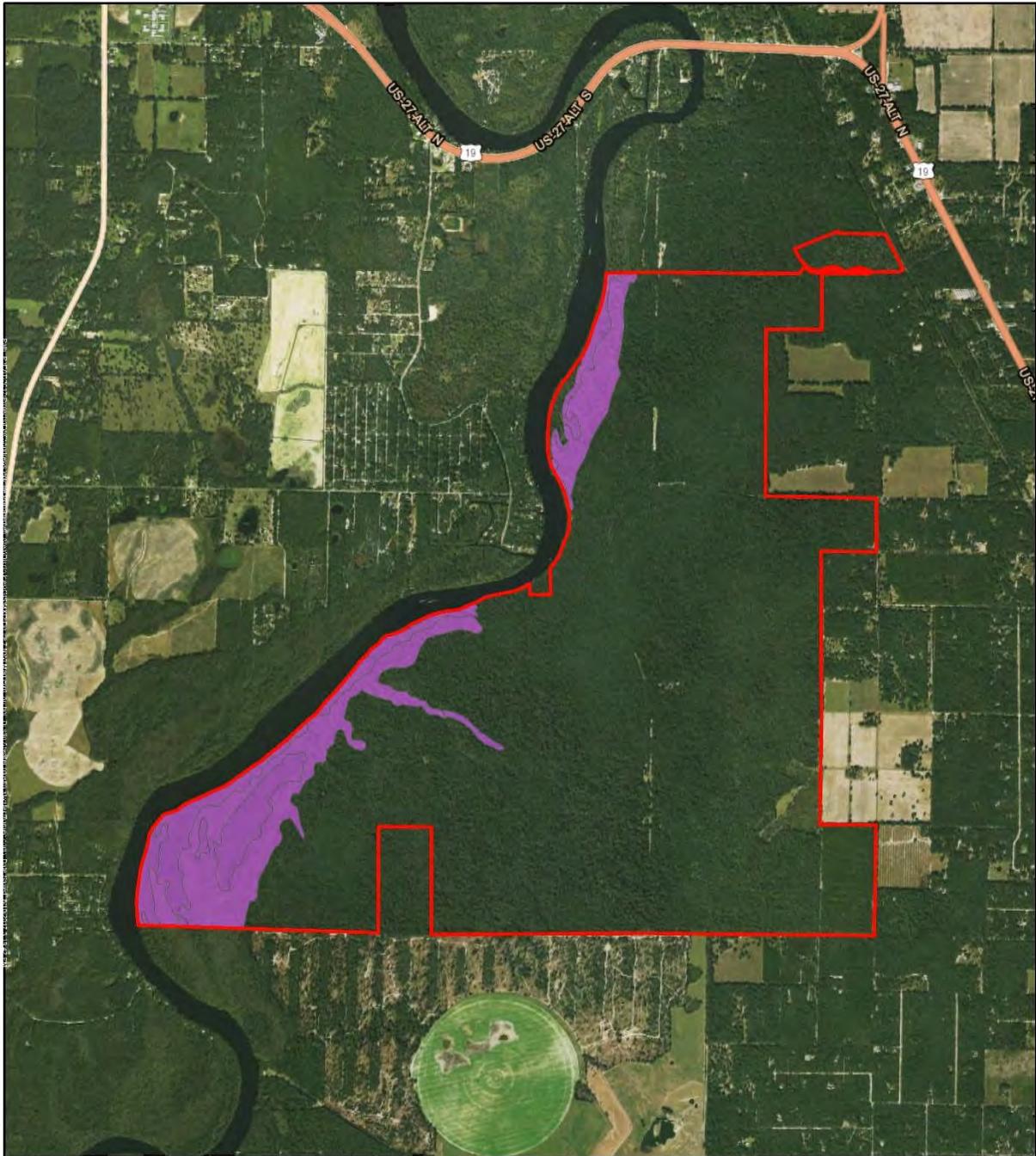
Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 5 Current FNAI Map.mxd Project # 6003-17-0709



Data Sources: FSR1 2014; FWC 2016; AMFC FW 2017; SRMM 2014

- Legend**
- Project Boundary - 3,512 Acres
 - 1130: MDC - Low Density, Mixed Units
 - 2110: Improved pastures
 - 2130: Woodland Pastures
 - 2153: Hay Fields
 - 3200: Shrub and Brushland
 - 4340: Hardwood Coniferous - Mixed
 - 4410: Coniferous Plantations
 - 4430: Forest Regeneration Areas
 - 5100: Streams and Waterways
 - 6170: Mixed Wetland Hardwoods
 - 6210: Cypress
 - 6300: Wetland Forested Mixed

FWC Andrews WMA Project		
Land Use Map		
		Figure 6
Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 6 Land Use Map.mxd Project # 6003-17-0709		



Data Sources: ESRI 2014; FWC 2016; AMEC FW 2017; NWI 2011

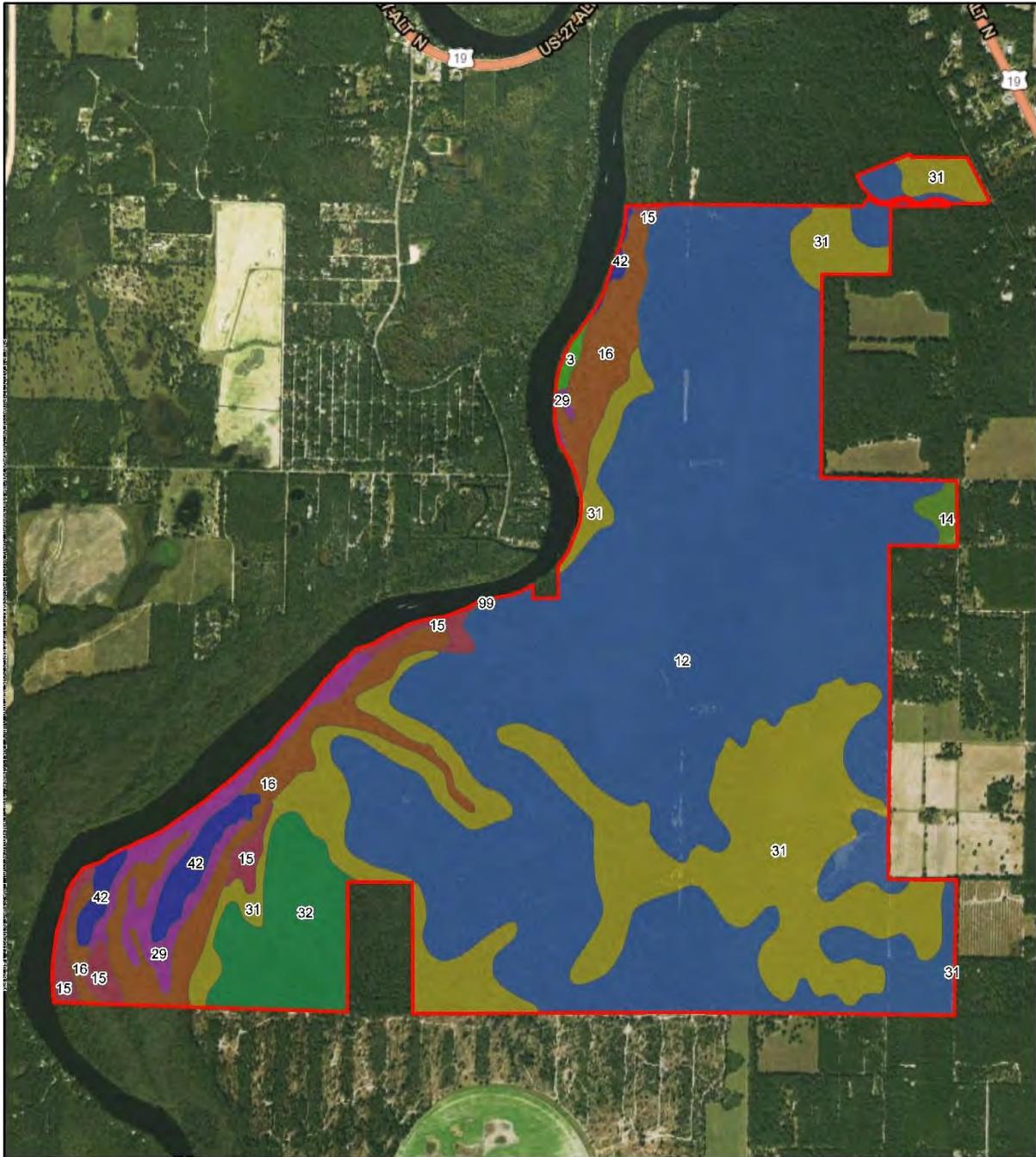
Legend

- Project Boundary - 3,512Acres
- FRESHWATER FORESTED/SHRUB WETLAND
- RIVERINE

FWC Andrews WMA Project		
NWI Map		
		Figure 7

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Project # 6003-17-0709



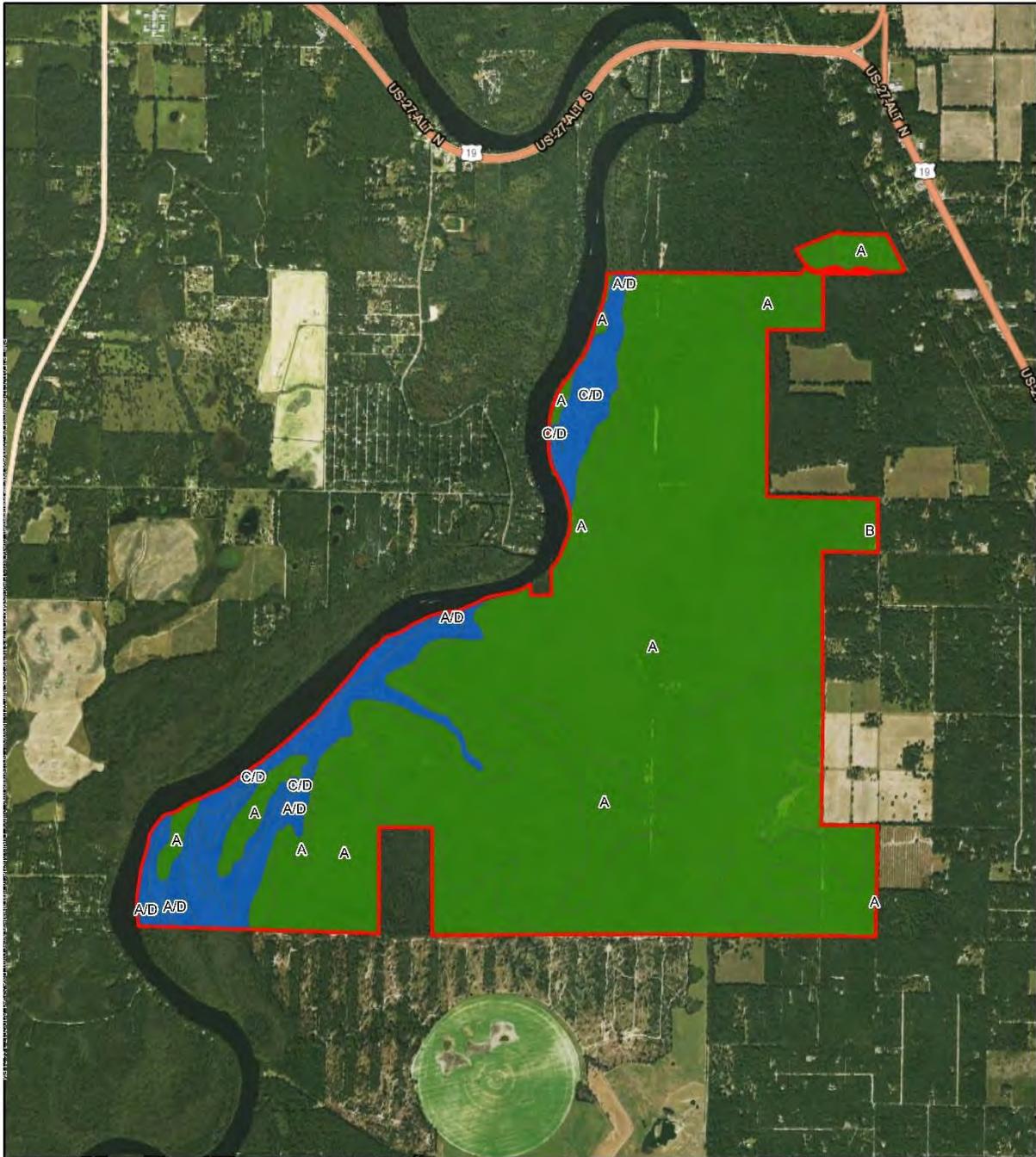
Data Sources: ESRI 2014, FWC 2018, AMEC FW 2017, NRCS 2012

- Legend**
- Project Boundary, 3,512 Acres
 - CHORSE-BRADENTON COMPLEX, FREQUENTLY FLOODED
 - CHORSE-GA. CH COMPLEX, FREQUENTLY FLOODED
 - HOI OPAK P INTVA COMPLEX, FREQUENTLY FLOODED
 - JONESVILLE-OTELA-SEABOARD COMPLEX, 1 TO 5 PERCENT SLOPES
 - ORBING (M. SAND, 0 TO 8 PERCENT SLOPES)
 - OTELA-CANDLER COMPLEX, 7 TO 5 PERCENT SLOPES
 - OTELA-HAWKER COMPLEX, 1 TO 5 PERCENT SLOPES
 - OUSLEY-ALBANY COMPLEX, OCCASIONALLY FLOODED
 - SHADYVILLE (DT) A COMPLEX, 1 TO 5 PERCENT SLOPES
 - WATER

FWC Andrews WMA Project		
NRCS Soils Map		
		Figure 8

Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 8 NRCS Soils Map.mxd

Project # 6003-17-0709



Data Sources: ESRI 2014, FWC 2016, AME/C HW 2017, NRCSS 2012

Legend

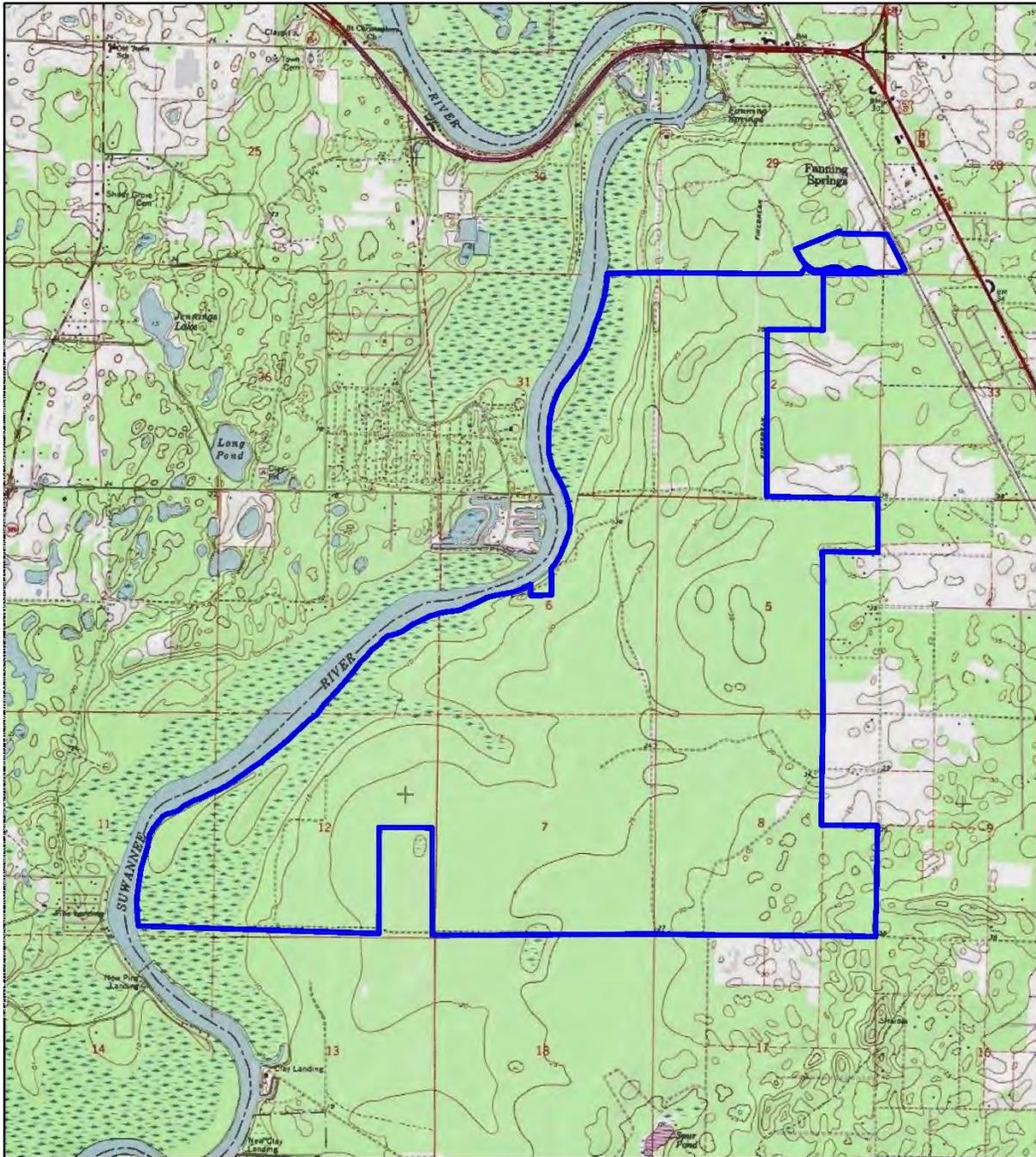
Project Boundary - 3,512 Acres

Hydric Soils

NO
 YES

FWC Andrews WMA Project		
NRCS Hydric Soils Map With Hydrologic Soil Groups		
<p>N</p>	<p>0 1,500 3,000 Ft</p>	<p>amec foster wheeler </p>
		<p>Figure 9</p>

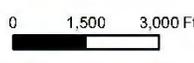
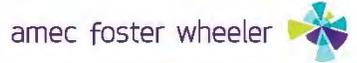
Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Discipline\GIS\MXD\Figure 9 Hydric Soils Map With Hydrologic Soil Groups.mxd Project # 6003-17-0709



Data Sources: FWC 2016 / AMEC FW 2017; USGS 2016

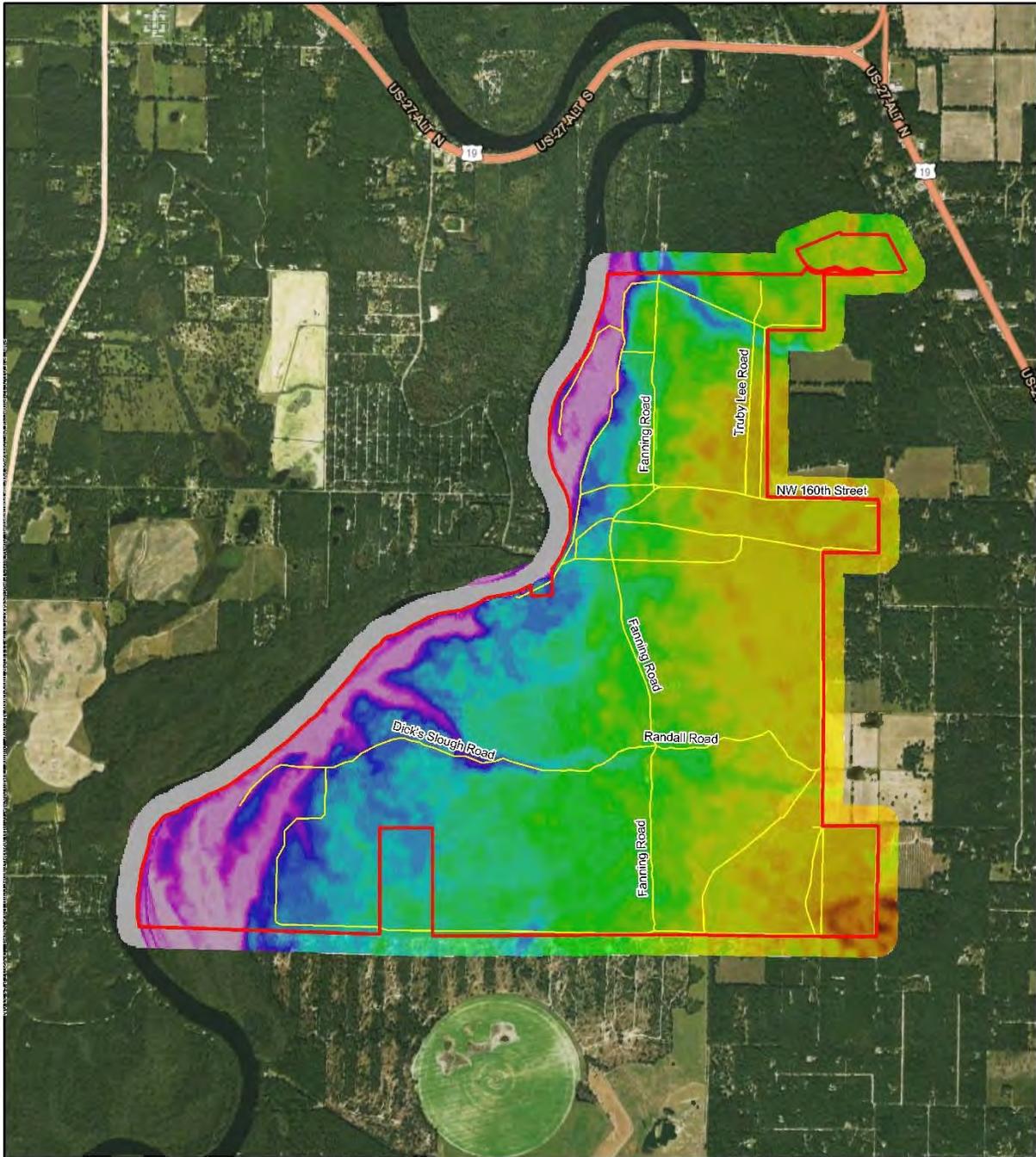
Legend

 Project Boundary - 3,512 Acres

FWC Andrews WMA Project		
USGS Topographic Map		
		
		Figure 10

Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 10 USGS Topographic Map.mxd

Project # 6003-17-0709



Data Sources: ESRI (Aerial 2014); FWC 2016; AMEC FW 2017

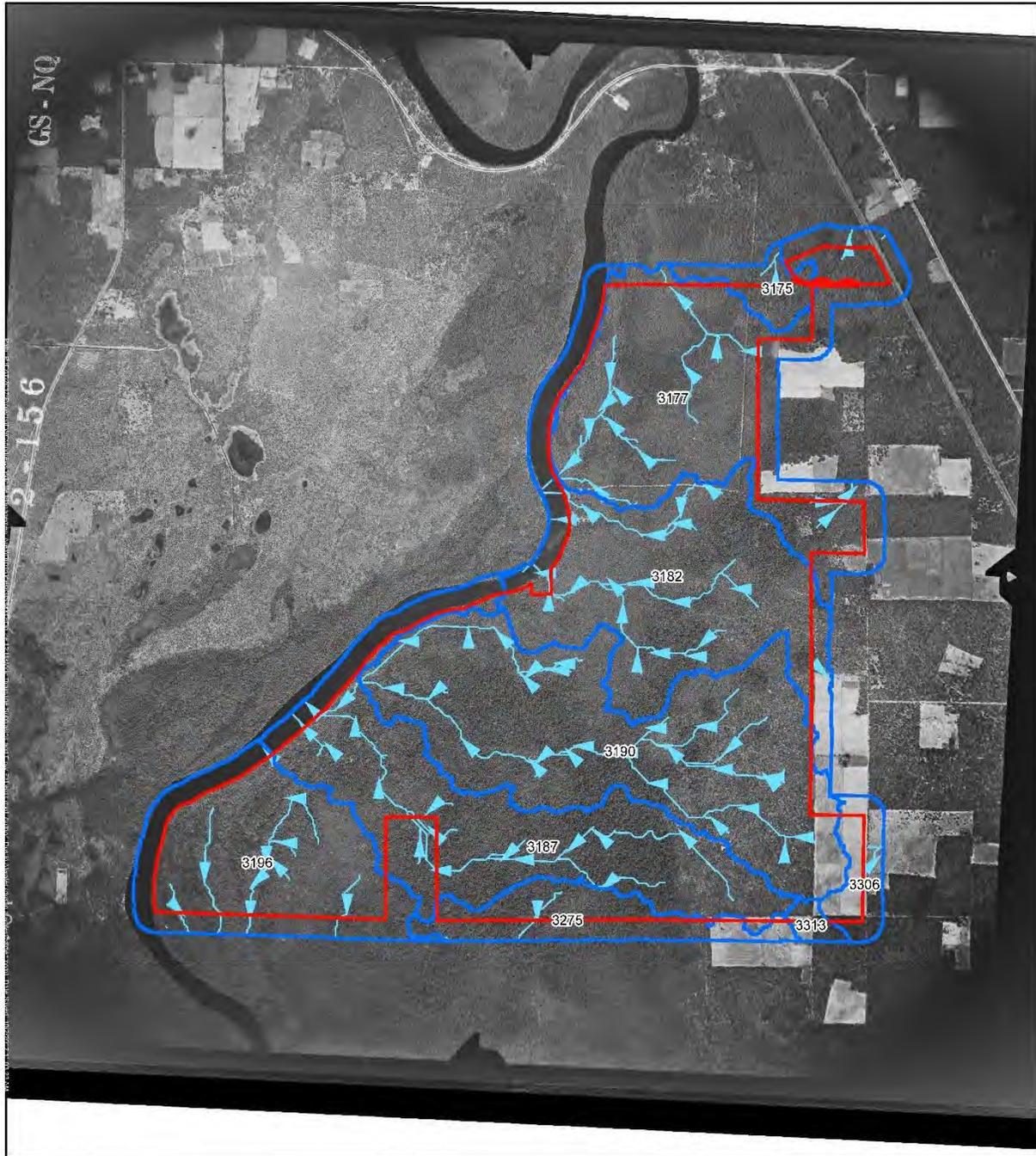
Legend

- Project Boundary - 3,512 Acres
- Andrews WMA Road
- LIDAR (NAVD88)**
- High : 44
- Low : 0

FWC Andrews WMA Project		
LiDAR Topography Map		
		Figure 11

Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 11 LiDAR Topography Map.mxd

Project # 6003-17-0709



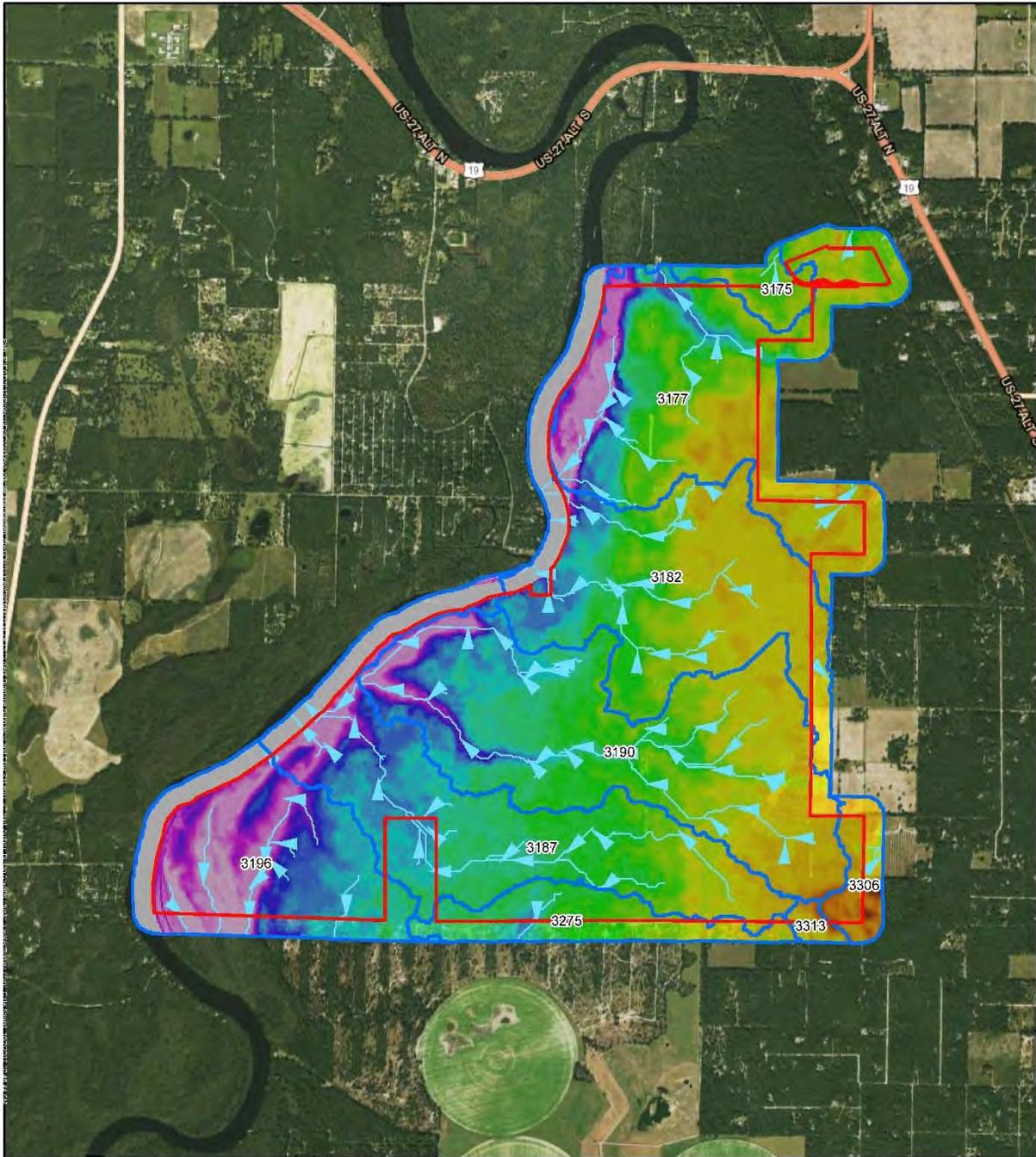
Data Sources: USGS 2011 (1992 Aerial); FWG 2011; AMEC FW 2011

Legend

- Project Boundary - 3,512 Acres
- Subbasin Boundary
- ▶ Flow Direction

FWC Andrews WMA Project		
Historic Drainage Subbasins and Flow Patterns		
		Figure 12

Path: P:\EAT\2317\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 12 Historic Drainage Subbasins and Flow Patterns.mxd / Project # 6003-17-0709



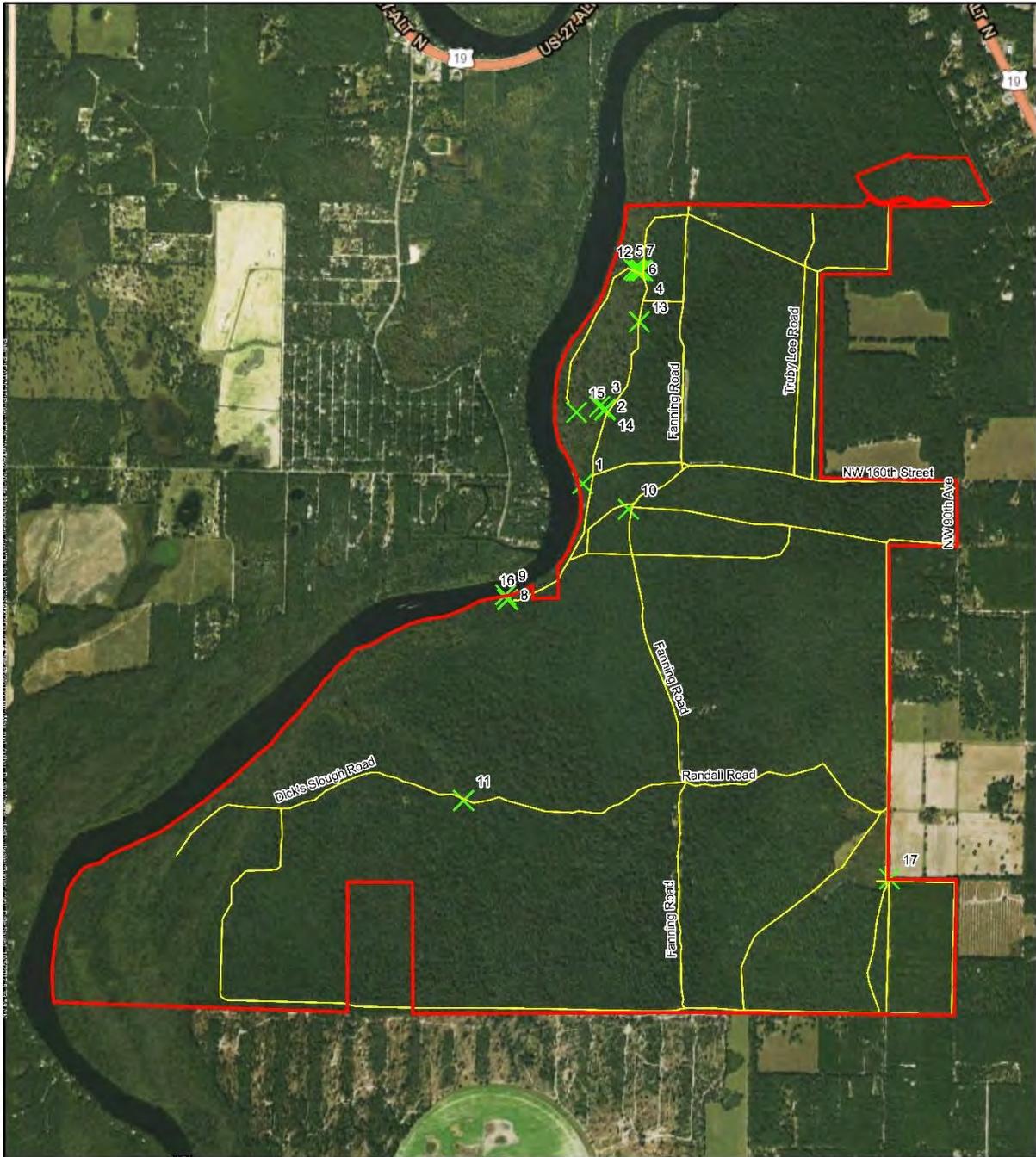
Data Sources: ESRI (Aerial 2014); FWC 2016; AMEC FW 2017

Legend

- Project Boundary - 3,512 Acres
- Subbasin Boundary
- LiDAR (NAVD88)
- High : 44
- Low : 0
- Flow Direction

FWC Andrews WMA Project		
Current Drainage Subbasins and Flow Patterns		
		Figure 13

Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 13 Current Drainage Subbasins and Flow Patterns_v2.mxd Project # 6003-17-0709



Data Source: ESRI 2014; FWC 2019; AMEC FW 2017

Legend

- Project Boundary - 3,512 Acres
- Andrews WMA Road
- X Site Photo Location

FWC Andrews WMA Project		
Site Photo Location Map		
		Figure 14

Path: P:\EAT\2217\Projects\FWC\Andrews Wildlife Management Area\Disciplines\GIS\MXD\Figure 14 Site Photo Location Map.mxd

Project # 6003-17-0709

Appendix A



Photo No. 1. Small spring location (August site visit). View to the west.



Photo No. 2. Boardwalk location (August site visit). View to the west.



Photo No. 3. Small creek that bisects the boardwalk (August site visit). View to the south.



Photo No. 4a. View of debris and sediment in the easternmost culvert (August site visit). View to the north.



Photo No. 4b. Culvert location; view of the easternmost culvert (August site visit). View to the northeast.



Photo No. 5a. View of culverts from low point in access road (August site visit). View to the southwest.



Photo No. 5b. Culvert location (August site visit). View to the north.



Photo No. 6. Culvert location; view of westernmost culvert (August site visit). View to the south.



Photo No. 7. Culvert location; view towards low point of access road (August site visit). View to the west.



Photo No. 8. Dock location (August site visit). View to the north.



Photo No. 9a. View of stairs leading down to dock (August site visit). View to the south.



Photo No. 9b. View of the Suwannee River from the dock (August site visit). View to the northwest.



Photo No. 10. Typical small sink (August site visit). View to the west.



Photo No. 11. Low spot in Dick's Slough Road (August site visit). View to the northwest.



Photo No. 12a. Culvert location; view towards low point in access road (September site visit). View to the west.



Photo No. 12b. Culvert location (September site visit). View to the south.



Photo No. 13. View of the edge of water adjacent to access road in northwestern area of site (September site visit). View to the west.



Photo No. 14. Beginning of boardwalk (September site visit). View to the west.



Photo No. 15. End of boardwalk (September site visit). View to the west.



Photo No. 16. Flooding at dock location (September site visit). View to the north.



Photo No. 17. Eastern property boundary (September site visit). View to the east.

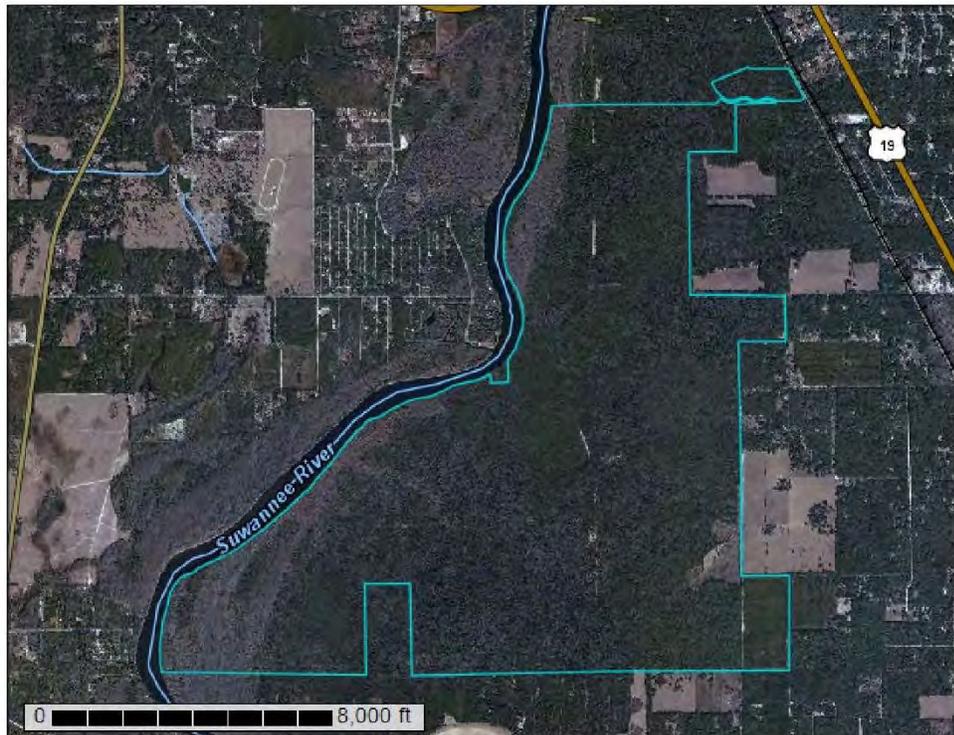
Appendix B



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Levy County, Florida

Andrews WMA



October 2, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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Soil Map



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MAP LEGEND		MAP INFORMATION	
	Area of Interest (AOI)		Spoil Area
	Soils		Stony Spot
	Soil Map Unit Polygons		Very Stony Spot
	Soil Map Unit Lines		Wet Spot
	Soil Map Unit Points		Other
	Special Point Features		Special Line Features
	Blowout		Streams and Canals
	Borrow Pit		Water Features
	Clay Spot		Transportation
	Closed Depression		Rails
	Gravel Pit		Interstate Highways
	Gravelly Spot		US Routes
	Landfill		Major Roads
	Lava Flow		Local Roads
	Marsh or swamp		Background
	Mine or Quarry		Aerial Photography
	Miscellaneous Water		
	Perennial Water		
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Levy County, Florida
 Survey Area Data: Version 12, Sep 16, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 29, 2010—Jan 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Orsino fine sand, 0 to 8 percent slopes	6.6	0.2%
12	Otela-Candler complex, 1 to 5 percent slopes	2,072.3	59.0%
14	Shadeville-Otela complex, 1 to 5 percent slopes	15.3	0.4%
15	Holopaw-Pineda complex, frequently flooded	64.3	1.8%
16	Chobee-Gator complex, frequently flooded	239.6	6.8%
29	Chobee-Bradenton complex, frequently flooded	92.9	2.6%
31	Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes	792.6	22.6%
32	Otela-Tavares complex, 1 to 5 percent slopes	166.2	4.8%
42	Ousley-Albany complex, occasionally flooded	58.5	1.7%
99	Water	0.8	0.0%
Totals for Area of Interest		3,511.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties

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and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

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Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Levy County, Florida

3—Orsino fine sand, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1jgff
Elevation: 10 to 150 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Orsino and similar soils: 88 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Orsino

Setting

Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 13 inches: fine sand
Bw - 13 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 50.02 in/hr)
Depth to water table: About 48 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)
Hydric soil rating: No

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Minor Components

Immokalee

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: No

Myakka

Percent of map unit: 2 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: No

Otela

Percent of map unit: 2 percent
Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)
Hydric soil rating: No

Placid, depressional

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Sparr

Percent of map unit: 1 percent
Landform: Flats on marine terraces, rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G152AA131FL)
Hydric soil rating: No

Pompano

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Dip, talf

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Down-slope shape: Linear, convex
Across-slope shape: Concave, linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: Yes

Samsula

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Popash

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

12—Otela-Candler complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jgfq
Elevation: 10 to 350 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Otela and similar soils: 56 percent
Candler and similar soils: 33 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Otela

Setting

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

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Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 50 inches: fine sand
Bt - 50 to 68 inches: fine sandy loam
Btg - 68 to 80 inches: sandy clay loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 48 to 66 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)
Hydric soil rating: No

Description of Candler

Setting

Landform: Knolls on karstic marine terraces, ridges on karstic marine terraces
Landform position (three-dimensional): Interfluvial
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian deposits and/or sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: fine sand
E - 7 to 75 inches: fine sand
E and Bt - 75 to 80 inches: fine sand

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0

Custom Soil Resource Report

Available water storage in profile: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands
(G152AA111FL)

Hydric soil rating: No

Minor Components

Bonneau

Percent of map unit: 2 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Convex

Other vegetative classification: Sandy over loamy soils on rises, knolls, and ridges
of mesic uplands (G152AA221FL)

Adamsville

Percent of map unit: 2 percent

Landform: Knolls on marine terraces, rises on marine terraces

Landform position (three-dimensional): Interfluve, tal

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands
(G152AA131FL)

Hydric soil rating: No

Jonesville

Percent of map unit: 1 percent

Landform: Rises on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Shallow or moderately deep, sandy or loamy soils
on rises and ridges of mesic uplands (G152AA521FL)

Hydric soil rating: No

Hague

Percent of map unit: 1 percent

Landform: Ridges on marine terraces, rises on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on knolls and ridges of
mesic uplands (G152AA211FL)

Hydric soil rating: No

Bushnell

Percent of map unit: 1 percent

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Custom Soil Resource Report

Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)

Hydric soil rating: No

Moriah

Percent of map unit: 1 percent

Landform: Flats on karstic marine terraces, rises on karstic marine terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on rises and knolls of mesic uplands (G152AA231FL)

Hydric soil rating: No

Shadeville

Percent of map unit: 1 percent

Landform: Knolls on karstic marine terraces, ridges on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on rises, knolls, and ridges of mesic uplands (G152AA221FL)

Hydric soil rating: No

Placid, depressional

Percent of map unit: 1 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)

Hydric soil rating: Yes

Popash

Percent of map unit: 1 percent

Landform: Depressions on marine terraces

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)

Hydric soil rating: Yes

14—Shadeville-Otela complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jgfs

Elevation: 10 to 120 feet

Mean annual precipitation: 56 to 64 inches

Custom Soil Resource Report

Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Shadeville and similar soils: 50 percent
Otela and similar soils: 31 percent
Minor components: 19 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Shadeville

Setting

Landform: Knolls on karstic marine terraces, ridges on karstic marine terraces
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits over limestone

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 35 inches: fine sand
Bt - 35 to 60 inches: fine sandy loam
Btg - 60 to 64 inches: fine sandy loam
2R - 64 to 68 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 40 to 72 inches to lithic bedrock
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 48 to 66 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Other vegetative classification: Sandy over loamy soils on rises, knolls, and ridges of mesic uplands (G152AA221FL)
Hydric soil rating: No

Description of Otela

Setting

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Linear

Custom Soil Resource Report

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 9 inches: fine sand
E - 9 to 60 inches: fine sand
Bt - 60 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 48 to 66 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)
Hydric soil rating: No

Minor Components

Bushnell

Percent of map unit: 3 percent
Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluvial
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)
Hydric soil rating: No

Levyville

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on knolls and ridges of mesic uplands (G152AA311FL)
Hydric soil rating: No

Mabel

Percent of map unit: 3 percent
Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluvial
Down-slope shape: Convex

Custom Soil Resource Report

Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats and rises of mesic lowlands (G152AA331FL)
Hydric soil rating: No

Micanopy

Percent of map unit: 3 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats and rises of mesic lowlands (G152AA331FL)
Hydric soil rating: No

Adamsville

Percent of map unit: 3 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G152AA131FL)
Hydric soil rating: No

Seaboard

Percent of map unit: 2 percent
Landform: Flats on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)
Hydric soil rating: No

Pedro

Percent of map unit: 2 percent
Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)
Hydric soil rating: No

15—Holopaw-Pineda complex, frequently flooded

Map Unit Setting

National map unit symbol: 1jgft
Elevation: 10 to 350 feet

Custom Soil Resource Report

Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Holopaw, frequently flooded, and similar soils: 55 percent
Pineda, frequently flooded, and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Holopaw, Frequently Flooded

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 3 inches: fine sand
E - 3 to 60 inches: fine sand
Btg - 60 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Description of Pineda, Frequently Flooded

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Custom Soil Resource Report

Typical profile

A - 0 to 4 inches: fine sand
E and Bw - 4 to 35 inches: fine sand
Btg1 - 35 to 52 inches: fine sandy loam
Btg2 - 52 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G152AA245FL)
Hydric soil rating: Yes

Minor Components

Albany

Percent of map unit: 3 percent
Landform: Flood plains on marine terraces, stream terraces on marine terraces
Landform position (three-dimensional): Tread, talff
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sandy or sandy over loamy soils on stream terraces or flood plains (G152AA134FL)
Hydric soil rating: No

Chobee

Percent of map unit: 3 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talff
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Bradenton

Percent of map unit: 3 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talff
Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Ousley

Percent of map unit: 2 percent
Landform: — error in exists on —
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sandy or sandy over loamy soils on stream terraces or flood plains (G152AA134FL)
Hydric soil rating: No

Gator, frequently flooded

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Terra ceia

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

16—Chobee-Gator complex, frequently flooded

Map Unit Setting

National map unit symbol: 1jgfv
Elevation: 10 to 130 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Chobee and similar soils: 45 percent
Gator and similar soils: 43 percent
Minor components: 12 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chobee

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

Oa - 0 to 3 inches: muck
A - 3 to 19 inches: fine sandy loam
Btg - 19 to 42 inches: sandy clay loam
Cg - 42 to 80 inches: loamy fine sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Description of Gator

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Herbaceous organic material over loamy and sandy marine deposits

Typical profile

Oa - 0 to 26 inches: muck
Cg1 - 26 to 52 inches: sandy clay loam
Cg2 - 52 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 1 percent

Custom Soil Resource Report

Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 12.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Minor Components

Bradenton

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Myakka, occasionally flooded

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces, tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Holopaw, frequently flooded

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Hicoria, depressional

Percent of map unit: 2 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip

Custom Soil Resource Report

Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G152AA245FL)
Hydric soil rating: Yes

Pineda, frequently flooded

Percent of map unit: 1 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G152AA245FL)
Hydric soil rating: Yes

Placid, depressional

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Popash

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Pompano

Percent of map unit: 1 percent
Landform: Drainageways on marine terraces, flats on marine terraces
Landform position (three-dimensional): Dip, talf
Down-slope shape: Linear, convex
Across-slope shape: Concave, linear
Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)
Hydric soil rating: Yes

29—Chobee-Bradenton complex, frequently flooded

Map Unit Setting

National map unit symbol: 1jgg7

Custom Soil Resource Report

Elevation: 0 to 350 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Chobee and similar soils: 53 percent
Bradenton and similar soils: 38 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chobee

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium

Typical profile

A - 0 to 11 inches: fine sandy loam
Btg - 11 to 48 inches: sandy clay loam
Cg - 48 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Description of Bradenton

Setting

Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Custom Soil Resource Report

Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 9 inches: fine sand
Btg - 9 to 28 inches: sandy clay loam
Cg - 28 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 5.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Minor Components

Samsula

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Hicoria, depressional

Percent of map unit: 1 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G152AA245FL)
Hydric soil rating: Yes

Wekiva

Percent of map unit: 1 percent
Landform: Flats on marine terraces, rises on marine terraces

Custom Soil Resource Report

Landform position (three-dimensional): Talf, rise
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G152AA341FL)
Hydric soil rating: Yes

Boca

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on flats of hydric or mesic lowlands (G152AA241FL)
Hydric soil rating: Yes

Myakka, occasionally flooded

Percent of map unit: 1 percent
Landform: Flood plains on marine terraces, tidal marshes on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Waccasassa

Percent of map unit: 1 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats of hydric or mesic lowlands (G152AA341FL)
Hydric soil rating: Yes

Gator, frequently flooded

Percent of map unit: 1 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)
Hydric soil rating: Yes

Holopaw, frequently flooded

Percent of map unit: 1 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Custom Soil Resource Report

Albany

Percent of map unit: 1 percent
Landform: Flood plains on marine terraces, stream terraces on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Other vegetative classification: Sandy or sandy over loamy soils on stream terraces or flood plains (G152AA134FL)
Hydric soil rating: No

31—Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jgg9
Elevation: 20 to 150 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Jonesville and similar soils: 48 percent
Otela and similar soils: 25 percent
Seaboard and similar soils: 16 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Jonesville

Setting

Landform: Rises on karstic marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits over limestone

Typical profile

A - 0 to 5 inches: fine sand
E - 5 to 27 inches: fine sand
Bt - 27 to 35 inches: sandy clay loam
2R - 35 to 39 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 24 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)

Custom Soil Resource Report

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)
Hydric soil rating: No

Description of Otela

Setting

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluvial
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 4 inches: fine sand
E - 4 to 58 inches: fine sand
Bt - 58 to 66 inches: sandy clay loam
2R - 66 to 70 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: 60 to 80 inches to lithic bedrock
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 48 to 66 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)
Hydric soil rating: No

Custom Soil Resource Report

Description of Seaboard

Setting

Landform: Flats on karstic marine terraces, rises on karstic marine terraces

Landform position (three-dimensional): Interfluvial, talus

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 8 inches: fine sand

C - 8 to 17 inches: fine sand

2R - 17 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: 4 to 20 inches to lithic bedrock

Natural drainage class: Moderately well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (1.98 to 19.98 in/hr)

Depth to water table: About 42 to 60 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)

Hydric soil rating: No

Minor Components

Levyville

Percent of map unit: 2 percent

Landform: Rises on marine terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Loamy and clayey soils on knolls and ridges of mesic uplands (G152AA311FL)

Hydric soil rating: No

Bushnell

Percent of map unit: 2 percent

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces

Landform position (three-dimensional): Interfluvial

Down-slope shape: Convex

Across-slope shape: Linear

Custom Soil Resource Report

Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)

Hydric soil rating: No

Candler

Percent of map unit: 2 percent

Landform: Knolls on marine terraces, ridges on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Convex

Other vegetative classification: Sandy soils on ridges and dunes of xeric uplands (G152AA111FL)

Hydric soil rating: No

Lutterloh, limestone substratum

Percent of map unit: 1 percent

Landform: Rises on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G152AA131FL)

Hydric soil rating: No

Tavares

Percent of map unit: 1 percent

Landform: Flats on karstic marine terraces, ridges on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)

Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent

Landform: Rises on marine terraces

Landform position (three-dimensional): Interfluve, rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Forage suitability group not assigned (G152AA999FL)

Hydric soil rating: Unranked

Moriah

Percent of map unit: 1 percent

Landform: Flats on karstic marine terraces, rises on karstic marine terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on rises and knolls of mesic uplands (G152AA231FL)

Hydric soil rating: No

Mabel

Percent of map unit: 1 percent

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces

Custom Soil Resource Report

Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on flats and rises of mesic lowlands (G152AA331FL)
Hydric soil rating: No

32—Otela-Tavares complex, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1jggb
Elevation: 20 to 350 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Otela and similar soils: 50 percent
Tavares and similar soils: 39 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Otela

Setting

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 8 inches: fine sand
E - 8 to 68 inches: fine sand
Bt - 68 to 80 inches: fine sandy loam

Properties and qualities

Slope: 1 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: About 48 to 66 inches
Frequency of flooding: None
Frequency of ponding: None

Custom Soil Resource Report

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)

Hydric soil rating: No

Description of Tavares

Setting

Landform: Flats on karstic marine terraces, ridges on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Eolian or sandy marine deposits

Typical profile

A - 0 to 9 inches: fine sand

C - 9 to 80 inches: fine sand

Properties and qualities

Slope: 1 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 50.02 in/hr)

Depth to water table: About 48 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)

Hydric soil rating: No

Minor Components

Bushnell

Percent of map unit: 1 percent

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Custom Soil Resource Report

Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)

Hydric soil rating: No

Hague

Percent of map unit: 1 percent

Landform: Ridges on marine terraces, rises on marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on knolls and ridges of mesic uplands (G152AA211FL)

Hydric soil rating: No

Jonesville

Percent of map unit: 1 percent

Landform: Rises on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)

Hydric soil rating: No

Levyville

Percent of map unit: 1 percent

Landform: Rises on marine terraces

Landform position (three-dimensional): Rise

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Loamy and clayey soils on knolls and ridges of mesic uplands (G152AA311FL)

Hydric soil rating: No

Shadeville

Percent of map unit: 1 percent

Landform: Knolls on karstic marine terraces, ridges on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on rises, knolls, and ridges of mesic uplands (G152AA221FL)

Hydric soil rating: No

Mabel

Percent of map unit: 1 percent

Landform: Knolls on karstic marine terraces, rises on karstic marine terraces

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Loamy and clayey soils on flats and rises of mesic lowlands (G152AA331FL)

Hydric soil rating: No

Moriah

Percent of map unit: 1 percent

Landform: Flats on karstic marine terraces, rises on karstic marine terraces

Custom Soil Resource Report

Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy over loamy soils on rises and knolls of mesic uplands (G152AA231FL)
Hydric soil rating: No

Bonneau

Percent of map unit: 1 percent
Landform: Knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Sandy over loamy soils on rises, knolls, and ridges of mesic uplands (G152AA221FL)

Lutterloh, limestone substratum

Percent of map unit: 1 percent
Landform: Rises on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Sandy soils on rises and knolls of mesic uplands (G152AA131FL)
Hydric soil rating: No

Pedro

Percent of map unit: 1 percent
Landform: Knolls on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)
Hydric soil rating: No

Seaboard

Percent of map unit: 1 percent
Landform: Flats on karstic marine terraces, rises on karstic marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Other vegetative classification: Shallow or moderately deep, sandy or loamy soils on rises and ridges of mesic uplands (G152AA521FL)
Hydric soil rating: No

42—Ousley-Albany complex, occasionally flooded

Map Unit Setting

National map unit symbol: 1jggn

Custom Soil Resource Report

Elevation: 10 to 350 feet
Mean annual precipitation: 56 to 64 inches
Mean annual air temperature: 66 to 73 degrees F
Frost-free period: 254 to 284 days
Farmland classification: Not prime farmland

Map Unit Composition

Ousley and similar soils: 50 percent
Albany and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ousley

Setting

Landform: Flood plains on marine terraces, stream terraces on marine terraces
Landform position (three-dimensional): Riser, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Sandy alluvium

Typical profile

A1 - 0 to 4 inches: fine sand
A2 - 4 to 12 inches: fine sand
C - 12 to 80 inches: fine sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy or sandy over loamy soils on stream terraces or flood plains (G152AA134FL)
Hydric soil rating: No

Description of Albany

Setting

Landform: Flood plains on marine terraces, stream terraces on marine terraces
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear, convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

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Typical profile

A - 0 to 6 inches: fine sand
E - 6 to 50 inches: fine sand
Bt - 50 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D
Other vegetative classification: Sandy or sandy over loamy soils on stream terraces or flood plains (G152AA134FL)
Hydric soil rating: No

Minor Components

Chobee

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)
Hydric soil rating: Yes

Holopaw, frequently flooded

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Sandy soils on stream terraces, flood plains, or in depressions (G152AA145FL)
Hydric soil rating: Yes

Bradenton

Percent of map unit: 2 percent
Landform: Flood plains on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear

Custom Soil Resource Report

Other vegetative classification: Loamy and clayey soils on stream terraces, flood plains, or in depressions (G152AA345FL)

Hydric soil rating: Yes

Myakka, occasionally flooded

Percent of map unit: 1 percent

Landform: Flood plains on marine terraces, tidal marshes on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Organic soils in depressions and on flood plains (G152AA645FL)

Hydric soil rating: Yes

Pineda, frequently flooded

Percent of map unit: 1 percent

Landform: Flood plains on marine terraces

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Sandy over loamy soils on stream terraces, flood plains, or in depressions (G152AA245FL)

Hydric soil rating: Yes

Pompano

Percent of map unit: 1 percent

Landform: Drainageways on marine terraces, flats on marine terraces

Landform position (three-dimensional): Dip, talf

Down-slope shape: Linear, convex

Across-slope shape: Concave, linear

Other vegetative classification: Sandy soils on flats of mesic or hydric lowlands (G152AA141FL)

Hydric soil rating: Yes

Orsino

Percent of map unit: 1 percent

Landform: Knolls on marine terraces, ridges on marine terraces

Landform position (three-dimensional): Interfluve, side slope

Down-slope shape: Convex

Across-slope shape: Linear

Other vegetative classification: Sandy soils on rises, knolls, and ridges of mesic uplands (G152AA121FL)

Hydric soil rating: No

99—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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Description of Water

Interpretive groups

Land capability classification (irrigated): None specified

Other vegetative classification: Forage suitability group not assigned
(G152AA999FL)

Hydric soil rating: Unranked

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Andrews WMA)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

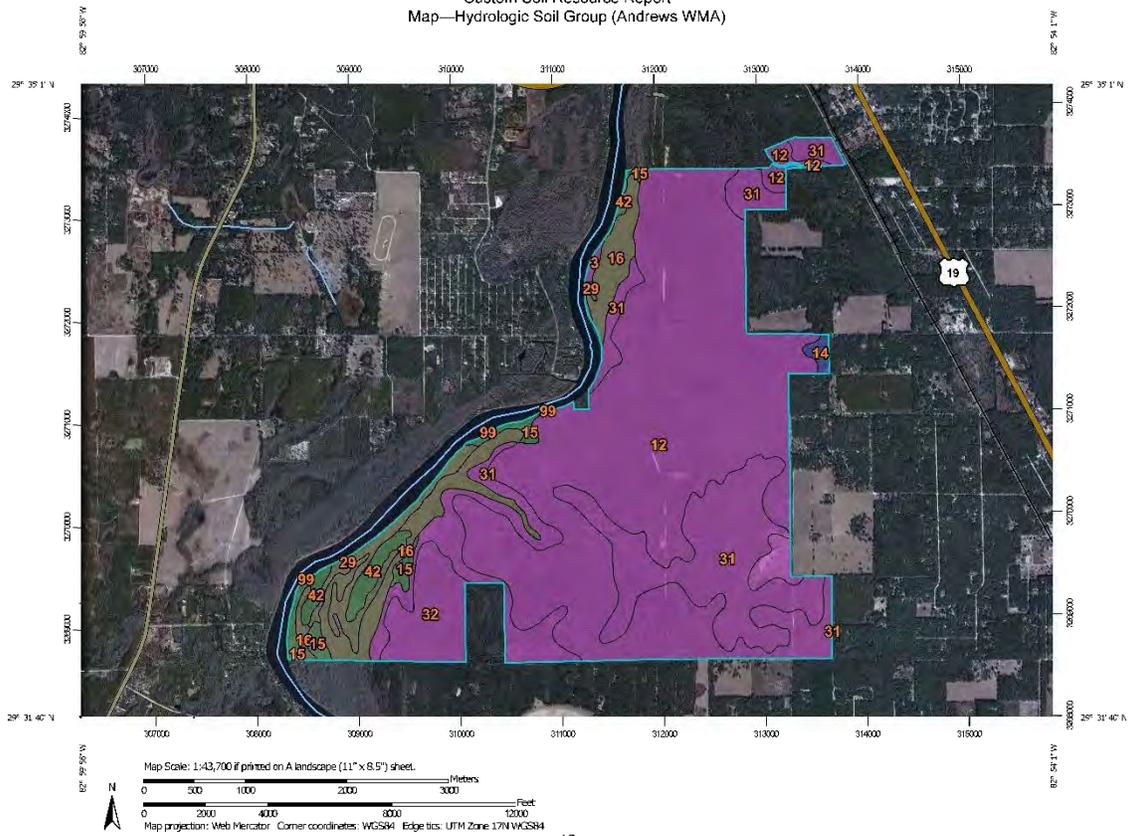
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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

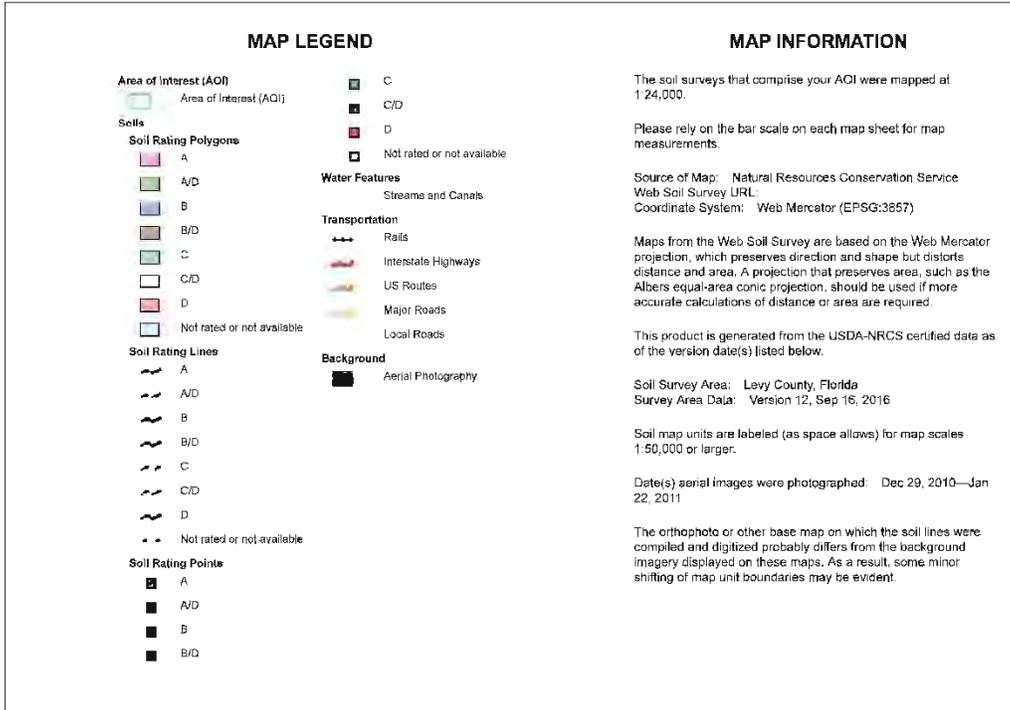
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

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 Map—Hydrologic Soil Group (Andrews WMA)



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Table—Hydrologic Soil Group (Andrews WMA)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Orsino fine sand, 0 to 8 percent slopes	A	6.6	0.2%
12	Otela-Candler complex, 1 to 5 percent slopes	A	2,072.3	59.0%
14	Shadeville-Otela complex, 1 to 5 percent slopes	B	15.3	0.4%
15	Holopaw-Pineda complex, frequently flooded	A/D	64.3	1.8%
16	Chobee-Gator complex, frequently flooded	C/D	239.6	6.8%
29	Chobee-Bradenton complex, frequently flooded	C/D	92.9	2.6%
31	Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes	A	792.6	22.6%
32	Otela-Tavares complex, 1 to 5 percent slopes	A	168.2	4.8%
42	Ousley-Albany complex, occasionally flooded	A/D	58.5	1.7%
99	Water		0.8	0.0%
Totals for Area of Interest			3,511.1	100.0%

Rating Options—Hydrologic Soil Group (Andrews WMA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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12.12 Management Procedures Guidelines - Management of Archaeological and Historical Resources

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, *‘Historic property’ or ‘historic resource’ means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state.’*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at:
<http://www.flheritage.com/preservation/compliance/guidelines.cfm>

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at:

http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf.

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Deena S. Woodward
Division of Historical Resources
Bureau of Historic Preservation
Compliance and Review Section
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

Phone: (850) 245-6425
Toll Free: (800) 847-7278
Fax: (850) 245-6435

12.13 Apiaries

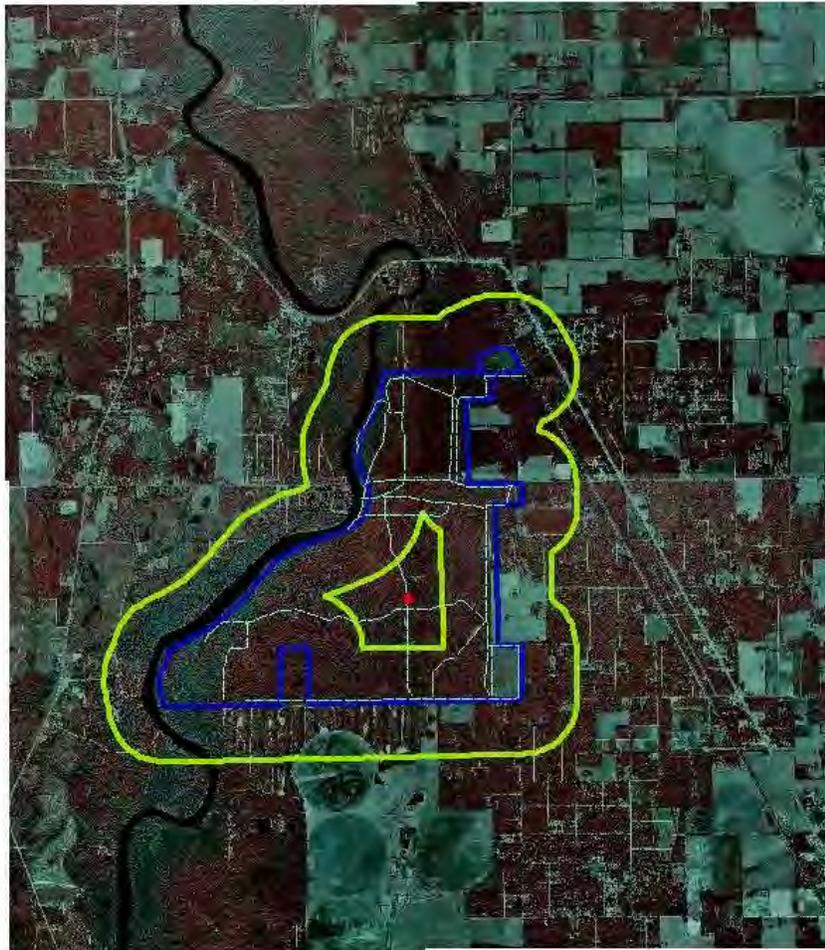
12.13.1 AWMA Apiary Assessment

ANDREWS WMA APIARY FEASIBILITYASSESSMENT

Jayde Roof
Area Manager
Andrews WMA
10-10-2011

Apiaries are addressed in the analysis of multiple-use potential within the current Andrews Wildlife Management Area (AWMA) Management Plan. The suitability of apiaries are identified as “conditional.” There are currently no apiary sites located on AWMA. As such, the guidelines set forth in the FWC Apiary Policy were used along with ArcGIS, to assess the feasibility of permitting apiary sites within AWMA.

Based on the criteria outlined in the FWC Apiary Policy, one apiary could be added on Andrews WMA (see attached map). This site meets all policy requirements and will require minimal preparation. Based on the requirements that apiary sites must be ½ mile from the WMA boundary and must be a minimum of 1 mile apart, no other suitable sites are available.



ANDREWS WMA APIARY ASSESSMENT

Legend

- Potential Apiary Site
- Roads
- Andrews WMA Boundary
- Andrews WMA 1/2 mile Buffer

12.13.2 FWC Apiary Policy

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Apiary Policy

Division of Habitat and Species Conservation

Issued by:
Terrestrial Habitat Conservation and Restoration Section
9/1/2010

Enclosed is the HSC/THCR Apiary Policy for all Florida Fish and Wildlife Conservation Commission's Wildlife Management Areas and Wildlife and Environmental Areas.

DIVISION OF HABITAT AND SPECIES CONSERVATION POLICY
Issued September 2010

**SUBJECT: APIARY SITES ON FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
 WILDLIFE MANAGEMENT AREAS AND WILDLIFE AND ENVIRONMENTAL AREAS**

STATEMENT OF PURPOSE: It is the intent of this policy to determine which Florida Fish and Wildlife Conservation Commission (FWC) Wildlife Management Areas or Wildlife and Environmental Areas (WMA/WEA) may have apiary sites, and provides direction on site location, management and administration of said apiaries.

Definitions

Apiary – A place where bees and beehives are kept, especially a place where bees are raised for their honey.

Apiary Site – An area set aside on a WMA/WEA for the purpose of allowing a beekeeper to locate beehives in exchange for a fee as established by contract between the beekeeper and FWC.

Apiary Wait List – An apiary wait list will be maintained by the Terrestrial Habitat Conservation and Restoration (THCR) Section Leader’s Office based on applications received from interested beekeepers. Only qualified apiarists will be added to the list. To become qualified the new apiarist must submit an application form and meet the criteria below under the section titled “Apiary Wait List and Apiary Application.”

Beekeeper/Apiarist – A person who keeps honey bees for the purposes of securing commodities such as honey, beeswax, pollen; pollinating fruits and vegetables; raising queens and bees for sale to other farmers and/or for purposes satisfying natural scientific curiosity.

Best Management Practices – The Florida Department of Agriculture & Consumer Services (FDACS; Division of Plant Industry (DPI), Apiary Inspection Section, P.O. Box 147100, Gainesville, FL 332614-1416) provides Best Management Practices (BMP) for maintaining European Honey Bee colonies and FWC expects apiarists to follow the BMP.

Hive/Colony – Means any Langstroth-type structure with movable frames intended for the housing of a bee colony. A hive typically consists of a high body hive box with cover, honey frames, brood chambers and a bottom board and may have smaller super hive boxes stacked on top for the excess honey storage. A hive/colony includes one queen, bees, combs, honey, pollen and brood and may have additional supers stacked on top of a high body hive box.

Establishment of Apiary Sites on WMA/WEA

During the development of an individual WMA/WEA Management Plan, apiaries will be considered under the multiple-use concept as a possible use to be allowed on the area. "Approved" uses are deemed to be in concert with the purposes for state acquisition, with the Conceptual State Lands Management Plan, and with the FWC agency mission, goals, and objectives as expressed in the agency strategic plan and priorities documents. Items to consider when making this determination can also include:

- Were apiaries present on the area prior to acquisition?
- Are there suitable available sites on the WMA/WEA?
- Will the apiary assist in pollination of an onsite FWC or offsite (adjacent landowner) citrus grove or other agricultural operation?

For those WMA/WEAs that have not considered apiaries in their Management Plan, upon approval of this policy Regional Staff will work with the Conservation Acquisition and Planning (CAP) staff and THCR Section leadership to determine if apiaries are an approved use on the area. If apiaries are considered an approved use then a request will be made to the Division of State Lands to allow this use as part of an amended Management Plan. This request will be made through the THCR's Section Leader's office and coordinated by the CAP.

Determination of apiary site locations on WMA/WEAs should be done using the following guidelines:

- Apiary sites should be situated so as to be at least one-half mile from WMA/WEA property boundary lines, and at least one mile from any other known apiary site. Exceptions to this requirement must be reviewed by the Area Biologist and presented to the THCR Section Leader for approval.
- Site should be relatively level, fairly dry, and not be prone to flooding when bees would normally be present.
- Site should be accessible by roads which allow reasonable transfer of hives to the site by vehicle.
- If a site is to be located near human activity, such as, an agricultural field, food plot, wildlife opening, campsites, etc., or if the site may be manipulated by machinery at a time when bees would be present, then the apiary site should be located at a minimum of 150 to 200 yards from the edge of that activity. This will ensure minimal disturbance to the bees and minimize incidents with anyone working in the area.

- It is preferable to have apiary sites located adjacent to or off roads whenever possible. If traditional apiary sites were located on roads and the Area Biologist determines that the site will not impact use of the road by visitors then it will be allowed.
- FWC Area Biologist shall select apiary site(s) and the site(s) selected should not require excessive vegetation clearing (numerous large trees, dense shrubs) or ground disturbance (including fill).

WMA/WEA Staff Responsibilities

Area Biologist on WMAs/WEAs with approved apiary sites will forward a GIS shapefile depicting all the apiary site polygon(s), including a name or number with coordinates for each apiary site, to the THCR Contract Manager.

Area Biologist will monitor each apiary site no less than once a year to determine if the beekeeper is abiding by the contract requirements. If violations are noted, staff should bring them to the attention of the beekeeper for correction. If violations continue staff should notify the THCR Contract Manager who will determine if or what additional action is warranted.

Area Biologist will establish and maintain firelines around the apiary site to ensure the apiary site is ready when a planned burn is scheduled.

Area Biologist will advise the beekeeper of burn plans, road work, gate closures, or other site conditions and management activities that may affect the beekeeper's ability to manage or access the apiary site.

Area Biologist is not responsible to ensure access roads are in condition suitable for beekeepers to access their hives with anything other than a four wheeled drive vehicle. (The site of the apiary may be high and dry, but the roads accessing them may be difficult to impossible to get a two wheeled drive vehicle into during extreme weather, e.g., heavy rainfall events.)

Apiary Wait List and Apiary Application

An electronic waiting list for apiary sites will be maintained by the THCR's Contract Manager for each WMA/WEA. To be placed on the waiting list an interested beekeeper must submit an apiary application form to the contract manager (See Enclosed Application Form). Each applicant will be considered based on the following criteria:

- Proof of a valid registration with the FDACS/DPI.
- Proof of payment of outstanding special inspection fees for existing sites.
- A validated history of being an apiary manager.
- Three references that can attest to the applicant's beekeeping experience.

If an apiary site becomes available on a WMA/WEA and there are beekeepers on the waiting list interested in that particular area, those individuals meeting the criteria above will be given preference. If there is more than one beekeeper meeting the criteria with their name on the list then a random drawing will be held by the THCR Contract Manager to determine who will receive the site. Beekeepers on the waiting list will be notified in writing of the random drawing's date/location and will be invited to attend. The individual's name selected during this drawing will be awarded the contract.

Apiary agreements are non-transferable. Each agreement serves as a contract between a specific individual or company and FWC, and the rights and responsibilities covered by an individual agreement cannot be transferred.

Contracts

Apiary contracts are for five (5) years and renewals are contingent upon a satisfactory performance evaluation by Area Biologist and concurrence of the THCR Section Leader. Approval is based on apiarist performance, adherence to rules and regulations and general cooperation. If an Area Biologist decides an apiarist whose contract is expiring is unacceptable he may recommend not approving the new contract. If this transpires then the wait list process using random selection will be used. If there is no apiarist on a current wait list then the apiarists who are in good standing with existing contracts will be notified to see if any want to be put on the wait list for the drawing. If none are interested then the site will be put on hold pending a valid request.

Pricing of Apiary Site(s)

Cost of each apiary site will be \$40 annually which will include up to 50 beehives. Additional beehives will be charged at the rate of \$40 per 50 beehives.

Pricing examples:

- A beekeeper is leasing 2 apiary sites with up to 100 beehives - the fee per year is \$80.
- A beekeeper is leasing 3 apiary sites with up to 200 beehives - the fee per year is \$160.

Note: The maximum number of hives/colonies allowed on an apiary site will be at the discretion of the apiarist. However, the apiarist is strongly recommended to follow the BMP as recommended by the FDACS/DPI. In addition to providing the BMP, FDACS/DPI's management has recommended 50 hives per site in pineland communities and no more than 100 hives per site in areas with bountiful resources. However, FWC will not dictate the number of hives on a site unless they create land management issues.

Bear Depredation Control at Apiary Site(s)

Beekeepers are required to consult with the WMA/WEA Area Biologist to see if electric fencing is required for their apiary sites. If the Area Biologist requires electric fencing then the Beekeeper shall construct and maintain electric fences for each apiary site. Numerous electric fence designs have been used to varying success and FWC as a courtesy provides an electric fence technical information bulletin with each Agreement. This bulletin is attached in order to assist the Beekeeper and/or provide a design that has been proven to be reasonable effective.

SUBJECT MATTER REFERENCES

Apiary Inspection Law - Chapter 586, Florida Statutes (see <http://www.leg.state.fl.us/Statutes/>), Rule Chapter 5B-54, Florida Administrative Code (see www.flrules.org).

The Board of Trustees of the Internal Improvement Trust Fund – Recommended Apiary Agreement Guidelines For Apiaries & Revisions to an Agreement for Apiary Activities on State Lands on September 23, 1986

S:\HSC\THCR\APIARY.BACKUP.POLICY\dlissupport@dos.state.fl.us_20100903_111446.pdf

Senate Resolution 580, September 21, 2006: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_bills&docid=f:sr580ats.txt.pdf

Attachments

Sample Apiary Agreement W/Attachments (Map Placeholder & Electric Fence Bulletin)

Sample Apiary Site Application Form W/Mission Statement

Best Management Practices for Maintaining European Honey Bee Colonies

Sample of Random Selection Process Procedure

APPROVED:

Division Director or Designee

DATE: _____

APIARY AGREEMENT

AGREEMENT FOR APIARY ACTIVITIES ON STATE LANDS

THIS AGREEMENT is made by and between the Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600, hereinafter known as “the COMMISSION,” and (Insert Name and Address of Apiarist Here), telephone number (Insert Phone Number of Apiarist Here), hereinafter known as “the USER.”

WITNESSETH

In consideration of the mutual promises to be kept by each and the payments to be made by the USER, the parties agree as follows:

1. TERM: This Agreement will begin (Insert date here) or the date signed by both parties, whichever is later, and will end five (5) years from the date of execution. Issuance of a new five (5) year Agreement is contingent upon satisfactory performance evaluation by the Area Biologist and approval of the THCR Section Leader.
2. The COMMISSION Agrees:
 - a. To provide apiary sites on state lands, which will be identified by the COMMISSION staff and located on the property identified in (4)(f) below.
 - b. To provide technical assistance for bear-proofing, if required by Area Biologist, of sites made available under this Agreement.
 - c. To allow the USER to place a total number of (insert number of hive boxes here) hive boxes on the COMMISSION-managed property at the apiary site(s).
3. The USER Agrees:
 - a. To pay (Insert Total Dollars Here) on or before the execution date of this Agreement and each year thereafter on or before anniversary date of the original contract execution date, with check or money order payable to the Florida Fish and Wildlife Conservation Commission. All payments shall be remitted to The Florida Fish and Wildlife Conservation Commission, Finance and Budgeting, Accounting Section, PO Box 6150, Tallahassee, FL 32399-6150, and a copy of the check to The Florida Fish and Wildlife Conservation Commission, Terrestrial Habit Conservation and Restoration Section, Attn: Section Leader, 620 South Meridian Street, Tallahassee, Florida 32399-1600.

- b. To have no more than (Insert Number of Hive boxes here) hive boxes on the property at one time.
- c. To comply with the Florida Honey Certification and Honeybee Law, Chapter 586, Florida Statutes, and Rule 5B-54, Florida Administrative Code, and all other applicable federal, state, or local laws, rules or ordinances.
- d. To not damage, cut or remove any trees in the course of preparing for or conducting operations under this Agreement.
- e. To repair within 30 days of occurrence any damage to roads, trails, fences, bridges, ditches, or other public property caused by USER'S operations under this Agreement based on discretion of the COMMISSION to ensure the WMA/WEA management goals are met. All repairs will be coordinated with the Area Biologist to ensure management goals are met. If USER does not comply within the 30 day requirement, then the COMMISSION may use a third party to perform the repairs and charge the USER accordingly.
- f. To report any forest fires observed and to prevent forest fires during the course of operations under this Agreement.
- g. To abide by all WMA/WEA rules and regulations in addition to items in this Agreement.
- h. To notify the Area Biologist within 24 hours when a bear depredation event occurs.
- i. To post their name in an agreed upon location at each site covered by this Agreement or otherwise use an identifying system that is approved by the Area Biologist.
- j. To furnish proof of general liability insurance prior to starting apiary activities on state property or within 30 days of execution of this Agreement, whichever is earlier, and proof of annual renewal of the general liability insurance policy prior to or upon expiration date of the policy. The USER shall maintain continuous general liability insurance throughout the term of this Agreement for no less than \$300,000 for bodily injury and \$100,000 for property damage for each occurrence. Such a policy shall name the COMMISSION as the Certificate Holder. The USER's current certificate of insurance shall contain a provision that the

insurance will not be canceled for any reason during the term of this Agreement except after thirty (30) days written notice to the COMMISSION.

- k. To be liable for all damage to persons or property resulting from operations under this Agreement, and to release, acquit, indemnify, save and hold harmless the COMMISSION, its officers, agents, employees and representatives from any and all claims, losses, damages, injuries and liabilities whatsoever, whether for personal injury or otherwise, resulting from, arising out of or in any way connected with activities under this Agreement or activities occurring from any other source not under this Agreement and the USER further agrees to assume all risks of loss and liabilities incidental to any natural or artificial condition occurring on state lands cover by this Agreement.
 - l. To construct and maintain electric fences, if required by the Area Biologist at the Area Biologist's discretion, to provide protection of apiaries from black bear depredation consistent with the technical information bulletin attached to this agreement, and, if so required, to maintain an open buffer around the fencing of five (5) feet or more. (See Attachment 1)
 - m. To remove all personal property from the site within thirty (30) days of termination or expiration of this Agreement. The USER understands that after this time, all the USER'S personal property remaining on the WMA/WEA shall be deemed abandoned and become the property of the COMMISSION, which will be utilized or disposed of at the sole discretion of the COMMISSION, and that reasonable storage and/or disposal fees and/or costs may be charged to the USER.
4. The parties mutually agree:
- a. This Agreement is not transferable.
 - b. The USER's failure to submit payment by the due date established herein may result in cancellation of the Agreement by the COMMISSION.
 - c. The USER's failure to submit proof of general liability insurance or proof of annual renewal in compliance with (3) (j) above may result in cancellation of this Agreement by the COMMISSION.

- d. This Agreement shall be in effect for a period of five (5) years and issuance of a new agreement will be contingent upon a satisfactory performance evaluation and approval of the Area Biologist and THCR Section Leader.
- e. Each apiary site shall be situated so as to be at least one-half (1/2) mile inward from state property lines and there shall be at least one (1) mile separation between sites. Exceptions to this rule must be reviewed by Area Biologist presented to and approved by the Terrestrial Habitat Conservation and Restoration Section Leader.
- f. The property covered by this Agreement is described as follows: That the property sites (Insert Area Name) Wildlife Management Area are represented by Attachment 2.
- g. In accordance with Section 287.134, Florida Statutes, an entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal or reply on a contract to provide goods or services to any public entity; may not submit a bid, proposal or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant with any public entity; and may not transact business with a public entity.
- h. As part of the consideration of this Agreement, the parties hereby waive trial by jury in action brought by either party pertaining to any matter whatsoever arising out of or in any way connected with this Agreement. Exclusive venue for all judicial actions pertaining to this Agreement is in Leon County, Florida.
- i. This Agreement may be terminated by the COMMISSION upon thirty (30) days written notice to the USER in the event the continuation of the apiary activities are found to be incompatible with the COMMISSION'S management plans or for any other reason at the sole discretion of the COMMISSION.

This Area Intentionally Left Blank

IN WITNESS WHEREOF, the parties have executed this Agreement on the day and year last below written.

USER SIGNATURE

Date: _____

Witness

Witness

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

Mike Brooks, Section Leader
Terrestrial Habitat Conservation and
Restoration

Date: _____

Approved as to form and legality

Commission Attorney

Date: _____

AGREEMENT

ATTACHMENT 1

Use of Electric Fencing to Exclude Bears And Prevent Property Damage

Florida Fish and Wildlife Conservation Commission
Technical Information Bulletin (2001)

Electric fencing has proven effective in deterring bears from entering landfills, apiaries (beehives), livestock pens, gardens, orchards, and other high-value properties. Numerous electrical fence designs have been used with varying degrees of success. Design, quality of construction, and proper maintenance determine the effectiveness of an electric fence. The purpose of this technical bulletin is to assist the property owner in understanding and implementing electrical fencing as a tool to exclude and prevent damage caused by black bears.

Understanding Electric Fencing

Electric fencing provides an electrical shock when an animal comes into contact with the electrically charged wires of the fence. People unfamiliar with electric fencing often are afraid that it will injure, permanently damage, or kill an individual or pet that contacts the fence. **This is not true!** A properly constructed electric fence is safe to people, pets, and bears.

Components of Electric Fencing

An electric fence is composed of four main elements: a charger, fence posts, wire, and the ground rod.

Fence Charger. On a small scale electric fence (like that typically needed for bear exclusion), the largest cost is normally the fence charger. A fence charger's job is to send an electrical pulse into the wire of the fence. Contrary to popular belief, there is not a continuous charge of electricity running through the fence. Instead the charger emits a short pulse or burst of electricity through the fence. The intensity and duration of the electrical pulse varies with the type of charger or controller unit. Chargers with a high-voltage, short duration burst capacity are the best because they are harder to ground out by tall grass and weeds. These types are also the safest, because, even though the voltage is high (5 kilovolts) the duration of the burst is very short (2/10,000 of a second) (FitzGerald, 1984).

Two basic energy sources for chargers are batteries (12-volt automotive type) and household current (110 volt). Battery-type chargers are typically cheaper to purchase but require more maintenance because of the necessity of charging the battery. The advantage of a battery powered charger is that it can be used in a remote location where 110-volt current is not available. Most units that are powered by a fully charged 12-volt deep-cycle batteries can last three weeks before needing a charge. Addition of a solar trickle charger will help prolong the duration of effective charge in 12-volt batteries.

Fence Posts. On small scale fences, the posts are normally the second largest expense involved in construction. Therefore, when planning an electric fence it is a good idea to utilize existing fencing in order to save money. If no existing fence is available, posts will need to be placed around the area needing protection. Posts may be wood, metal, plastic, or fiberglass. Wood and metal posts will need to have plastic insulators attached to them which prevent the electric wire from touching the post causing it to ground out. Plastic and fiberglass posts do not need insulators, the wire may be affixed directly to these posts. Wood and metal posts are typically more expensive and require the added expense of insulators, however, they are more durable and generally require less maintenance.

Wire. Fourteen to seventeen gauge wire is the most common size range used in electric fencing. Heavier wire (a lower gauge number) is more expensive but carries current with less resistance and is more durable (FitzGerald, 1984).

The two most common types of wire are galvanized and aluminum. Galvanized wire is simply a steel wire with a zinc coating to prevent rust, which makes the wire last longer. Some wire is more galvanized than others. The degree or amount of zinc coating that is around the core steel wire is measured in three classes. A class I galvanization means the wire has a thinner coating of zinc than a class II galvanization. Class III galvanized wire has the heaviest zinc coating and will last longer than the class I and class II wire (FitzGerald, 1984). In general, the cost of galvanized wire increases as the class or amount of galvanization increases.

Aluminum wire is typically more expensive than the galvanized wire. Some advantages of aluminum wire are: it will not rust, it conducts electricity four times better, and it weighs one-third less than steel wire.

The Ground Rod. The ground is an often overlooked, but critical part of an electric fence. Without a good ground, electricity will not flow through the wire. When an animal touches a charged wire, the body of the animal completes the electrical circuit and the animal feels the “shock”. The current must travel from the charger through the wire to the animal and then back through the ground to the charger if the animal is to

feel the shock. The soil acts as the return “wire” (ground) in the circuit. However, if a bird was to land on a charged wire without touching the soil the bird would not complete the circuit and would be unaffected (FitzGerald, 1984). Some fence configurations use actual grounded wires within the fence to enhance the grounding system.

The ground may be a commercial ground rod or a copper tube or pipe driven six to eight feet in moist soil. Copper is expensive, so a copper coated steel pipe or any other good conducting metal pipe will work also. Very dry soil can effect the ability to create a good ground and has sometimes been a problem during drought conditions. Pipe may be a better choice than a solid rod during drought conditions, because water may be poured down the ground pipe to improve the ground. Some fence configurations use wires as the grounding system, rather than relying solely on the soil as a ground.

Recommended Electric Fence to Deter Black Bears

Conditions at fence sites will vary and will determine what the most effective fence configuration will be. Commission biologists welcome the opportunity to visit sites and provide custom tailored advice on constructing an effective electric fence. The following recommendation will cover most situations with low to moderate pressure from black bears. Use a five strand aluminum wire fence that is 40 inches high with wire spacing every eight inches apart using the previously mentioned wired grounding system (see Figure 1). The wire closest to the ground level (the lowest wire) should be a charged or “hot” wire. The second wire should be grounded. The third wire should be hot. The fourth wire should be grounded and the fifth wire should be hot. If using metal or wood posts, insulators must be used to keep the hot wires from grounding out. The cost of this type of electric fence utilizing fiberglass posts and a 110 volt fence charger is approximately \$200 for a 40' x 40' area (160 linear feet of fence).

Materials:

- 1 - 1, 312 foot roll (1/4 mile) 14 gauge aluminum electric fence wire
- 1 - 50 foot roll 12 gauge insulated wire
- 20 - 5 foot 5/8 inch dia fiberglass fence posts
- 5 - plastic gate handles
- 1 - 110 volt fence charger
- 1 - 10 foot ground pipe
- 4 - plastic electric fence signs

Installation. These instructions are for a square shape fence exclusion, but the process would be very similar for other applications. Drive 4 corner posts 1-foot deep into ground and stake with guy wires. Clip, rake, and keep clear any vegetation in a 15-inch wide strip under the fence and apply herbicide. Attach and stretch the aluminum wire at 8-inch increments starting 8 inches from ground level. A loop of wire

should be left on each wire at the first corner post. Once the wire has been stretched around the outside of all the corner posts back to the first post a plastic gate handle should be attached to each wire and the gate handles should be attached to each corresponding loop on the first corner post. Drive in the remaining 16 posts to the same depth at 8-foot intervals between corner posts. Secure each of the five wires to each of the posts with additional wire. Attach four plastic electric fence signs (one on each side) to the top wire of the fence. Attach a 12-gauge strand of insulated wire to the positive terminal of the fence charger and attach it to the first, third, and fifth wires of the fence. Attach another 12 gauge insulated wire to the negative terminal of the charger and attach this wire to the ground pipe which has been driven into the ground 6 to 8-feet deep. Attach another 12 gauge insulated wire from the negative terminal of the charger to the second and fourth wires on the fence. Plug the charger into a 110 volt power supply and the fence is in operation.

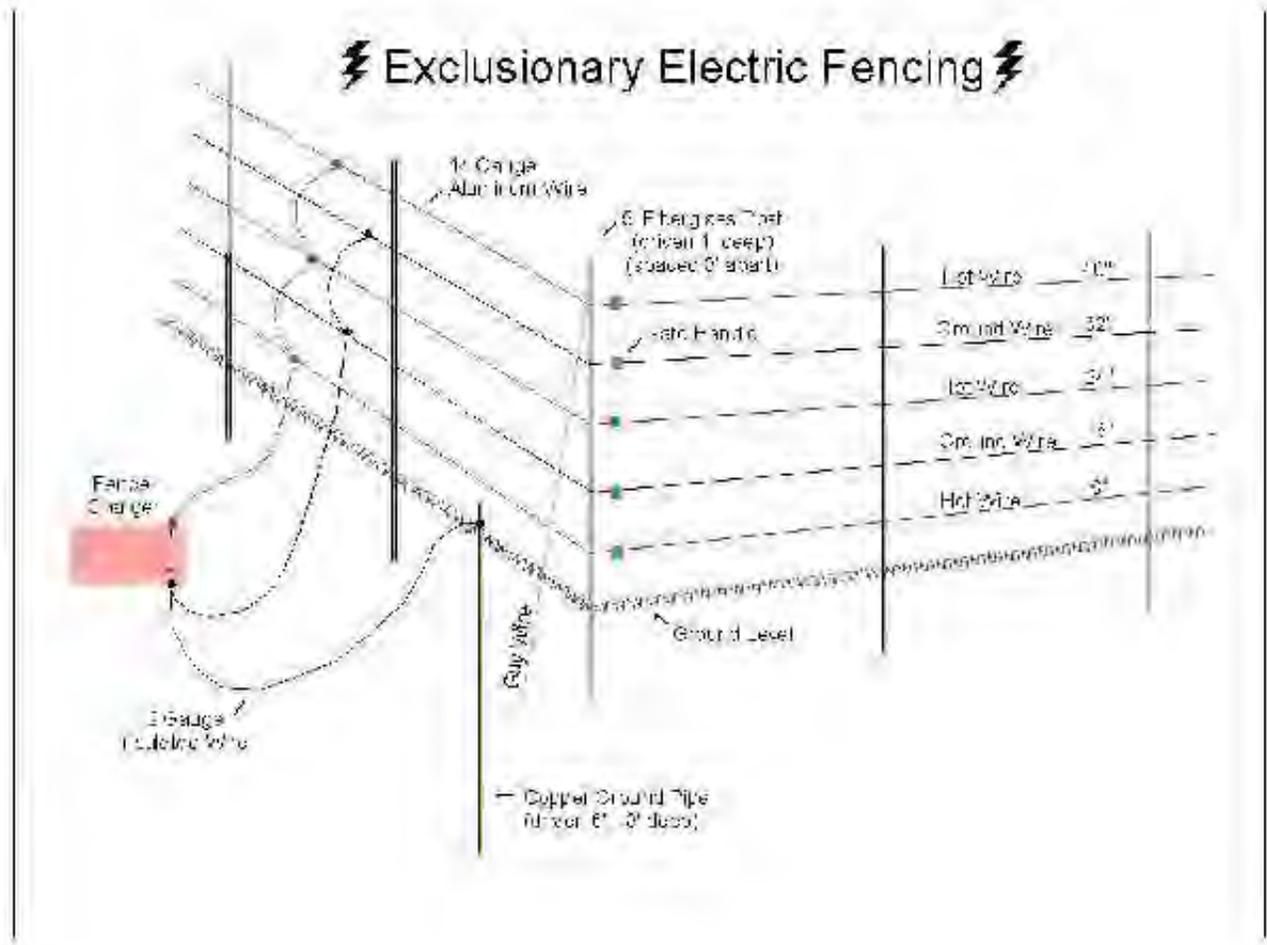
Tips to improve the effectiveness of your electric fence to deter black bears:

1. If using a 12-volt fence charger, ensure that the battery is charged; check every two weeks.
2. Make sure terminals on the charger and battery are free of corrosion.
3. Make sure hot wires are not being grounded out by tall weeds, fallen tree branches, broken insulators, etc.
4. If fence wires have been broken and repaired, make sure wires are corrosion free where they have been spliced together. Also, tighten the fence at each corner post as wires that have been spliced and are loose make poor connections.
5. Be sure to rake vegetation from under and around the outside of the fence as this may act as an insulator.
6. To improve the ground around the perimeter of the fence add a piece of 24 inch chicken wire laying on the ground around the outside of the fence. This should be connected to ground.
7. During periods of drought pour water down the ground pipe and around the ground pipe to improve the ground. Digging a 6 inch deep 6 inch diameter hole around the ground pipe and back filling with rock salt will also improve the ground. Additional ground pipes may also be added to portions of the fence farthest from the charger.
8. To ensure that the bear solidly contacts the charged portion of the fence, a bait like bacon strips, a can of sardines, or tin foil with peanut butter may be attached to one of the top hot wires. Make sure these do not contact the ground, thus shorting out the fence.
9. When protecting a specific structure (like a shed or rabbit hutch), the fence should be placed 3 to 5 feet away from the structure (rather than on it) so that the bear encounters the fence before reaching the attractant.

10. Protect the fence charger from the elements by covering it with a plastic bucket or a wooden box.
11. Place plastic electric fence signs around the perimeter of your fence to improve visibility and to warn other people.

LITERATURE CITED

FitzGerald, James (1984), *The Best Fences*. Storey Publishing Bulletin A-92, Pownal, Vermont. p. 14-16.



AGREEMENT
ATTACHMENT 2

Place Holder for Map

Of

Apiary Locations

At

WMA/WEA

APIARY SITE APPLICATION FORM

Florida Fish and Wildlife Conservation Commission

RETURN TO: The Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600. Please print or type all information. Attach additional sheets if necessary.

Name _____ Telephone Number _____

Mailing Address _____

City or Town _____ County _____ Zip Code _____

Physical Address (If Different from Mailing Address) _____

Company Name: _____

Email Address _____

Requested Wildlife Management or Wildlife and Environmental Area(s)(see attached list of WMA/WEAs with apiary sites):

WMA/WEA _____ County _____ # of Sites _____

WMA/WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

WMA /WEA _____ County _____ # of Sites _____

Planned Number of Hives Per Site: _____ Permanent: ____ Seasonal: ____

Member of Beekeepers Association: Yes ____ No ____

Number of Years a Member _____

Name of Beekeepers Association: _____

Are you registered with Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI): _____ Yes _____ No _____ N/A If yes, please provide proof.

Are you current with any and all special inspection fees: _____ Yes _____ No _____ N/A. If yes, please provide proof.

Do you follow all recommended Best Management Practices from FDACS/DPI?: _____ Yes _____ No

If no, then please explain on a separate piece of paper.

Please provide below a chronological history of your beekeeping experience. If you need more space, please provide additional sheets:

References: If a new apiary contractor, please provide on a separate piece of paper at least 3 references who can verify your apiary experience. Provide each reference's name, address, phone number and email address (if applicable). Please attach reference sheet to this document and submit.

MISSION STATEMENT

**Management
Of
Florida Fish and Wildlife Conservation Commission's
Wildlife Management Areas
And
Wildlife and Environmental Areas**

The mission of the Florida Fish and Wildlife Conservation Commission (FWC) is to manage fish and wildlife resources for their long-term well-being and the benefit of the people. To aid in accomplishing this mission, one of FWC's management goals is to manage fire-adapted natural communities on our Wildlife Management and Environmental Areas (WMA/WEA) to support healthy populations of the plants and animal's characteristic of each natural community. In order to achieve this goal various habitat management techniques are used. These include prescribed burning, applications of herbicides and mechanical treatment of vegetation. These management efforts will take place at various times and locations on each of the FWC's WMA/WEAs. Staff on each WMA/WEA will work with and make users aware of these activities when necessary. Users must be aware and accept that these activities are necessary for the proper management of the area.

Note: This document is included as an attachment with each Application and executed Contract.

FDACS/DPI's BMP

Florida Department of Agriculture & Consumer Services

BEST MANAGEMENT PRACTICES FOR

MAINTAINING EUROPEAN HONEY BEE COLONIES

1. Beekeepers will maintain a valid registration with the Florida Department of Agriculture and Consumer Services/Division of Plant Industry (FDACS/DPI), and be current with any and all special inspection fees.
2. A Florida apiary may be deemed as European Honey Bee with a minimum 10% random survey of colonies using the FABIS (Fast African Bee Identification System) and/or the computer-assisted morphometric procedure (i.e., Universal system for the detection of Africanized Honey Bees (AHB) (USDA-ID) or other approved methods by FDACS on a yearly basis or as requested.
3. Honey bee colony divisions or splits should be queened with production queens or queen cells from EHB breeder queens following Florida's Best Management Practices.
4. Florida beekeepers are discouraged from collecting swarms that cannot be immediately re-queened from EHB queen producers.
5. Florida Beekeepers should practice good swarm-prevention techniques to prevent an abundance of virgin queens and their ready mating with available AHB drones that carry the defensive trait.
6. Maintain all EHB colonies in a strong, healthy, populous condition to discourage usurpation (take over) swarms of AHB.
7. Do not allow any weak or empty colonies to exist in an Apiary, as they may be attractive to AHB swarms.
8. Recommend re-queening with European stock every six months unless using marked or clipped queens and having in possession a bill of sale from an EHB Queen Producer.
9. Immediately re-queen with a European Queen if previously installed clipped or marked queen is found missing.
10. Maintain one European drone source colony (250 square inches of drone comb) for every 10 colonies in order to reduce supercedure queens mating with AHB drones.
11. To protect public safety and reduce beekeeping liability, do not site apiaries in proximity of tethered or confined animals, students, the elderly, general public, drivers on public roadways, or visitors where this may have a higher likelihood of occurring.

12. Treat all honey bees with respect.

RANDOM
SELECTION PROCESS
FOR VACANT APIARY SITE

When an apiary site becomes available the following procedure is used to randomly select the next apiarist (beekeeper) for an available apiary site on a WMA or WEA. Only those who have been evaluated and deemed qualified to be an apiarist on a WMA/WEA through the Apiary Application process will be eligible for this selection process. The steps below will be followed by the THCR Contract Manager when a site becomes available to be filled by a qualified apiarist:

1. The THCR Contract Manager will maintain an “Apiary Wait List Folder” on the THCR SharePoint for each WMA/WEA with apiary sites.
2. A wait list is either created or updated when an Apiary Application(s) is received by the THCR Contract Manager from a qualified apiarist.
3. Upon receipt of an apiary site application, the THCR Contract Manager will review the WMA/WEA folder to see if there is an “Apiary Wait List”.
4. If a list exists then the qualified applicant will be added to the list.
5. When an apiary site becomes available if there are more than one qualified apiarist then these apiarists will be contacted by certified letter to determine their interest.
6. The letter will request a response within 10 working days to make them eligible for the random drawing.
7. If there is no response or is negative then that apiarist will not be included in the random drawing and the name will be removed from the waiting list*.
8. If only one apiarist responds positively to the certified letter then the available site will be awarded to that interested apiarist.
9. If there are no apiarists on a wait list or all responses are negative then apiarists who currently have site(s) under Agreement and where not on the waiting list will be

contacted to see if any have interest in the available site. If more than one responds then the random drawing process will be used to determine who will be awarded the site.

10. Steps to be performed by the THCR Contract Manager to execute the random selection for an available apiary site are listed below:

- a. The names of each interested apiarist will be noted on a 1" X 2" piece of paper and folded in half.
- b. The pieces of paper will be inserted into a "black film canister" which has a snap top and placed into a container and stirred up prior to the selection.
- c. A non-biased person will be selected to reach into the bowl (which will be held above the selection person's eyesight) and randomly select one of the canisters.
- d. The canister will be opened by the person performing the selection and the name is read aloud for those in attendance. Everyone in attendance will sign a witness sheet.
- e. The apiarist whose name is selected will be awarded the available site.
- f. A new Agreement will be developed by the THCR Contract Manager.

*A new apiary application must be submitted once requestor's name is removed from a waiting list.

12.14 Operation Plan Fiscal Year 2018-2019

Fiscal year 2018 Projects: 7246

Activity Title	Man Days	Salary	FuelCost	Other	Total	Units
100 Administration	21.00	\$4,577.58	\$178.50	\$350.00	\$5,106.08	0
101 Project inspection	7.00	\$1,525.86	\$59.50	\$0.00	\$1,585.36	0
103 Meetings	8.00	\$1,743.84	\$68.00	\$235.00	\$2,046.84	0
104 Budget/purchasing/accounting	12.00	\$2,615.76	\$102.00	\$200.00	\$2,917.76	0
128 New Vehicle and Equipment Purchases	2.00	\$435.96	\$17.00	\$18,000.00	\$18,452.96	1
140 Report writing/editing/manuscript preparation	10.00	\$2,179.80	\$85.00	\$0.00	\$2,264.80	0
150 Personnel management	5.00	\$1,089.90	\$42.50	\$0.00	\$1,132.40	0
182 Data management	12.00	\$2,615.76	\$102.00	\$200.00	\$2,917.76	0
185 GIS	6.00	\$1,307.88	\$51.00	\$200.00	\$1,558.88	0
200 Resource Management	10.00	\$2,179.80	\$85.00	\$0.00	\$2,264.80	0
203 Tree and shrub planting	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
206 Prescribed burning - growing season	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
207 Prescribed burning - dormant season	10.00	\$2,179.80	\$85.00	\$500.00	\$2,764.80	560
212 Exotic plant control (chemical)	5.00	\$1,089.90	\$42.50	\$200.00	\$1,332.40	0
219 Upland restoration	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
221 Animal surveys	15.00	\$3,269.70	\$127.50	\$300.00	\$3,697.20	0
235 Vegetation and plant surveys	8.00	\$1,743.84	\$68.00	\$0.00	\$1,811.84	0
263 Nest box monitoring	3.00	\$653.94	\$25.50	\$0.00	\$679.44	30
282 Herbaceous seeding	20.00	\$4,359.60	\$170.00	\$6,000.00	\$10,529.60	25
285 Nest structures	6.00	\$1,307.88	\$51.00	\$500.00	\$1,858.88	12
289 Native vegetation management (mechanical)	20.00	\$4,359.60	\$170.00	\$7,500.00	\$12,029.60	30
290 Native vegetation management (chemical)	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
294 Program coordination and implementation	15.00	\$3,269.70	\$127.50	\$0.00	\$3,397.20	0
295 Biological data collection, analysis, and reporting	10.00	\$2,179.80	\$85.00	\$6,500.00	\$8,764.80	0
311 Boundary signs	7.00	\$1,525.86	\$59.50	\$200.00	\$1,785.36	0
312 Informational signs	10.00	\$2,179.80	\$85.00	\$385.00	\$2,649.80	8
320 Outreach and education	4.00	\$871.92	\$34.00	\$0.00	\$905.92	0
341 Public use administration (hunting)	7.00	\$1,525.86	\$59.50	\$527.00	\$2,112.36	0
342 Public use administration (non-hunting)	13.00	\$2,833.74	\$110.50	\$315.00	\$3,259.24	0
350 Customer service support	5.00	\$1,089.90	\$42.50	\$0.00	\$1,132.40	0
920 FEM -- buildings/structures	15.00	\$3,269.70	\$127.50	\$17,800.00	\$21,197.20	7
921 FEM -- utilities	1.00	\$217.98	\$8.50	\$1,088.00	\$1,314.48	0
922 FEM -- custodial functions	8.00	\$1,743.84	\$68.00	\$500.00	\$2,311.84	0

Activity Title	Man Days	Salary	FuelCost	Other	Total	Unit s
923 FEM -- vehicles/equipment	17.00	\$3,705.66	\$144.50	\$1,500.00	\$5,350.16	3
925 FEM -- boating access	0.00	\$0.00	\$0.00	\$0.00	\$0.00	0
926 FEM -- roads/bridges	24.00	\$5,231.52	\$204.00	\$7,500.00	\$12,935.52	26
927 FEM -- trails	10.00	\$2,179.80	\$85.00	\$500.00	\$2,764.80	10
928 FEM -- fences	8.00	\$1,743.84	\$68.00	\$500.00	\$2,311.84	20
<hr/>						
All totals	334.00	\$72,805.32	\$2,839.00	\$71,500.00	\$147,144.32	732

12.15 Arthropod Control Plan



CHARLES H. BILSONSON
COMMISSIONER

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

Chapters 388.4111, F.S. and 5E-13.042(4)(b), F.A.C.
Telephone: (850) 922-7011

For use in documenting an Arthropod control plan for lands designated by the State of Florida or any political subdivision thereof as being environmentally sensitive and biologically highly productive therein.

Name of Designated Land:
Andrews Wildlife Management Area

Is Control Work Necessary: Yes No

Location:
9550 NW 160th Street, Fanning Springs, Fla. 32693

Land Management Agency:
Florida Fish and Wildlife Conservation Commission

Are Arthropod Surveillance Activities Necessary? Yes No
If "Yes", please explain:

Which Surveillance Techniques Are Proposed?
Please Check All That Apply:

- Landing Rate Counts
- Light Traps
- Sentinel Chickens
- Citizen Complaints
- Larval Clips
- Other

If "Other", please explain:

Arthropod Species for Which Control is Proposed:
N/A

Proposed Larval Control:

Proposed larval monitoring procedure:

Are post treatment counts being obtained:

Yes

No

Biological Control of Larvae:

Might predacious fish be stocked:

Yes

No

Other biological controls that might be used:

Material to be Used for Larviciding Applications:

(Please Check All That Apply.)

Bti

Bs

Methoprene

Non-Petroleum Surface Film

Other, please specify:

Please specify the following for each larvicide:

Chemical or Common name:

Ground

Aerial

Rate of application:

Method of application:

Proposed Adult Mosquito Control:

- Aerial adulticiding Yes No
Ground adulticiding Yes No

Please specify the following for each adulticide:

Chemical or common name:

Rate of application:

Method of application:

Proposed Modifications for Public Health Emergency Control: Arthropod control agency may request special exception to this plan during a threat to public or animal health declared by State Health Officer or Commissioner of Agriculture.

N/A

Only in extreme circumstances, the state might offer to bring helicopter in to spray or have us spray.

Proposed Notification Procedure for Control Activities:

N/A

Records:

Are records being kept in accordance with Chapter 388, F.S.:

- Yes No

Records Location:

How long are records maintained:

Vegetation Modification:

What trimming or altering of vegetation to conduct surveillance or treatment is proposed?
None

Proposed Land Modifications:

Is any land modification, i.e., rotary ditching, proposed?
None

Include proposed operational schedules for water fluctuations:
None

List any periodic restrictions, as applicable, for example peak fish spawning times.

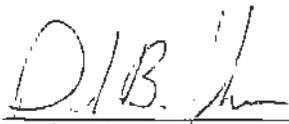
Proposed Modification of Aquatic Vegetation:

None

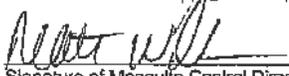
Land Manager Comments:

Andrews Wildlife Management Area is located in a rural area adjacent to the Suwannee River and no controls are needed.

Arthropod Control Agency Comments:

 9/1/11

Signature of Lands Manager or Representative Date



Signature of Mosquito Control Director / Manager Date

12.16 Levy County Letter of Compliance with Local Government Comprehensive Plan



LEVY COUNTY
BOARD OF COUNTY COMMISSIONERS

Planning Department
PO BOX 930
Bronson, Florida 32621
Office (352) 486-5405 / Fax (352) 486-5549

April 18, 2019

Mr. Lance Jacobson
Conservation Planner
Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Land Conservation and Planning

Re: Andrews WMA Management Plan 2019 - 2029

Dear Mr. Jacobson:

Levy County is pleased to provide a review of the Florida Fish and Wildlife Conservation Commission's Andrews Wildlife Management Area (AWMA) Management Plan. Planning Department staff finds that the AWMA Management Plan is in compliance with the Levy County 2026 Comprehensive Plan.

Thank you for the opportunity to contribute and to review the proposed management plan. If you have questions or need additional information, we can be reached at (352) 486-5405 M-F 8:00AM - 4:30PM.

Sincerely,

A handwritten signature in black ink that reads "Shenley Neely".

Shenley Neely, Planning Director

12.17 AWMA WCPR Strategy

Andrews Wildlife Management Area Species Management Strategy

December 2013

Florida Fish and Wildlife Conservation Commission
Division of Habitat and Species Conservation
Wildlife and Habitat Management Section

A product of the Wildlife Conservation,
Prioritization, and Recovery Program



Executive Summary

The Florida Fish and Wildlife Conservation Commission's (FWC) Wildlife and Habitat Management Section (WHM) takes a proactive, science-based approach to species management on lands in the Wildlife Management Area system (WMA/WEA). This approach uses information from statewide models, in conjunction with input from species experts and people knowledgeable about the area, to create site-specific wildlife assessments of a number of focal species. Staff combines these assessments with management considerations to develop a wildlife management strategy for the area (most game management is addressed in another document). The FWC intends for this Strategy to: 1) Provide land managers with information on actions that should be taken provided the necessary resources are available, 2) Promote the presence of and ensure the persistence of focal wildlife species on the area, and 3) Provide measurable species objectives that can be used to evaluate the success of wildlife management on the area.

This document presents the results of a science-based process for evaluating focal species needs using an ecosystem management approach on the Andrews Wildlife Management Area (AWMA). Natural community management focused on a set of focal species benefits a host of species reliant upon the same natural communities. Monitoring select species verifies whether natural community management is having the desired effect on wildlife. To maximize the potential benefit to conservation, staff considered the role of AWMA in regional and statewide conservation initiatives throughout the process.

[Section 1](#) informs the reader about the process used to generate this document.

[Section 2](#) describes the historic and ongoing management actions on the property.

[Section 3](#) provides a list of the focal and listed species on the area, and an assessment of each species' level of opportunity and need. This includes species-specific objectives for the gopher tortoise and Florida mouse.

[Section 4](#) describes specific land management actions recommended for focal species. This section also discusses management considerations necessary to ensure continued persistence of focal species.

[Section 5](#) describes species-specific management and monitoring prescribed for the area. For this area, we discuss species management for the southeastern myotis, and monitoring recommended for the gopher tortoise, southeastern myotis, and Florida mouse. Documentation of opportunistic encounters with other focal species is recommended.

[Section 6](#) identifies coordination that will assist in conserving these focal species. We identify coordination with 5 other units in the FWC and inter-agency coordination with 3 other entities.

[Section 7](#) describes efforts that are prescribed to occur "beyond the area's boundaries" to ensure conservation of the species on the area.

Continuation of current resource levels would be required to provide for most of the land management recommended in this document. The FWC will use a combination of private sector contract work and efforts of area staff to accomplish these activities. Some of the monitoring recommendations may require additional resources, while FWC can accomplish others with continuation of existing resources.

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Acronym List

ARCI	Avian Research and Conservation Institute
AWMA	Andrews Wildlife Management Area
BMU	Bear Management Unit
CCA	Candidate Conservation Agreement
CPS	Conservation Planning Services (office; formerly Habitat Conservation Scientific Services)
DFC(s)	Desired Future Condition(s)
FFS	Florida Forest Service (formerly Division of Forestry)
FNAI	Florida Natural Areas Inventory
FSSP	Fanning Springs State Park
FWC	Florida Fish and Wildlife Conservation Commission
FWLI	Florida Wildlife Legacy Initiative
FWRI	Fish and Wildlife Research Institute
HGM	Division of Hunting and Game Management
ISMP	Imperiled Species Management Plan
LSNWR	Lower Suwannee National Wildlife Refuge
MU(s)	Management Unit(s)
OBVM	Objective Based Vegetation Management
PLCP	Public Lands Conservation Planning (project)
PVA	Population Viability Analysis
SaMP	Survey and Monitoring Protocol database
SAP	Species Action Plan(s)
SCP	Species Conservation Planning (section)
SGCN	Species of Greatest Conservation Need
SHCA	Strategic Habitat Conservation Area
SMA	Strategic Management Area
SRWMD	Suwannee River Water Management District
USFWS	United States Fish and Wildlife Service
WCPR	Wildlife Conservation Prioritization and Recovery
WHM	Wildlife and Habitat Management (section)
WMA	Wildlife Management Area

Statewide Species Prioritization Parameters

This table provides the values for the 6 prioritization parameters for the focal species. Parameters that are “triggered” (exceed the threshold) are in **bold**. Typically, the more parameters a species triggers, the higher the statewide prioritization.

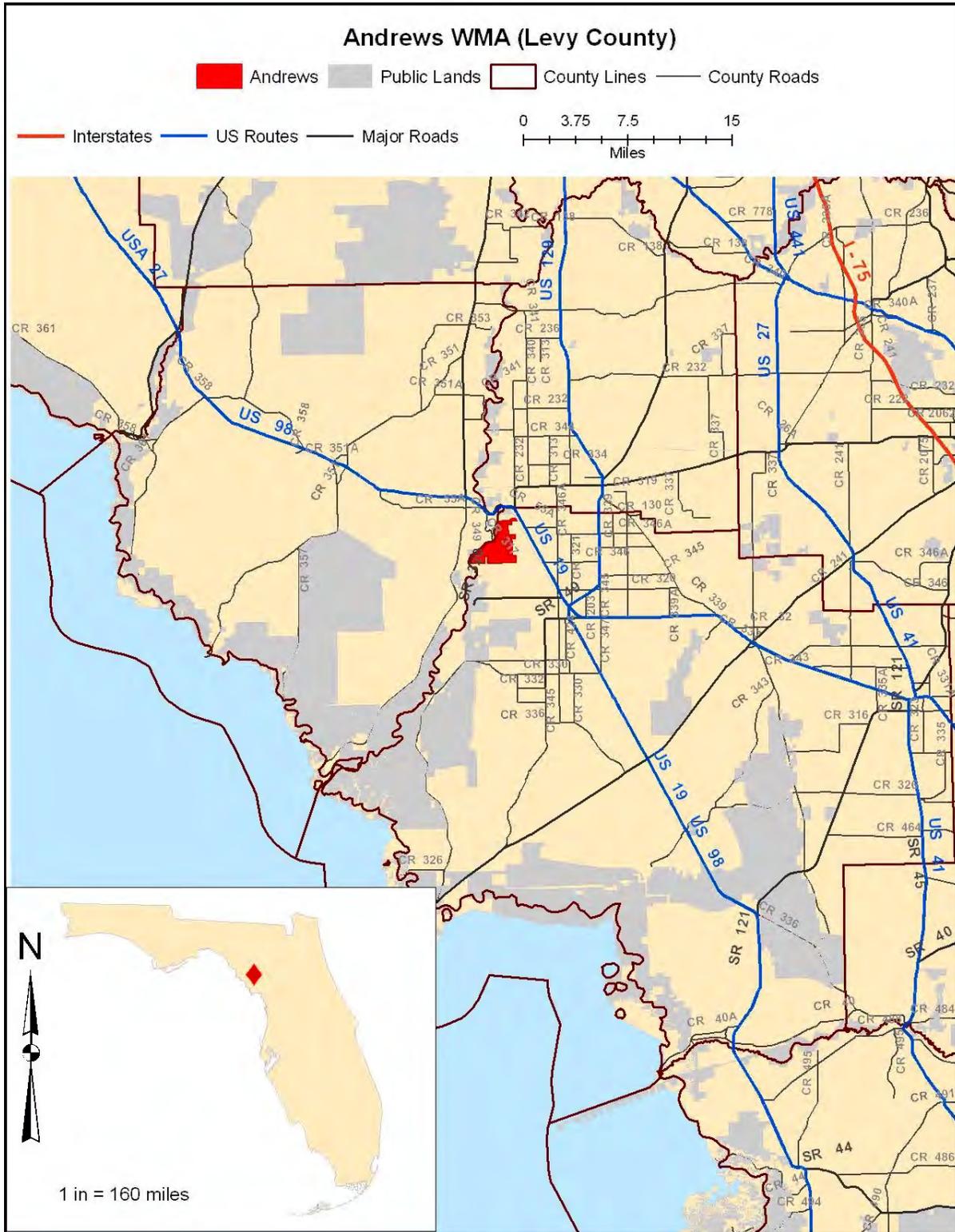
Species Common Name	Millsap et al ¹		Wildlife Action Plan ²		PVA on managed lands	
	Biological Score ³	Supplementa 1 Score ⁴	Population Status ⁵	Population Trends ⁶	Probability of a 50% decline ⁷	Populations persisting (to 80 or 100 years) ⁸
Florida Pine Snake	23.7	15	medium	declining	0	31% (to 80)
Gopher Tortoise	27.3	17	medium	declining	0	55% (to 100)
American Swallow-Tailed Kite	25.7	13	low	unknown	20%	50% (to 100)
Bachman's Sparrow	16.0	12	medium	declining	0	49% (to 80)
Brown Headed Nuthatch	17.0	13	medium	declining	0	25% (to 80)
Cooper's Hawk	15.0	12	not a SGCN ⁹	not a SGCN	96%	100% (to 100)
Northern Bobwhite	11.0	14	low	declining	0	100% (to 100)
Limpkin	24.3	14	medium	unknown	0	100% (to 100)
Short-tailed Hawk	30.6	15	low	unknown	65%	50%(to 100)
Southeastern American Kestrel	28.0	14	low	declining	0	67% (to 100)
Southern Bald Eagle	21.3	10	medium	increasing	0	100% (to 100)
Wading Birds	23.7	13	varying	varying	0	100% (to 100)
Florida Mouse	22.0	19	medium	declining	74% (in 83 yrs)	17% (to 65)
Sherman's Fox Squirrel	24.0	17	low	declining	0	28% (to 80)
Southeastern Myotis	22.6	16	medium	stable	5%	100% (to 100)
Gopher Frog	24.6	12	medium	declining	0	9% (to 80)
Florida Black Bear	32.7	13	medium	stable	5%	100% to (100)

¹ scores derived from Millsap et al, (1990) “Setting priorities for the conservation of fish and wildlife species in Florida”, as updated by staff of the FWC. We use the most recent updates to score.

² [Florida's State Wildlife Action Plan](#).

- ³ Species trigger this parameter if the score is ≥ 25.9
- ⁴ Species trigger this parameter if the score is ≥ 15
- ⁵ Species trigger this parameter if the score is low or unknown
- ⁶ Species trigger this parameter if the score is declining or unknown
- ⁷ Species trigger this parameter if the score is > 0
- ⁸ Species trigger this parameter if the score is $\leq 75\%$
- ⁹ SGCN = species of greatest conservation need

Locator Map



Section 1: Introduction

The FWC manages the lands in the Wildlife Management Area system using a proactive approach, which includes an understanding of natural communities of plants and animals. As applied by FWC, natural community management starts by classifying lands into distinct natural communities that we then manage in a way that maintains or enhances the communities' unique structure and function. This ecological management of natural communities improves and restores the habitats upon which wildlife depends. Natural community management that has a positive influence on the natural community condition benefits the wildlife living in these habitats.

Another important aspect of FWC's management approach is ensuring that it is science-informed and meets the needs of Florida's wildlife. The agency's Wildlife Conservation, Prioritization, and Recovery Program (WCPR) created this Species Management Strategy for AWMA to inform and guide management on the area, and to verify that area management is meeting the needs of wildlife. The FWC intends for this Strategy to: 1) provide land managers with information on management actions that should be taken provided the necessary resources are available; 2) promote the presence and facilitate the persistence of wildlife species on the area; and 3) provide measurable objectives that can be used to evaluate the success of wildlife management on the area.

When developing a Strategy, WCPR staff utilizes concepts that facilitate the analysis and evaluation of an area's opportunities to manage for wildlife. The [focal species](#) concept is an approach to identify the needs of wildlife collectively by strategically focusing on a subset of wildlife species. The subset of species FWC selected as focal species includes umbrella species, keystone species, habitat specialist species, and indicator species. Other concepts in a Strategy include Objective Based Vegetation Management and Strategic Management Areas. [Objective Based Vegetation Management](#) (OBVM) is a method used to assess if vegetation management within natural communities is achieving the desired conditions. A [Strategic Management Area](#) (SMA) is a specially designated piece of land where additional management actions are required to address a particular species' needs.

In addition to the concepts discussed above, we use specific definitions in a Strategy. *Goals* are broad statements of a condition or accomplishment to be achieved; goals may be unattainable, but provide direction and inspiration. *Objectives* are a measurable, time-specific statement of results responding to pre-established goals. *Imperiled Species* refers to any plant or animal federally listed under the Endangered Species Act, or state-listed by the Florida Fish and Wildlife Conservation Commission or the Department of Agriculture and Consumer Services.

Creating the AWMA Strategy involved a number of steps. First, staff assessed the results of species-specific habitat models and statewide potential habitat maps for focal species to determine which focal species had potential habitat on AWMA. We then used staff knowledge, species-expert opinions, and area-specific natural community maps, to modify the statewide

models to create area-specific potential habitat maps for each focal species on the area. Next, we conducted a workshop at which local staff, species experts, and section leaders discussed and evaluated AWMA's potential role in the conservation of focal species. For each species, workshop participants determined the status of the species on the area; evaluated the opportunities for management on the area; specified appropriate monitoring and research actions; and identified beneficial coordination and 'beyond the boundary' considerations. Using the information from the workshop, staff drafted the Strategy document and sent it to species experts and other professionals for review. Following the review, the Strategy was finalized and staff initiated implementation of actions in the Strategy.

Staff considered the goals and objectives in AWMA's Management Plan (formerly known as Conceptual Management Plan) when discussing and assessing the species; therefore, this Strategy supports the goals of the Management Plan. Management plans are on a 10-year revision cycle. During the next revision of the Management Plan, staff will incorporate the objectives in this Strategy into the Management Plan, and append this Strategy to the revised Management Plan.

While this Strategy focuses on AWMA, it considers the role of the area within the larger state or regional context. Similarly, while the Strategy has species-specific objectives and actions, it does not endorse single-species management. Natural community management is the core of FWC's ecological management approach, and by paying special attention to the needs of focal and imperiled species, we verify that our management actions are having the desired effect. By implementing the actions in the Strategy, the FWC believes our management will keep common species common, aid in the recovery of listed species, and benefit the largest suite of native wildlife.

Section 2: Current and Historic Management on Andrews Wildlife Management Area

2.1: Location, Acquisition, and Influences on Current Condition

Andrews Wildlife Management Area (AWMA) comprises 3,582 acres in western Levy County between Fanning Springs and Chiefland. The Suwannee River forms the western boundary, and Fanning Springs State Park (FSSP) borders AWMA to the north. AWMA is 5 miles north of Chiefland, less than 1 mile south of Fanning Springs, and approximately 2.5 miles southeast of Old Town.

The primary land uses adjacent to AWMA are agriculture and silviculture. Residential subdivisions are located near the northern boundary. Although these are low-density developments, this type of land use is increasing in the surrounding areas, especially on lands along the Suwannee River to the north and south of AWMA.

The location of AWMA along the Suwannee River places it in a corridor of conservation lands. Lower Suwannee National Wildlife Refuge (LSNWR) covers 53,000 acres from the Gulf of Mexico upstream approximately 16 miles on the east bank and 22 miles on the west bank of the Suwannee River. Manatee Springs State Park (2,500 ac) is between LSNWR and AWMA on the east bank of the Suwannee River and FSSP (200 ac) is north of AWMA. The Suwannee River Water Management District (SRWMD) owns or holds conservation easements on an additional 5,500 acres along the river. For many wide-ranging species, especially birds, these adjacent lands help support regional populations.

In the early 1900s, the land that later became AWMA was subject to a wide range of uses, including open range livestock grazing, recreational hunting and fishing, and logging. Feral hogs (*Sus scrofa*) readily adapted to the habitat and are still present on AWMA. In 1945, the Andrews family purchased the area. They managed the land for outdoor recreation and were careful to protect natural resources. Limited weekend hunts were held for white-tailed deer (*Odocoileus virginiana*), wild turkey (*Meleagris gallipavo*), and gray squirrel (*Sciurus carolinensis*). To provide wildlife food plots, the Andrews family created 4 five-acre clearings in the upland hardwoods, and scattered roadside openings. Following storm damage, a small section of uplands was planted to slash pine (*Pinus elliottii*) in the early 1960s. No mining or significant timber harvest occurred during the time of the Andrews' family ownership. The stewardship of the Andrews family provided an opportunity for the State of Florida to conserve a unique and valuable part of the Suwannee River watershed in relatively pristine condition.

In 1985, the Department of Environmental Protection (DEP), with assistance from The Nature Conservancy, used Conservation and Recreation Lands (CARL) funds to acquire the 2,922 acres of uplands that were established as part of AWMA. The CARL program was established in 1979 to acquire environmentally endangered lands for preservation and natural resource based recreation; it was funded principally from the documentary stamp tax and severance taxes on phosphate rock. The CARL program was succeeded by the Preservation 2000 program and then the Florida Forever program, both of which have land acquisition purposes similar to those of the CARL program.

The high intrinsic wildlife value, relatively unspoiled mature hardwood forest, and the importance of the area's floodplain to the Suwannee River were primary reasons for acquiring AWMA. The tract is one of the very few remaining large contiguous areas of old growth hardwood forest in Florida. The primary management intent for AWMA, as expressed in the CARL assessment, is the following: (1) to provide protection to significant ecological and historical components, and (2) to manage the area's intrinsically high floral and faunal resources for public outdoor recreation. It was further recommended that: (1) outdoor recreation be emphasized and major efforts directed toward "protecting the pristine state of the mature hardwood forest," and (2) the area be managed as "a high-quality, resource-based natural area where wild plants and animals are the feature attraction."

Also in 1985, the SRWMD used Save Our Rivers (SOR) funds to acquire the 576 acres of floodplain that are now part of AWMA. The SOR program was approved in 1981 and established as the Water Management Lands Trust Fund. Funds for the SOR land acquisition program are generated from the documentary stamp tax on properties purchased in Florida, and its funds are specifically designed for the purchase of environmentally sensitive riverine lands.

In 1995, the Florida Game and Freshwater Fish Commission (now FWC) used funds from the Preservation 2000 Inholdings and Additions program to acquire 3.3 acres of an existing AWMA inholding. Additionally, FWC acquired an 80-acre parcel in 2008 under the FWC Florida Forever Inholdings and Additions Program. Other adjacent lands have been nominated for acquisition under the same program.

The Andrews family maintains 2 life estates on AWMA (1.9 acres and 2.8 acres). There is a 160-acre area within AWMA where the Andrews family retains the hunting rights for the duration of Mr. Dennis Andrews' lifetime. Additionally, there is an easement for ingress and egress to Mr. Andrews and Timber Development, Inc. These reserved areas are closed to public hunting, but do not have a significant impact on the management of AWMA.

2.2: Management Since State Acquisition

The FWC focuses management activities on AWMA on managing for native habitat, emphasizing maintenance of high-quality natural communities, and restoration of disturbed areas, excluding existing wildlife openings. The AWMA's old-growth hardwood forest has not been appreciably altered during the past 70 to 80 years. This vegetative association is important to a variety of wildlife species and represents a relic of Florida hammock. Retention of the native old growth component of forests while also providing for natural regeneration remains an important consideration, particularly the upland hardwood natural community. Habitat manipulation by mechanical means is restricted to existing wildlife openings, pine plantations, service road margins, and their associated agricultural plantings.

The Florida Natural Areas Inventory (FNAI) completed natural community mapping at AWMA in 2004. No historic mapping was done at the time since managers believed the majority of the property has not been converted from its historic natural community. Based on the 2004 mapping effort, approximately 540 acres were classified as xeric hammock. A land management review in 2009 suggested that further evaluation was needed to determine if the historic natural communities included sandhill and/or upland mixed woodland, and if so, the extent of these natural communities. Recertification mapping of the natural communities completed in January 2013 revised the natural communities map to include upland mixed woodland in areas previously mapped as xeric hammock ([Table 1](#)). According to FNAI, some of the upland mixed woodland on the extreme eastern edge historically would have been sandhill. The 80-acre parcel acquired in 2008 is currently a mixed plantation of slash and longleaf (*Pinus palustris*) pine. Historic natural community mapping on this 80 acres identifies it as sandhill.

Sandhill and upland mixed woodland communities have similar fire regimes and differ primarily in the composition and coverage of hardwood trees and shrubs. The southeast corner of AWMA falls along the transition zone between these natural communities. Continued use of prescribed fire in this area will result in a gradual transition between these communities, dictated by edaphic conditions and other natural factors. Staff identified 9 management units (MUs) on the property, each containing one or more natural communities. All actively managed communities fall within MUs 5,7,8,9. All the restoration activities are contained in MUs 8 and 9.

Table 1. Mapped acreage of current plant communities on AWMA, including management status and number of focal species that use the community.

Community Type	Estimated Current Acreage	# of focal species that use the NC
Abandoned Field/Abandoned Pasture	9	10
Clearing/Regeneration	23	10
Developed	1	0
Floodplain Forest	147	7
Floodplain Swamp	321	6
Pine Plantation (Historic Sandhill) ¹	80	13
Restoration Upland Mixed Woodland ¹	38	13
Upland Hardwood Forest	2,329	4
Upland Mixed Woodland ¹	541	7
Xeric Hammock	65	3
TOTAL ACRES²	3,554	

¹ Communities that are actively managed with prescribed fire.

² The total acres identified in the lease differs from the total acres identified during the mapping effort. This is possibly due to a combination of digitizing error and complications in determining actual boundaries.

In 2008, Pandion Systems Inc. surveyed for exotic plant occurrences. The survey included surveys within 50 feet of road margins and using 20 meter transects in the floodplain. The survey did not detect any Florida Exotic Pest Plant Council Category I and II plants on the road margins. Three invasive exotic plants were located in the floodplain: 2 Chinese tallow plants (*Triadica sebifera*) and a single tropical soda apple plant (*Solanum viarum*). All invasive exotic plants encountered were treated and killed. Subsequent surveys by staff have found and eliminated tropical soda apple plants in the southeast portion of the area and a small patch of cogon grass (*Imperata cylindrica*) in the newly purchased pine plantation. Japanese climbing

fern (*Lygodium japonicum*) was found in 2009 in a small area of floodplain swamp along the Suwannee River and is being treated whenever water levels allow.

2.2.1: Sandhill and Upland Mixed Woodland Restoration

Past silvicultural activities altered two areas on AWMA and FWC staff plan to restore these areas to the historic natural communities of sandhill and upland mixed woodland. The first stand is 33 acres that FNAI mapped as historically being upland mixed woodland, which the previous landowner converted to a slash pine plantation. In 2008, this stand was clear-cut after a pine beetle outbreak damaged the stand. After clearing, the stand was burned to reduce logging slash and promote recovery of native groundcover. Prior to 2008, the closed canopy and lack of fire appears to have suppressed the native ground cover. Staff has since observed that the ground cover responded to the removal of the canopy and the re-introduction of fire, and appears to be recovering.

Based on the recommendations of a Florida Forest Service (FFS) timber assessment conducted in 2011, staff replanted the clear-cut with longleaf pines in 2011 at a rate of 500 trees per acre. A survival check conducted in March 2013 estimated average survival to be 203 longleaf per acre. This is a low density for establishing a longleaf stand, but is sufficient for managing this stand without supplemental planting. The only restoration activity planned in this stand is the continued use of prescribed fire to control excessive hardwood regeneration and promote herbaceous ground cover.

The other altered area is the recently acquired 80-acre pine plantation that FNAI mapped as historic sandhill. The plantation contains densely planted slash pine on the northern half and densely planted longleaf pine on the southern half, with some mixing of the species in the middle. Based upon aerial photographs taken of the plot, the plantation was planted from 1995-1996. The FFS completed a timber assessment on the plantation in 2011 and recommended clear-cutting the slash pines and thinning the longleaf when sufficient volume is available to attract timber buyers. The assessment recommends that the timber harvest be followed with the planting of longleaf pine at 500 trees per acre in the newly clear-cut area.

Area and regional staff agree with most of the assessment. However, area staff plans on thinning both the slash pine and longleaf pines. Retaining some of the slash pines in the stand will ensure a source of needle cast that will facilitate prescribed burning. Additionally, retaining some slash pines will provide vertical structure for wildlife. Prescribed fires applied to the pine plantation will control midstory shrubs will cause mortality in stressed or diseased pines, which will promote herbaceous ground cover.

The goal is to restore both of these altered areas to their original natural communities. To meet this goal, staff will continue to apply prescribed fire, conduct silvicultural treatments, and plant trees and ground cover species as needed to restore these communities. To facilitate successful restoration, the measurable objective is:

1. Complete a restoration plan by 2016 that guides management activities within the 113-acres of silviculturally-altered land.

Prescribed fire is critical to the restoration of the sandhill and other upland communities. Currently AWMA has approximately 600 burnable acres that include historic sandhill and upland mixed woodland ([Table 1](#)). Xeric hammock and ruderal areas that will not carry fire account for approximately 91 acres. The xeric hammock will be retained where it historically occurred and in some areas where the hammock has matured to the point that restoration would be extremely costly. As staff applies prescribed fire to restored areas, fire will be allowed to burn into the xeric hammock. Fire will be the primary tool that influences the extent of xeric hammock over time.

A prescribed burn plan developed in 2011 provides guidance to staff when developing annual prescribed burning goals. Staff has burned 600 acres (518 growing season; 82 dormant season) since acquisition. Staff plans to increase prescribed burning to establish a 1-3 year fire return interval for sandhill and a 3-5 year interval in upland mixed woodland. Growing season burns (April-September) are preferred to maximize control of understory shrubs and hardwoods, but dormant season burning is used as necessary to meet management objectives or maintain desired fire frequency.

2.3 Monitoring Since State Acquisition

Staff used the mitigation park gopher tortoise (*Gopherus polyphemus*) burrow survey protocol on the 80-acre pine plantation in 2010. The survey recorded 194 active and inactive burrows yielding an estimate of 1.5 tortoises per acre, based on the correction factor used in mitigation park surveys.

In 1989-90, staff conducted a pilot survey for herpetofauna and mammals in the xeric hammock. The survey detected 12 species of reptiles and 5 species of amphibian, but none were federally listed species or WCPR focal species. The short-tailed snake (*Lampropeltis extenuatum*), state listed as threatened, was captured in an array and one was captured while checking traps. Trapping efforts documented 2 small mammals [golden mouse (*Ochrotomys nuttalli*) and cotton mouse (*Peromyscus gossypinus*)] and 3 meso-mammals [Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and gray fox (*Urocyon cinereoargenteus*)]. No state or federally listed mammalian species and no WCPR focal species were detected.

The FNAI conducted a herpetological survey using drift fences, funnel traps, and pitfalls in 2006-07. The survey detected 16 species of reptiles and 9 species of amphibian, but none were state or federally listed species or WCPR focal species. The eastern diamondback rattlesnake (*Crotalus adamanteus*), which is currently a candidate for federal listing, was captured in 2 arrays.

Staff conducted a small mammal survey in 2007-08 using the sites FNAI surveyed for herpetofauna in 2006-07. The survey documented 5 species of rodents in 2,142 trap nights. The cotton mouse was the most common species trapped (n=58). Florida mouse (*Podomys floridanus*), eastern woodrat (*Neotoma floridana*), and eastern harvest mouse (*Reithrodontomys humulis*) were each documented once. The Florida mouse, a WCPR focal species, was the only rare species caught and was documented at an upland hardwood site. In the floodplain forest, the oldfield mouse (*Peromyscus polionotus*) was an unexpected capture, as was the eastern harvest mouse. Additionally staff documented a least shrew (*Cryptotis parva*) while driving between surveys during the spring trapping season.

Ecosystem Research Corporation surveyed for [rare plants](#) on AWMA in 1994, and identified one state listed species, Florida spiny pod (*Matelea floridana*), as well as 4 species that are commercially exploited. Additional locations of Florida spiny pod have been documented during natural community mapping surveys. These locations are avoided when conducting management activities that may be detrimental, such as mowing or road maintenance. Although no formal monitoring for rare plants occurs, known locations are periodically checked to confirm persistence.

Section 3: Focal Species

The FWC's management approach focuses on maintaining and restoring the ecological form and function of natural communities. However, in some instances, it is important to consider the needs of specific wildlife species and to monitor the influences of natural community management on these species. To achieve a science-informed approach to species management, the FWC uses the focal species concept embraced by the [Wildlife Habitat Conservation Needs in Florida](#) project. This concept allows one to identify the needs of wildlife collectively by strategically focusing on a subset of wildlife species. The subset of species selected includes umbrella species, keystone species, habitat specialist species, and indicator species.

The Public Lands Conservation Planning (PLCP) project, an expansion of the Wildlife Habitat Conservation Needs in Florida project, added a few species and provided potential habitat modeling on public lands. For the PLCP, the FWC selected 60 focal species (including 1 group of species, the wading birds) for which potential habitat models were created to generate statewide potential habitat maps for each focal species. The FWC's 2003 landcover data served as the base layer for all potential habitat models, and staff selected additional layers considering the particular natural history of each species (e.g., species' range, known occurrence records); as such, each model is species specific. Once statewide potential habitat maps were completed, a Population Viability Analysis (PVA) was conducted for each focal species.

The statewide landcover-based habitat models identified 15 of the 60 focal species to have potential habitat on AWMA ([Section 3.1](#)). Two species, the Florida mouse and short-tailed

hawk are not identified by the PLCP to have potential habitat on AWMA, but have been documented on AWMA by staff (Florida mouse) or near AWMA by species experts (short-tailed hawk). For all focal species modeled to have potential habitat on the WMA, staff created more accurate area-specific potential habitat maps by using the same statewide models but replacing the landcover data with area-specific natural community data. The resulting area-specific potential habitat maps were then refined based on the input of local managers and species experts.

The WCPR Workshop for AWMA held April 18-19, 2013, brought decision makers together to assess species' opportunities and needs, identify measurable objectives, outline necessary coordination efforts, and determine required actions such as monitoring. To facilitate informed discussion of the species, WCPR staff compiled a workbook that contained information on the focal species. Participants at the workshop discussed the "level of opportunity and need" for each species. This included considering the number of statewide prioritizations the species triggered ([Statewide Species Prioritization Table](#)), the species' listing status, and the long-term security of the species (i.e., examining PVA results). Other factors considered were the species' use of actively managed communities ([Table 1](#)), species' response to management, and any local overriding factors (e.g., status of species in the region, local declines or extirpations). A brief summary of the opportunity and need assessments for each focal species is available in [Section 3.2](#).

3.1: Andrews WMA Focal Species List

Workshop participants assessed 17 species for their level of opportunity or need on AWMA. In the following species list, we use a ¹ to denote species for which a measurable objective is identified, a ² for species for which some level of monitoring is recommended, and a ³ for species for which species management is recommended. Occasionally, statewide models indicate a species has potential habitat on the area, but the local assessment indicates there is little opportunity to manage for these species. These [limited opportunity species](#) are denoted with an *. Except for those species identified with a number, workshop participants and expert reviewers determined that ongoing management would meet the needs of the species. Therefore, for species with no numerical superscripts, participants and reviewers agreed there is no need for measureable objectives, monitoring, SMAs, or species-specific management.

Gopher frog (*Lithobates capito*) *

Florida pine snake (*Pituophis melanoleucus mugitus*)

Gopher tortoise (*Gopherus polyphemus*)^{1, 2}

American swallow-tailed kite (*Elanoides forficatus*)

Bachman's sparrow (*Peucaea aestivalis*)
Brown-headed nuthatch (*Sitta pusilla*)
Cooper's hawk (*Accipiter cooperii*)
Limpkin (*Aramus guarauna*)
Northern bobwhite (*Colinus virginianus*)
Short-tailed hawk (*Buteo brachyurus*)
Southeastern American kestrel (*Falco sparverius paulus*)
Southern bald eagle (*Haliaeetus leucocephalus*)
Wading birds (Multiple species)

Florida black bear (*Ursus americanus floridanus*)*
Florida mouse (*Podomys floridanus*)^{1,2}
Sherman's fox squirrel (*Sciurus niger shermani*)
Southeastern myotis (*Myotis austroriparius*)^{2,3}

3.2: Focal Species Opportunity/Needs Assessment

This section provides an assessment of the opportunities for management, and the needs of each of the focal species. The assessment considers a number of attributes, including the status of a species, the number of prioritization parameters it triggers, the species' response to management, and the amount and spatial arrangement of species' potential habitat available on the area. Because all species listed by the United States Fish and Wildlife Service (USFWS) are FWC-listed, we will provide only the federal listing status for federally listed species. When a species is not federally listed but is FWC-listed, we will provide the FWC listing status. The FWC is currently in the process of developing an Imperiled Species Management Plan (ISMP) for FWC-listed species. The first phase of the ISMP process is the development of individual Species Action Plans (SAP). Staff will review these plans and if warranted, will revise this Strategy accordingly.

Unless otherwise noted, all reported acres of potential habitat are the result of using the area-specific natural community data in the species' potential habitat model. These estimates include all the area mapped in a natural community identified as potential habitat including patches that may not be contiguous with other suitable habitat. During the workshop, participants considered the spatial arrangement and habitat patch size when assessing the potential role AWMA plays in the conservation of each species. For species that require larger habitat patches, we considered the continuity and condition of habitat on lands adjacent to the WMA.

3.2.1: Florida Pine Snake

The Florida pine snake is not documented to occur on AWMA. Drift fence surveys in 1988 and 2006-07 did not detect the species, but drift fences are not the most effective technique

for capturing large-bodied snakes like the Florida pine snake. Pine snakes have been documented nearby in Dixie, Gilchrist, and Levy counties, so it is likely the species uses AWMA.

There is little information about the specific habitat requirements of this species, except it is most closely associated with upland pine and sandhill communities. Pine snakes typically occupy locations on sandy soils dominated by pines and a well-developed grassy understory, though they have been documented in a number of plant communities. Southeastern pocket gophers (*Geomys pinetis*) are a preferred prey item. Florida pine snakes commonly use pocket gopher burrows, but also may be found in stump holes and, occasionally in gopher tortoise burrows. Southeastern pocket gopher burrows are evident in the southeast corner of AWMA and on adjacent pasture.

The Florida pine snake triggers 3 of 6 prioritization parameters ([priorities table](#)) and is an FWC-listed species of special concern. Based on a recent biological status review, the FWC will classify the pine snake as a threatened species after approval of the ISMP currently in development. A SAP is currently under development for the Florida pine snake.

Models identified 864 acres of Florida pine snake potential habitat on AWMA. According to the literature, pine snakes and indigo snakes have similar home range sizes, and at least 2,471 acres of suitable habitat are required to support a viable population of pine snakes. While AWMA cannot in isolation support a viable population, AWMA has enough potential habitat to significantly contribute to the local population. Potential habitat on AWMA is in fair to good condition, and planned restoration of upland mixed woodland and sandhill natural communities will provide further benefits to this species. Potential habitat on adjacent privately owned property is also in fair to good condition. Because there is not enough habitat on AWMA to support a population, the persistence of the Florida pine snake on AWMA will depend on management decisions made by these private landowners. We recommend coordination with Conservation Planning Services (CPS) staff to facilitate cooperation with surrounding landowners ([Section 6.1.4](#)) to help ensure AWMA remains connected to the regional pine snake population.

Management actions that maintain or enhance habitat for this species include prescribed fire and ground cover restoration treatments that aid in restoring sandhill and associated natural communities. Stumps and other coarse woody debris should be retained during land management activities ([Section 4.3.1](#)).

Because there is no adequate monitoring technique available for this species, opportunistic monitoring is recommended ([Section 5.2.6](#)). The drift-fence survey ([Section 5.2.1](#)) conducted in 2006 should be repeated at approximately 10-year intervals if resources are available. While these surveys will not provide population level information, they can produce indices to the relative abundance of terrestrial herpetological species. Although previous drift fence surveys have not captured pine snakes, future drift-fence surveys should include large

snake traps in addition to funnel and pit-fall traps, as this type trap is more likely to capture large snakes like the pine snake.

The goal is to maintain suitable habitat to contribute to the sustainability of the regional population. To meet this goal, staff will continue to apply prescribed fire and natural community restoration in an effort to maintain the habitat in a condition that will support the species. The continued presence of this species on AWMA is dependent on conditions that influence the regional population. However, adjacent private tracts in conservation and agriculture uses that are currently compatible with the needs of this species increase the opportunity for Florida pine snakes to persist on AWMA.

3.2.2: Gopher Tortoise

The gopher tortoise is relatively common in the pine plantation and the clear-cut, with a low density of tortoises found in other communities near roads and openings. Area staff conducted a survey of the 80-acre pine plantation in 2010 and found 194 potentially occupied burrows which yielded an estimated density of 1.47 tortoises per acre.

The gopher tortoise is a management-responsive species that can serve as an indicator of properly managed upland pine or grassland communities. It prefers xeric upland communities with diverse groundcover maintained with fire. The gopher tortoise is often considered a keystone species because many other species use its burrows, including focal species such as the Florida mouse and gopher frog. This FWC-listed threatened species triggers 4 of 6 prioritization parameters ([priorities table](#)), making it a high priority species statewide. The FWC revised the gopher tortoise management plan in 2012, and this plan places emphasis on increasing the number of tortoises on public lands. The gopher tortoise has been proposed as a candidate species for federal listing throughout its range.

Models indicate 690 acres of potential gopher tortoise habitat on AWMA. Of the 690 acres modeled, the condition varies from very good in the clear-cut and the edges of roads and openings, to marginal in some of the upland mixed woodland community. Further, 541 acres of the modeled potential habitat are upland mixed woodland, which is not optimal gopher tortoise habitat. While there is discussion in the literature about the minimum requirements to sustain a population of gopher tortoises with estimates ranging from 50–200 or more acres, the USFWS is using 250 acres as the minimum required to support a viable population. Given this, it appears that AWMA has enough potential habitat to support a viable population.

The gopher tortoise is a moderate priority on AWMA. With the increased use of prescribed fire, there is good opportunity for management on AWMA to have a positive effect on the existing gopher tortoise population. Planned management to restore a more natural fire regime in the clear-cut, pine plantation, and upland mixed woodland communities will improve habitat quality for gopher tortoises. Tortoises are also dispersed in low densities through the upland hardwood community, but only along the roads and around permanent wildlife openings. Maintaining roadsides by mowing creates a strip of herbaceous vegetation that facilitates

connectivity between the higher and lower density areas, and helps ensure the persistence of the population. Mowing should continue as a habitat management activity.

Ongoing natural community management emphasizing the frequent use of prescribed fire to promote a diverse groundcover and open tree canopy will benefit gopher tortoises. Additional land management considerations are found in [Section 4.3.2](#). The estimated density of 1.47 tortoises per acre exceeds the restocking threshold recommended in the September 2012 Gopher Tortoise Management Plan. Densities may be lower in other more marginally suited communities, but restocking in those communities is not recommended. The January 2012 Area Management Plan establishes a long-term objective to conduct a survey of the gopher tortoise population by July 2016-2017 ([Section 5.2.2](#)). This survey should be repeated on a 5-10 year interval to monitor trends in the population.

The goal is to sustain a viable gopher tortoise population on AWMA. To meet this goal, staff will continue to apply prescribed fire in an effort to maintain the diverse groundcover that is preferred by the species. The measurable objectives are:

1. For the duration of this Strategy, maintain the current 659 acres of pine plantation and upland mixed woodland community under the recommended fire return interval and continue to manage the existing 32 acres of wildlife openings in a condition suitable for gopher tortoises.
2. Conduct a baseline survey of all gopher tortoise potential habitat by fiscal year 2017, then conduct follow-up survey in 2022 and 2027.

3.2.3: American Swallow-Tailed Kite

The swallow-tailed kite is common on AWMA, but nesting activity has not been documented. Breeding has been confirmed nearby in southern Levy County and in the adjacent Dixie and Gilchrist counties along the Suwannee and Santa Fe rivers. The swallow-tailed kite uses a variety of natural communities that include a mosaic of tall trees for nesting habitat and open areas for foraging habitat. Dominant trees taller than the surrounding trees are preferred for nesting sites. Shrub height and density tend to be greater around nest sites. Large, mature pines that are potential nest sites on AWMA currently occur in the upland mixed woodland natural community, but large cypress trees in the floodplain swamp may be potential nest sites as well.

American swallow-tailed kites trigger 4 of 6 statewide prioritization parameters ([priorities table](#)), making them a moderate statewide priority. This species is not listed at either the state or federal level.

Models indicate 3,487 acres of potential habitat. While this is a large area of potential habitat that appears to have good potential for nesting, it is unlikely that any WMA/WEA will independently support a population of this wide-ranging, migratory species. This species is not typically considered management dependent and the opportunity for management to have significant influence on this species at the population level is low. However, swallow-tailed

kites do have strong nest site fidelity, so even small areas can play an important role in the conservation of the species.

Protection of the floodplain forest and management for mature stands, in conjunction with prescribed fire and actions that aid in restoring natural community structure, should continue to maintain and enhance habitat for this species on AWMA. Cooperation with the Avian Research and Conservation Institute (ARCI) for future monitoring efforts is encouraged as this could help further define the regional needs of the species and the role of AWMA. If nests are located on AWMA, management recommendations around these sites will be considered ([Section 4.3.3](#)), and the nest will be reported to ARCI ([Section 6.3](#)). If swallow-tailed kite nesting activity is observed, this information should be documented and reported ([Section 5.2.6](#)).

The goal is to provide suitable habitat for the American swallow-tailed kite that will allow individuals using AWMA to continue to function as part of a regional population. Habitat suitability for this species is very good and planned management will ensure AWMA remains suitable. While the continued presence of American swallow-tailed kites on AWMA is dependent on conditions that affect the regional population, the amount of potential habitat on AWMA and adjacent conservation lands increases the likelihood that this species will continue to persist on AWMA.

3.2.4: Bachman's Sparrow

Bachman's sparrows have not been heard on AWMA. There is a well-managed 80-acre pine stand on adjacent private property that is potential habitat for Bachman's sparrow, but no surveys have been conducted to determine its presence. The species is listed as a confirmed or probable breeder in Gilchrist and Levy counties according to the Florida Breeding Bird Atlas, and may currently be present, or capable of re-colonizing AWMA. This species prefers areas with abundant herbaceous vegetation and a moderate cover of short shrubs. These conditions are typical of cutover pine plantations, mature open stands of pine forests maintained by regular fire, or early successional old field habitat. The suitability of habitat on AWMA will continue to increase as trees mature and fire helps enhance the condition of the groundcover.

The Bachman's sparrow triggers 2 of 6 prioritization parameters ([priorities table](#)). Although the Bachman's sparrow is currently experiencing range-wide population declines, the species is not listed by the FWC or USFWS. Bachman's sparrow can be an indicator of well-managed pine-grassland sandhills and flatwoods communities.

Models indicate 118 acres of potential habitat. The PVA for this species suggested populations with at least 35 females could remain viable. Combining this information with information in the literature, areas with at least 510 acres of good habitat can support a viable population. AWMA does not have sufficient potential habitat to sustain a population of Bachman's sparrows and even if the potential habitat on adjacent private lands is considered, there may not be a sufficient amount to sustain a population. Although Bachman's sparrows are

management responsive, there is only a small acreage of potential habitat on AWMA; therefore, there is a low opportunity to influence this species on AWMA.

The occurrence of fire is critical to sustaining this species as use of an area by Bachman's sparrows declines rapidly around 18 months post-fire. Bachman's sparrows typically abandon sites in which fire is excluded for greater than 3 years. In many areas, the optimal fire return interval necessary to achieve desired vegetative attributes for Bachman's sparrow habitat is 2-3 years. Current land management focusing on the frequent use of prescribed fire and restoration of sandhill habitat will continue to improve and maintain suitable habitat for Bachman's sparrow. Additional land management considerations are found in [Section 4.3.4](#). Bachman's sparrow monitoring is not conducted on AWMA, however opportunistic observations will be documented ([Section 5.2.6](#)). The regional conservation biologist will make an effort using call playback methods to document the presence of the species in the area.

The goal is to restore and maintain sandhill to provide suitable habitat for the Bachman's sparrow to allow AWMA to contribute to the sustainability of the regional population. The goal will be obtained by managing for mature, open stands maintained with prescribed fire.

3.2.5: Brown-Headed Nuthatch

There have been no surveys to document the presence of brown-headed nuthatches on AWMA and local staff has not reported them. The species is listed as a confirmed or probable breeder in Dixie, Gilchrist, and Levy counties according to the Florida Breeding Bird Atlas, therefore, it is possible the species is present or nearby. This species prefers open stands of mature pines managed with frequent fire. Older pine forests (>35 years for longleaf or slash pine) and stands with basal area between 35–50 ft²/acre are preferred, although nuthatches can use pine stands with younger trees and higher basal areas. Brown-headed nuthatches are weak cavity nesters, and while they occasionally use cavities excavated by other species, they require old short snags with soft wood and flaking bark when excavating their own cavities. This species frequently uses old decaying oaks with a diameter at breast height of <10 inches for cavity excavation. Unfortunately, and to the detriment of the nuthatch, management activities frequently knock over these snags.

This species triggers 2 of 6 prioritization parameters ([priorities table](#)). Although brown-headed nuthatches are currently experiencing range-wide population declines, the species is not listed by either the FWC or USFWS. This species is management responsive, and there is moderate opportunity for management on AWMA to have a positive influence; therefore, it is a moderate priority species.

Models indicate 581 acres of potential habitat. Literature suggests between 320 and 1,000 acres of suitable habitat are necessary to support a viable population of this species. Given this, AWMA may have sufficient habitat to support a viable population of brown-headed nuthatches. Some suitable habitat is also found on adjacent private property.

Planned and ongoing land management actions will improve the potential of supporting the regional brown-headed nuthatch population. Breeding success is correlated with increasing density of appropriate snags. Current efforts to increase the extent of prescribed burning in the upland mixed woodland community are creating the more open forest this species prefers, and have produced many snags that are becoming suitable as potential nest sites. Management that includes increasing the amount of prescribed fire should continue to maintain and enhance habitat for this species. Additional land management considerations are found in [Section 4.3.5](#). Brown-headed nuthatch monitoring is not conducted on AWMA, however opportunistic observations will be documented ([Section 5.2.6](#)). The regional conservation biologist will make an effort using call playback methods to document the presence of the species in the area.

The goal is to restore and maintain appropriate natural communities to provide suitable habitat for the brown-headed nuthatch to ensure AWMA contributes to the sustainability of the regional population. While AWMA may possibly support a viable population, it is likely that potential habitat on the adjacent private lands will be required to ensure the persistence of a regional population.

3.2.6: Cooper's Hawk

Staff has not observed the Cooper's hawk on AWMA. The breeding bird atlas suggested that Cooper's hawk probably breeds in the general area. Commonly associated with woodlands, this species will nest in a variety of habitats including swamps, floodplain and bottomland forests, sand pine scrub, and baygalls. Nests are usually placed near the crown of a tree, close to an edge in dense stands of oaks. Cooper's hawks primarily feed on other birds, so nests are located in proximity to suitable hunting areas. While not documented, nesting may occur on AWMA.

The Cooper's hawk triggers 1 of 6 prioritization triggers ([priorities table](#)). There are 3,556 acres of potential habitat on AWMA. Cooper's hawks are not typically considered management dependent and the opportunity for management to have significant influence on this species at the population level is low. Because the Cooper's hawk is not management dependent, the species, if present, is likely to persist on AWMA without directed management. Despite the low level of management opportunity, planned and ongoing natural community management will benefit this species by improving conditions for their prey.

During the nesting season (April-July), the Cooper's hawk is secretive and sensitive to human disturbance near the nest site. No attempt will be made to actively search for nests, but if individuals are observed exhibiting nesting behavior (e.g., carrying nesting material to/from an area, acting aggressively), the location will be noted and the area will be protected from disturbance. Cooper's hawk monitoring is not conducted on AWMA; however, opportunistic observations will be documented ([Section 5.2.6](#)).

The goal is to restore and maintain appropriate natural communities to provide suitable habitat for the Cooper's hawk to ensure AWMA contributes to the sustainability of the regional

population. While the potential presence of Cooper's hawk on AWMA is dependent on conditions that affect the regional population, the amount of potential habitat on AWMA and adjacent conservation lands increases the likelihood that this species can persist on AWMA.

3.2.7: Limpkin

Limpkins have not been reported on AWMA by local staff or visitors. This species is known to breed along stretches of the lower Suwannee River south of AWMA. Limpkins use freshwater marshes, swamps, springs and spring runs, and pond and river margins where they feed on apple snails and other aquatic mollusks. Although some potential habitat exists on AWMA, the absence of reports indicates that AWMA is probably only occasionally visited by limpkins moving through the area.

The limpkin triggers 1 of 6 statewide prioritization parameters and is currently a state listed species of special concern ([priorities table](#)). A recent biological status review determined that the limpkin does not warrant listing as a species of special concern. The FWC will remove the limpkin from the imperiled species list after approval of the ISMP that is currently in development. A SAP is currently under development for the limpkin.

On AWMA, models indicate 320 acres of potential habitat within existing natural communities. The available habitat for limpkins on AWMA is primarily the floodplain along the river, which is not actively managed. While information on minimum habitat requirements for this species is lacking, based on the natural history of the species, AWMA likely does not have enough potential habitat to support a viable limpkin population. The opportunity to influence the limpkin at the WMA-level is limited to ensuring that management activity in the uplands does not negatively impact water quality. However, AWMA potentially has a role providing non-breeding habitat for the regional limpkin population.

Because limpkins are highly mobile and sensitive to water quality and the availability of apple snails, they respond to changes at the regional scale. Management on AWMA is focused on the protection of water quality and the integrity of floodplain habitats used by limpkins, therefore management is compatible with the needs of this species. Limpkin monitoring is not currently conducted on AWMA; however, opportunistic observations will be documented ([Section 5.2.6](#)).

The goal is to provide suitable habitat for the limpkin to ensure AWMA contributes to the sustainability of the regional population. The protection of AWMA's floodplain along the banks of the Suwannee River will ensure that limpkins are able to use the area in the future.

3.2.8: Northern Bobwhite

Staff regularly see and hear Northern bobwhites on AWMA, although systematic efforts to document local distribution and relative abundance have not been attempted. Bobwhites are associated with open canopy forests and grassland communities dominated by warm-season

grasses, legumes, and patchy bare ground. Northern bobwhites require an interspersed of multiple habitat conditions to meet their needs. Areas with abundant native warm-season grasses and herbaceous annual vegetation are used for raising broods and foraging. Shrubs or other thickets are useful as roosting habitat or escape cover. A 2-3 year fire return interval is typically necessary to maintain the patchy herbaceous or saw palmetto groundcover this species prefers.

The northern bobwhite is a game species that triggers 2 of the 6 statewide prioritization parameters ([priorities table](#)). However, ongoing declines in this species' population are cause for concern and this species is a focus of a number of ongoing conservation initiatives, making it a high statewide priority.

Models indicate 690 acres of potential habitat on AWMA. Literature suggests that 2,000-4,000 acres are likely necessary to support a viable population. Further, the entire potential habitat on AWMA is of moderate quality for northern bobwhite because of the limited amount of good brood habitat, and moderate quality forage habitat. For these reasons, AWMA likely cannot support a viable population in isolation. However, there is some potential habitat on adjacent private lands. As such, there is a reasonable probability of the species persisting on the area.

Frequent prescribed fire should create favorable habitat for bobwhite if varied timing of burning on adjacent units creates a good mosaic. Growing season fire is preferred on AWMA but staff use dormant season fire if conditions are not suitable during the growing season. Additional land management considerations are found in [Section 4.3.6](#). While managers believe northern bobwhite will persist or increase on AWMA in response to management, it is unlikely to be a featured game species on the area.

The area goal is to maintain suitable habitat for northern bobwhite on AWMA to continue to support the regional population. While AWMA may not support a viable population in isolation, there is potential habitat on the adjacent private lands that will help support the regional population.

3.2.9: Short-Tailed Hawk

Short-tailed hawks have not been observed on AWMA. The ARCI documented nesting short-tailed hawks near the Suwannee River in Dixie and Levy counties, though not on AWMA. Because short-tailed hawks can forage 15 km or further from a nest, it is likely that AWMA provides foraging habitat and potential nesting habitat for this species.

The short-tailed hawk is an elusive species that breeds in dense or open woodland stands in wetlands, cypress swamps, and bayheads. Vegetation surrounding nest trees is often very dense, making it difficult to locate and assess nests from the ground. This species exhibits high nest-site fidelity, emphasizing the need to locate and preserve nest sites. Foraging habitat includes prairies and open areas adjacent to nesting areas. Transitional zones and ecotones may be important components of foraging habitat for this species.

This species is not listed at either the state or federal level, but is considered a high statewide priority as it triggers 6 of the 6 statewide prioritization parameters ([priorities table](#)). Models indicate 3,403 acres of potential habitat. While this is a large area of potential habitat and appears to have good potential for nesting, it is unlikely that any WMA/WEA will independently support a population of this wide-ranging, migratory species. This species is not typically considered management dependent and the opportunity for management to have significant impact on this species at the local level is low. Protection of potential nest trees or nesting areas will provide future nesting habitat for this species.

Monitoring for this species is best conducted at a regional level, but opportunistic observations on AWMA should include documenting season and color phase. Cooperation with ARCI for future monitoring will further define the regional needs of the species and the role of AWMA. If nests are located on AWMA, management recommendations around these sites will be considered ([Section 4.3.7](#)) and the nest will be reported to ARCI ([Section 6.3](#)).

The goal is to provide suitable habitat for the short-tailed hawk that will allow individuals using AWMA to continue to function as part of a regional population. Habitat suitability for this species is very good and planned management will ensure habitat remains suitable. While the continued presence of short-tailed hawk on AWMA is dependent on conditions that affect the regional population, the amount of potential habitat on AWMA and adjacent conservation lands increases the likelihood that this species will continue to persist on AWMA.

3.2.10: Southeastern American Kestrel

The southeastern American kestrel has not been observed on AWMA. Breeding occurs nearby in eastern Levy County and in Dixie and Gilchrist counties, but these breeding sites are generally on open agricultural landscapes. The FWC lists the Southeastern American kestrel as threatened, and the species triggers 4 of 6 prioritization parameters ([priorities table](#)). A SAP is currently under development for this species.

Southeastern American kestrels utilize upland habitats, including sandhills and longleaf savannas, pastures, sand pine scrub, and prairies. As a secondary cavity nesting species, southeastern American kestrels use previously excavated cavities in large snags. They will utilize artificial cavities when placed in areas of suitable habitat. They require adequate perch sites, low ground cover (<1 ft), and an open canopy (<20%) within foraging areas. Average breeding territory size is 125 acres, though more area may be necessary if the habitat quality is marginal. Modeling indicates 149 acres of potential habitat for southeastern American kestrels on AWMA. The potential habitat on AWMA is in the southeast corner of the property adjacent to private lands that are also potentially suitable; therefore, kestrels on neighboring private lands could potentially include AWMA within their home range.

The level of opportunity on AWMA is low, given the small amount of potential habitat and the fact that birds have not been observed on the area during the breeding season. Opportunistic observations of southeastern American kestrel during the breeding season (mid-

March-May) will be documented ([Section 5.2.6](#)). Ongoing efforts to restore AWMA's natural community structure and function may improve the habitat suitability for kestrels, but will not significantly increase the quantity of habitat. Management actions that maintain or enhance habitat for this species include prescribed fire, natural community restoration, and management that favors mature stands of longleaf pine. Additional land management considerations, including the protection and creation of snags, can be found in [Section 4.3.8](#).

The goal is to provide suitable habitat for southeastern American kestrels that will allow individuals using AWMA to function as part of a regional population. However, the presence of this species on AWMA is dependent on conditions that influence the regional population.

3.2.11: Southern Bald Eagle

The southern bald eagle is occasionally seen on AWMA, but has not been documented nesting on AWMA. The nearest nest (approximately 5 miles south) was documented as active in 2000, but the nearest recently active nest (active in 2011) is approximately 7 miles southeast of AWMA. There are at least 3 recently active nests within 10 miles, and AWMA is northwest of a cluster of eagle nest territories that occur along the Gulf coast. The species uses a number of natural communities with the best nesting habitat occurring in forested areas close to open water. While not considered management dependent, this species does benefit from active management to restore natural communities provided nest protection guidelines are followed. Further, protection of the floodplain will continue to have a positive influence on water quality, which benefits this species.

Statewide, this species triggers 0 of the 6 prioritization parameters ([priorities table](#)). However, federal and state protections remain, and there is a FWC management plan to ensure the continued recovery of the species.

Models identify 3,017 acres of potential habitat based on natural communities. Because the majority of potential habitat is upland hardwood forest and floodplain swamps that are not actively managed, the management opportunity for this species is low. Nevertheless, given the location of AWMA along the Suwannee River, there is a good chance that bald eagles may establish a nest on the area, especially if a nearby nest tree is damaged or destroyed.

The FWC monitors southern bald eagle nesting in Florida at the statewide level using aerial surveys, so there is no need for local monitoring. If staff observes eagle behavior indicative of nesting (e.g., courtship flights, carrying sticks), staff will attempt to determine the location of any nest on the area. If staff documents bald eagle nesting ([Section 5.2.6](#)) staff will report the nest location and status to baldeagle@myfwc.com. Staff will employ management considerations around any future nests ([Section 4.3.9](#)).

It is unlikely that any WMA will independently support a population of this wide-ranging, migratory species. The goal is to continue to provide suitable habitat for the southern bald eagle that will allow individuals using AWMA to function as part of a regional population.

The amount of potential habitat on AWMA and adjacent conservation lands increases the likelihood that this species will continue to persist on AWMA.

3.2.12: *Wading Birds*

Although no formal surveys have been conducted, staff see 4 of the 8 focal wading bird species foraging on AWMA, including the white ibis (*Eudocimus albus*), great egret (*Ardea alba*), little blue heron (*Egretta caerulea*), and tricolored heron (*E. tricolor*). The snowy egret (*E. thula*), reddish egret (*E. rufescens*), roseate spoonbill (*Platalea ajaja*), and wood stork (*Mycteria americana*) have not been seen on AWMA. No active nesting colonies have been documented on AWMA. Historically wading bird nesting colonies were found throughout the Lower Suwannee River watershed, but no formal monitoring has occurred in recent years.

Statewide, this group of species is a moderate priority. Six species are FWC-listed species of special concern, and the wood stork is federally listed as endangered. The Millsap biological scores for the reddish egret, little blue heron, and wood stork are high. The snowy egret, little blue heron, and roseate spoonbill have SGCN population trends identified as declining, while the tricolored heron and white ibis have unknown trends ([priorities table](#)).

Based on a recent biological status review of 6 species of wading birds, the FWC will classify the little blue heron, reddish egret, roseate spoonbill, and tri-colored heron, as threatened species after approval of the ISMP currently in development. Two species, snowy egret and white ibis, will be delisted. A SAP is currently under development for the wading birds.

Models indicate 467 acres of potential habitat for wading birds within natural communities on AWMA. The available habitat for this suite of species on AWMA is primarily the floodplain along the river, which is not actively managed. As long as wading birds primarily use the area for foraging rather than nesting, they are a moderate local priority.

Wading birds are capable of significant dispersal and are heavily influenced by regional conditions. The opportunity to influence them at the WMA-level is limited to protecting nesting colonies from disturbance and insuring that management activity in the uplands does not negatively influence water quality ([Section 4.3.10](#)). As protection of the floodplain was part of the purpose for acquisition, AWMA will continue to have a positive influence on water quality.

If nesting colonies are identified, measures to protect these colonies from disturbance will be taken. Observations of the 4 species (snowy egret, reddish egret, roseate spoonbill, and wood stork) not previously seen on the area should be documented ([Section 5.2.6](#)).

The goal is to continue to provide suitable habitat that allows wading birds on AWMA to function as part of the regional population. While the continued presence of these species on AWMA is dependent on conditions that influence the regional population, the location of AWMA on the banks of the Suwannee River ensures that wading birds are likely to continue to use the area in the future.

3.2.13: *Florida Mouse*

Staff has captured Florida mice on AWMA, but the complete extent of occupancy is unknown. This species commonly inhabits fire-maintained, xeric uplands that have well-drained, sandy soils. Abundance of Florida mice is highest in areas supporting early succession vegetation; populations decline as natural communities become more densely vegetated, more heavily shaded, and more mesic. The Florida mouse is an obligate commensal of the gopher tortoise, and may not be able to persist long-term on sites where tortoises are absent. On AWMA, 2 survey efforts have captured Florida mice. A 2008 survey for small mammals caught a Florida mouse in the upland hardwood forest. Florida mice do not typically inhabit this community and no gopher tortoise burrows were observed nearby. In 2010, fifteen captures of Florida mice occurred during 5 nights of trapping along the west edge of the pine plantation. A more thorough survey of the pine plantation and upland mixed woodland communities is needed to determine the extent of Florida mice occupancy on AWMA.

This state-listed species triggers 4 of the 6 statewide prioritization parameters ([priorities table](#)). A recent biological status review determined that the Florida mouse does not warrant listing, and the FWC will remove the species from the species of special concern list after approval of the ISMP currently in development. A SAP is under development for the Florida mouse.

Models indicate 149 acres of potential habitat for Florida mice on AWMA. The model only includes pine plantation and clearings and may underestimate potential habitat if upland mixed woodland or xeric hammock is occupied on AWMA. Florida mice are likely to occupy at least some of the upland mixed woodland where it transitions from sandhill. Literature suggests Florida mice require 75–200 acres of suitable habitat to support a viable population. Based on this information, with appropriate management, AWMA can support a population of Florida mice. Since this species is management responsive, there is the opportunity for management on AWMA to have a positive influence; therefore, it is a medium priority species. Management of sandhill and upland mixed woodland habitat using prescribed fire to open the canopy and promote healthy native ground cover will benefit Florida mice. Based on the results of the initial survey effort, Florida mice occur on the property. Additional survey efforts in the pine plantation and upland mixed woodland natural communities are needed to establish the extent of occupied habitat on AWMA ([Section 5.2.3](#)). If Florida mice are found inhabiting the upland mixed woodland, the amount of potential habitat on AWMA will be substantially higher. Follow-up surveys in other natural communities will follow the previous small mammal survey methodology used in 2008 ([Section 5.2.4](#)).

The goal is to maintain appropriate upland habitat to sustain a viable Florida mouse population on AWMA. To meet this goal, staff will increase the application of prescribed fire in an effort to maintain the diverse groundcover that is preferred habitat for the species. The measurable objectives are to:

1. By the end of 2015, determine the distribution of Florida mice on AWMA by completing a baseline survey using the standard occupancy protocol in appropriate upland habitats.
2. Conduct follow-up surveys on a 5-year interval to monitor persistence of populations.

3.2.14: Sherman's Fox Squirrel

Sherman's fox squirrels are regularly seen on AWMA, although efforts to document their abundance and distribution on the area have not been attempted. They are also common on adjacent private lands near AWMA. Suitable habitat for fox squirrels includes longleaf pine sandhills or pine-oak mixed woodlands with sparse shrub cover. Their preferred habitat is a mixture of pines and oaks, such as along the edges of longleaf pine savannas and live oak forests. Mast-producing hardwoods, especially mature oaks, are important as fox squirrels often use large oaks for nest sites and daytime refugia. In addition, acorns provide a major part of their diet. Mature longleaf pines that produce seed-bearing cones are an important energy-rich food source, particularly during summer. A mosaic of habitat conditions across the landscape, including a variety of oaks, ensures a year-round supply of food items that vary seasonally.

This state-listed species of special concern triggers 4 of the 6 statewide prioritization parameters ([priorities table](#)). This species is management responsive and there is moderate opportunity for management to have a significant effect on this species on the area. A recent biological status review found the Sherman's fox squirrel did not meet the criteria for threatened status; however, the species will remain a species of special concern due to uncertainty in the data used for analysis. A SAP is currently in development that will include actions necessary to address the data needed to overcome this uncertainty in conservation status.

Models indicate 690 acres of potential habitat. Literature suggests 2,000-9,000 acres are required for a viable population. The potential habitat on AWMA and on adjacent lands is generally in good to fair condition for fox squirrels. Management actions that maintain or enhance habitat for this species include prescribed fire and mechanical actions that aid in restoring natural communities to an open canopied structure. Sherman's fox squirrels also benefit from the protection of mast producing hardwoods distributed throughout the landscape. Restoration of upland habitat using prescribed fire rather than broad-spectrum herbicide treatments will ensure that mature hardwoods are retained even as coverage of hardwoods is reduced sufficiently to restore native ground cover. Additional land management considerations are found in [Section 4.3.11](#). As there is not enough potential habitat to sustain Sherman's fox squirrels on AWMA in isolation, the conservation of Sherman's fox squirrels in this area will be influenced by the land management decisions of private landowners in the surrounding area. For this reason, when possible, land management coordination with staff from CPS and adjacent property owners could enhance the survival potential of this species ([Section 6.1.4](#)).

Because this species naturally occurs at low densities and can be difficult to detect, documentation of opportunistic observations is recommended ([Section 5.2.6](#)). The goal is to continue to provide suitable habitat that allows the Sherman's fox squirrels on AWMA to function as part of a regional population. While the continued presence of fox squirrels on AWMA may be dependent on conditions affecting the regional population, the surrounding landscape and habitat conditions on other conservation lands, as well as on private lands, provides an opportunity to conserve this species.

3.2.15: *Southeastern Myotis*

The southeastern myotis has been documented on AWMA, but no standardized survey for bats has been conducted on the area. AWMA is located south and west of several large maternity roosts and is north of a large bachelor roost, so the area may have a role in bat conservation. Southeastern myotis forage primarily over marshes, rivers, creeks, and lakes. They will forage in other natural communities including hammock edges and in flatwoods. Roosting habitat varies seasonally. Individuals may roost in caves, culverts, bridges, hollow trees, and occasionally houses. In Florida, most of the known maternity sites are located in caves. Hollow trees and manmade structures also serve as maternity sites, but the prevalence and importance of these to the population is not fully understood.

This species triggers 2 of 6 prioritization parameters ([priorities table](#)) and is a moderate statewide priority. Models indicate 3,552 acres of potential habitat on AWMA. However, the vast majority of the modeled potential habitat is upland hardwood forest. While the species occasionally feeds in upland hardwood hammock, sites over water are more important foraging habitat. This species is not typically considered management dependent and the opportunity to affect this species on AWMA is low. The proximity to known roosts and along a major river suggests AWMA may have a role in bat conservation. AWMA is in an area of karst geology, so undocumented cave roosts may occur in the vicinity. The amount of large hollow trees throughout AWMA provides an abundance of potential roost trees. Should a roost be detected on the area, staff will communicate with the mammal taxa coordinator ([Section 6.1.1](#)) to determine appropriate protection measures. Protection of the floodplain and upland hardwood forest, as well as the use of prescribed fire along habitat edges to prevent shrubby encroachment, will benefit southeastern myotis.

Staff erected bat houses in a number of wildlife openings on AWMA. Brazilian free-tailed bats (*Tadarida brasiliensis*) are the primary occupants of these bat houses; however, acoustic surveys have documented southeastern myotis roosting in these houses. Staff will monitor these bat houses periodically to assess use ([Section 5.2.5](#)). The bat house monitoring protocol determines occupancy, but does not determine the species using the bat house. Coordination with the mammal taxa coordinator ([Section 6.1.1](#)) will be required to confirm if southeastern myotis are in occupied boxes.

The goal is to continue to provide suitable habitat for southeastern myotis that allows myotis on AWMA to function as part of a regional population. While the continued presence of southeastern myotis on AWMA is dependent on conditions that affect the regional population, the amount of potential habitat on AWMA and adjacent conservation lands increases the likelihood that this species will continue to persist on AWMA.

3.2.16: Limited Opportunity Species

On AWMA, reasonable opportunity for management is lacking for focal species (gopher frog and Florida black bear) modeled to have potential habitat on the area. Staff should document observations of these species ([Section 5.2.6](#)). If any of these species are documented with increasing regularity, AWMA's role in their conservation and recovery should be re-visited.

Gopher Frog - It is unknown if gopher frogs occur on AWMA; no surveys have been conducted to determine their status, but they have not been documented during herpetological inventories. Additionally, gopher frogs breed in seasonally flooded grassy ponds that lack predatory fish, and no potential breeding ponds exist on AWMA or on adjacent lands. After breeding, gopher frogs move into xeric uplands and often occupy gopher tortoise burrows. However, they can use rodent and crayfish burrows, stump holes, and hollow logs. They rarely occur more than 1 mile from breeding habitat.

The gopher frog triggers 2 of 6 statewide prioritization parameters ([priorities table](#)). A recent biological status review determined the gopher frog no longer warrants listing as a species of special concern, and the FWC will delist the species after approval of the ISMP. The FWC is developing a SAP to ensure the species does not require listing in the future. Models indicate 118 acres of potential habitat exists. While information on minimum habitat requirements or home ranges for this species is lacking, the available acreage is unlikely to support a viable population, especially given the lack of suitable breeding wetlands. Continued use of prescribed fire in upland habitats and efforts to restore sandhill will maintain and/or enhance suitable habitat for gopher frogs providing the species occurs on site. However, with no suitable wetlands for breeding nearby, there is limited opportunity to contribute to the conservation of the species.

Florida Black Bear – Potential habitat models identify all 3,552 acres of AWMA as Florida black bear habitat, but AWMA is not included in the primary or secondary range of the Apalachicola, Chassahowitzka, or Ocala populations, as identified by the [FWC Bear Management Plan](#) adopted in June 2012. No bears or bear sign have been reported on AWMA, no records of road-killed bears are within 10 miles, and only a few reports of nuisance bears in Old Town and Chiefland exist. The plan places AWMA within the Big Bend Bear Management Unit (BMU), which includes the Chassahowitzka population. There have been efforts to establish bears in the LSNWR to the south of AWMA and the Bear Management Plan does call for establishing a linkage between the Apalachicola and Big Bend BMUs. If these efforts are successful it would put occupied bear habitat much closer to AWMA and increase the likelihood

of visitation by bears. Due to AWMA's close proximity to developed areas and US Highway 19/98, there is a high potential for bears on AWMA to become a nuisance.

The Florida black bear triggers 2 of 6 prioritization parameters ([priorities table](#)). The FWC recently removed Florida black bear from the threatened species list. This species requires a mosaic of natural communities throughout the year to meet nutritional and reproductive needs. Optimal bear habitat in Florida is described as a thoroughly interspersed mixture of flatwoods, swamps, scrub oak ridge, bayheads, and hammock habitats. AWMA's location between Chiefland and Fanning Springs, and its proximity to a major four-lane highway is not considered ideal for supporting bear, and these traits limit the suitability of AWMA for bears. However, if efforts to increase the bear subpopulation in the Big Bend BMU are successful, AWMA's location along a major river and the associated natural communities on AWMA increase the likelihood AWMA may have a role in bear conservation in the future.

3.3 Other Listed and Locally Important Species

While natural community management consideration of a set of focal species provides benefits to a host of species reliant upon these natural communities, species that are imperiled sometimes require specific attention. Further, subsection 253.034(5) of the Florida Statutes (F.S.) requires all land management plans to include an analysis of the property to determine if significant natural resources, including listed species, occur on the property. If significant natural resources occur, the plan shall contain management strategies to protect the resources. The Florida Forever Act (s. 259.105, F.S.) adds that all State lands that have imperiled species habitat shall include, as a consideration in the management plan, restoration, enhancement, management, and repopulation of such habitats. In this subsection, we discuss listed or locally important species that are not PLCP focal species.

It is possible other imperiled species occur on AWMA, and if encountered, staff will document these encounters. Florida's imperiled species are adapted to natural communities and should continue to benefit from FWC's ongoing or planned ecological management that aims to restore natural community structure and function. Under FWC's ecological management, these species have a higher probability of persistence than in the absence of this management.

3.3.1: Other Focal and Imperiled Wildlife

In addition to the listed species discussed in [Section 3.2](#), 6 listed animal species are known or are likely to occur on AWMA: alligator snapping turtle (*Macrochelys temminckii*), American alligator (*Alligator mississippiensis*), eastern indigo snake (*Drymarchon couperi*), short-tailed snake (*Stilosoma extenuatum*), Suwannee cooter (*Pseudemys concinna suwanniensis*), and Homosassa shrew (*Sorex longirostris eionis*). One species, the Rafinesque's

big-eared bat (*Corynorhinus rafinesquii*) is not listed, but is of conservation interest and has been documented on the area.

Alligator snapping turtle- There are no documented occurrences of the alligator snapping turtle on AWMA, but the species occurs within and nests along the Suwannee River. These turtles are generally aquatic, but females do emerge to lay a single clutch of 2 to 4 dozen eggs per year. Nesting typically occurs from late April to mid-May along river berms, high banks, and artificial spoil mounds. Young emerge from nests in August and September.

A recent biological status review determined that the alligator snapping turtle does not warrant listing as a threatened species. The FWC will remove the species from the imperiled species list after approval of the ISMP currently in development. However, recently published data indicate the alligator snapping turtles in the Suwannee river are a separate species; this could trigger a future listing review.

Planned management to maintain the floodplain forest and adjacent uplands will help protect water quality and potential nest sites, thereby ensuring AWMA helps meet the needs of this species.

American Alligator – There are no documented occurrences of the American alligator on AWMA, but the species occurs along the Suwannee River. The alligator is federally listed due to similarity of appearance with other listed crocodylians. Planned management on AWMA to maintain the floodplain forest and adjacent uplands will help protect water quality and help meet the needs of this species.

Eastern Indigo Snake - The federally threatened Eastern indigo snake has been documented on adjacent private lands. As this species has large home ranges, staff believes they occur on or occasionally pass through the area. Planned habitat management that includes restoration of sandhill and the use of prescribed fire will enhance conditions for this species. When possible during land management activities, stumps and other coarse woody debris should be retained as potential refuge sites ([Section 4.3.2](#)). While a drift-fence survey conducted in 2008 did not document the species, staff should repeat the on approximately 10-year intervals. Drift-fence surveys will not provide population level information, but they can produce indices to the relative abundance of terrestrial herpetological species, and can help track changes in species composition through time. Future drift-fence surveys conducted on AWMA should include large snake traps in addition to funnel and pit-fall traps. All indigo snake sightings on AWMA should be documented ([Section 5.2.6](#)).

Short-Tailed Snake – Staff documented a short-tailed snake on AWMA during a 1988-89 drift fence survey. No documentation of the exact location of the trap array was found, but the area was described as xeric hammock. Little is known regarding the life history of this species.

A recent biological status review determined that the short-tailed snake warrants classification as a threatened species, and the FWC will list the species as threatened after approval of the ISMP currently in development. A SAP is currently under development for the short-tailed snake.

Restoration and conservation of sandhill habitat will presumably benefit this species. Any incidental sighting of this species should be documented ([Section 5.2.6](#)) and collection of a photo-voucher is encouraged.

Suwannee Cooter- There are no documented occurrences of the Suwannee cooter on AWMA, but the species occurs within, and nests along, the Suwannee River. These turtles are generally aquatic, but are frequently bask on woody snags or limestone rocks along the river. Females emerge to lay 4 to 5 clutches of 8-27 eggs per year; nesting typically occurs from late March to early August in well-drained upland soils that receive moderate to high solar exposure.

A recent biological status review found the Suwannee cooter does not warrant listing. The FWC will remove the species from the imperiled species list after approval of the ISMP currently in development.

Planned management to maintain the floodplain forest and adjacent uplands will help protect water quality and ensure the potential for future nest sites. As such, AWMA will continue to support the conservation of this species.

Homosassa Shrew – The Homosassa shrew is a sub-species of the southeastern shrew that has not been documented on AWMA. Previously thought to be limited to a small range, one study suggested this species actually has a larger range. Based largely on this 1 publication, a recent biological status review determined the subspecies does not warrant listing on the FWC’s imperiled species list. However, due to concern in regards to the available data, the FWC will retain the Homosassa shrew as a species of special concern. A SAP is currently under development for the Homosassa shrew, which will address the data needed to resolve the uncertainty of conservation status.

Shrews forage and nest in leaf litter and downed woody debris that is abundant in floodplain forest, upland hardwood hammock, and upland mixed woodland communities. Incidental observations or specimens captured during small mammal and herpetofauna survey efforts ([Section 5.2](#)) should be reported to the mammal taxa coordinator ([Section 6.1.1](#)). Planned management to protect and maintain floodplain forest and upland hardwood, in conjunction with efforts to restore upland mixed woodlands, will allow AWMA to meet the needs of this subspecies.

Rafinesque’s Big-Eared Bat- The Rafinesque’s big-eared bat is not currently listed, but is a rare species that has been observed roosting in an unused check station on AWMA. Little is known of the natural history of this species, but Rafinesque’s big-eared bats seem to prefer to

roost in more open structures than other bat species. Rafinesque's big-eared bats are reported to prefer roosts in frequently flooded areas of major river bottoms in the Georgia coastal plain. South of AWMA on LSNWR, Rafinesque's big-eared bats are using a concrete culvert-style bat house. If resources become available, a culvert-style bat house could be located in the floodplain forest or swamp on AWMA, and would provide a suitable roosting location for Rafinesque's big-eared bats. If a culvert bat house is placed on AWMA, it will be included in the standard bat house occupancy monitoring protocol ([Section 5.2.5](#)).

3.3.2: Rare Plants

Ecosystem Research Corporation conducted a listed plant survey in 1994 on AWMA. Only one plant found on AWMA, Florida spiny pod (*Matelea floridana*), is listed by the Florida Department of Agriculture and Consumer Services as endangered. The protections afforded plants that occur on conservations lands, in conjunction with management actions that include exotic plant removal and prescribed fire, will continue to maintain habitat for these and other rare plants. As such, these species should persist under planned management on AWMA.

In addition to the listed plant, 4 plants on the State list of commercially exploited plants, green-fly orchid (*Epidendrum conopseum*), royal fern (*Osmunda regalis*), needle palm (*Rhapidophyllum hystrix*), and coontie (*Zamia pumila*) were observed on AWMA. Staff should be aware that some potential exists for illegal collection of these plants and if evidence of illegal activities are found on AWMA, appropriate authorities should be notified.

Florida spiny pod – Florida spiny pod is found in a variety of wooded habitats from moist woods, such as those in lime sink areas, to dry, open oak-hickory or oak-hickory-pine upland forests. Perceived threats include loss of habitat to human alteration, completion from invasive exotics, and unnatural succession following fire suppression. It may respond well to fire and low intensity canopy opening activities, and is adversely affected by mechanical soil disturbance. Soil-disturbing activities such as road grading and plowing fire lanes can be destructive to this species, and should be avoided near known occurrences.

Section 4: Land Management Actions and Considerations

Models identified potential habitat for 17 focal species on the area ([Section 3.1](#)); however, not all of these species have the same level of management opportunity or need ([Section 3.2](#)). The FWC's natural community-based management, which emphasizes protection of the floodplain forest, restoration of xeric communities, and use of prescribed fire, will promote the habitat conditions necessary for most of these species, without the need for further strategic management actions. We may designate SMAs when actions over and above ongoing natural community management are required in a specific location ([Section 4.1](#)). In addition, to

ensure natural community management addresses the needs of these focal species, we evaluate the OBVM DFCs for natural communities ([Section 4.2](#)). [Section 4.3](#) provides recommendations for species that need specific protective measures or land management considerations to ensure their continued use of the property.

4.1: Strategic Management Areas

The intent on AWMA is to apply management actions that maintain intact natural communities in good condition and restore degraded or altered natural communities to a condition that will better suit focal and listed species. However, SMAs focus management actions on MUs with the highest possibility of success, and or MUs most critical for the conservation of a species on the WMA. Staff designates SMAs to achieve at least one of the following:

- Identify the area in which to apply specific land or species management that creates the highest probability for persistence and conservation of a species or suite of species. These specific actions should aid in restoring, enhancing, or maintaining the habitat or population.
- Identify an area in which to focus specific land or species management actions for the best chance of success, when there is more restoration and enhancement than can be accomplished in short order on the WMA. This might be the first or next step in a sequential series of management actions that will increase the likelihood of occupation and or persistence of a specific species.
- Identify an area that is so critical to the persistence of a species on the WMA that it warrants special designation to ensure protection against negative alteration.
- Identify areas that are critical for research or monitoring.
- Recommend MU-specific natural community DFCs that differ from the DFCs in the natural community area-wide, when this is necessary to benefit a specific species.

Workshop participants agreed that planned and ongoing management actions across AWMA will meet the needs of the focal species; therefore, they did not designate any SMAs.

4.2: Objective-Based Vegetation Management Considerations

OBVM is an approach to land management that emphasizes maintaining and restoring natural plant communities towards pre-determined desired conditions. The OBVM DFCs ([Table 2](#)) target a range of values for various habitat attributes within actively managed communities. However, if a focal species requires a different range in values than is reflected in the statewide DFCs, or depends on an attribute that is not currently monitored on AWMA, we may

recommend adjusting the DFC range or adding the attribute. The workshop gave participants the opportunity to evaluate if the current DFCs meet the needs of focal species and if not, to suggest modifications. The following are common reasons to modify DFCs:

- To obtain maximum habitat suitability for a species that requires a different range of DFC values than the statewide or current DFC values.
- To benefit a particular species in specific MUs, typically when we have designated a SMA that requires a change in natural community DFCs only within the SMA and not in the natural community area-wide.
- To add an attribute that was not previously monitored.

The FWC has not conducted an OBVM workshop for AWMA. At the WCPR workshop, participants agreed that use of the reference sites' values would best meet the needs of the focal species. Reference sites are areas identified by FNAI as representing the highest quality examples of natural communities in the State. The actively managed natural communities on AWMA include sandhill and upland mixed woodland. [Table 2](#) reflects the recommended OBVM DFCs for sandhill and upland mixed woodland on AWMA, based on the FNAI's reference site recommendations. However, there has been only 1 upland mixed woodland reference site identified, and this occurs in northwest Florida. If other upland mixed woodland reference sites are found closer to AWMA and have attribute values that differ from the current site, we may need to revisit the AWMA DFCs for this community.

Table 2. Desired Future Conditions for specific vegetative attributes in actively managed natural communities at AWMA as identified via the WCPR workshop process.

Sandhill	DFC Value Range
Basal Area of Pine (ft ² per acre)	20-60
Non-Pine Stem Density >4 in DBH ¹ (count/7m radius)	<3
Subcanopy stems 2-4 in DBH (avg count in 4m ² quad)	<1
Average maximum Serenoa height (ft)	<3
Serenoa Cover <1 m (%)	<5
Serenoa Petiole Density (>1 m)	0
Average Maximum Shrub Height (ft)	<3
Shrub Cover <1 m (%)	10-20
Shrub Stem Density >1 m (avg count in 4m ² quad)	0
Maximum Shrub DBH ¹	<1
Herbaceous Cover (%)	>25
Upland Mixed Woodland	
Basal Area of Pine (ft ² per acre)	0-30
Non-Pine Stem Density >4 in DBH ¹ (count/7m radius)	<5

Subcanopy stems 2-4 in DBH (avg count in 4m ² quad)	<1
Average maximum Serenoa height (ft)	<3
Serenoa Cover <1 m (%)	<5
Serenoa Petiole Density (>1 m)	0
Average Maximum Shrub Height (ft)	>0
Shrub Cover <1 m (%)	<20
Shrub Stem Density >1 m (avg count in 4m ² quad)	<10
Maximum Shrub DBH ¹	≥0
Herbaceous Cover (%)	>5

¹ DBH = diameter at breast height.

4.3: Further Land Management Considerations

Most generalist or wide-ranging species benefit from management that maintains or restores the structure and function of the natural communities they use. However, specific management recommendations and precautions are necessary to ensure continued suitability of the area for some species. The following recommendations should help AWMA continue to fulfill its role in the conservation of these species.

4.3.1: *Eastern Indigo Snake and Florida Pine Snake*

Large upland snakes such as the eastern indigo and Florida pine snake are relatively wide-ranging and elusive. Ongoing land management activities will enhance the suitability of habitat for these species but could also be directly detrimental. When using heavy equipment during land management activities, avoid direct mortality, if possible. When practical, keep heavy equipment at least 25 feet from areas with a high density of pocket gophers or gopher tortoise burrows, as pine snakes regularly use the burrows of both species and forage on the pocket gophers. In general, do not remove stumps and leave coarse woody debris and residual stumps intact to provide cover for these species. If necessary to pile and burn excess logging slash, ensure some debris remains in the stand to provide cover for these species. Creating brush piles can provide cover for these species if escape cover is lacking.

4.3.2: *Gopher Tortoise*

The timing of mechanical treatments should minimize negative impacts to gopher tortoises. Gopher tortoises are generally less active and remain in burrows during the winter months; therefore, mechanical equipment at this time will be less likely to crush or otherwise harm foraging tortoises. Because it is difficult for equipment operators to see hatchling tortoises, and hatchlings are most abundant during September and October, avoid mechanical treatments

during these months when practical. However, also consider how timing of the treatment will affect management results because growing season treatments frequently are more successful in creating the diverse groundcover required by the gopher tortoise. Regardless of timing, make efforts to minimize impacts to known burrows, whether active, inactive, or abandoned.

4.3.3: American Swallow-Tailed Kite

While swallow-tailed kites have not been documented nesting on AWMA, it is important to preserve future potential nest trees. This can be done by retaining the largest, oldest, site-appropriate native trees on the landscape during land management. Because swallow-tailed kites exhibit high nest site fidelity, protect known nest sites from disturbance and alteration by maintaining a 330-foot protective buffer around active nests during nesting season (March-June). When possible, kite nesting areas should be managed to have a higher shrub height and density than surrounding areas as this may reduce the likelihood of nest predation. If kite activity is observed during nesting season, particularly if kites are observed carrying nesting material, mobbing, or congregating in groups of 3 or more, document this information and try to locate the nest. For information on how to locate nests, see:

Meyer, K. D., and M. W. Collopy. 1995. [Status, distribution, and habitat requirements of the American swallow-tailed kite \(*Elanoides forficatus*\) in Florida](#). Project Report, Florida Game and Fresh Water Fish Commission, Tallahassee, Florida, USA.

4.3.4: Bachman's Sparrow

Prescribed fire improves habitat quality for Bachman's sparrows, and the restoration of native sandhill groundcover will increase the acreage of available habitat on AWMA. With restoration of a native warm-season grass-dominated groundcover, suitable habitat can be maintained through frequent (≤ 3 -year) use of prescribed fire in sandhills. The occurrence of fire is critical to sustaining this species, as use of an area by Bachman's sparrows declines rapidly around 18 months post-fire, and the species may abandon habitat if fire is excluded for more than 3 years. Because males use small shrubs as singing perches, leave some patches of low shrubs when using mechanical treatments to reduce understory. Follow mechanical treatment with a prescribed burn.

4.3.5: Brown-Headed Nuthatch

Brown-headed nuthatches have not been documented on AWMA and current conditions are not optimal. However, management can be applied to increase habitat suitability, which will increase potential for future occupation by the species. This cavity-nesting species is dependent

on the presence of snags for suitable nesting habitat. As such, retain snags during land management activities and evaluate the affect of management activities on snags to ensure that new snags are replacing consumed snags. Old short snags with flaking bark and soft wood, and old decaying oaks with a diameter at breast height of <10 inches are important potential nesting sites for this species. Take care to retain these particular types of snag when possible.

4.3.6: Northern Bobwhite

The primary land management tool used to benefit northern bobwhite is the frequent use of prescribed fire. Conducting prescribed fires using a variety of firing techniques and environmental conditions with the goal of promoting a mosaic burn is essential to bobwhite conservation. Mosaic burns result in a patchwork of burned and unburned areas that meet different life history requirements for northern bobwhite. Growing season fires are generally preferred as they trigger flowering and viable seed production in many native species. Recent evidence suggests that the frequency of fire may be just as important as the seasonality of burn. Thus, if growing season burns do not occur, it is better to burn the unit during the following dormant season than to wait until the following summer. In general, to provide habitat diversity, smaller burn units (50–200 acres) are preferred over larger burn units (>1,000 acres).

Pine stands with basal areas >70 ft²/acre should be thinned to trigger herbaceous growth and improve habitat conditions for this species. Ruderal areas can be managed for northern bobwhite through mechanical actions like mowing and or disking strips during the summer months to promote herbaceous growth.

4.3.7: Short-Tailed Hawk

Nests of this species often are difficult to locate and monitor. When nest sites are located, protective action should be taken if nests are active. Known nesting sites should be protected from human disturbance (e.g., prescribed fire, timber thinning, mechanical treatments) by maintaining a 330-ft buffer around the nest during the nesting season, and avoiding heavy alteration of the nesting location.

4.3.8: Southeastern American Kestrel

Southeastern American kestrels are dependent on the occurrence of open upland habitats that contain a number of snags for nest sites and perches. While ongoing management will encourage the open foraging condition this species requires, snag management will also benefit southeastern American kestrels. This practice includes retaining large snags during land management activities, protecting snags when safe and practical, and promoting the creation of new snags in areas currently lacking. If nesting is documented, minimize the amount of

mechanical activity within 500-feet of the nest during the nesting season and protect the snag during prescribed fire activities. For more information on management for kestrels, see:

Stys, B. 1993. [Ecology and habitat protection needs of the southeastern American kestrel \(*Falco sparverius paulus*\) on large-scale development sites in Florida.](#) Florida Game and Fresh Water Fish Commission, Nongame Wildlife Program Technical Report No. 13. Tallahassee, Florida, USA.

4.3.9: Southern Bald Eagle

State and federal law requires protection of bald eagles, including avoiding disturbance of nesting eagles. Managers will follow the management guidelines in the [FWC management plan](#) when planning activities within 660-feet of known eagle nests. Any new nests that are located will be documented. As this species is surveyed on a statewide basis, the [bald eagle nest locator](#) will be checked annually to determine if any new nests have been detected. It is undesirable to have unnaturally dense stands around eagle nests. Continue to manage stands in which eagle nests occur, but avoid negative impacts to the eagles per the guidance of the management plan. During management activities, retain large, mature pines as potential future eagle nesting sites.

4.3.10: Wading Birds

It is possible that some future actions (e.g., prescribed fire, timber harvest) could have negative impacts on wading birds if the needs of the species are not considered during the planning of these activities. The potential to have negative impacts on these species can be reduced by taking actions to avoid disturbing colonies of nesting wading birds. This is accomplished by providing a 330-foot buffer around colonies during the nesting season.

4.3.11: Sherman's Fox Squirrel

To help these areas reach their full potential for fox squirrels, prescribed fire should continue to be used to create an open, mature forest structure. Efforts to reduce canopy closure in the upland mixed woodland will benefit this species by providing the open conditions the species prefers. As fox squirrels require an oak component, mature oaks should be retained in appropriate sites (e.g., fire shadows) during sandhill restoration. Ideally, a variety of oak species in a range of age classes should be retained, but not to the extent that interferes with other species needs and natural community management. Maintaining single, large hardwood trees and small patches of oaks within pine uplands creates the highest quality fox squirrel habitat. Studies conducted in southwest Georgia produced a recommendation of 2-3 large single trees (>12 inch DBH), or patches of smaller trees (4-12 inch DBH), for every acre of pine savanna, to

accommodate the needs of Sherman's fox squirrels.

Section 5: Species Management Opportunities

Land management considerate of the needs of a suite of focal species provides direct benefits to many associated species. However, land management actions alone are insufficient to maintain or recover some species. These species need species-specific management ([Section 5.1](#)). Additionally, monitoring ([Section 5.2](#)) is required to verify management is having the desired influence on wildlife. [Section 5.3](#) identifies research necessary to guide future management.

5.1: Species Management

Species management as used here refers to actions other than land management, monitoring, or research, taken for a specific species. Species-specific management actions can include actions such as translocation, restocking, or installing artificial cavities. These actions may be needed for species that are currently present but occur at low densities, have low reproduction potential, or have other limitations that inhibit recovery. Additionally, species that are not present on a site, have limited dispersal capabilities, or are unlikely to occupy a site without reintroduction, may require species-specific management. [Section 2](#) and [Section 4](#) provide information on land management actions, such as prescribed fire or mechanical treatments. [Section 5.2](#) covers monitoring related actions, including banding or tagging.

5.1.1: Bat House Program

Species management activities for bats on AWMA consist of maintaining a suite of bat houses for use by southeastern myotis and other species. The purpose of the bat house program is to provide suitable roost sites for a variety of bat species. Several different designs and sizes of bat houses are currently in place on AWMA. Bat houses are located on 4 wildlife openings and at 1 picnic area. There is one large bat house (1 ft X 4 ft X 8 ft), 3 medium houses (1 ft X 4 ft X 2 ft), and 5 small houses (4 in X 22 in X 16 in). In general, small houses are placed in an opening first and large houses are added as the small houses are occupied. Staff maintains and replaces bat houses as needed, and adds capacity as resources allow. If resources are available, consideration will be given to adding a culvert-style bat house that is preferred by Rafinesque's big-eared bat. Staff will continue to maintain the current suite of bat houses on AWMA.

5.2: Species Monitoring

Monitoring is critical to evaluating the effect of management on wildlife. While we are unable to monitor all of the focal species on AWMA, the recommended monitoring will assess species in all actively managed communities, select wetland dependant species, and includes opportunistic monitoring for uncommon or hard to monitor species. Data collected will be reported to the regional conservation biologist for inclusion in the appropriate database developed for the WCPR program. The FWC will make monitoring data available to cooperating agencies and organizations, such as FNAI ([Section 6](#)).

This section lists the monitoring recommended for AWMA. We also provide the purpose for each monitoring effort. The FWC is in the process of standardizing monitoring protocols for a number of these species, and developing the Sampling and Monitoring Protocol (SaMP) database for data storage. Area staff will work with the regional conservation biologist to implement standardized protocol, standardize ongoing monitoring that does not have a standardized protocol, and ensure data is included in SaMP.

5.2.1: Herpetological Survey

The purpose of conducting repeated herpetological surveys is to create an inventory of species occurring on the area. An added benefit of repeated surveys is that they provide the opportunity to determine if there are changes in species composition or relative abundance, and they are a good way of verifying presence of some species. Staff conducted a pilot herpetological survey on AWMA in 1989-90, and the FNAI conducted a survey on AWMA in 2006-07. Future surveys should follow the format of the FNAI survey. However, to provide an increased chance of capturing large-bodied snakes, some of the arrays should include a large-bodied snake trap. Provided resources are available, it is ideal to repeat these surveys on a 10-year basis.

5.2.2: Gopher Tortoise Monitoring

The purpose of gopher tortoise monitoring will be to track the distribution and relative abundance of the species to determine the effect of management on the population trend. Past surveys on the 80-acre addition followed the established gopher tortoise mitigation park protocol. At this time, AWMA should continue to follow this protocol. If resources are available, scoping $\geq 20\%$ of burrows would allow for an area-specific occupancy rate, which would enhance the quality of the data. To allow for the collection of 3 data points on which to base trend analysis, we recommend the initial monitoring occur at a 5 year interval. Once 3 data points are obtained, switching to a 10 year interval would be sufficient to track the population through time.

However, the FWC is part of a gopher tortoise CCA and the members of this Agreement have adopted a Line Transect Distance Sampling (LTDS) monitoring protocol for the gopher tortoise throughout its range. LTDS will allow for estimating gopher tortoise density, which will

then allow managers the ability to track changes in the population, rather than just changes in the number of burrows. There is an effort under way to prioritize public lands in Florida for LTDS monitoring. This protocol may be adopted on AWMA if it is designated a priority, and resources are available. Regardless of the monitoring methodology, data will be reported to the gopher tortoise plan coordinator and entered into SaMP.

5.2.3: Florida Mouse Monitoring

The purpose of monitoring Florida mice is to determine the distribution and persistence of Florida mice on AWMA, and to document colonization of restoration areas. In the pine plantation, clear-cut area, and upland mixed woodland community, staff will implement the standard Florida mouse monitoring protocol at a 5-year interval. In other natural communities that Florida mice typically do not inhabit, a survey of small mammals was conducted in 2008, and will be repeated at 5-year intervals. Data will be reported to the conservation biologist for entry into SaMP.

5.2.4: Small Mammal Survey

The purpose of conducting repeated small mammal surveys is to create an inventory of species occurring on the area. An added benefit of repeated surveys is that they provide the opportunity to determine if there are changes in species composition or relative abundance, and they are a good way of verifying presence of some species. Staff conducted a pilot survey in 1989-90, and another survey, using the same sites as FNAI used for the herpetological survey, in 2007-08. Future surveys should follow the protocol of the 2007-08 survey. Provided resources are available, it is ideal to repeat these surveys on a 10-year basis.

5.2.5: Bat House Monitoring

Bat houses provide roosting sites for several species of bats including southeastern myotis and Rafinesque's big-eared bats. The purpose of bat house monitoring is to provide better information about where and when bats use bat houses on conservation lands, and if land management activities have the potential to impact bat house use. SCP staff developed a standard bat house occupancy monitoring protocol that is currently being implemented on WMAs throughout Florida. This protocol requires a minimum of 3 visits per year to determine occupancy and estimate the proportion of space in the house occupied by bats. Additional optional visits before and after land management activities that may affect bat house occupancy are encouraged. Participating in bat house occupancy assessments will lead to better recommendations on bat house placement and may provide long-term trend information on bat house use.

5.2.6: Opportunistic Monitoring Opportunities

The purpose of opportunistic monitoring is to document the presence of specific species. Opportunistic monitoring is the process of recording important information as it is encountered. By following the standardized monitoring protocol, staff ensures their data are compatible with other opportunistic observations. Documentation of opportunistic sightings including species, date of the observation, observer, approximate lat/long or appropriate MU, number of individuals, behavior, and habitat type should be forwarded to the regional conservation biologist or entered into the SaMP. Record encounters or sign of the following focal species:

- Gopher frog
- Eastern indigo snake
- Florida pine snake
- Short-tailed snake (all sightings, photo voucher if possible)
- American swallow-tailed kite (aggregations of 3 or more birds on regular basis in one area during spring and any nesting activity)
- Bachman's sparrow
- Brown-headed nuthatch
- Cooper's hawk
- Limpkin
- Short-tailed hawk (all sightings, but report nests to ARCI)
- Southeastern American kestrel
- Southern bald eagle (record and report new nests)
- Any wading bird colonies and observations of wood stork, roseate spoonbill, reddish egret, snowy egret
- Florida black bear
- Sherman's fox squirrel (presence of nests or young)
- Any listed species that does not have a monitoring protocol in this section.

5.3: Species Research Needs

Species management recommendations in other sections of this document are based on the most current information available. Cases may arise where little or no information is available to guide management, and research is needed. However, workshop participants did not identify any species research needs on AWMA.

Section 6: Intra/Inter Agency Coordination

The WCPR process identified many recommendations regarding possible management actions for focal species. WHM staff can handle most proposed management actions; however, coordination with other sections in FWC or with other agencies sometimes is necessary or more efficient. This section describes coordination that is necessary outside of the WHM section, identifies the entity to coordinate with, and provides position contacts for these entities. We attempt to provide the name, position, and contact information for the people holding the position when the Strategy was drafted. As positions experience turnover, when in doubt, contact the current Section Leader or supervisor to determine the appropriate person now holding the position.

6.1: Florida Fish and Wildlife Conservation Commission

6.1.1: Species Conservation Planning Section (SCP)

Monitoring animal populations on a WMA/WEA gives managers a way to gauge animal response to management. If this information is not shared with others, valuable data that can be used to assess statewide conservation efforts is often lost. Managers will share monitoring data with the appropriate taxa coordinator and with program coordinators for species that are part of conservation initiatives or other management programs. The regional SCP biologist is a good source of information on the regional status of non-game species. The mammal taxa coordinator has access to bat detectors and is a good source of information on bat issues. FWC staff is authorized to handle federally listed species as long as actions are consistent with the requirements of the agency's [Endangered Species Act Section 6 Cooperative Agreement](#). To meet these requirements, staff will provide reporting as outlined in the Agreement to the agency's Endangered Species Coordinator. Please note some contacts will also be covered under [Section 6.1.3; FWRI](#), and [Section 6.1.5; Florida's Wildlife Legacy Initiative](#).

Contacts:

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Michelle Vandeventer, Bald Eagle Management Plan Coordinator: (941) 894-6675

Terry Doonan, Regional Biologist: (386) 754-1662

6.1.2: Division of Hunting and Game Management (HGM)

As the FWC has a [statewide quail strategy](#), coordination with HGM is recommended if issues regarding northern bobwhite quail arise on AWMA. Mourning dove banding activities are reported to HGM.

Contacts:

Paul Schulz, Section Leader: (850) 488-3831

Greg Hagan, Northern Bobwhite Coordinator: (850) 488-3831

6.1.3: Fish and Wildlife Research Institute (FWRI)

Area staff will cooperate with FWRI staff conducting monitoring and research for bald eagles by reporting new eagle nests to baldeagle@myfwc.com. Area staff will cooperate with Kevin Enge on herpetofauna monitoring and report documentation of these species to FWRI. The vacant research administrator position administers the FWC's [migratory bird scientific collection permit](#). Report handling of migratory birds covered by the permit to this person in January of each year.

Contacts:

Robin Boughton, Section Leader: (352) 334-4218

Jeff Gore, Biological Administrator (mammals): (850) 265-3677

Janell Brush, Assistant Research Scientist (bald eagle): (352) 334-4202

Kevin Enge, Associate Research Scientist (herps): (352) 334-4209

6.1.4: Conservation Planning Services (CPS)

CPS works with private landowners and may be able to assist in making contacts or providing incentives for management activities on neighboring private lands. Additionally, CPS staff administers the FWC's environmental commenting process, which may help with commenting on environmental use permits. Maintaining communication regarding current and future projects will be critical.

Contacts:

Scott Sanders, CPS Section Leader: (850) 488-3831

Kris Cathey, Regional Coordinator: (386) 754-6244

Courtney Tye, Wildlife Biologist: (352) 334-0311

6.1.5: Florida's Wildlife Legacy Initiative (FWLI)

FWLI is an FWC program developed to generate and coordinate cooperative conservation projects that address high priority issues identified in Florida's State Wildlife

Action Plan. FWLI can assist in identifying potential partners and assisting with collaborative efforts for monitoring and management of focal species. FWLI is a potential source of project funding via [Florida's State Wildlife Grants program](#). Regular communication with this section will be valuable.

Contacts:

Kate Haley, Program Administrator: (850) 617-9503

Caroline Gorga, Wildlife Legacy Biologist: (386) 754-1667

6.2: Florida Forest Service (FFS)

The FFS provides authorizations for prescribed burning, assists in controlling escaped fires, and periodically conducts wildfire mitigation activities. FFS can provide assistance with timber management including administration of contracts for thinning operations. AWMA staff should continue to coordinate prescribed fire and timber management activities with FFS.

Contacts:

Ben Beauchamp, East Levy County Forest Area Supervisor, Waccasassa District: (352) 493-6803

6.3: Avian Research and Conservation Institute (ARCI)

ARCI surveys and keeps information on American swallow-tailed kite and short-tailed hawk populations. Location information on the swallow-tailed kite and short-tailed hawk, particularly nests or nesting behavior, should be shared with ARCI.

Contacts:

Dr. Ken Meyer, Avian Researcher: (352) 335-4151; meyer@arcinst.org

Gina Kent, Research Ecologist and Coordinator: (352) 514-5607; ginakent@arcinst.org

6.4: Florida Natural Areas Inventory (FNAI)

FNAI collects, interprets, and disseminates ecological information critical to the conservation of Florida's biological diversity. The FNAI's database and expertise facilitate environmentally sound planning and natural resource management to protect the plants, animals, and communities that represent Florida's natural heritage. The FNAI maintains a database of rare and listed species that is often used for planning purposes. By entering data into the SaMP,

staff ensures their data are available to FNAI. FWC also has a contract with FNAI for plant and animal surveys if the need exists and resources are available.

Contacts:

Dan Hipes, Chief Scientist: (850) 224-8207

Kim Gullede, Senior Ecologist (850) 224-8207

Section 7: Beyond the Boundaries Considerations

With appropriate management, there is enough potential habitat to support many of AWMA's focal species. AWMA can currently support a viable population of several species, such as the gopher tortoise, and Florida mouse. While many of AWMA focal species are highly mobile outside of the nesting season (e.g., southern bald eagle, American swallow-tailed kite, short-tailed hawk, and wading birds) and will likely continue to occur on the area, their long-term persistence is dependent on regional conditions. The surrounding network of conservation lands along the Suwannee River will help ensure the persistence of many of the wide-ranging focal species.

While the primary purpose for acquisition of AWMA is the conservation of upland hardwood forest and floodplain habitats, a number of focal species are dependent upon other natural communities that are part of the habitat matrix. Focal species such as the gopher tortoise and Florida mouse are dependent on the sandhill and upland mixed woodland communities, while the southeastern myotis, limpkin, and wading birds rely upon the floodplain forest and swamp to meet their needs.

The current management boundaries identified for AWMA do not include all important habitat for focal species, such as the lands identified as Strategic Habitat Conservation Areas (SHCAs) for American swallow-tailed kite and Florida mouse. The FWC originally identified SHCAs in the Closing the Gaps in Florida's Wildlife Habitat Conservation System report (Cox et al. 1994; available at [Closing the Gaps Report, 1994](#)). The goal of SHCAs is to identify the minimum amount of land needed in Florida to ensure long-term survival of key components to Florida's biological diversity. The SHCAs identify important remaining habitat conservation needs on private lands. New SHCAs have been identified in a recent FWC update to the Closing the Gaps entitled "[Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas](#)". The American swallow-tailed kite, Cooper's hawk, Florida black bear and Florida mouse are species for which an SHCA was identified within 3 miles of AWMA tracts. Although it is unlikely Florida will acquire all property identified in SHCAs, property acquisition and encouraging land use and management that is compatible with the needs of AWMA's focal species should be a priority.

Many of AWMA's species are dependent on the availability of suitable habitat on adjacent private and public lands. Because AWMA is a relatively small tract, the actions of

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adjacent landowners will determine if some of these focal species will persist on AWMA. Many adjacent parcels are in public ownership or in conservation easements and provide some stability for many focal species.

Much of the private land in the area is currently in some form of agricultural or silvicultural land use, but some of these lands are likely to be converted to residential development. CPS staff assists private landowners by providing technical assistance, financial incentives, and workshops to educate and inform private land managers. The workshops also provide a forum where landowners can interact with staff from public conservation lands and establish communication. Staff should continue to coordinate with CPS to ensure private landowners are informed about incentive programs that encourage conservation-based management, and that they receive the proper technical assistance to affect this management. CPS should ensure environmental commenting includes recommendations for compatible use of lands adjacent to AWMA.

As many of AWMA's focal species also occur on neighboring public lands, staff should maintain communication with DEP and USFWS staff. Collaboration with neighboring conservation managers for land and species management activities will further benefit focal species found in the Suwannee River valley. Conservation partnerships are critical to the long-term persistence of many species and should be encouraged.

12.18 AWMA Recreation Master Plan

Recreation Master Plan

Andrews Wildlife Management Area



Florida Fish and Wildlife Conservation Commission



October 2004

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1. Recreation and Wildlife Viewing Facilities Design Guidelines
2. Monitoring and Management Guidelines
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I. Introduction

A. Purpose of the Andrews Recreation Master Plan

The purpose of this Recreation Master Plan (RMP) is to serve as a guide for providing recreational experiences focused on wildlife viewing and nature study on Andrews Wildlife Management Area (Andrews or Andrews WMA). The plan contains specific recommendations for recreational enhancements and interpretive products and programs. It also provides guidelines for monitoring recreation-related use to avoid negative resource impacts and to ensure satisfactory visitor experiences.

In the RMP for Andrews WMA, emphasis is placed on integrating recreation and interpretive planning. Using this approach, the type of recreational experience offered and the location of recreation amenities provided, is strongly influenced by the interpretive goals for the area. Recreation opportunities thus become a means to an end - reaching visitors with important concepts about an area's natural resources, wildlife and wildlife management. The interpretive themes presented below were developed by considering the purposes for which the area was acquired and the significance of the area.

B. Purpose of the Andrews WMA Acquisition

Andrews WMA comprises 3,501 acres in western Levy County between Fanning Springs and Chiefland. The primary purpose for acquiring the WMA was to protect its high intrinsic wildlife value, relatively unspoiled mature hardwood forest and an important area of the Suwannee River floodplain. According to the CARL assessment documentation, purchase was recommended to protect the fish and wildlife habitat of this outstanding natural area as well as the water quality of the Suwannee River. It was further recommended that: (1) outdoor recreation be emphasized and that major efforts be directed toward protecting the pristine state of the mature hardwood forest, and (2) the area be managed as a high quality, resource-based natural area where wild plants and animals are the feature attraction.

C. Significance of Andrews WMA

Andrews is unique as one of Florida's largest remaining unaltered contiguous hardwood hammock forests representing xeric and mesic vegetative communities in close proximity. The 3,000 acres of old-growth upland hardwood forests, with its well-developed canopy, provide an ecological niche for many wildlife species. The 800-acre hydric community lying adjacent to the mesic forest and bordering the Suwannee River adds to the unique and scenic character of the property.

Three Florida Champion trees exist on the area. They include persimmon, Florida maple and bluff oak. Three previous champion trees, Florida basswood, winged elm and river birch were lost due to natural causes during the period from 1993-95. Additional champion trees may be discovered as a thorough inventory of vegetation is completed.

D. Interpretive Themes for Andrews WMA

Interpretive themes are categorized as primary and secondary. Primary themes are based on critical concepts that we want visitors to remember after they have left Andrews WMA. Primary themes help set visitor experience goals and priorities and are considered in the design of amenities offered to nature-based recreationists. Secondary themes are based upon other significant features of the area and may expand upon or support the primary themes. The content of interpretive signs, recreation guides, web pages and other materials will be guided by these themes.

1. Primary Interpretive Themes

- a. Andrews contains one of Florida's largest remaining unaltered, contiguous hardwood hammock forests representing xeric and mesic vegetative communities in close proximity. This large, intact hardwood community provides important habitat for many forest-dwelling species
- b. Floodplain forests, as found along the Suwannee River in Andrews WMA, play a critical role in protecting water quality, buffering flood waters, and in providing habitat for numerous species of fish and wildlife.

2. Secondary Interpretive Themes

- a. FWC biologists monitor and manage the area to sustain its fish and wildlife resources.
- b. The visible landscape of today has been altered by human uses and activities including logging and fire.
- c. The Suwannee River played an important role in the history of North Florida in terms of settlement and commerce.

II. Resource and Recreation Assessment

The following is a brief summary of the existing natural and cultural resources of Andrews WMA (a complete description of these resources is provided in the AWMA 2001-2006 Conceptual Management Plan). Also provided in this section is a description and analysis of the existing recreation uses and facilities on the area. Existing facilities are delineated on Map 2: Site Inventory.

A. Natural Resources

There are five major plant communities on AWMA (Map 1): mixed hardwood-pine, hardwood hammock (Photo 1), hardwood/floodplain swamp (Photo 2), pinelands, and

grass/agriculture/barren land. Roughly 20 percent (800 acres) of the area is located in the 100-year floodplain of the Suwannee River, and approximately 80 acres are in planted pine.

The old-growth upland hardwood forest lacks evidence of previous timbering operations.

The overstory now consists of mature and senescent tree species. There is a fairly well-developed hardwood midstory of shade-tolerant species, especially in the upland mixed hardwoods. The herbaceous understory vegetation, once severely suppressed by extensive browsing is showing signs of recovery as deer and hog populations have been reduced.

The canopy and subcanopy include laurel oak, live oak, bluff oak, scrub live oak, pignut hickory, southern magnolia, sweet gum, persimmon, American holly, sparkleberry, and wild olive. Understory includes needle palm, coontie, American beautyberry, saw palmetto, and sedges.



In the mixed hardwood/pine areas the canopy and subcanopy include Florida elm, ironwood, cabbage palm, fringe-tree, sweetgum, longleaf pine, live oak, scrub live oak, turkey oak, blue-jack oak. Ground cover is dominated by saw palmetto.



In the floodplain swamp adjacent to the Suwannee River, large sloughs parallel the river and in some areas project inland, forming islands of river-front bluffs. Water from seepage springs and sinkholes flow into many of the sloughs. While some sinkholes connect directly to the sloughs or Suwannee River, others appear to be spring-fed and hold water year-round. These perennial springs support ground cover vegetation and macro invertebrates that provide a valuable food source for many vertebrate life forms.

The canopy and subcanopy of the floodplain swamp include bald cypress, water tupelo, swamp tupelo, various ashes, willow, Florida elm, red maple, swamp chestnut oak, water hickory, and river birch.

B. Wildlife Resources

Since the dominant habitat feature of the area is old growth hardwood forest, those wildlife species which utilize a climax forest are most abundant. Tree cavities provide nesting sites, dens,

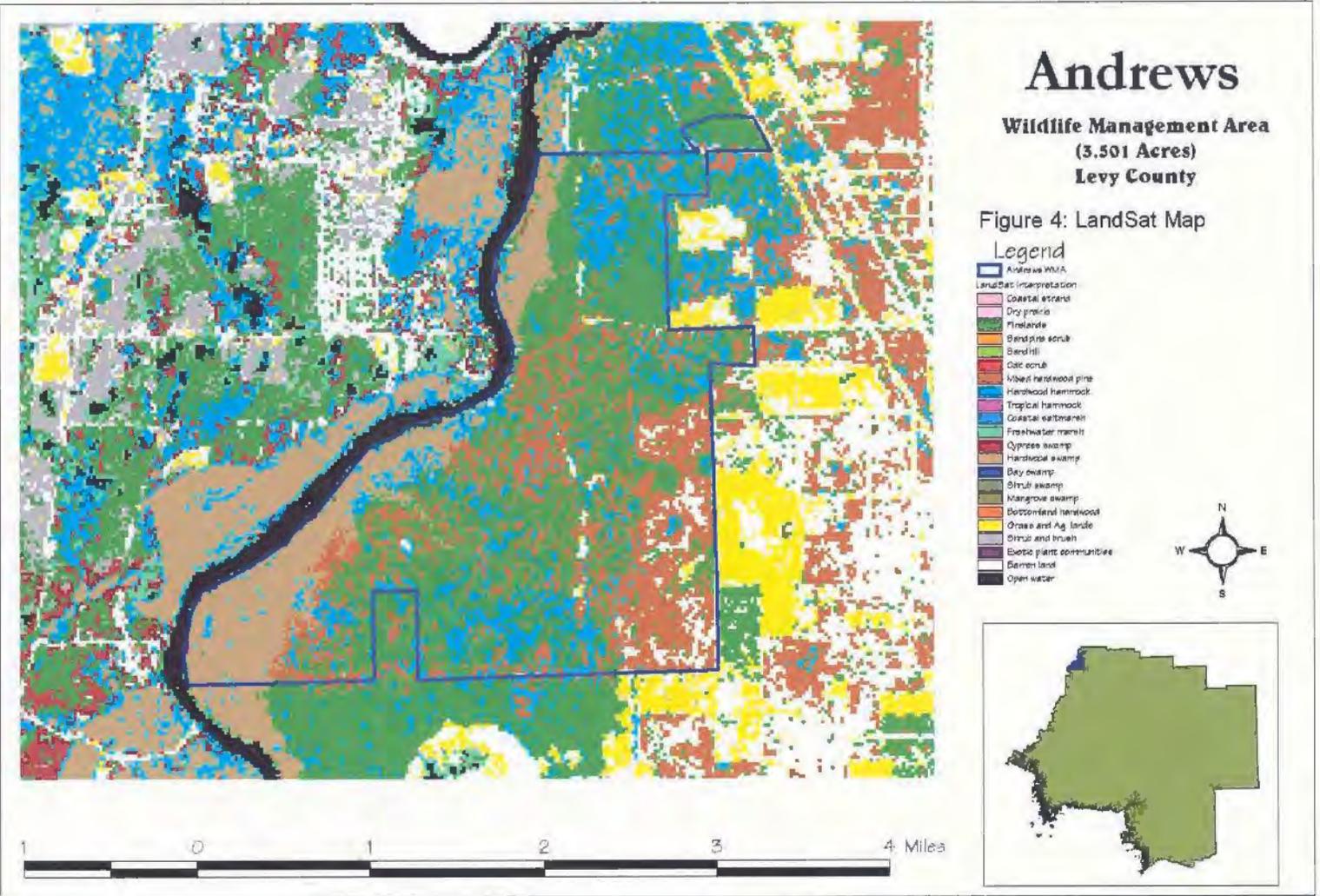
roosting areas and escape cover for species such as raccoons, opossums, squirrels, bats, owls, woodpeckers and wood ducks. The relatively open understory is attractive to worm-eating warblers and eastern wood pewees. Many canopy-dwelling birds such as warblers, vireos, orioles, cuckoos, and titmice inhabit the forest canopy at different times of the year.

In the summer and early fall, the sound of falling hickory nuts is common throughout the forest. Upland game such as white-tailed deer, wild turkey, feral hogs and gray squirrels benefit from the variety of mast-producing hardwoods and plants found here.

Openings in the forest canopy created by the previous landowner have promoted some of the edge-preferring species such as white-tailed deer, white-eyed vireos and gopher tortoises. The river border and unique blend of hydric-mesic and xeric soils create a diversity of micro-habitats for an even greater variety of wildlife.

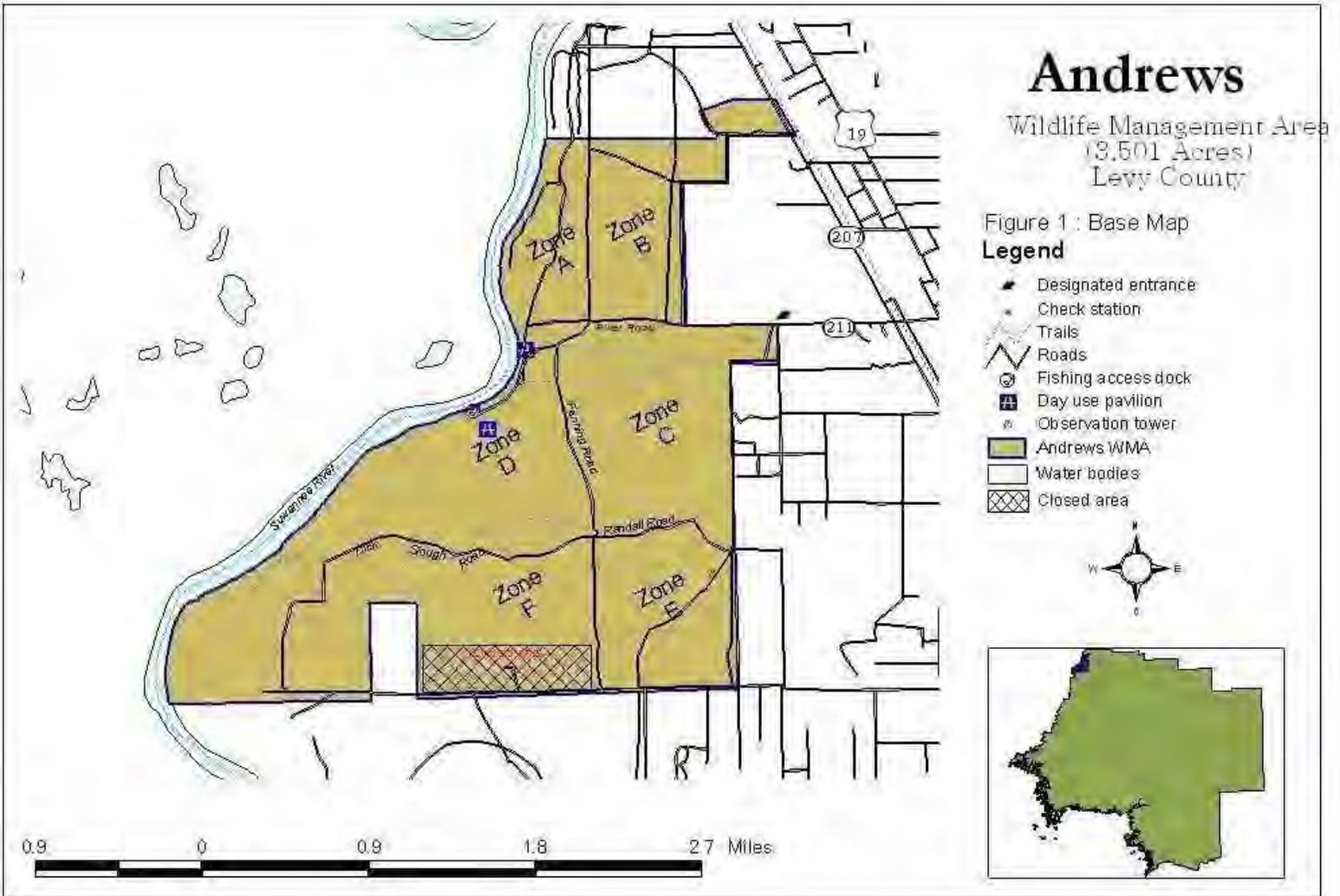
C. Cultural Resources

In the Florida Master Site File there is one record of an aboriginal village on the bluff along the Suwannee River. Site LV00036 is a buried site probably representing the accumulation of temporary hunting camps. One small burial plot relating to modern settlers exists on the tract.



Map 1. Vegetative cover on Andrews Wildlife Management Area

Map 2. Site Inventory



C. Existing Recreation Uses and Facilities

Hunting: Hunting is limited 31 days out of the year with an average of 902 hunter days per season. All hunts are by quota except for squirrel hunts which are limited to the first 40 hunters per day. Zone tags are given out to hunters, and only a limited number are allowed in each zone at a time.

Andrews has a good population of deer and turkey, and is one of the top 5 hunting areas in the state. The area is closed to other uses on hunting days. During two weekends each fall, Andrews has supervised youth hunts for boys and girls ages 8 through 15.

Due to the area's small size, it has to be closed to non-hunting uses on hunting days. Communicating open and closed times to the public is important.



The hunter check station and area office are located at the entrance to the area.

Fishing: The area has three miles of shoreline on the Suwannee River. Boat fishing is popular along the shoreline. The area at the end of River Road is a well-established bank fishing spot due to its auto accessibility. There is one dock located on the river just south of the terminus of River Road. From the dock, visitors can climb the steps up the riverbank to access a shelter and picnic tables.

The dock and steps are aging and need to be repaired or replaced.



Boat dock on Suwannee River

Improvements have recently been made here to stabilize the eroding river bank and provide better access to the water's edge by way of a terrace/step system. Terracing should be monitored to ensure that it is providing adequate erosion control.

Fishing is best in April, May, and June. Redbreast sunfish, Suwannee bass and catfish make up the bulk of the catch.

Wildlife Viewing: The mature hardwood forest and forested wetlands of Andrews are home to a variety of birds and mammals. Excellent viewing opportunities are available from the many roads and trails that wind through the area. Viewing opportunities are enhanced by the fact that Andrews is within the Suwannee River basin, which is a major route for many species of migrating birds.

Several wildlife food plots that were established by the previous owners are still maintained by FWC in a mixture of perennial grasses and annual grain crops. Many species of wildlife use these clearings. Gopher tortoises are common here. Their burrows provide shelter to many other types of wildlife from spiders and moths to skunks and mice. In the spring, ground-nesting birds, such as wild turkey, use the clearings for nesting and brood-rearing. White tailed deer are often seen feeding on the succulent young plant shoots found growing in the clearings.

From the banks of the Suwannee River, visitors can see a variety of wading birds and waterfowl. During the spring and summer months, Gulf sturgeon can frequently be seen and heard leaping from the river.

Andrews is a designated a Watchable Wildlife site and is located on the West segment of the Great Florida Birding Trail. The area manager reports an increase in birding activity since its inclusion.

There are two observation towers located at the edge of food plots in Zone E in the southeastern corner of the property. The sparse vegetative cover around both



Observation tower at Persimmon Trail

towers provides little screening between viewers and wildlife. This should be corrected to provide better viewing experiences and to reduce disturbance to wildlife.

Hiking: There are six existing named nature trails on the area totaling more than three miles in length. Three of the trails lead hikers to Florida champion trees. Most of the trails exist as individual spur trails to champion trees. They are not linked or looped in a systematic manner (Map 2). In addition to the named trails, visitors may walk along more than thirteen miles of unpaved roads through the area.

Biking: Cyclists may use all sixteen miles of trails and roads throughout the area (Map 2). While roads and trails are in good condition, off-road bicycles are necessary to access most of them. With the Nature State Coast Rail Trail located approximately one mile to the east of the main entrance, trail users could be attracted to Andrews via NW 160th street for an interesting side trip experience. However, street bike riders (more common on the paved rail trail) may have a hard time negotiating the unpaved trails and roads on Andrews.

Scenic Driving: The winding roads on Andrews are very scenic with a full hardwood canopy in many places (Photo 7). There are six miles of named roads on the area. These are in good shape and provide year round two-wheel drive accessibility.



Dick's Slough Road

Spur roads off the main roads are gated but not marked as such although most have adequate turning around space at the gate. The road system could benefit from better wayfinding signs.

Paddling and boating: There are no boat launching facilities on Andrews, however paddlers and boaters can access the WMA from the boat dock area. As illustrated in the photograph people are climbing up the steep bank destroying vegetation and causing the bank to erode. This should be corrected with a terrace similar to that on River Road or fencing to direct users to the stairs. The Suwannee River Wilderness Trail, being developed by the Department of Environmental



Protection and Suwannee River Water Management District will likely increase the use of the area by paddlers and may increase demand for camping. A kiosk and trailhead near this area also would enhance the visitor experience for those arriving by boat or paddlecraft.

Picnicking: There are two picnic areas on the banks of the Suwannee. One car accessible site is located at the terminus of River Road. The other site is located at the boat dock

area. It is only accessible to boaters and hikers. Each site has a covered pavilion with two tables, a trash receptacle and a pedestal grill.

Currently no facilities are accessible to people with disabilities. The River Road facilities should be upgraded to accommodate disabled visitors. Neither picnic site has sanitary facilities. There is considerable erosion at the river picnic sites due to anglers, swimmers and other accessing the river's edge (the Wildlife Management Area road crew recently installed erosion control structures at both picnic sites and stabilized the boat dock pilings which were being undercut by the river). Handrails along the steps leading up from the boat dock are not safe. Defined parking should be developed at the River



Road picnic area to help correct the erosion problem and prevent further damage to surrounding trees through root compaction.



Camping: Primitive camping is allowed only by special use permit. Boaters are allowed access from the river for overnight camping at designated spots.

Entrances: Andrews has two entrances. The main entrance is marked by a primary entrance signs, three-panel information kiosk, hunter check station, area office, an iron ranger fee station, and an information sign with payment instructions.



The entrance should be improved with information to orient visitors to available recreation opportunities on the area and by

replacing the aging green and yellow routed wood signs.



III. Proposed Visitor Experiences and Recreational Uses

A. Appropriate Recreational Uses on Andrews WMA

Based on the interpretive themes developed for the area, the analysis of existing resources and uses, and the approved uses and activities as stated in the 2001-2006 Conceptual Management Plan (pages 30-31 and 116-121), the following activities should be continued and enhanced on Andrews:

- Hunting
- Fishing
- Wildlife viewing
- Nature study
- Photography
- Hiking
- Biking
- Paddling
- Picnicking

B. Recreation Management Zones

Recreation studies demonstrate that visitors come to recreate on public lands with many different expectations (NPS, 1997). Providing a variety of settings allows visitors to select the type of experience they desire, simplifies management and reduces conflicts between visitors who are seeking different types of experiences. The zones delineated by the planning team are provided on Map 3: Conceptual Site Plan. Each zone is described in terms of the type of experience it offers, the natural resources related to the experience and the level of management required.

1. Semi-primitive Zone

The semi-primitive zone provides a sense of being immersed in a natural landscape with opportunities for solitude. Observation structures, boardwalks, interpretative signs, and unpaved trails are the types of recreational facilities that are appropriate in this zone. A moderate level of management is provided for resource protection and safety.

Within the semi-primitive zone on Andrews, visitors will experience the major community types including floodplain forest, hardwood hammock, and mixed pine/hardwood forest. Here they can learn about the complex relationship of upland and wetland communities in providing critical habitat to many species of wildlife.

The majority of Andrews WMA is categorized as semi-primitive.

2. Developed Zone

The developed zone contains visitor facilities such as parking, restrooms and picnicking. The visitor's experience in this zone is highly social. This is the most appropriate zone for building construction. Trails may be paved or hardened for access by people with disabilities. The level of monitoring and management is highest in this zone to ensure resource protection and visitor satisfaction and safety. The most intensive interpretation is provided in the developed zone. The developed zones on Andrews are located around the entrances and trailheads.

3. Sensitive Resource Protection Zone

Sensitive resource protection zones encompass areas with fragile habitats, rare and endangered species, archaeological/historical sites, and steep slopes. This zone can support little visitor impact. Only limited and strictly controlled access should be allowed for interpretation purposes. The sensitive zones on Andrews are areas around wetland communities, sinkholes and the steep river bluff.

C. Visitor Experience Goals

At Andrews WMA, the FWC will provide opportunities for visitors and area residents to:

1. Learn information and stories associated with major interpretive themes through interpretive materials accompanying welcome kiosks and at trailheads.
2. Become oriented to and participate in a range of recreational activities on Andrews and adjoining natural areas while learning about its:
 - wildlife and natural plant communities, and
 - natural, cultural and commercial history of the area in context with the history and prehistory of Florida.
3. Have an enjoyable recreational experience without impairing the natural and cultural resources of the site.
4. Understand the management role and goals of the FWC on Andrews WMA.

D. Proposed Visitor Experiences and Recreation Facilities

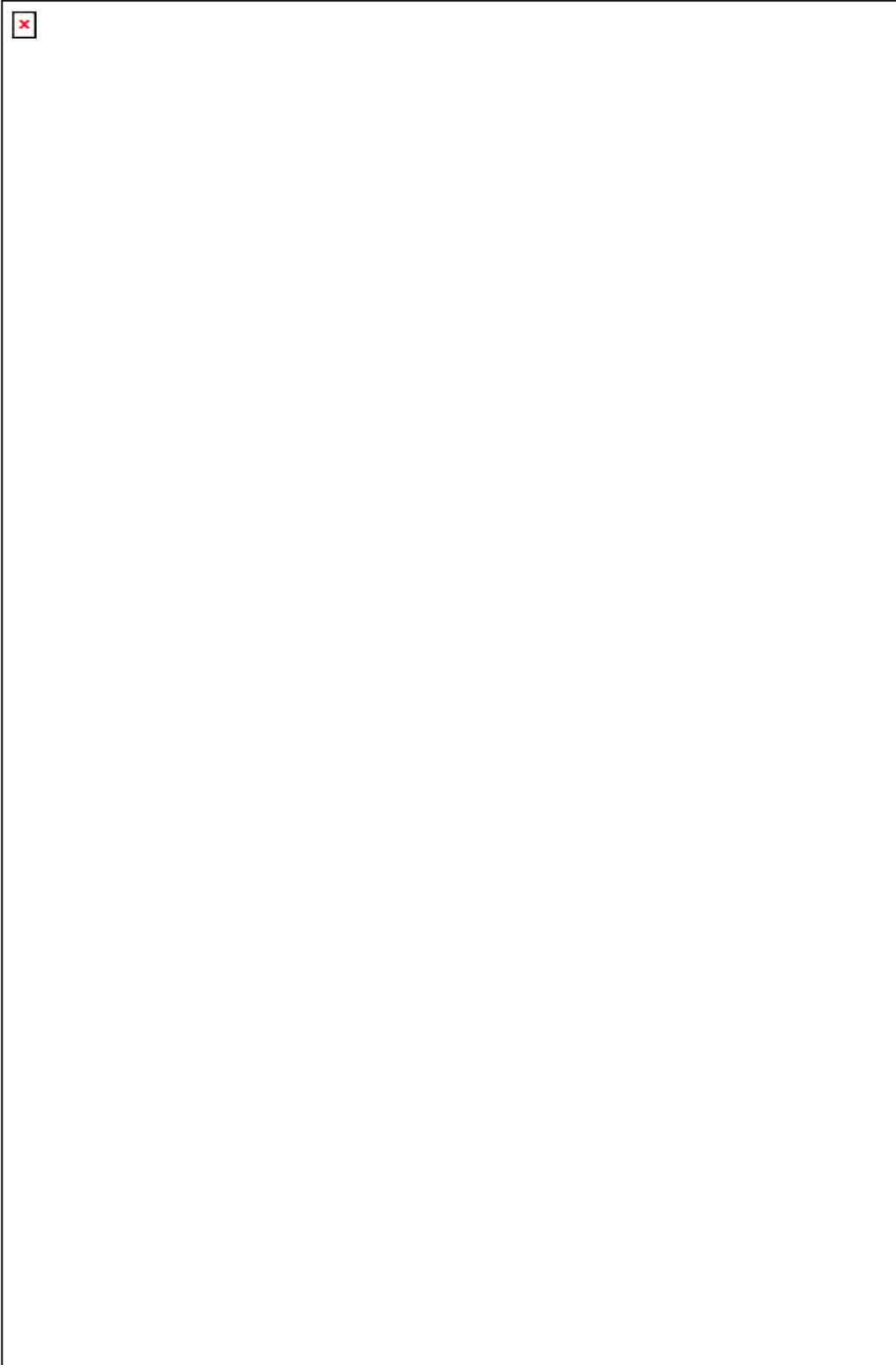
The following narrative describes the overall experience that is intended for visitors to Andrews WMA. A conceptual site plan for proposed recreation facilities is provided on Map 3. Visitors will arrive at the main entrance where the existing kiosk provides an overview of the habitats and wildlife that visitors can expect to see on the area. A second, smaller kiosk will be erected at the pay station providing a full color area map with information about the recreational

opportunities available on the area, including hiking, biking and wildlife viewing opportunities. Area bird lists and recreational guides will also be located on this kiosk.

From the main entrance, visitors continue on River Road to the trailhead and picnic area on the banks of the Suwannee River. Here they can throw in a fishing line and enjoy the sites and sounds of Florida's most famous river including leaping Gulf sturgeon during the spring and summer months. A small kiosk displays a map and information about trail opportunities on the north half of the property. Hikers and cyclists can take the loop trail that meanders north through a hardwood hammock and heads west to an interesting park-like community on the bluffs of the Suwannee River. At this point, the trail loops back to the south toward the trailhead and crosses, via boardwalk, a floodplain forest of large second growth cypress trees. Evidence of early 20th century logging operations are common in the way of large stumps and drag trails from the swamp forest to the banks of the Suwannee. In the spring, visitors can view bright yellow prothonotary warblers as they go about their breeding and nesting activities.

Visitors can access the southern part of the property on Fanning Road, which leads south from River Road to the intersection of Dick's Slough and Randall Roads. These canopy roads provide several miles of scenic driving through one of Florida's largest contiguous tracts of hardwood forest. At the intersection of the above mentioned roads, there is a trailhead with a small kiosk that provides information about a series of loop trails through the forest. Spurs from these trails will lead hikers and cyclists to the sites of three national champion trees including a Florida maple, persimmon, and bluff oak.

Several wildlife-viewing structures provide visitors with the opportunity to see a variety of wildlife including deer, turkey and hogs. A blind, located on the edge of an opening just off Fanning Road, will provide visitors, including those with disabilities, a sheltered, ground level viewing experience. Two observation towers in the southeastern corner of the property, located on the edge of wildlife food plots, provide the opportunity for visitors to see wildlife from a 15-foot vantage point.



Map 3. Conceptual Recreation Site Plan

IV. Prescriptions

A. Recommended Nature-Based Recreation Goals and Objectives

The goals and objectives in this section focus primarily on the WMA. However, recommendations have been made to partner with other agencies and organizations to enhance recreational and conservation education opportunities on not only Andrews but within the region as well.

Careful design and placement of recreational facilities can provide suitable visitor experiences and minimize impacts to the natural and cultural history of the area. All planning and implementation should be done in accordance with guidelines in Appendix 1. A conceptual site plan for proposed recreation facilities is provided on Map 3.

Goal A: Design and implement a comprehensive multi-use trail system

1. Redesign the trail system to enhance wildlife viewing opportunities and the overall interpretive program. Reroute existing trails to establish nested loops to reinforce interpretive concepts and to provide all trail opportunities from either trailhead.
2. Create spur trails from the main loop trails as necessary to champion trees or other features of interest.
3. Develop a loop trail system in the northern portion of the property that features the Suwannee River, hardwood swamps and hardwood forests. As part of this loop trail, develop a trailhead at the end of river road and construct a boardwalk/footbridge through the hardwood swamp.
4. Develop a loop trail system in the southern portion of the property that features the unique features of the hardwood forest including all champion trees. As part of this loop trail, develop a trailhead at the intersection of Fanning, Dick's Slough and Randall Roads.
5. Develop a connector route between loop trail system in north and that in the south.

Goal B: Renovate facilities and develop new wildlife viewing/recreation opportunities

1. Construct one viewing blind (accessible to people with disabilities) with interpretive panels on the edge of the food plot on the east side of Fanning Road just north of the Hardwood Hammock Trailhead.

2. Provide vegetative screening to enhance viewing opportunities and reduce wildlife disturbance at the Gopher Road and Persimmon Trail viewing towers.
3. Install picnic tables at the Hardwood Hammock Trailhead.
4. Retrofit existing River Road picnic facilities to accommodate people with disabilities. Define parking area to correct erosion and prevent further root compaction.
5. Stabilize the existing dock on the Suwannee River and improve the handrail on the steps leading from dock to the top of the riverbank.

Goal C. Orient visitors to the area and its recreation opportunities and provide interpretive information

1. Develop and install new wayfinding signs at appropriate locations (as described in the sign plan, Appendix 3).
2. Improve the existing entrance kiosk by installing 2 new interpretive panels to establish the significance of the area and invite users in.
3. Develop and install new information kiosks at the pay station, at the Suwannee River Trailhead at the end of River Road, the dock area on the Suwannee River, and the Hardwood Hammock Trailhead at the intersection of Fanning and Dick's Slough Road.
4. Install interpretive panels at key locations along the trail system.
5. Develop area recreation guide with high quality map and information about available recreation opportunities.
6. Stock recreation guide and bird list in brochure racks at entrance kiosk.
7. Maintain up-to-date information about the area on the FWC website.

Goal D: Manage recreational use to minimize negative resource impacts and maximize visitor satisfaction

1. Implement a monitoring strategy to assess resource impacts and institute corrective management actions if indicators begin to approach standards.
2. Collect and evaluate information about visitor use and satisfaction:
 - Number of visitors to the area and patterns of visitation
 - User group conflicts

- Origin and length of stay
- Motivations for visiting and preferred experiences
- What they already know about the area, and what they learned about primary interpretive themes

Goal E: Coordinate with local, regional, state and federal agencies and organizations when planning and implementing nature-based recreation opportunities

1. Communicate regularly with the local tourist development council to ensure responsible and accurate promotion of nature-based recreation opportunities.
2. Coordinate with appropriate agencies to develop connector trails between Andrews and adjacent properties.

B. Challenges and Strategies

There are numerous challenges facing the effective implementation and management of nature-based recreation opportunities on the Andrews WMA. Challenges and proposed strategies to address them are discussed in this section.

Challenges:

- As recreational uses expand in scope and increase in volume, resource impacts may occur. Uncontrolled access to the banks of the Suwannee River is damaging the sensitive river bluffs and causing erosion and sedimentation problems. This problem may get worse with increased visitor use. Swamps, sinkholes and other wetland habitats could be adversely affected from soil disturbances resulting from inappropriate hiking and biking activities.
- As recreational uses expand in scope and increase in volume conflicts among user groups may occur.

Strategies:

- Avoid sensitive environments to the greatest degree possible when planning for recreational uses. Consistently provide environmental protection information in all interpretive materials. Continually monitor all recreational uses for environmental impacts and implement corrective actions when and where necessary.
- Provide a range of recreational opportunities in a variety of settings to avoid user conflicts as much as possible.

C. Work Plans

As annual work plans and budgets are developed for Andrews WMA, Recreation Services staff will assist the area manager with developing cost estimates for nature-based recreation related construction such as interpretive kiosks, boardwalks or trails and estimates of hours required for tasks such as trail maintenance. Recreation Services staff will design interpretive materials for the areas in consultation with management area staff.

D. Monitoring and Management of Recreation Facilities

Measurable indicators for monitoring key aspects of the visitor's experience and resources at Andrews WMA are described in Appendix 2. Standards represent the point at which visitor experience and resource conditions become unacceptable. Indicators should be monitored for each zone, and when necessary, management actions taken to ensure that visitor use and resource impacts remain within the established standards.

References

Florida Fish and Wildlife Conservation Commission. 2001. A Conceptual Management Plan for Andrews Wildlife Management Area (2001-2006).

National Park Service. 1997. The Visitor Experience and Resource Protection (VERP) Framework: A Handbook for Planners and Managers.

Appendix 1

Recreation and Wildlife Viewing Facilities Design Guidelines

Entrances

Should welcome visitors to the area, identify the Commission, describe the range of potential experiences on the area, describe the wildlife viewing experiences by season, time of day or wildlife event.

Viewing structures

Structures should include wildlife identification or other interpretive information. The structure should be surrounded by and focused on wildlife and habitat, rather than being the focus itself. For towers, each level should focus visitor attention to a different habitat or feature.

Trails

Trails should be described at the trailhead with length or time required. If the focus is wildlife viewing, include best seasons. Interpretive panels or brochure stops should be well-spaced and focused by season and should not exceed $\frac{1}{2}$ to $\frac{3}{4}$ of a mile.

General considerations in developing facilities:

- Locate viewing facilities on previously disturbed properties wherever possible.
- Preserve a sense of solitude and limit impact on natural resources by concentrating recreation uses in small “developed” zones and along existing road/trail corridors.
- Site facilities and design trails to minimize user conflicts.
- Avoid sensitive areas such as wetlands and route trails to avoid fragmenting habitat.
- Consider physical characteristics and the historical and natural character of the location.
- Adapt parking lots, buildings, and other physical developments to existing topography.
- Retain on-site surface water run-off generated by development.
- Use porous pavements where surface hardening is required.
- Consider sewage disposal needs.
- Use native plants representative of the area for all landscaping.
- Design and build trails and observation structures to avoid disturbing wildlife and to minimize negative impacts such as erosion.
- Use elevated boardwalks in wet areas and swamps and walkovers to protect other sensitive areas.
- Incorporate wildlife viewing ethics into all interpretive materials.
- Incorporate interpretive themes into all brochures, trail guides and other materials produced to support recreation opportunities.
- Install interpretive signs and panels as appropriate at all recreation facilities.
- Route trails to interpret restoration and wildlife management activities.
- Insure interpretation of highly desired species viewable on the area.

Universal Access

Nature-based recreation facilities and programs must be developed and implemented in compliance with the Americans with Disabilities Act. All facilities in developed zones should be universally accessible. Recreation facilities in semi-primitive or primitive zones should be planned to be accessible to the degree possible except where:

- compliance will cause harm to cultural, historic or religious sites or significant natural features or characteristics
- compliance will substantially alter the nature of the setting or purpose of the facility or portion of the facility
- compliance would require construction methods or materials prohibited by federal, state or local regulations or statutes, or compliance would not be feasible due to terrain or prevailing construction practices.

Appendix 2 Management and Monitoring

Provisional Resource Indicators and Standards

These indicators and standards are provisional and should be tested to ensure they are feasible to monitor and provide useful data. They should be revised as necessary after field-testing and then maintained. Indicators measure both resource and social conditions and should be measured annually. If indicators show that conditions are approaching or exceeding a standard, monitoring frequency may need to be increased to determine if corrective management actions are having the desired effect.

Social Indicators and Standards:

ZONE	INDICATORS	STANDARDS
Upland Mixed Use Trail and Paddling Trail	Conflicts between different groups	No conflicts
	Number of groups encountered per day	1 group of 2 to 4
Developed (wildlife viewing facilities, picnic areas)	People at one time (PAOT) per zone	3 – 4 groups of 3 each
	Parking congestion	Parking area at 75% capacity
Sensitive Resource Protection Zone	PAOT	0

Resource Indicators and Standards:

- Trail Widening
- Density of Social (unofficial) Trails
- Road Widening
- Ground Cover (percent cover)
- Frequency of Litter

Trail Width – Some variance in tread width is acceptable and even preferred. But, if sections of the trail seem to be widening due to use (such as hikers cutting corners, avoiding unfavorable tread, etc) document existing and potential problem areas and specify exact location so immediate corrective action can be taken.

Trail type	Tread Width (m)	Cleared Width (m)	Grade	Height (m)
Hiking Trails	0.6	1.2	Max. 10%	2.1
Biking	Desirable 2.4 Min. 1.5	Same	Max. 8%	2.1

Source: National Recreation and Park Association

- 1 = width is at standard
- 2 = width exceeds standard in a few spots
- 3 = trail widening and social trail observed in numerous areas

Erosion – Observers should visually estimate erosion based on the following criteria:

- 1 = Very Little
- 2 = Some: Tree roots or standing water evident
- 3 = Moderate: Exposed trees or rocks but little evidence of widening, some exposed soil
- 4 = Extensive: Tree roots exposed and damaged. Many exposed patches of soil. On trails, ruts formed and evidence of widening
- 5 = Very Extensive: Eroded to substrate or tree roots severely damaged. On trails, ruts significant and significant evidence of widening. Extensive stretches of exposed soil.

Litter – Observers should estimate the amount of litter collected along trails or in developed areas based on the following criteria:

- 1 = None
- 2 = Very Little, <5 pieces.
- 3 = Some, 5 – 10 pieces
- 4 = Extensive, 10 – 15 pieces
- 5 = Very Extensive, 15 + pieces

Sanitation – To determine the need for toilet facilities, note the amount of litter associated with human waste.

Monitoring

Resource and visitor data should be regularly collected in a consistent manner to determine if standards are being exceeded. This task should be incorporated into the work plan for the area. Monitoring data can demonstrate if visitor use is exceeding capacity and will support decisions to limit recreational access if necessary. An initial survey should be conducted to serve as a baseline and monitoring should be conducted annually. Traffic counters can be installed as desired to generate data on vehicles entering the area. Photos stations should be set and photos taken each time the area is monitored.

Trail Maintenance

Conditions should be inspected approximately once every 3 months. Ideally, volunteers can assist in checking trails and document litter, erosion, and trail widening, vandalism, trail obstructions, wet conditions and informal trails. A logbook may be placed near the trail for users to document any experiences on the trail, including species seen, obstructions or hazards, signage problems and general comments.

Example Monitoring Form

Observer: _____

Date: _____

Site: _____

Litter Rank (circle one):

1 = None

3 = Some, 5 – 10 pieces

5 = Very Extensive, 15 + pieces

2 = Very Little, < 5 pieces.

4 = Extensive, 10 – 15 pieces

Comments:

Were there any erosion problems? Please note the exact location and rank according to following criteria:

1 = Very Little

2 = Some: Tree roots or standing water evident

3 = Moderate: Exposed roots/rocks but little evidence of widening, some patches of exposed soil.

4 = Extensive: Many tree roots exposed, many spots of exposed soil, ruts and/or trail widening.

Comments:

The hiking trail should be between about 3 and 4 feet wide. Please rank overall trail width.

1 = 3 ft. (OK)

3 = 5 ft. (exceeding standards)

2 = 4 ft. (just about “normal”)

4 = 6 ft. (unacceptable)

If there were problem areas, please describe condition and exact location:

How many other groups of hikers did you encounter along the trail? How many vehicles were in the parking lot?

_____ groups _____ approx. # in the group _____ vehicle in parking area

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Appendix 3 Andrews WMA Sign Plan

This sign plan contains locations for both wayfinding (directional) signs and interpretive panels. Existing wayfinding signs are wooden, routed signs and should be replaced with aluminum or recycled plastic signs for a consistent look throughout the WMA system.

US Highway 19 and NW 160th St: Approach sign (wildlife viewing site) is already installed

NW 160th St/DEP Rail Trail/CR 207: wayfinding

NW 160th St./AWMA Entrance: add 2 panels to existing kiosk

Fee Station: add small kiosk

River Road/1st trail on right: wayfinding

River Road/1st road on right: wayfinding

River Road-Suwannee River Trailhead: medium kiosk with 1 map and 3 interpretive panels

Suwannee River Loop Trails (north of River Trailhead): trail markers

Boardwalk through Cypress Swamp: rail mounted interpretive panel

Connector Trail from River Trailhead to Dock: trail markers

Dock (River Access): small kiosk with 1 map panel and 1 interpretive panel **Connector**

Trail from Dock to Hardwood Hammock Trail Loops: Trail markers **River**

Road/Fanning Road: wayfinding

Accessible Viewing Blind on Fanning Road: 2 interpretive panels

Fanning Road/Dick's Slough Road/Randall Road: wayfinding **Randolph**

Road/Gopher Road: wayfinding

Two Existing Viewing Towers: 1 interpretive panel for each

Hardwood Hammock Trailhead: Small kiosk with 1 map panel and 1 interpretive panel

Hardwood Hammock Trail Loops: Trail markers

Champion Trees: 3 tree markers

Appendix 4

Work Plan for Nature-Based Recreation Enhancements

Based on the prioritization of the goals and objectives listed above, the following list of projects and tasks has been ordered in terms of short and long term completion timeframes.

1. Year one through three

- Install new wayfinding signs on area road system.
- Redesign the trail system and establish trailheads.
- Construct boardwalk on Suwannee River Loop Trail.
- Construct kiosks and install interpretive and informational signs.
- Construct wildlife viewing blind.
- Develop area brochure with high quality map and information about available recreation opportunities.
- Retrofit existing picnic facilities to provide accessibility.
- Install additional picnic tables.

2. Long-Term Completion and Ongoing Tasks

- Monitor need for restroom facilities at River Road and/or boat dock area.
- Communicate regularly with the local tourist development council to ensure responsible and accurate promotion of nature-based recreation opportunities.
- Work with other agencies to coordinate regional recreational opportunities. (For example, Suwannee River Wilderness Trail and rail trail.)
- Implement a monitoring strategy to assess resource impacts and institute corrective management actions if indicators begin to approach standards.
- Inspect boat dock, boardwalk and other constructed facilities
- Update and revise consumable interpretive materials
- Collect and evaluate information about visitor use and satisfaction.